

PROJECT MANUAL

SPECIFICATIONS AND CONDITIONS OF THE CONTRACT

Volume 1 of 2
Divisions 00 - 14

Creekland Middle School Classroom Addition

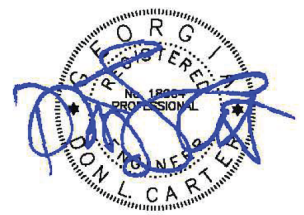
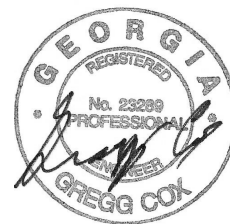
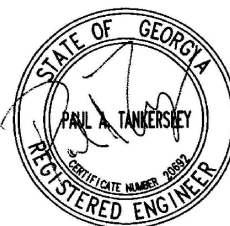
Cherokee County School District

Perkins&Will Project Number:

801873.000

Construction Documents:

June 22, 2023



DOCUMENT 00 01 10

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Gym
Cherokee County School
District
2022.N.19.01**



06-22-2023

**SECTION 001113
REQUEST FOR PROPOSALS ("RFPS")**

THE CHEROKEE COUNTY, GEORGIA, BOARD OF EDUCATION (the "Owner"), under the provisions of O.C.G.A. § 36-91-1, et. seq. herein seeks competitive sealed Proposals from General Contractors (GCs) for the construction of the Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym (the "Project").

Proposals will be received through the Bonfire Interactive Portal ("Bonfire"), until 2:00 p.m. on the 17th day of August 2023 for General Contractor Services for RFP No. 2022.N.19.01 for the Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym project. The Owner shall not consider late Proposals. Proposals received after said time will not be accepted. Paper copies, emails, and/or faxes of Proposals will not be accepted.

SCOPE OF SERVICES

To provide GC services for the construction (site, building, and systems) of the Owner's Construction of the Project as specified per the Proposal Documents.

The requirements for this Project, and the duties and responsibilities of the GC whose Proposal is accepted, are outlined in the Contract Documents which include the Instructions to Proposers; Contract for Construction and Incorporated General Conditions (the "Contract"); supplementary and other conditions; the drawings; the specifications; and, any addenda issued by the Architect. The Contract Documents require, among other things, the furnishing of all materials, labor, and equipment for the construction of the Project. The Owner reserves the right to make available other relevant documents or information concerning the Project.

RFP documents will be available Thursday, June 22, 2023, and may be obtained through the Bonfire Interactive Portal at www.cherokeek12.net.

MANDATORY PRE-PROPOSAL CONFERENCE WITH SITE VISIT

A mandatory Pre-Proposal Conference, in conjunction with a site visit, will be held at 01:30 p.m. local time on Thursday, July 06, 2023. The Pre-Proposal Conference will be conducted at the Cherokee County School District Support Services Office, 200 Mountain Brook Ct, Canton, GA 30115.

SCHEDULE FOR SELECTION (dates are subject to change)

| | |
|---------------------------------------|---|
| Mandatory Pre-Proposal Conference | July 06, 2023, @ 01:30 p.m. |
| Mandatory Site Visit | July 06, 2023, @ 01:30 p.m. |
| Final Questions Due | August 02, 2023, not later than 2:00 p.m. |
| Final Addendum Issued (if necessary) | August 04, 2023, not later than 2:00 p.m. |
| Proposals Due | August 17, 2023, not later than 2:00 p.m. |
| Anticipated Board Review and Approval | September 14, 2023 |

**Creekland MS Classroom
Addition and Creekview HS
Classroom Addition - Auxiliary
Gym
Cherokee County School
District
2022.N.19.01**



06-22-2023

Any Proposal submitted in response to this RFP should strictly comply with all requirements outlined in the Instructions to Proposers - Section 002116. Any such Proposal must contain the completed Proposal Form - Section 004213 setting forth the GC's proposed lump sum contract price for the complete construction of the Project in conformity with all requirements of the Contract Documents. Any Proposal must include a fully executed Bid Bond - Section 004313 in the amount of five percent (5%) of the proposed lump sum contract price (exclusive of any alternates and unit prices) in the exact form referenced. As noted above, any contractor submitting a Proposal must also complete and submit the required General Contractors Checklist and Certification - Section 002118.30, along with all referenced Owner's Standard Forms. For any work requiring a specialty or professional license, only licensed subcontractors may be submitted for consideration.

In evaluating Proposals, the Owner may seek additional information from any Contractor concerning such GC's Proposal to construct the Project. Additionally, the Owner at its discretion, and in conformity with the applicable provisions of Georgia Law, the Owner may afford GCs an opportunity for subsequent discussion, negotiation, and revision of Proposals. The Owner reserves the right to reject any Proposals and to waive technicalities and informalities.

The Owner intends to award the Contract to the responsible and responsive GC whose Proposal is determined in writing to be the most advantageous to the Owner, taking into consideration the following evaluation factors which are outlined in the Instructions to Proposers, Item P – Contract Award.

Except as expressly provided in, or permitted by, the Proposal Documents, from the date of issuance of the RFP until the final Board action of approval of Contract Award, the GC submitting a Proposal shall not initiate any communication or discussion concerning the Project, the RFP or the GC's Proposal or any part thereof with any employee, agent, or representative of the Owner. Any violation of this restriction may result in the rejection of the GC's Proposal.

END OF SECTION 001113

SECTION 001119.15
DEFINITIONS

Definitions contained in the proposed Contract Documents shall apply to the Proposal Documents.

- 1) **Addenda:** Addenda are written, or graphic instructions issued by the Architect before Proposal closing which modify or interpret the Proposal Documents by additions, deletions, clarifications, corrections, or revisions.
- 2) **Alternate Proposal:** An Alternate Proposal is an amount stated in the Proposal to be added to, or deducted from, the amount of the Base Proposal if the corresponding change in the Work, as described in the Proposal Documents ("Alternate"), is accepted.
- 3) **Architect:** The Owner has selected as the Architect, the Architect listed in the Request for Proposals, who has prepared plans and specifications and who will administer the Contract for Construction. If the Owner's design professional for the Project is an Engineer rather than an Architect, then the term "Architect" as used throughout the Proposal Documents shall mean "Engineer".
- 4) **Base Proposal:** Base Proposal is the sum stated in the Proposal for which the Proposer offers to perform the Work described in the Proposal Documents as the base to which Work may be added, or from which Work may be deleted, for sums slated in the Alternates, if any.
- 5) **Board:** Wherein the word "Board" is used it shall refer to the Cherokee County, Georgia, Board of Education aka the Cherokee County School Board.
- 6) **Closeout:** The period during which all details of both construction and commissioning are completed.
 - A. The Closeout period is the time from the date of Substantial Completion until final payment, both as defined by the Conditions of the Contract.
 - B. Before and during the Closeout period, the Owner will ascertain whether the completed project complies with the Contract Documents.
 - C. GC is responsible for the operation and maintenance of the project until the end of the Closeout period.
 - D. Training of Owner's personnel in operation and maintenance occurs during the Closeout period unless specifically indicated otherwise for certain items.
- 7) **Contract Documents:**
 - A. At the time of execution of the Agreement, Contract Documents consist of the following:
 1. The Contract for Construction and Incorporated General Conditions.
 2. The Proposal and Proposal Exhibits, except for provisions that contradict the requirements of the Conceptual Documents and that are not specifically accepted by the Owner through written Modification before the execution of the Contract for Construction.

- B. From time to time after execution of the Contract, upon approval by the Owner, the following types of documents will be incorporated into Contract Documents:
1. The Proposal.
 2. The Project Program.
 3. Drawings and other documents documenting the design.
 4. Construction drawings and specifications detailing the execution of the design.
- 8) **General Contractor:** ("GC") A qualified and experienced GC holding a current and valid General Contractor Licence from the State of Georgia, to perform general construction services by adhering to all Federal, State, Local, and District laws, regulations, and policies, while also meeting the qualifications outlined in Section 002116 ~ Instructions to Proposers, specifically Items Q - GC's Qualifications.
- 9) **Occupancy:** The period during which the project is occupied for its intended purpose.
- A. The Occupancy period begins at the Date of Substantial Completion, as defined by the Conditions of the Contract.
- B. GC is responsible for the operation and maintenance of the project until the end of the Closeout period.
- 10) **Owner:** The Owner is whom the Work will be executed: the Cherokee County School District, 1205 Bluffs Parkway, Canton, GA 30114. The Owner may be referred to as "Owner" or "District" interchangeably throughout this project manual.
- 11) **Project Program:** The Owner's requirements for size, arrangement, organization, and location of functional spaces, description of space functions, identification of fittings, equipment, and furnishings, description of the physical and environmental requirements for each space, together with a description of the image, goals, or "mission" of the project.
- 12) **Proposal:** A Proposal is a complete and properly executed Proposal - Section 004213 to do the Work in accordance with the Contract for the sums stipulated in the Proposal supported by data required by the Proposal Documents, submitted in accordance with the Proposal Documents. Complete Proposal submission must also include the following fully completed and executed forms:

| Section ID | File Name |
|-------------------|---|
| 002116.35 | Offeror's and Individual's Affidavit of Non-Collusion |
| 002118.30 | General Contractor's Checklist and Certification |
| 002118.40 | Conflict of Interest Disclosure Affidavit |
| 002118.45 | Consent to Release Information |
| 004300 | Subcontractor Listing |
| 004313 | Bid Bond |
| 006113.12 | Vendor Reference Form |
| 006113.18 | Contractor Affidavit |
| 006113.17 | Suspension and Debarment Certification |
| N/A | Sample Certificate of Insurance, per General Conditions |

| <u>Section ID</u> | <u>File Name</u> |
|-------------------|--|
| N/A | Copy of Business License, per General Conditions |
| N/A | Acknowledge ALL Addenda (if any) on the General Contractor's RFP Checklist |

A. Corporate Authority

13) **Proposal Documents:** Proposal Documents means the inclusion of the following:

| <u>Section ID</u> | <u>File Name</u> |
|-------------------|--|
| 001113 | Request for Proposals |
| 001119.16 | General Conditions |
| 002116 | Instructions to Proposers |
| 002116.10 | Instructions for Submitting Proposals |
| 002116.35 | Offeror's and Individuals' Affidavit of Non-Collusion |
| 002118.40 | Conflict of Interest Disclosure Affidavit |
| 002118.45 | Consent to Release Information |
| 003113.16 | Master Project Schedule |
| 003113.17 | Cherokee County School District Calendars |
| 003113.20 | Special Conditions |
| 004213 | Proposal Form |
| 004215 | Request for Best and Final Offers |
| 004300 | Subcontractor Listing |
| 004313 | Bid Bond |
| 005510 | Resolution (Board) |
| 006113.12 | Vendor Reference Form |
| 006113.13 | Performance Bond |
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| 006113.17 | Suspension and Debarment Certification |
| 006113.18 | Contractor Affidavit |
| 007213 | Contract for Construction and Incorporated General Conditions Plans and Specifications All other proposed Contract documents |
| N/A | Any Addenda issued prior to Solicitation Opening |

A. The form of Corporate Certificate, Partnership Certificate, or Entity Certificate.

14) **Proposer:** A Proposer is a person or entity who submits a Proposal.

15) **Subcontractor:** A Subcontractor is a person or entity who submits a bid to a Proposer for materials, equipment, or labor for a portion of the Work.

16) **Substantial Completion:** The date as defined in the Conditions of the Contract. The date of Substantial Completion is the due date of the following:

A. GC's complete punch list of items to be itemized.

B. Owner's complete punch list of items to be itemized.

C. Compliance with the requirements of governing authorities, for submittals, inspections, and permits.

- D. Compliance with the Owner's requirements for access to areas occupied by the Owner.
 - E. Final cleaning.
 - F. Maintenance manuals.
 - G. Warranties.
 - H. Spare parts and extra materials.
 - I. Maintenance supplies and tools.
 - J. Project record documents.
 - K. Final site survey.
 - L. Maintenance plan.
- 17) **Unit Price:** Unit Price is an amount stated in the Proposal as a price per unit of measurement for specified materials, equipment, or services or a portion of the work as described in the Proposal Documents.

END OF SECTION 001119.15

SECTION 001119.16
GENERAL CONDITIONS

General Conditions

- A. **Business License** Respondents are required to submit with their Proposal, a copy of their valid company business license. If the Respondent is a Georgia corporation, the Respondent shall submit a valid county or city business license. If the Respondent is not a Georgia corporation, the Respondent shall submit a certificate of authority to transact business in the state of Georgia and a copy of their valid business license issued by their home jurisdiction. If Respondent holds a professional certification that is licensed by the state of Georgia, Respondent shall submit a copy of their valid professional license. Any license submitted in response to this requirement shall be maintained by the Respondent for the duration of the Contract.
- B. **Conditional Proposals** Proposals that are conditional and/or in any way qualify or vary the terms of these instructions, conditions, and specifications shall be considered non-responsive and shall be rejected.
- C. **Confidentiality and Non-Disclosure** Information made available to Respondents by the District shall be used only for purposes related to responding to this RFP and shall not be used for any other purpose without the express written permission of the District.
- Respondents to this RFP unequivocally agree to assume responsibility for protecting and safeguarding the confidentiality of District records that are not public information. Such information may include but is not limited to student and human resource file contents.
- D. **Conflict of Interest** Respondents shall disclose with their Proposal the name of any officer, director, or agent who also is an employee of the District or a member of the Board. Respondents shall also disclose the name of any District employee or Board member who owns, directly or indirectly, an interest in five percent (5%) or more in the Respondent's company or any of its branches. Respondents shall certify that their response to this RFP is impartial, at arms-length, and free of any conflict of interest, unfair advantage, or personal benefit to any District official.
- E. **Costs Incurred** The District is not liable for any costs incurred by a Respondent in preparing and/or submitting a response to this RFP or for any interview if requested. Any costs incurred by the Respondent in preparing and/or submitting a response to this RFP and interviewing with the District (if requested) shall be the sole responsibility of the Respondent and shall not be reimbursed by the District.
- F. **Contract Terms** The District's Standard Form of The Contract for Construction and Incorporated General Conditions - Section 007213 between the Board and the General Contractor, specifically outlines the contractual responsibilities. All Respondents should thoroughly review the documents before submitting a Proposal. No alterations can be made in the Contract after award by the Board.

- G. **Drug-Free Workplace** By submission of a response to this RFP, the Respondent certifies that he/she and his/her employees shall not engage in the unlawful manufacture, sale, distribution, dispensation, possession, or use of controlled substances or drugs during the performance of the Contract.
- H. **Georgia Open Records Act** Without regard to any designation made by the person or entity submitting, the District considers all information submitted in response to this invitation or request to be a public record that may be disclosed upon request under the Georgia Open Records Act, O.C.G.A. § 50-18-70 et seq., without consulting or contacting the person or entity submitting, unless a court order is presented with the submission. You may wish to consult an attorney or obtain legal advice before submitting.
- I. **Indemnification** The GC shall indemnify and hold the Owner harmless from any claims, liability, damages, loss, liens, costs, and expenses of every type whatsoever including, without limitation, attorneys' fees and expenses, arising out of or in connection with the GC's performance of this Contract and the Work, to the extent caused by the GC, or anyone for whose acts the GC is or may be responsible or liable, regardless of whether such liability, claim, damage, loss, cost or expense is caused in part by the Owner. The GC shall not indemnify or hold harmless the Owner against claims for damages, losses, or expenses, including attorneys' fees, caused by or resulting from the sole negligence of the Owner, or its officers, agents, or employees; provided, however, this indemnification obligation shall not be limited by any limitation on amount or type of damages, compensation, or benefits payable by or for the GC or its subcontractors, sub-subcontractors, or suppliers under workers' compensation acts, disability benefit acts or other employee benefit acts.
- J. **Insurance** A Certificate of Insurance and/or ACCORD form is a mandatory requirement with solicitation submittal. Proposals submitted with certificates of insurance will be considered conditionally responsive to the insurance and indemnification requirement. The final award of this RFP will be contingent upon receipt within five (5) business days of the request for insurance documentation. In the event the awarded Respondent cannot produce insurance coverage acceptable to the District within the time provided, the District reserves the right to award this solicitation to the next highest-ranked firm. Please refer to Article XIV of the Contract for the required insurance.
- K. **Interviews** The District reserves the right to require Respondents to participate in one or more interviews with District staff. Respondents must be prepared to discuss the salient points of their Proposal within seven (7) normal working days of being asked to participate in interviews. There are to be no presentations, individually or collectively, without such an invitation.
- L. **No Assignment of Award** The successful Respondent may not assign the award or Contract to or subcontract with another party without the express written permission of the District.
- M. **Non-Collusion** Respondents shall fully certify that they, as individuals or as officials of a business entity have not entered into any agreement, participated in collusion, or otherwise taken any action in restraint of free and competitive responses to this RFP. Further, Respondents guarantee that their response is not made in conjunction with or on behalf of

another party and that they have not been directly or indirectly induced in any manner or taken any action to result in a restriction of trade or an unfair advantage.

- N. **Non-Discrimination** The District does not discriminate based on race, color, religion, sex, national origin, age, or disability in any of its employment practices, education programs, services, or activities.

The District supports an open, fair, and impartial free-market system which maximizes competition and seeks to include all responsible businesses and provides ample opportunities for business growth and development. Minority businesses are encouraged and allowed to submit a Proposal on various projects; however, all responses will be evaluated on the same criteria. It is not the intention or desire of the District to restrict or impede competition, nor to increase the cost of the work.

- O. **Permits and Applicable Law** Respondents shall at their own expense obtain all necessary permits, certifications, and licenses and shall comply with all applicable local, state, and federal laws, ordinances, rules, and regulations necessary to fully execute the requirements stated herein. Respondents shall maintain all such permits, licenses, certifications, and compliances in a current status throughout the Contract. Respondents shall submit copies of permits, licenses, and certifications evidencing proof of the aforementioned immediately upon the request of the District. Respondents shall comply with registration with the Georgia Secretary of State's Office as applicable.
- P. **Proposal Duration** Proposals submitted in response to this RFP must be valid for sixty (60) days from the Proposal submission deadline, as indicated by the submission of the Lump Sum Construction Proposal Bid Form.
- Q. **Respondent Failure** In the event services are to be furnished by the successful Respondent should for any reason fail to conform to the scope of work contained herein, the District reserves the right to reject the services and further reserves the right to terminate the Contract.

Failure of the successful Respondent to perform contracted services may also result in the removal of that Respondent from doing business with the District for not less than one (1) year.

- R. **Respondent Performance** The successful Respondent is required to perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of this RFP document and any negotiated Contract(s). Failure of the Respondent to fully perform these obligations may result in the cancellation of the award and Contract.

The District will look to the Respondent and his/her identified personnel to coordinate and deliver the services described in this RFP. The obligations of the Contract shall not be delegated to subcontractors or assigned to any third party.

- S. **Rights Reserved** The District reserves the right to accept or reject any and/all parts of responsive Proposals received and/or to reject all Proposals submitted. The District reserves the right to award any resulting Contract in the manner that is in the best interest of and most advantageous to the District. The District reserves the right to waive any technicalities or minor irregularities in responses received and to award the Contract the most beneficial for the

District. The decision of the District and the Board shall be final.

The District reserves the right to request and negotiate a “best and final” response from Respondents.

- T. **Smoke-Free Workplace** By submission of a response to this RFP, the Respondent certifies that he/she and his/her employees shall not use tobacco products on District property at any time during the performance of this Contract.
- U. **Taxes** Purchases made by the District are not subject to federal, state, or local sales tax. A Sales Tax Exemption Certificate will be furnished upon request.
- V. **The Laws of the State of Georgia** This RFP and subsequent agreements are subject to the laws of the State of Georgia, Cherokee County.

END OF SECTION 001119.16

SECTION 002116
INSTRUCTIONS TO PROPOSERS

Instructions to Proposers

- A. **Introduction:** To be considered, Proposals must be made per the following instructions and must be submitted through the Bonfire Portal, not later than the date and time outlined in the Request for Proposals ("RFPs") or any extension thereof made by Addendum.

The Owner reserves the right to reject any or all Proposals and to waive any technicalities and informalities.

- B. **Owner:** The Owner for whom the General Contractor ("GC") Services and the Work will be executed is:

Cherokee County School District
1205 Bluffs Parkway
Canton, GA 30114

- C. **Architect:** The Architect is:

Perkins & Will
1315 Peachtree Street NE
Atlanta, Georgia 30309

- D. **Mandatory Pre-Proposal Conference and Site Visit:** A mandatory Pre-Proposal Conference in conjunction with a site visit will be held at 01:30 p.m. on Thursday, July 06, 2023. The Pre-Proposal Conference and site visit will be conducted at the Cherokee County School District Technology Learning Theatre, 1020 Keeter Road, Canton, GA 30114.

- E. **Specific Instructions:** Any GC submitting a Proposal in response to the RFPs shall comply with the following Specific Instructions:

1. The submission of a Proposal constitutes a representation by the GC that it has studied and examined the Proposal Documents and such other information as may have been furnished by the Owner or the Architect. Furthermore, the submission of a Proposal constitutes a representation by the GC that it does not know any ambiguities, errors, omissions, or other inaccuracies in any of the Proposal Documents or material furnished by the Owner or Architect in connection with the Project.;
2. Any Proposal must include a fully completed General Contractor Checklist and Certification - Section 002118.30 and must include all referenced Owner's Standards Forms. Omission of any required items listed on the GC Checklist and Certification shall cause the Proposal submission to be declared non-responsive and to be rejected.
3. Any Proposal may include such documentation and information as the GC deems appropriate to establish that it is a responsible and responsive Contractor and that its Proposal is the most advantageous to the Board, taking into consideration the specific

evaluation factors, listed in their order of relative importance, as outlined in the aforesaid RFPs.

4. All questions must be submitted through the Bonfire Portal and must be received no later than the day and hour set as Final Questions Due on the Master Project Schedule - Section 003113.16. All responses to questions will be answered in writing and any changes, additions, interpretations, or corrections, to or concerning the Proposal Documents before the date for submission of Proposals will be issued as an Addendum by the Architect. Such responses will be posted within the Bonfire Portal. Registered GCs will receive an email notification from Bonfire of the Addendum. Only such written changes, additions, interpretations, or corrections by the Addendum shall be binding. Any changes, additions, interpretations, or corrections given by any other method shall not be valid and the GC shall not rely upon in any manner whatsoever any verbal statements, instructions, interpretations, corrections, or other information provided by the Owner or the Architect or their representatives;
 5. Upon submission, all Proposals shall become and remain the Owner's property. The Owner shall have no liability arising out of the disclosure, dissemination, or publication of any Proposal or any information contained therein.
 6. Any Proposal submitted to the Owner shall remain open for acceptance by the Board, and the same shall be honored by the GC, for sixty (60) days from the date and time set forth on the Master Project Schedule to receive Proposals.
 7. The Owner reserves the right to amend these Instructions or clarify same by Addendum, within the time provided by Georgia Law. If such revisions or amendments are of such magnitude as to warrant, in the sole discretion of the Owner, the postponement for the date of the submission and receipt of Proposals, written notification will be issued and posted within the Bonfire Portal. Although all registered GCs will receive email notification of the same, it is the sole responsibility of the GC to review and acknowledge the issued Addendum.
- F. **Proposals:** Proposals will only be received from GCs who are registered through the Bonfire Portal, not later than the date and time outlined in the accompanying RFP or any extension thereof made by Addendum.

The GC is fully responsible for timely electronic submission. The Bonfire Portal will not accept proposals received after the set specified time. No paper submissions will be accepted.

- G. **Documents:** Proposal documents must be obtained through the Bonfire Portal which can be accessed through the District website www.cherokeek12.net.

Plans and Specifications are available electronically in PDF format on Bonfire.

- H. **RFP Addenda:** Addenda, if any, will be posted in the Bonfire Portal. Although Bonfire will generate an email for notification of the Addenda posted for all GCs registered, it remains the responsibility of all Proposers and Subcontractors to check the Bonfire Portal for issued Addenda. Copies of the Addenda will be made available for inspection wherever Proposal

Documents are on file for that purpose. No Addenda will be issued later than seventy-two (72) hours before the time for Proposal openings, except for Addenda withdrawing the RFPs or Addenda which includes a postponement of the date through which Proposals may be submitted. Each GC firm shall ascertain before submitting a Proposal that the GC firm has received all Addenda issued if any, and the GC firm shall acknowledge their receipt in the Proposal. Failure of a GC firm to receive or acknowledge any Addendum shall not relieve the GC firm of any obligation under the Proposal. All Addenda shall become part of the Proposal Documents.

- I. **Scope of Work:** The scope will consist of the following: The GC shall supply all materials, labor, tools, plans, supplies, equipment, transportation, superintendence, temporary construction of every nature, and any other services and facilities necessary to complete the construction of the described Project facilities, including, but not limited to, incidental work described in the Proposal Documents.
- J. **Interpretations:** The GC shall carefully study and compare the Proposal Documents with each other, and with other work being solicited or offered concurrently or presently under construction to the extent that it relates to the GC Services for which the Proposal is submitted, shall examine the site of the Project and the local conditions, and shall at once report to the Owner any errors, inconsistencies, or ambiguities in the Proposal Documents. If a GC is in doubt as to the meaning of any part of the Proposal Documents, or otherwise has questions or requires clarification or interpretation of the Proposal Documents, he or she shall request an interpretation from the Owner. Requests for such interpretations must be submitted through the Bonfire Portal by the date and time set forth on the Master Project Schedule, and failure of the successful GC to request such interpretation shall not relieve him or her as a GC of the obligation to execute the GC Services by a later interpretation by the Owner, without additional charge to the Owner. Interpretations, corrections, and changes to the Proposal Documents will be made by Addendum. No oral interpretations will be made to GC as to the meaning of Proposal Documents. Any purported interpretations, corrections, and changes of the Proposal Documents made in any manner other than the Addendum will not be binding, and GC shall not rely upon them.
- K. **Communication:** Any communication, or attempted communication, by a GC or its agents concerning this RFP by any means or method other than that provided for in this RFP shall be inappropriate. In the event of such inappropriate communication or attempted communication, the Owner shall have the right to reject such offending Offeror's Proposal.
- L. **Substitutions:** Substitutions are not acceptable. Provide only products and manufacturers specified.
- M. **Withdrawal of Proposals:** Except as may be otherwise expressly provided by law, a GC's Proposal cannot be withdrawn after it has been received by the Owner as submitted through the Bonfire Portal, for sixty (60) days after the date fixed for receiving said Proposals, and all Proposals are subject to acceptance by the Owner during the said period, and each Offeror so agrees by submitting a Proposal.

- N. **Background Checks:** If applicable, a criminal background check may be performed on all contractors, consultants, subcontractors, volunteers, and vendors (hereinafter jointly referred to as “individuals”) who provide services, supervise services, or has contact with students on any District premises. These Individuals shall undergo the same criminal background check, within the last 365 days, as required by District employees. Such background checks will be performed by the District School Police Department at the expense of the Individual at an individual cost of \$45.00. Additionally, any charges against the Individual may be deemed unacceptable in the District’s sole discretion regardless of whether dismissed, expunged, sealed, removed from the record, treated as a “first offender” or dead docketed. Upon receipt and evaluation of the District’s background check results, the District may demand that the Individual have no contact with any District students or parents or provide services on any District premises. Any failure of the contractor to obtain a criminal records background check through the District, as stated herein, may result in the termination of any resulting Contract between GC and the District.
- O. **Irregularities:** The Owner, at its sole option, may accept or reject Proposals that contain irregularities of any kind, or Proposals that do not comply fully with the Proposal Documents.
- P. **Contract Award:**

| Criteria | Possible Points |
|---|-----------------|
| A. Project Approach, Qualification, and Reputation | 35 |
| B. Project Staff and Team Experience | 25 |
| C. Proposed Fixed Pricing | 30 |
| D. Litigation | 5 |
| E. Proposal Completeness & Accuracy | 5 |
| | 100 |
| F. Interview & Presentations (if Owner Requested) - possible 50 additional points | |
| Overall Approach, Methodology, Knowledge of the Site | 10 |
| Project Team | 10 |
| Project Scheduling | 10 |
| Cost Control/Value Engineering | 10 |
| References | 10 |
| | 50 |
| Overall Total Possible Points | 150 |

NOTE: All information identified above in items A-E is required for this Proposal to be considered.

Upon approval of the GC by the Owner, the District will issue a Notice of Award ("NOA") in writing, to the GC. The selected GC shall submit all required documentation, including Payment Bond - Section 006113.14 and Performance Bond - Section 006113.13 on the exact forms provided by the Owner in the RFP, insurance certifications, executed Contract, etc. within five (5) days of NOA issuance. The GC shall submit the Builder’s Risk policy required by the RFP and Contract. The Contractual Schedule included in the RFP and the Contract will be reduced

by any days that exceed the total of five (5) business days identified in the Master Project Schedule, Section 003113.16 with the final executed Contract and a revised schedule, if appropriate, shall be issued to the GC upon receipt of all documents.

After evaluation of the Proposals received in response to the RFP, the District may interview two or more Proposers deemed fully qualified, responsive, responsible, and suitable based on initial responses, and with professional competence to provide the required services. The District is under no obligation to perform interviews for this RFP. The Proposers may be awarded up to an additional fifty (50) points based on their interview.

After the interviews, if they are held, and based on evaluation factors outlined in Section K of the General Conditions - Section 001119.16 and the information provided and developed in the selection process to this point, the District Selection Committee ("Committee") shall rank, in the order of preference and begin negotiations with the firm whose Proposal is determined to be most advantageous to the Owner. If a contract satisfactory and advantageous to the District cannot be negotiated, then the Owner reserves the right to automatically, without notification, terminate such negotiations and enter into negotiations with the second most qualified firm. Failing accord with the second most qualified firm, the District shall terminate negotiations and enter into negotiations with the third most qualified firm. Should the District be unable to negotiate a contract at a fair and reasonable price with any of the top three (3) selected firms, the Committee shall select additional firms in order of their rankings, and the District shall continue negotiations until an agreement is reached.

- Q. **GC'S Qualifications**: The Owner, before the Contract award, will require GC to document that they are "responsible" to the satisfaction of the Owner. They will thus be required to show that they have the necessary facilities, technical ability, licenses, and financial resources to execute the Scope of Work as referenced in the design documents herein, in a satisfactory manner, and within the time specified; that they have had experience in the Scope of Work of a similar nature; and that they have history and references which will verify their qualifications for executing the Scope of Work. The Owner shall have the right to make such additional inquiry as it deems necessary to determine the ability of the GC to perform the Scope of Work promptly and efficiently following the Proposal Documents. The failure of a GC to promptly supply information in connection with the Owner's inquiry shall be grounds for a determination that such GC is not responsive, not responsible, or both. In determining the qualifications and responsibility of the GC, the Owner may take into consideration any relevant facts and circumstances available to it including, but not limited to, the GC's experience, capacity, facilities, previous work standing with the District financial standing, skill, available supervisory personnel, available labor, the current volume of work being performed for the District at the time of this procurement process, quality and efficiency of construction plant and equipment proposed to be utilized on the Project. The Owner shall have the right to reject the Proposal of any GC failing to show to the satisfaction of the Owner the GC could perform the Scope of Work promptly and efficiently following the Proposal Documents. GCs may be afforded an opportunity for discussion, negotiation, and revision of Proposals to obtain Best and Final Offers - Section 004215. In the event the Owner deems it necessary or appropriate, responsible GCs found by the Owner to have submitted Proposals reasonably susceptible of being selected

for the award shall be allowed to participate in such discussions, negotiations, and revisions.

The successful GC will also be required to submit appropriate entity and authority certificates acceptable to the Owner as a part of this RFP.

- R. **Owner as Outlined in The Contract for Construction and Incorporated General Conditions**: Included and made a part of this RFP is the Owner's Contract for Construction and Incorporated General Conditions - Section 007213 (the "Agreement" or the "Contract"). GCs are responsible for the review of this document in the preparation of their Proposals. The successful GC shall comply with all insurance requirements outlined in the Agreement and any other Contract Documents, and the GC's attention is directed to the insurance section within the Agreement. These insurance requirements shall be considered in the preparation of the GC's Proposal.
- S. **Commencement, Prosecution, and Completion**: The GC will be required to commence its services under the Owner's form of Agreement immediately after its receipt of a written Notice to Proceed from the Owner and to prosecute the effort with competence, faithfulness, and energy.
- T. **Bid Bond**: The GC's Proposal shall be accompanied by a Bid Bond - Section 004313 in the exact form set forth herein. The Bid Bond shall be in an amount not less than five percent (5%) of the Fixed Price Proposal. **The amount stated in the Bid Bond shall be included as an exact dollar figure written in numeric and word form. Failure to do so shall result in your proposal being deemed non-responsive. A Bid Bond submitted using an AIA document is unacceptable and shall result in your Proposal being deemed non-responsive.** The attorney-in-fact who executes the Bid Bond on behalf of the Surety shall affix to the Bid Bond a certified and current power of attorney. The Surety must be satisfactory to the Owner and must be licensed to do business in Georgia as approved by the State Insurance Commissioner's Office. No other form of bid security will be accepted. The Owner shall have the right to retain the Bid Bond of all GCs until either (a) the Agreement has been executed and a satisfactory Payment Bond and Performance Bond have been furnished, or (b) sixty (60) days after Proposal opening, or (c) all Proposals have been rejected. Except as otherwise expressly allowed by law, no Proposal may be withdrawn for sixty (60) days following the closing time and date for receipt of Proposals, and all Proposals are subject to acceptance by the Owner during the said period, and each GC so agrees by submitting a Proposal.
- U. **Non-Collusion Affidavit**: As a part of the response to this RFP, the GC shall submit with its Proposal an affidavit in the form of the Offeror's and Individuals' Affidavit of Non-Collusion - Section 002116.35.
- V. **Conflict of Interest**: If any officer, director, or agent of the GC is also an employee of the District, then the GC shall clearly identify it in their Proposal including the name of the individual(s) and the position he or she holds in the organization. Further, the GC shall disclose the name(s) of any District employee(s) who owns, directly or indirectly, any interest in your organization or any of its affiliates, excluding stock in a publicly-traded organization if such person owns an interest of ten percent (10%) or less. The GC must complete and have

notarized a Conflict of Interest Form - Section 002118.40 and include the same in their Proposal.

- W. **Existing Conditions**: The GC is responsible to visit, examine, and inspect the site of the proposed Project, obtaining first-hand knowledge of existing conditions, the conformation of the ground, the character, quality, and quantity of the products needed preliminary to and during the prosecution of the Work, the general and local conditions and all other matters which can in any way affect the Services or the Work to be done under the Agreement, and become thoroughly familiar with all conditions under which the Work is to be performed and correlate all the GC's observations and any other facts or conditions that are known to be reasonably knowable by the GC with the requirements of the Proposal Documents, including the proposed Contract Documents.
- X. **Subsurface Investigations**: If soil and subsurface investigations were conducted at the site of the proposed Project, a copy of the report is included in this RFP as an Appendix. Such information is provided for disclosure only and shall not relieve the GC from its obligation to investigate the soil and subsurface conditions. The Owner does not guarantee the accuracy or completeness of the data and shall not be responsible, therefore. The GC shall not rely on such subsurface information and shall make its own investigation of subsurface conditions. The Owner will not be responsible in any way for additional compensation because of the reliance on or assumptions based on the soil investigation data furnished with the Proposal Documents.
- Y. **Consent To Release Information**: By submitting a Proposal, the GC authorizes the Owner, and the Owner's agents, attorneys, and other representatives, to contact every reference, person, or entity identified in the Proposal. The GC agrees that any information concerning the GC in possession of any identified reference, person, or entity may be fully disclosed, and made available, to the Owner and its agents, attorneys, and other representatives. The enclosed Consent to Release Information - Section 002118.45 must be executed by the GC and submitted to the Owner with the Proposal.
- Z. **Communications with District Staff**: It is intended that this Proposal be adequate for any vendor to respond to the District requirements. However, should Proposers have questions, all questions should be submitted electronically via the Bonfire Portal. Questions submitted in any other format will not be considered. The deadline for receipt of Proposers' questions is the day and time set forth on the Master Project Schedule. Questions received after the deadline time will not be considered. Questions received by the deadline time will be answered in writing and posted to the Bonfire Portal.

Only responses posted to the Bonfire Portal will be binding upon the District.

The assigned contact person(s) for this RFP is Tina Farmer, Executive Director ~ Procurement and School Food Services. Prospective Proposers must limit their contact regarding this RFP to the assigned contact person(s) and/or his/her designee(s).

Except with the consent of the proposal contact person, all Proposers, including any persons affiliated with or in any way related to Proposers, are strictly prohibited from contacting the District on any matter having to do in any respect with this RFP, other than as provided herein.

Any contacts with such persons associated with the District shall be in writing, in appropriate circumstances or cases, as directed by the contact person(s) above. Except as expressly provided in, or permitted by, the RFP documents, for the date of issuance of the Request for Proposals until the Owner action of approval of Contract award, the Proposer submitting a proposal shall not initiate any communication or discussion concerning this procurement with any employee, agent, representative, or member of the Board of Education for the Cherokee County School District. Any violation of this restriction may result in the rejection of the proposal response.

Except as expressly provided in, or permitted by, the Proposal Documents, from the date of issuance of the RFP until the final Board of action approval of contract award, the GC submitting a Proposal shall not initiate any communication or discussion concerning the Project, the RFP or the GC's Proposal or any part thereof with any employee, agent, or representative of the Owner or Architect. Any violation of this restriction may result in the rejection of the GC's Proposal.

END OF SECTION 002116

SECTION 002116.10
INSTRUCTIONS FOR SUBMITTING PROPOSALS

1) **Required Forms for Submission**

- A. Proposals must be submitted by uploading files in a PDF format to the Bonfire Portal. Proposals must include all Owner's Standard Forms (as outlined on the General Contractor Checklist and Certification) and must be uploaded in the following order, using the file name referenced below (i.e. ABC Construction Company - Letter of Introduction):

File Name - Section No.

- 1) GC Firm Name – Letter of Introduction
 - 2) GC Firm Name – Compliance
 - 3) GC Firm Name – Proposed Project Staff *
 - 4) GC Firm Name – Project Approach *
 - 5) GC Firm Name – Experience *
 - 6) GC Firm Name – Current Workload *
 - 7) GC Firm Name – Proposal Form - (004213) *
 - 8) GC Firm Name – Bid Bond - (004313) *
 - 9) GC Firm Name – Subcontractor Listing - (004300)
 - 10) GC Firm Name – General Contractor's Checklist and Certification - (002118.30)
 - 11) GC Firm Name – Offeror's & Individuals Affidavit of Non-Collusion - (002116.35)
 - 12) GC Firm Name – Consent to Release Information - (002118.45)
 - 13) GC Firm Name – Vendor Reference Form - (006113.12)
 - 14) GC Firm Name – Suspension and Debarment Certification - (006113.17)
 - 15) GC Firm Name – Contractor Affidavit - (006113.18)
- (*) EVALUATED CRITERIA

The Proposal shall be signed by the person or persons legally authorized to bind the GC to a Contract, and, if submitted by an agent, shall have an original current power of attorney attached certifying the agent's authority to bind the GC. All signatures shall have the name and title of the signer typed below the signature.

- B. The Respondent's Proposal shall be submitted in the following order and format:

1. **Letter of Introduction and Interest** signed by an officer or partner of responding GC. The letter shall include the specific reason(s) why GC would be the best choice for the services listed. The letter shall include the name of the entity submitting, contact name, phone number, email address, and address of the GC submitting. **(2 pages maximum)**
2. **Compliance Information** This is a compliance section and carries no evaluation points. GCs must meet the minimum criteria as specified to receive further consideration. Proposals shall include the following:
 - a. The GC must be properly certified by the Georgia Secretary of State to do business in Georgia at the time of submission.

- 1) State the legal name of the entity submitting and if GC submitting is a corporation, joint venture, or partnership. Note: It is understood that if selected for this project the stated entity name will be used in all legal contracting documents derived from this Section.
 - 2) Provide a copy of the certification for proper incorporation or registration from the Georgia Secretary of State. In the alternative, joint ventures and partnerships should provide a copy of their joint venture or partnership agreement and certification from the Georgia Secretary of State establishing that each joint venture partner or partner is authorized to do business in Georgia.
- b. The GC must be properly registered, licensed, and certified at the time of submission:
- 1) Provide a copy of the current Georgia Professional Registration Certificate for GC.
 - 2) If GC is a joint venture, provide a copy of the joint venture agreement and either:
 - (a) A copy of the current Georgia Professional Registration Certificate of the joint venture; or
 - (b) A copy of the current Georgia Professional Registration Certificate of one of the joint venture partners.
3. **Financial Information:**
- a. **Financial Statements:** The GC's financial capability is to be expressed in the financial statement (audited financial information current within the past twelve (12) months, such as a balance sheet and statement of operations) and should indicate the resources and the necessary working capital to assure financial stability through the completion of the project. A certified audit is preferred; however, the GC's most recent tax return and balance sheet will be accepted.
 - b. **Bonding Capacity:** The GC must submit a letter from their insurer or Surety stating their current bonding capacity for a single job and their aggregate capacity, the current value of work under the contract, and the current value of bonded work. The GC will be required to bond 100% of the cost of the Project.
 - c. **Compliance Letter:** Provide a compliance letter from a bonding company indicating the bonding company's A.M. Best financial rating and whether the bonding company will provide a separate Payment Bond (006113.14) and Performance Bond (006113.13), each in the amount of 100% of the Contract Price, on the exact forms provided by the Owner for your services as GC. **Upon award, GC must submit Payment and Performance Bonds on the exact forms provided by the Owner.**
- 2) **Evaluation Criteria**
- A. **Project Approach, Qualification, and Reputation (35 points):**
1. **Project Approach**

- a. **Knowledge:** The GC shall provide information regarding its knowledge of working on active school campuses, local codes, and ordinances, local subcontractors, and suppliers as an indication of its ability to deliver quality workmanship in an effective and timely manner.
- b. **Approach:** The GC shall demonstrate verbally and graphically its plan for performing the Project, documenting the services to be provided and showing the interrelationships of all parties, including the District's consultants, departments (IT, Transportation, Nutrition, etc.) local authorities, Architects and Program Manager, to name a few. As part of its services, the GC shall indicate knowledge and experience in the evaluation of building systems and construction techniques.
- c. **Schedule:** The Master Project Schedule - Section 003113.16 has been included in this RFP identifying the start and finished dates for construction. Use the dates shown and develop a Preliminary schedule that you plan to use to construct this project.
- d. **Quality Assurance/Quality Control:** Describe your experience and technical expertise your firm will employ concerning safety, cost, quality assurance, and quality control.

2. **Qualification and Reputation**

Please list experience, including examples of renovations, refurbishments, repairs, and new construction projects completed by the GC. Consideration will be given to the successful completion of previous projects comparable in design, scope, and complexity. This will include evaluating the GC's performance and quality of work on previous projects.

- a. List the projects which best illustrate the experience of the GC which utilized the current staff which is being assigned to this Project. (List no more than 10 projects and do not list projects which were not completed by your firm or completed more than ten (10) years ago). Including the following for each project:
 - 1) Name and location of the project;
 - 2) Project owner's representative name, address, and telephone number;
 - 3) Project user's representative name, address, and telephone number;
 - 4) The date project was completed. Provide a comparison of the original schedule completion to the actual completion date;
 - 5) Size of project (construction gross square feet);
 - 6) Cost of project (construction cost). Provide a comparison of the original contract amount with the final contract amount; and
 - 7) Work for which GC and GC's staff were responsible.

8) GC's project manager, superintendent, and other key professionals involved in the project and who of that staff would be assigned to the Project covered by this RFP.

- b. **Location:** Provide the location of the office(s) that will be providing the required services.
- c. **Organization Chart:** Develop an organization chart as it relates to this Project indicating key personnel and their relationship.

B. Project Staff and Team Experience (25 points):

The quality, experience, and quantity of staff and their functions will be evaluated by the Committee.

The GC shall name the actual key personnel to be assigned to this Project, describe their ability, and experience, and indicate the function of each within their organization and their proposed role on this Project. It is the intent that the proposed staff shall be assigned to this Project unless otherwise approved by the Owner. All proposed key staff members must be present at the time of the interview unless prior written approval is received from the Owner.

- 1. **Experience:** Give brief resumes of key personnel (project manager, superintendent, and controls specialist at a minimum) to be assigned to the Project, including, but not limited to, the following:
 - a. Name and title;
 - b. Job assignment for other projects;
 - c. How many years with this GC? For sub-consultants, list prior projects your firm has worked with sub-consultants;
 - d. How many years with other GCs;
 - e. Experience including types of projects, size of projects (dollar value and square footage of project), and specific project involvement;
 - f. Education;
 - g. Active registrations (if any); and
 - h. Proliance experience (if any).
- 2. **Current Workload:**
 - a. As part of the evaluation criteria, the Committee will review the GC and their sub-consultants current workload. If the submitting GC is a joint venture, the Committee will review the current workload of each of the GCs comprising the submitting entity.
 - b. GCs and their sub-contractor(s) shall provide a list of projects in construction or closeout, client name, percent complete on the project, anticipated completion date, and dollars committed to open project workload. Furthermore, if the submitting GC is

a joint venture, they shall also include projects for each GC comprising the joint venture.

- c. Definition of sub-contractor as it relates to this selection process: an individual and/or firm contracted or to be contracted by the submitting entity to provide services related to or in part of those which this will be required as part of the selection process.

C. Proposed Fixed Pricing (30 points) (Use Owner's Proposal Form included in this RFP)

1. Indicate your proposed Fixed Price for the Services and Work as required by the Proposal Documents and the Owner's Agreement. Provide this Fixed Price on the Proposal Form - Section 004213.
2. Indicate any breakdown of the proposed Fixed Price required by the attached Proposal Form.
3. Indicate any alternates to the proposed Fixed Price required by the attached Proposal Form.
4. Acknowledge receipt of an addendum, if any.
5. All blanks shall be filled in by completing the fillable PDF version of the Proposal Form listed in Bonfire. Where so indicated on the Owner's forms, amounts and sums shall be expressed in both words and numerals and in case of a discrepancy between the two, the amount of sum written in words shall govern.

D. Litigation (5 points)

1. Litigation: Identify and briefly discuss any instances in the past five (5) years when a contract was terminated, with or without cause. Provide the owner name, project name, and owner project representative name and number. For joint ventures responding to this RFP, provide the above information as it pertains, to the joint venture and for each partner or entity creating said joint venture. If there is no failure or failure to complete, please include a statement that the GC has never failed to complete a contract or contract or has defaulted or has been declared in default of any contract.
2. Capacity: Based on your current workforce and staffing in addition to the number of projects your firm currently has under contract or in negotiation, please demonstrate your firm's capacity to complete this project. Describe any claims, mediation, litigation, arbitration, or other forms of dispute resolution filed by or against your company regarding K-12 projects (and, in the case of a joint venture, by or against any partner in the joint venture) in the past five (5) years, including case name, number, location of court or arbitration. This list shall also disclose any failure or failure to complete a contract, or contracts, and any instances of having defaulted or having been declared to be in default, on any contract or contracts. If there are no claims, mediation, litigation, arbitration, or other forms of a dispute filed by or against your company regarding K-12 projects, please include a statement declaring the same.

3. Convictions: Include a statement as to whether or not the GC (and in the case of a joint venture, each of the partners in the joint venture) or any of its officers has been convicted or entered a guilty plea (or plea of non-contendere) in any court within two (2) years before the date of application of a violation of any State or Federal statute concerning competitive bidding or competitive proposals or the restraint of trade.

E. Proposal Completeness & Accuracy (5 points)

Proposals must contain all required elements and be free of mistakes and omitted requested information and details.

THE INFORMATION FOR THE FOLLOWING SECTION IS NOT TO BE INCLUDED IN THE PROPOSAL.

3) **Interview and Presentation (possible 50 points, *IF OWNER REQUESTED*)**

Interviews and Presentation

After evaluation of the Proposals received in response to this RFP, the District may interview two (2) or more Proposers deemed fully qualified, responsive, responsible, and suitable based on initial responses, and with professional competence to provide the required services.

At the time of its scheduled interview, each short-listed GC shall provide additional information about its firm and operations as may be required by the District. This additional information shall include, but is not limited to, the following:

A. Overall Approach, Methodology, and Knowledge of the Site (10 Points)

The GC shall provide information regarding its knowledge of working on active school campuses, local codes, and ordinances as an indication of its ability to deliver quality workmanship in an effective and timely manner.

The GC shall demonstrate verbally its plan for performing the services outlined in this RFP, documenting the services to be provided and showing the interrelationship of all parties.

B. Project Team (10 points)

The GC shall express the general and specific project-related experience and capability of in-house staff and sub-consultants and their functions as it relates to the project.

The GC shall develop an organization chart as it relates to the Project indicating key personnel and their relationship. It shall be understood that the District intends to insist that the staff presented at the time of the interview as those key personnel indicated as the project team in the RFP execute the Project.

C. Project Scheduling (10 points)

As part of the project approach, the GC shall propose a schedule for effectively managing and executing the work in the optimum time. Provide a schedule and describe any major milestones for achieving the schedule and any other recommendations that may directly impact the schedule.

D. Cost Control/Value Engineering (10 points)

The GC shall provide suggestions for potential savings to the project that will maintain the design intent and still maintain exceptional quality.

E. References (10 points)

The GC must demonstrate a positive relationship with prior clients on similar projects.

The GC shall submit written recommendations from previous owners and discuss their strategy to provide a positive working relationship with the District. This strategy must include actual examples of how the GC has demonstrated its cooperation with other Owners. The District reserves the option of contacting any of the references provided to confirm the information provided.

If applicable, the District staff will provide input on a GC's past work performance, this information includes but is not limited to the number of warranty requests and responsiveness, contract, and process compliance, and information from the District contractor evaluation process if available.

END OF SECTION 002116.10

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SECTION 002116.15
QUALIFICATIONS FOR SELECTION AND THE SELECTION PROCESS

QUALIFICATIONS FOR SELECTION OF GENERAL CONTRACTOR

The evaluation of the Proposals will be based upon consideration of the demonstrated qualifications and capabilities of the GC based on the identified evaluation factors and their relative weight, which will result in an award that is in the best interest of the Owner.

SELECTION PROCESS

The District Selection Committee will perform Proposal evaluations and, following completion of the evaluations and subject to the District's right to reject any or all Proposals, the responsible and responsive GC whose Proposal is determined to be the most advantageous to the Owner will be selected to perform the GC Services and Work for this RFP. The evaluation factors that will be employed, and their relative importance, are identified in the Instructions for Submitting Proposals - Section 002116.10.

Offerors may be afforded an opportunity for discussion, negotiation, and/or revision of Proposals to obtain the Best and Final Offers. If the District deems it necessary or appropriate, responsible Offerors found by the District to have submitted Proposals reasonably susceptible to being selected for the award shall be allowed to participate in such discussions, negotiations, and/or revisions.

The District reserves the right to reject any or all Proposals, before or after opening, for any reason whatsoever including, but not limited to, any failure of any Proposal to be accompanied by a proper Bid Bond - Section 004313 or by other data required by the Proposal Documents, any incompleteness or irregularity of any Proposal received, any evidence of collusion with the intent to defraud or other illegal practices on the part of the GC, failure to comply with the requirements of the Proposal Documents, or exceeding the funds available. The District also reserves the right to waive any technicalities or informalities and to award the Contract in the best interest of the District.

END OF SECTION 002116.15

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**SECTION 002116.20
PROTEST PROCESS**

This section describes the mandatory administrative procedure whereby Offerors submitting competitive Proposals (hereinafter referred to as "Proposers") to the District directly related to design and construction, for Proposals worth \$100,000 or more may challenge the solicitation process, and whereby Proposers directly related to Capital Improvement for Proposals worth \$100,000 or more may challenge contract awards.

- 1) **Protests.** A Proposer may file a written protest challenging the District's compliance with applicable procurement procedures subject to the Proposer's compliance with the provisions outlined below. Any such written protest will be resolved by these provisions.
- 2) **Types of Challenges.** Any Proposer interested in and capable of responding to a competitive solicitation may file a protest concerning the competitive solicitation process including, but not limited to, a challenge to specifications or any events or facts arising during the solicitation process. Any Proposer submitting a timely Proposal in response to a competitive solicitation may file a protest concerning the District's intended or actual contract award including, but not limited to, events or facts arising during the evaluation and/or negotiation process.
- 3) **Form of Protest:** At a minimum, the written protest must include the following:
 - A. The name and address of the protestor.
 - B. Appropriate identification of the solicitation.
 - C. A statement of reasons for the protest.
 - D. Supporting exhibits, evidence, or documents to substantiate any claims unless not available within the filing time (in which case the Proposer must proceed to file the protest during the filing period identified below but state the expected availability of the material); and
 - E. The desired remedy.

The District, at its discretion, may deem issues not raised in the initial protest as waived with prejudice by the protesting Proposer.

- 4) **Filing Protests:** A protest is considered to be properly filed when it is in writing, signed by a company officer authorized to sign contracts on behalf of the Proposer, and received by the Chief Financial Officer. The protest must be sent by mail to:

Kenneth Owen
Chief Financial Officer
Cherokee County School District
1205 Bluffs Parkway
Canton, GA 30114

The Proposer must observe the following deadline when filing a protest:

| Type of Protest | Protest Filing Deadline |
|---|---|
| Challenge to Competitive Solicitation Process | Two (2) business days before the closing date and time of the solicitation as identified on the Request for Proposals - Section 001113. |
| Challenge to an Intended or Actual Contract Award | <p>In the event the District posts a Notice of Intent to Award (“NOIA”), the protest must be filed within ten (10) calendar days of the date the NOIA is posted.</p> <p>In the event the District does not post a NOIA, the protest must be filed within ten (10) calendar days of the date of the Notice of Award (“NOA”) is posted.</p> |

If a Proposer fails to file a protest by the applicable deadline, such failure shall be deemed as a waiver with prejudice of any grounds the Proposer may have for protest.

- 5) **Stay of Procurement During Protest Review.** When a protest challenging the competitive solicitation process has been timely filed at least two (2) business days before the closing date and time, the solicitation shall not close until a final decision resolving the protest has been issued, unless the Capital Improvements Department makes a written determination that the closing of the solicitation without delay is necessary to protect the interests of the District.

When a protest challenging an intended contract award has been timely filed, the District shall not proceed to the actual contract award unless the Capital Improvements Department makes a written determination that the issuance of a contract or performance of the contract without delay is necessary to protect the interests of the District. If it is determined that it is necessary to proceed with contract performance without delay, the Proposer with this contingent contract may proceed with performance and receive payment for work performed in strict accordance with the terms of the Contract. The provisions of this paragraph do not apply to a protest about events or facts arising during the solicitation process.

- 6) **Protest Resolution.** The Capital Improvements Department shall review and issue a written decision on the protest within seven (7) business days. This decision shall be deemed final. Available remedies for sustained protests are as follows:
- A. If a protest is sustained before the closing date and time of the solicitation, available remedies may include, but are not limited to, the following: modification of the solicitation document including, but not limited to, specifications and terms and conditions; extension of the solicitation closing date and time (as appropriate); and/or cancellation of the solicitation.
 - B. If a protest of the intended/actual contract award is sustained, available remedies may include but are not limited to, the following: revision or cancellation of the NOIA/NOA, re-evaluation, and re-award, or re-solicitation with appropriate changes to the new solicitation.

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- 7) **Costs**. In no event shall a Proposer be entitled to recover any costs incurred in connection with the solicitation or protest process, including, but not limited to, the costs of preparing a Proposal, the costs of participating in the protest process, or any attorney fees.

END OF SECTION 002116.20

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SECTION 002116.35
OFFEROR'S AND INDIVIDUAL'S AFFIDAVIT OF NON-COLLUSION

This affidavit is to be executed under O.C.G.A. § 36-91-21(e)

COMES NOW, _____ (“Offeror”) appearing by and through _____ (individual authorized to bind Offeror), it’s _____ (title) (averring both individually and in his or her representative capacity on behalf of Offeror) (the “Individual and Representative Affiant”), and (list below all those required to give the oath under of O.C.G.A. § 36-91-21 (e):

(collectively, the “Individual Affiants”), and each of the Individual and Representative Affiant and the Individual Affiants, after first being duly sworn, deposes and says that:

- A. He, she, or it, as applicable, has not directly or indirectly violated subsection (d) of the Official Code of Georgia Annotated Section 36-91-21, which subsection provides as follows:

Whenever a public works construction contract for any governmental entity subject to the requirements of this chapter is to be let out by a competitive sealed bid or proposal, no person by himself or herself or otherwise shall prevent or attempt to prevent competition in such bidding or proposals by any means whatsoever. No person who desires to procure such work for himself or herself or another shall prevent or endeavor to prevent anyone from making a bid or proposal therefore by any means whatever, nor shall such person so desiring the work cause or induce another to withdraw a bid or proposal for the work.
- B. If the Offeror is a partnership, then the Individual and Representative Affiant, together with the Individual Affiants, constitute all of the partners and any officer, agent, or another person who may have represented or acted for them in bidding or proposing for or procuring the contract for the Cherokee County Board of Education for the Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym (the “Project).
- C. If the Offeror is a corporation or other entity, then the Individual and Representative Affiant, together with the Individual Affiants, constitute all officers, agents, or other persons who may have acted for or represented the corporation or other entity in bidding for or procuring the contract for the Project.

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Further, the Individual and Representative Affiant and the Individual Affiants sayeth not.

This _____ day of _____, 20_____, _____ (Offeror)
and _____ (Individual and Representative Affiant), by:
_____ (Signature), both individually and on behalf of Offeror as
its _____.

Individual Affiant's Signatures and Names:

| Typed/Printed Name: | Signature: |
|---------------------|------------|
| | |
| | |

Sworn to and subscribed for me this _____ day of _____, 20_____.

NOTARY PUBLIC (SEAL) / My Commission Expires:

END OF SECTION 002116.35

**SECTION 002118.30
GENERAL CONTRACTOR CHECKLIST AND CERTIFICATION**

The undersigned, hereby acknowledges having received Request for Proposals (“RFPs”) – Section 001113 for Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym (the “Project”) containing a full set of documents:

Owner’s Specific RFP Information

| Section ID | Title |
|-------------------|---|
| 001119.15 | Definitions |
| 001119.16 | General Conditions |
| 002116 | Instructions to Proposers |
| 002116.10 | Instructions for Submitting Proposals |
| 002116.15 | Qualifications for Selection and the Selection Process |
| 002116.20 | Protest Process |
| 003113.16 | Master Project Schedule |
| 003113.17 | District Calendars |
| 003113.20 | Special Conditions |
| 004215 | Request for Best and Final Offers |
| 005510 | Resolution (Board) |
| 006113.13 | Performance Bond |
| 006113.14 | Payment Bond |
| 007213 | The Contract for Construction and Incorporated General Conditions Owner’s Criteria and Narrative Scope of Work (3 pages) |

Owner’s Standard Forms for Proposal Submission:

| Section ID | Title | Include with Proposal | Check Box to Confirm Inclusion |
|-------------------|---|------------------------------|---------------------------------------|
| 002118.30 | General Contractor’s RFP Checklist (2 pages) | YES | <input type="checkbox"/> |
| 002116.35 | Offeror’s and Individuals’ Affidavit of Non-Collusion | YES | <input type="checkbox"/> |
| 002118.40 | Conflict of Interest Disclosure Affidavit | YES | <input type="checkbox"/> |
| 002118.45 | Consent to Release Information | YES | <input type="checkbox"/> |
| 004213 | Proposal Form | YES | <input type="checkbox"/> |
| 004300 | Subcontractor Listing | YES | <input type="checkbox"/> |
| 004313 | Bid Bond | YES | <input type="checkbox"/> |
| 006113.12 | Vendor Reference Form | YES | <input type="checkbox"/> |
| 006113.17 | Suspension and Debarment Certification | YES | <input type="checkbox"/> |
| 006113.18 | Contractor Affidavit | YES | <input type="checkbox"/> |

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| Other Requirements: | Include with Proposal | Check Box to Confirm Inclusion |
|--|----------------------------------|---|
| Sample Certificate of Insurance, per General Conditions Item J | YES | <input type="checkbox"/> |
| Copy of Business License, per General Conditions Item A | YES | <input type="checkbox"/> |
| Copy of Corporate Authority Certificate | YES | <input type="checkbox"/> |
| Acknowledgment of ALL Addenda (if any) below. | YES | <input type="checkbox"/> |

IMPORTANT NOTICE: The omission of any of the required items listed above as Owner's Standard Forms for Proposal Submission shall cause the proposal submission to be declared non-responsive and to be rejected.

Indicate the Addenda(s) Nos. _____ received (none unless indicated here). The General Contractor is responsible for reading and understanding all sections of this RFP and affirms that the General Contractor shall be bound by all the terms and conditions contained in this RFP.

Further, the undersigned, being duly sworn, states, on oath that no disclosures of ownership have been withheld from the Board, that the information provided herein is current, and General Contractor and its officers and employees have not entered into any agreement with any other General Contractor or prospective General Contractor or with any other person, firm, or corporation relating to any prices or other terms named in this RFP or any other RFP, nor has it entered into any agreement or arrangement under which a person, firm or corporation is the refrain from responding to this RFP.

 General Contractor

 Signature

 Printed Name/Title

 Date

Sworn to and subscribed before me this ____ day of _____, 20____.

 Notary Public / My Commission Expires:

THE CHEROKEE COUNTY SCHOOL DISTRICT RESERVES THE RIGHT TO REJECT ANY AND ALL PROPOSALS AND TO WAIVE INFORMALITIES.

END OF SECTION 002118.30



**SECTION 002118.40
 CONFLICT OF INTEREST DISCLOSURE AFFIDAVIT**

STATE OF _____

COUNTY OF _____

I HEREBY CERTIFY, UNDER OATH THAT:

I _____ (Printed Name), am the _____ (Title) and I am the duly authorized representative of _____ (General Contractor "GC") for purposes of this Affidavit, whose address is _____ (GC Address), and I possess the legal authority to make this Affidavit on behalf of myself and the GC, as follows:

- A. The following employee(s), officer(s), or agent(s) of the GC (collectively, "GC Representative") is/are related, by blood or marriage, to an employee, agent, or Board Member of the Cherokee County Board of Education (Collectively, "Owner Representative"), as indicated below. If none, list "None".

| GC Representative | Owner Representative | Relation |
|-------------------|----------------------|----------|
| | | |
| | | |
| | | |

- B. Except as listed below under "EXCEPTIONS", neither the GC nor any GC Representative has any conflicts of interest, whether real or potential, due to kinship, ownership, other clients, other contracts, interests, or otherwise concerning the Cherokee County Board of Education, the Project or any Owner Representative.

EXCEPTIONS (fully disclose and completely explain)

Wherefore, the foregoing disclosure is fully complete and true and may be relied upon by the Cherokee County Board of Education.

Signature: _____

Printed Name: _____

Firm Name: _____

Date: _____

Sworn to and subscribed for me this _____ day of _____, 20_____.

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NOTARY PUBLIC (SEAL) / My Commission Expires:

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SECTION 002118.45
CONSENT TO RELEASE INFORMATION

The undersigned, having submitted a competitive Proposal to the Owner in respect of a local government entity public works construction project (or being a partner in a joint venture that has submitted such Proposal), hereby authorizes any person or entity having in its possession, custody or control any information regarding the undersigned to fully disclose and make available such information to the Cherokee County Board of Education its agents, attorneys, and other representatives.

This _____ day of _____, 20____.

(Printed Name of person or entity providing consents to release information)

By: _____

Printed Name: _____

Firm Name: _____

Title: _____

END OF SECTION 002118.45

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**SECTION 003113.16
MASTER PROJECT SCHEDULE**

- 1) If all dates for Items 1 through 5 are maintained, then the dates for Items 6 through 11 become the fixed Construction Schedule.

If any dates of Items 1 through 5 advance forward, then all subsequent dates for Items 6 through 11 shall advance by the same number of days that Item 3 is advanced from the schedule reflected below.

Except as provided above, the scheduled dates for the project shall be strictly adhered to and are the last acceptable dates unless they are modified by mutual consent of the Owner and the General Contractor by written change order. All dates shall be indicated on the GC’s construction schedule. All dates indicate midnight of the date scheduled unless otherwise stipulated.

- 2) Schedule:

| Activity | Start Date |
|--|---------------------|
| 1. Advertise for Request for Proposals | June 22, 2023 |
| 2. Pre-Proposal Meeting | July 06, 2023 |
| 3. Final Questions Due | August 02, 2023 |
| 4. Final Addendum | August 04, 2023 |
| 5. Proposals Due | August 17, 2023 |
| 6. Request for Best and Final Offer (Owner's Option) | TBD (if applicable) |
| 7. Board Approval | September 14, 2023 |
| 8. Award Contract/Notice of Award | September 14, 2023 |
| 9. Pre-Construction Meeting | September 27, 2023 |
| 10. Receipt of Insurance/Bonds | September 27, 2023 |
| 11. Contract Execution | September 27, 2023 |
| 12. Notice to Proceed | September 27, 2023 |
| 13. Start of Construction | October 02, 2023 |
| 14. Substantial Completion | April 25, 2025 |
| 15. Final Completion | July 18, 2025 |
| 16. Final Documentation | July 18, 2025 |

END OF SECTION 003113.16

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**SECTION 003113.17
DISTRICT CALENDARS**

The GC shall familiarize themselves with the school and testing calendars for the District. Links to each calendar are contained below. It is the GC's responsibility to verify calendars on the District website as edits are made from time to time. An updated testing calendar is available annually on the District website.

CCSD 2023-24 School Calendar

CCSD 2024-25 School Calendar

Additional District calendars that may be updated from time to time can be located using this link ~ District Calendars.

END OF SECTION 003113.17

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**SECTION 003113.20
SPECIAL CONDITIONS**

1) **Written Notice**

No notice shall be deemed to have been provided to the Architect and the Owner or either of them as appropriate under the Contract unless and until the writing in which such notice is contained has been physically placed in the hands of an employee of the Architect or the Owner, respectively, either by registered or certified mail, return receipt request, or hand delivery to the following addresses for the Architect and the Owner, respectively:

To Architect: Perkins & Will

1315 Peachtree Street NE

Atlanta, Georgia 30309

To Owner: Cherokee County School District

200 Mountain Brook Ct

Canton, GA 30115

Attn: Matt Shettle, Director ~ Capital Improvements

2) **Computation of Time**

Unless otherwise specifically provided in the Contract, when a period measured in days, weeks, months, years, or other measurements of time except hours is prescribed by the Contract for the exercise of any privilege or the discharge of any duty, the first day shall not be counted but the last day shall be counted. Unless otherwise specifically provided in the Contract, "day" shall mean a calendar day.

3) **Furniture, Fixtures, and Equipment**

- A. The General Contractor ("GC") is to provide staff on-site to coordinate with the Architect to provide access to all spaces for the delivery of furniture, fixtures, and equipment.
- B. The GC is responsible for the final cleaning of all furniture and areas before occupancy. This includes all vertical and horizontal surfaces, inside and out.

4) **Commencement, Possession, and Completion of the Work**

- A. Before commencing Work, the Owner, Architect, GC, and all interested sub-contractors shall inspect the entire existing building (if there is an existing building or buildings) and GC shall prepare a list of any defects or inoperative systems. The list shall be signed by all parties and retained by the Architect.
- B. At the time of commencement of Work, the existing building, if any, shall be assumed to be in structurally sound condition, free from cracks and leaks, and that all electrical, heating and air conditioning, and plumbing systems are operational, except as noted on said list.

- C. Upon completion of the Work, all then-existing defects not recorded upon said list shall be repaired, replaced, or made operative by the GC at his own risk and expense.
- D. Certain existing systems (if there is an existing system or systems) may be under warranty or critical to the Owner's operation, or both, and, if damaged by GC, shall, unless otherwise directed in writing by the Owner, be repaired only by the Warrantor or the Owner at the GC's expense. The GC shall protect all piping, wiring, equipment, and related devices from damage during the progress of the Work and ensure operation unless outages are specifically coordinated with the Owner. These systems include, without limitation:
1. All utility services to existing facilities, if any, including water, electricity, telephone, sewer, and media cable data or video;
 2. Security System;
 3. Fire Alarm System;
 4. Intercom System;
 5. Energy Monitoring and Control System;
 6. TV/Cable Distribution; and
 7. Computer Network System.

In the event of damage to any such system, the GC shall immediately notify the Architect and the Owner in writing.

5) **Temporary Utilities**

The GC shall arrange and pay for the installation, set up, use, and removal of all temporary utility services at the Project site. Temporary utilities shall include, but not be limited to sanitary, water, heating and ventilation, telephone, and electrical service.

6) **Clean-Up**

Mud and construction-related debris shall be cleaned from roadways and walkways outside construction limits daily.

7) **Code and Standards**

Any codes and standards referred to in the Contract Documents are minimum standards. Where the requirements of the Contract Documents exceed those of the codes and standards, the Contract Documents shall govern.

8) **Interruption of Utilities**

Work shall be scheduled to avoid as much as possible interference with the normal operation of the buildings. The GC shall give written notice to the Owner at least ten (10) days in advance of the date on which he wishes to interrupt power, phones, gas, water, or other services. The duration of each separate interruption shall not exceed forty-eight (48) hours. Interruption may be scheduled between Friday after the hour of four o'clock (4:00) p.m. and Monday before the

hour of eight o'clock (8:00) a.m. Interruptions of electrical service within buildings exceeding one hour shall be scheduled only between four o'clock (4:00) p.m. Friday and eight o'clock (8:00) a.m. Monday unless written permission is obtained from the Owner. The GC may otherwise interrupt service at any time that he shall have written permission from the Owner to do so. In the event of an emergency affecting, or potentially affecting in the opinion of the Architect or the Owner, the safety of property, health, or life, the Owner may restrict interruptions.

9) **Protection of Roadways, Sidewalks, Property Surfaces, and Persons**

- A. The GC shall repair, and clean roadway, sidewalk, and property surfaces located outside construction limits free of dirt and mud where caused by the conveyance of construction or demolition materials, equipment, and personnel to and from the construction site. GC shall provide the Architect for review a written schedule, by which the GC shall perform corrective and clean-up work. Such Work shall be done at no additional expense to the Owner.
- B. The GC shall be responsible for damage to property and persons that result from its Work inside and outside the construction limits. The GC shall promptly correct conditions it has caused which create a health, safety, or property danger.

10) **Trash Disposal**

Burning of trash, refuse or debris, or other material on the site is not permitted.

11) **Demolition**

- A. All materials indicated to be removed shall be disposed of off the Owner's Property.
- B. The use of explosives will not be permitted.
- C. The amount of dust resulting from the operations shall be controlled to prevent the spread of dust to avoid creating a nuisance in the surrounding area.
- D. The amount of dust resulting from the accomplishment of demolition work shall be submitted to the Architect for approval. The procedure shall provide for the safe conduct of the Work, careful removal and disposition of materials, protection of property which is to remain undisturbed, and coordination with other Work in progress. The procedures shall include a detailed description of the methods and equipment to be used for each operation and the sequence of operations.

12) **Protection of Personnel**

Where the safety of pedestrians and drivers is endangered in the area of Work, the GC shall use barricades and other necessary precautions at no additional expense to the Owner.

13) **Vehicle Parking Regulations**

If applicable to the Project, the GC must park all vehicles inside the designated construction area. The GC is responsible for transporting its employees to and from the job site from offsite staging areas.

14) **Street Address**

For the purpose of utility work, the street address for the Project is:

Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym
(CMS) 1555 Owens Store Road
(CVHS) 1550 Owens Store Road
Canton, Georgia 30115

15) **Site Limitations**

Construction and staging are limited to the areas within the "Limits of Fenced Construction Area" indicated on the plans.

16) **Access to Site by Personnel of Owner**

The GC agrees that mechanics, electricians, and maintenance personnel of the Owner may enter the site during the progress of the Work to maintain the existing facilities if any, and to take emergency measures necessary to preserve life or property. The GC shall have the right to exclude from the site any mechanic or maintenance personnel who undertakes to enter without a hard hat or who violates any of the safety regulations imposed by the U.S. Department of Labor, OSHA (Occupation Safety & Health Act), by the GC, by law, or by the State Commissioner of Labor.

17) **Hazardous Materials**

- A. The GC shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.
- B. Disposal of Environmental Hazardous Items: The Owner has contracted with a special contractor to dispose of Asbestos Type Hazardous Items on a large scale. If the GC comes in contact with small amounts then, the Owner is prepared to remove these items with its crew. The GC is hereby notified that these are the conditions from which they will work by providing a Bid for any work with the Owner.

18) **Design Professional**

If the Owner's design professional for the Project is an engineer rather than an architect, then the term "Architect" as used throughout these Special Conditions shall mean "Engineer."

END OF SECTION 003113.20

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Section 004213
Proposal Form

In compliance with the Request for Proposals ("RFP") dated June 22, 2023, the undersigned General Contractor ("GC"), hereby submits its Proposal to the:

Cherokee County Board of Education ("Board")
Support Services
200 Mountain Brook Ct
Canton, GA 30115

The GC further agrees that it has carefully examined the proposed Contract for Construction and Incorporated General Conditions (007213) (the "Agreement" or the "Contract") and the Owner's other Proposal Documents included or referenced in the RFP, any Addenda thereto, for the Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym (the "Project"), proposes and agrees, if this proposal is accepted, to enter into the Agreement with the Owner and to perform the Work including all services, supervision, labor, coordination, equipment, and material in conformance with the Contract Documents, in the time and for the Contract Price set forth below, and submits the following proposed Fixed Price, schedule and other matters set forth below. The submission of this Proposal constitutes a representation by the GC that it has carefully studied and examined all of the Contract Documents dated _____ furnished by Perkins & Will (the "Architect") and such other information as may have been furnished by the Board or the Architect including Addendum/Addenda No(s). _____. GC further represents that it does not know any ambiguities, errors, omissions, or other inaccuracies in any of the Contract Documents or other material furnished by the Board or Architect in connection with the Project.

- 1) The Contractor proposes to fully and completely construct the Project in conformity with all requirements of the Contract Documents and furnish all necessary labor, material and equipment for such construction, and, furthermore, to fully, completely, and strictly perform all obligations of the Contractor as set forth in the Contract Documents, for the lump sum contract price of _____ dollars (total base Proposal written) \$_____ (numerical). The lump sum contract price allocated in its entirety, to the following elements of work and should be inserted in as the Contract Price in Article IV.

A. Base Proposal

Said lump sum contract price in its entirety is represented by combining the base proposal and allocations for unit pricing together with the contingencies for each scope of the project. Scope 1 will be Creekland MS Classroom Addition and Scope 2 will be the Creekview HS Classroom Addition ~ Auxiliary Gym.

B. Unit Price Proposal (Quantity Allowances)

The Contractor proposes the following Allowance/Unit Prices as described in Sections 021200 and 012700. The total allowance for each item must be calculated from the quantities specified

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in Section 012100 (entered below) and the Contractor's proposed unit prices. Please reference Section 021200 for a complete description of the work for each item.

The undersigned Contractor further agrees that if any of the following Alternates as described in the RFP Documents are accepted, the following amounts shall be added to or deducted to the Base Proposal as indicated.

C. Lump Sum Allowances

| | |
|--|--------------|
| Utility Allowance – Creekland MS – Scope 1 | \$ 30,000.00 |
| Utility Allowance – Creekview HS – Scope 2 | \$ 30,000.00 |

D. Contingency Allowances

| | |
|--|--------------|
| Contingency Allowance – Creekland MS – Scope 1 | \$175,000.00 |
| Contingency Allowance – Creekview HS – Scope 2 | \$290,000.00 |
| Total Contingency Allowances – Scope 1 | \$205,000.00 |
| Total Contingency Allowances – Scope 2 | \$320,000.00 |

2) Creekland MS Classroom Addition – SCOPE 1

A. Base Bid ~ Scope 1

| | | |
|-----|---|-----------|
| 1. | General Conditions | \$ |
| 2. | Site Work | \$ |
| 3. | Concrete | \$ |
| 4. | Masonry | \$ |
| 5. | Metals | \$ |
| 6. | Carpentry | \$ |
| 7. | Thermal and Moisture Protection | \$ |
| 8. | Doors and Windows | \$ |
| 9. | Finishes and Accessories | \$ |
| 10. | Specialties | \$ |
| 11. | Equipment | \$ |
| 12. | Furnishings | \$ |
| 13. | Special Construction | \$ |
| 14. | Conveying Systems | \$ |
| 15. | Mechanical | \$ |
| 16. | Electrical | \$ |
| 17. | Lump-Sum Allowance | \$30,000 |
| 18. | Quantity Allowances (Unit Price Proposal) | \$ |
| 19. | Contingency Allowances | \$175,000 |
| | Total Base Proposal | \$ |

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B. Alternate Proposals

1. Alternate No. 1 ~ Scope 1

The Proposer proposes the following additive alternate price to construct building addition to the Cafeteria and Band Room and associated MEP, structural site work in its entirety.

Alternate No. 1 ~ Scope 1 Add \$ _____

C. Quantity Allowances

| # | Description | Allowance Qty. | Unit | Unit Price | Total Allowance |
|----|--|----------------|------|------------|-----------------|
| 1. | Include in the Base Bid an amount to remove and dispose of offsite 500 cubic yards of unsuitable soil including rock-filled soil or uncompacted earth. | 500 | C.Y. | \$ _____ | \$ _____ |
| 2. | Include in the Base Bid an amount to remove and dispose of offsite 500 cubic yards of Mass Rock. | 500 | C.Y. | \$ _____ | \$ _____ |
| 3. | Include in the Base Bid an amount to remove and dispose of offsite 500 cubic yards of Trench Rock. | 500 | C.Y. | \$ _____ | \$ _____ |
| 4. | Include in the Base Bid an amount to place 500 cubic yards of #57 stone. | 500 | C.Y. | \$ _____ | \$ _____ |
| 5. | Include in the Base Bid an amount to place 500 cubic yards of suitable backfill/fill material (mass or trench). | 500 | C.Y. | \$ _____ | \$ _____ |
| 6. | Include in the Base Bid an amount to furnish and place 200 tons of graded aggregate base material. | 200 | Tons | \$ _____ | \$ _____ |
| 7. | Include in the Base Bid an amount to furnish and place 400 cubic yards of screened topsoil. | 400 | C.Y. | \$ _____ | \$ _____ |

3. Creekview HS Classroom Addition ~ Auxiliary Gym – SCOPE 2

A. Base Bid ~ SCOPE 2

| | | |
|-----|---|-----------|
| 1. | General Conditions | \$ |
| 2. | Site Work | \$ |
| 3. | Concrete | \$ |
| 4. | Masonry | \$ |
| 5. | Metals | \$ |
| 6. | Carpentry | \$ |
| 7. | Thermal and Moisture Protection | \$ |
| 8. | Doors and Windows | \$ |
| 9. | Finishes and Accessories | \$ |
| 10. | Specialties | \$ |
| 11. | Equipment | \$ |
| 12. | Furnishings | \$ |
| 13. | Special Construction | \$ |
| 14. | Conveying Systems | \$ |
| 15. | Mechanical | \$ |
| 16. | Electrical | \$ |
| 17. | Lump-Sum Allowance | \$30,000 |
| 18. | Quantity Allowances (Unit Price Proposal) | \$ |
| 19. | Contingency Allowances | \$290,000 |
| | Total Base Proposal | \$ |

B. Alternate Proposals

1. Alternate No. 1 ~ SCOPE 2

The Proposer proposes the following additive alternate price to construct building the addition of the auxiliary gymnasium building and associated MEP, structural site work in its entirety.

Alternate No. 1 ~ SCOPE 2

Add \$ _____

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2. Alternate No. 2 ~ SCOPE 2

The Proposer proposes the following additive alternate price to construct building the classroom addition to Building 5020 (Ag. Science building) and associated MEP, structural site work in its entirety.

Alternate No. 2 ~ SCOPE 2

Add \$ _____

C. Quantity Allowances

| # | Description | Allowance Qty. | Unit | Unit Price | Total Allowance |
|----|--|----------------|------|------------|-----------------|
| 1. | Include in the Base Bid an amount to remove and dispose of offsite 500 cubic yards of unsuitable soil including rock-filled soil or uncompacted earth. | 500 | C.Y. | \$ _____ | \$ _____ |
| 2. | Include in the Base Bid an amount to remove and dispose of offsite 500 cubic yards of Mass Rock. | 500 | C.Y. | \$ _____ | \$ _____ |
| 3. | Include in the Base Bid an amount to remove and dispose of offsite 500 cubic yards of Trench Rock. | 500 | C.Y. | \$ _____ | \$ _____ |
| 4. | Include in the Base Bid an amount to place 750 cubic yards of #57 stone. | 750 | C.Y. | \$ _____ | \$ _____ |
| 5. | Include in the Base Bid an amount to place 500 cubic yards of suitable backfill/fill material (mass or trench). | 500 | C.Y. | \$ _____ | \$ _____ |
| 6. | Include in the Base Bid an amount to furnish and place 200 tons of graded aggregate base material. | 200 | Tons | \$ _____ | \$ _____ |
| 7. | Include in the Base Bid an amount to furnish and place 400 cubic yards of screened topsoil. | 400 | C.Y. | \$ _____ | \$ _____ |

The Contractor proposes and agrees to commence actual construction (i.e., physical work) on-site with adequate management, labor, materials, and equipment within ten (10) days after receipt of Notice to Proceed and prosecute the Work diligently and faithfully to completion within the required Contract Time. Before commencing such Work, and before the issuance of the Notice to Proceed, Contractor shall furnish to the Board duly executed Payment and Performance Bonds - Sections 006113.14 and 006113.13

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respectively, complying with all requirements of the Contract Documents along with Certificates of Insurance demonstrating that all required coverages are in place.

GC submits herewith its executed Bid Bond - Section 004313 by the requirements of the Owner as outlined in the Instruction to Proposers - Section 002116.

GC herein acknowledges that this Proposal shall constitute an offer by GC to contract with the Owner for construction of the Project in conformity with all requirements of the Contract Documents for the lump sum contract price as set forth hereinabove. Such an offer also includes the proposed unit prices and proposed pricing for any Alternates.

The GC understands that the Owner reserves the right to reject any Proposals and to waive any technicalities and informalities. The GC agrees that this Proposal is irrevocable and subject to acceptance by the Board until the expiration of sixty (60) days following the date outlined in the RFP for receipt of Proposals by the Board.

The person executing this Proposal Form must be legally authorized to bind the General Contractor.

Respectfully submitted,

GENERAL CONTRACTOR

General Contractor Printed Name

Signature

Printed Name, Title

Printed Contractor Address

Date of Execution

Sworn to and subscribed before me this _____ day of _____, 20____.

Notary Public

My Commission Expires:

END OF SECTION 004213

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**SECTION 004215
REQUEST FOR BEST AND FINAL OFFERS
(at Owner's Discretion)**

Date:

Re: Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym

Dear Sir/Madam:

In conformity with the Request for Proposals ("RFPs") issued by the Cherokee County, Georgia, Board of Education ("the Board") in connection with the above-referenced Project, you are invited to submit in writing your best and final offer for the construction of the Project. Any such best and final offer must provide for the construction of the Project following all requirements of the Contract Documents. Any such offer must be received by the Board at its office located at the Cherokee County School District, Support Services Offices, 200 Mountain Brook Court, Canton, GA 30115, (telephone number 770.479.1871) on or before _____ a.m., _____ day of _____, 20_____.

Any best and final offer submitted should set forth your proposed lump sum contract price as well as any applicable prices for unit price work and alternates as provided in the Contract Documents.

In the event the Board receives no further response from your firm, it will consider your Proposal as previously submitted to be your best and final offer. The Board continues to reserve the right to reject any Proposals and to waive any technicalities or informalities. All Proposals, and any response to this RFP for a best and final offer, are subject to all requirements of the RFPs, the Instructions to Proposers, and all other requirements of the Contract Documents, and the Board expressly reserves any rights relating thereto.

Should you have any questions concerning this matter, please contact _____.

Very truly yours,

END OF SECTION 004215

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**SECTION 004313
BID BOND**

KNOWN ALL PERSONS BY THESE PRESENT that we _____, as Surety (the "Surety"), and _____, as Principal (the "Proposer") enter into, execute and are held and firmly bind ourselves, our heirs, administrators, executors, and successors, jointly and severally, in favor of the CHEROKEE COUNTY, GEORGIA, BOARD OF EDUCATION (the "Board"), pursuant to the terms and conditions of this Bond (the "Bid Bond") as set forth herein:

WHEREAS, the Proposer, in response to a Request for Proposals issued by the Board, has submitted its Proposal for the construction of the Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym located at (CMS) 1555 Owens Store Road, (CVHS) 1550 Owens Store Road Canton, Georgia 30115 (hereinafter the "Project").

NOW, THEREFORE, the condition of this obligation is such that if the Board accepts the Proposal of the Proposer as submitted, or as revised or negotiated in accordance with the provisions of O.C.G.A. § 36-91-21(c)(2), and

- 1) The Proposer timely executes the Agreement between the Board and Proposer (the "Agreement") as provided by the Board and as included in the Contract Documents; and,
- 2) The Proposer furnishes to the Board fully executed Payment and Performance Bonds as required by the Agreement, then this obligation shall be void: otherwise, the Surety and the Proposer shall be jointly and severally liable to the Board, and shall make payment to the Board, in the amount of five percent (5%) of the lump sum contract price (exclusive of any pricing for Alternates or unit prices) as outlined in the Proposal.
- 3) The Proposer agrees that the Bid Bond amount is _____,
\$_____.

The Proposer agrees that the amount of this Bid Bond as set forth herein above constitutes a proper and lawful sum for liquidated damages which the Board will sustain in the event Proposer fails or requests to execute the Agreement or fails or refuses to furnish the requirement Payment and Performance Bonds.

The Surety shall cause to be attached to this Bid Bond a current and effective original Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of the Surety to execute and deliver same. The Surety must be authorized to transact business in the state of Georgia and be in good standing with the Georgia Department of Insurance.

This Bid Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bid Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bid Bond conflicts with any applicable statute, then the provision of a said statute shall govern and the remainder of this Bid Bond that is not in conflict therewith shall continue in full force and effect.

IN WITNESS WHEREOF, the undersigned has caused this Bid Bond to be executed and their respective corporate seals to be affixed and attested by their duly authorized representatives this ____ day of _____, 20_____.

SIGNED AND SEALED THIS _____ day of _____, 20_____.

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PROPOSER

SURETY

Printed Name

Printed Name

Signature

Signature

Printed Name, Title

Printed Name/Title

Printed Address

Printed Address

[ATTACH PROPERLY EXECUTED POWER OF ATTORNEY]

END OF SECTION 004313

**SECTION 005510
RESOLUTION (BOARD)**

Resolution

WHEREAS, THE CHEROKEE COUNTY, GEORGIA, BOARD OF EDUCATION (the "Board"), desires and intends to construct for its use and benefit a project known as the Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym (the "Project") to be located at (CMS) 1555 Owens Store Road, (CVHS) 1550 Owens Store Road Canton, Georgia 30115 and,

WHEREAS, in accordance with the provisions of O.C.G.A. § 36-91-1, et. seq., the Board issued and duly advertised its Request for Proposals (the "Request") wherein written proposals were requested from contractors interested in constructing the Project; and,

WHEREAS, as required by law, the Request set forth in their order of relative importance the evaluation factors to be utilized by the Board in its selection of a contractor to construct the Project; and,

WHEREAS, in response to the Request, written proposals for the construction of the Project have been received by the Board from the following named contractors:

and,

WHEREAS, in accordance with the Request, and as provided by law, the Board, by and through its authorized representatives, has conducted discussions with each contractor submitting a proposal responsive to the Request; and,

WHEREAS, staff has summarized the proposals of all contractors and has provided the Board with all proposals along with a said summary in advance of the Board's meeting; and,

WHEREAS, the Board, has duly and carefully reviewed the proposals received and has applied the evaluation factors in their order of relative importance as set forth in the Request.

NOW, THEREFORE, upon motion duly made and carried, IT IS HEREIN RESOLVED AS FOLLOWS:

Taking into consideration the evaluation factors as set forth in the Request together with the staff's summary of criteria and applying said evaluation factors in their order of relative importance, the Board herein finds and determines that the proposal submitted by _____ is the most advantageous to the Board for construction of the Project. Attached hereto as Exhibit "A," and incorporated herein by reference, is the Board's Evaluation of the Proposals received. Said Exhibit sets forth the basis upon which the proposal of _____ has been determined to be the most advantageous to the Board.

On the grounds set forth herein, the Board awards the contract for construction of the Project to _____.

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This _____ day of _____, 20_____.

CHEROKEE COUNTY

BOARD OF EDUCATION

Cherokee County School District

Chairman-CCBOE

1205 Bluffs Parkway

Canton, GA 30114

Approved as to Form:

Legal Counsel for the Cherokee County Board of Education

(Date of Execution)

END OF SECTION 005510



SECTION 006113.12
VENDOR REFERENCE FORM
(complete additional pages as needed)

VENDOR REFERENCES FOR: _____

References must be completed by ALL Vendors. It is the vendor's responsibility to provide COMPLETE and ACCURATE reference information on the form below: completing ALL Fields. Failure to do so can result in the District being unable to verify the vendor's past work, which may affect the District's determination that the vendor is responsive and responsible. The District reserves the right to consider past experience with the vendor.

1)

Company: _____

Address, City, State, Zip: _____

Telephone: _____

Email Address: _____

Name of Contact Person: _____

Project: _____

2)

Company: _____

Address, City, State, Zip: _____

Telephone: _____

Email Address: _____

Name of Contact Person: _____

Project: _____

3)

Company: _____

Address, City, State, Zip: _____

Telephone: _____

Email Address: _____

Name of Contact Person: _____

Project: _____

END OF SECTION 006113.12

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**SECTION 006113.13
PERFORMANCE BOND**

Performance Bond

KNOW ALL MEN BY THESE PRESENTS that _____ {Contractor} (hereinafter called the "Principal") and _____ {Surety} (hereinafter called the "Surety") are held and firmly bound unto the CHEROKEE COUNTY, GEORGIA, BOARD OF EDUCATION (hereinafter called the "Obligee") in the amount of \$ _____ lawful money of the United States of America, for the payment whereof the Principal and the Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these present.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement with the Obligee dated _____, (hereinafter the "Agreement"), for the Construction of a project known as the Creekland MS Classroom Addition (hereinafter the "Project");

NOW, THEREFORE, the conditions of this obligation are as follows:

- A. That if the Principal shall fully and completely perform each and all of the terms, provisions, and requirements of the Agreement, including and during the period of any warranties or guarantees required thereunder, and all modifications, amendments, changes, deletions, additions, and alterations thereto that may hereafter be made; and if the Principal and the Surety shall indemnify and hold harmless the Obligee from any losses, liability, and damages, claims, judgments, liens, costs, and fees of every description, arising under the Agreement, whether imposed by law or equity, which may be caused by failure or default on the part of the Principal in the performance of any or all of the terms, provisions, and requirements of the Agreement, including all modifications, amendments, changes, deletions, additions, and alterations thereto and any warranties or guarantees required thereunder, then this obligation shall be void; otherwise to remain in full force and effect.
- B. In the event of a failure of performance of the Agreement by the Principal, which shall include, but not be limited to, any breach or default of the Agreement, the Surety, upon demand by the Obligee, shall undertake and complete such required performance and cure any breach or default of the Agreement.

The Surety shall commence performance of its obligations and undertakings hereunder no later than forty-five (45) days after written notice from the Obligee to the Surety; and, if the Surety fails to commence performance as required herein within such period, or if the Surety otherwise breaches its obligations to the Obligee under this Bond and the Agreement, the Surety shall be liable to the Obligee for the Obligee's actual damages, including all costs of litigation and attorney's fees, plus any penalties, as may be provided by law.

The means, methods, or procedure by which the Surety undertakes to perform its obligations under this Bond shall be subject to the advance written approval of the Obligee, said approval not to be unreasonably withheld.



If the Surety fails or refuses to perform as provided above, or if the Obligee and the Surety cannot agree as to the means, methods, or procedure of performance by the Surety, the Obligee shall have the right, through itself or others, to do all or any part of the remaining work yet to be performed by the Principal and the Surety shall pay Obligee any losses or damages resulting therefrom.

The Surety hereby waives notice of any modifications, omissions, additions, changes, and advance payments or deferred payments in or about the Agreement and agrees that the obligations undertaken by this Bond shall not be impaired in any manner because of any such modifications, omissions, additions, changes, and advance payments or deferred payments.

- C. Any suit under this Bond must be instituted before the expiration of two (2) years from the date on which the final payment under the Agreement falls due.

By Agreement, this Bond shall not be subject to the limitation period of O.C.G.A. § 36-91-54.

Should any term or condition of this Bond be held or determined unenforceable, all other terms and conditions shall remain in full force and effect.

IN WITNESS WHEREOF, the Principal and Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers or attorneys-in-fact, this _____ day of _____, 20_____.

| PRINCIPAL | SURETY |
|--------------------|--------------------|
| _____ | _____ |
| Printed Name | Printed Name |
| _____ | _____ |
| Signature | Signature |
| _____ | _____ |
| Printed Name/Title | Printed Name/Title |
| _____ | _____ |
| Printed Address | Printed Address |

Approved: _____

Date: _____

[ATTACH SURETY'S PROPERLY EXECUTED POWER OF ATTORNEY]

END OF SECTION 006113.13

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**SECTION 006113.14
PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENTS that _____ {Contractor} (hereinafter called the "Principal") and _____ {Surety} (hereinafter called the "Surety") are held and firmly bound unto the CHEROKEE COUNTY, GEORGIA, BOARD OF EDUCATION (hereinafter called the "Obligee") in the amount of \$_____ lawful money of the United States of America, for the payment whereof the Principal and the Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these present.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement with the Obligee, dated _____, (hereinafter the "Agreement"), for the Construction of a project known as Creekland MS Classroom Addition (hereinafter the "Project");

NOW, THEREFORE, the condition of this obligation is such, that if the Principal shall promptly make payment to any Claimant, as hereinafter defined, for all labor, services, and materials used or reasonably required for use in the performance of the Agreement, then this obligation shall be void; otherwise to remain in full force and effect.

A "Claimant" shall be defined herein as any contractor, subcontractor, person, party, partnership, corporation, or other entity furnishing labor, services, or materials used or reasonably required for use in the performance of the Agreement, or construction of the Project, without regard to whether such labor, services or materials were sold, leased or rented, and without regard to whether such Claimant is or is not in privity of contract with the Principal or any contractor or subcontractor performing work on the Project. Any entity entitled to the protection of a payment bond under Georgia law shall be deemed a "Claimant" under this bond.

The Surety is herein bound and obligated for all obligations of a surety as set forth in O.C.G.A. §§ 36-91-90 through and including O.C.G.A. § 36-91-94. Any suit under this Bond must be instituted before the expiration of two (2) years from the date on which the final payment under the Agreement falls due. By Agreement, this Bond shall not be subject to the limitation period of O.C.G.A. § 36-91-94.

In the event of any claim made by a Claimant against the Obligee, or the filing of a lien against the property of the Obligee affected by the Agreement, the Surety shall either settle or resolve the claim, or remove any such lien by bond, or otherwise take such action as provided in the Agreement.

This bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this bond shall be deemed to be included herein as set forth at length. If any provision of this bond is held by a court competent jurisdiction to conflict with any applicable statute, then the provision of a said statute shall govern and the remainder of this bond that is not in conflict therewith shall continue in full force and effect.

IN WITNESS WHEREOF, the Principal and Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers or attorneys-in-fact, this _____ day of _____, 20_____.

| | |
|-----------|--------|
| PRINCIPAL | SURETY |
|-----------|--------|

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| | |
|--------------------|--------------------|
| _____ | _____ |
| Printed Name | Printed Name |
| _____ | _____ |
| Signature | Signature |
| _____ | _____ |
| Printed Name/Title | Printed Name/Title |
| _____ | _____ |
| Printed Address | Printed Address |

Approved By: _____

Date: _____

[ATTACH SURETY'S PROPERLY EXECUTED POWER OF ATTORNEY]

END OF SECTION 006113.14



SECTION 006113.17
SUSPENSION AND DEBARMENT CERTIFICATION

I _____, as the _____ (specify Corporate Authority) of _____, (Corporation) hereby swear or affirm under penalty of perjury provided below. These representations apply to the Corporation as well as to the owners, parent company, or Corporation Principals.

Upon reasonable inquiry, belief, and knowledge of the corporation, as well as of the owners, parent company, or corporation principals:

- 1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- 2) Have not within three (3) years preceding this certification been convicted of or had a civil judgment rendered against them for the commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property;
- 3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with the commission of any of the offenses listed above; and
- 4) Have not within three (3) years preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.

In the event, you have knowledge or belief that any of the above statements are not true and correct, list any fact that supports your knowledge or belief.

Executed this _____ day of _____, 20_____.

Contractor: _____

By: _____

Title: _____

Sworn and subscribed before me this _____ of _____, 20_____.

NOTARY PUBLIC / My Commission Expires:

END OF SECTION 006113.17

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**SECTION 006113.18
CONTRACTOR AFFIDAVIT**

The Undersigned, after being duly sworn, deposes and states as follows:

- 1) The Undersigned is over the legal age of majority and is duly competent to execute this Affidavit. The Undersigned is _____ of _____, a general contractor (hereinafter "Contractor"), which maintains its principal place of business at _____. The Undersigned is expressly authorized to execute this Affidavit on behalf of the Contractor. The Undersigned has personal knowledge of all facts set forth herein and said facts are true and correct. This Affidavit is executed in accordance with the provisions of O.C.G.A. § 13-10-91 and is submitted in connection with the Contractor's Proposal to construct for the Cherokee County, Georgia, Board of Education (hereinafter "the Board") a project known as Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym (hereinafter "the Project").
- 2) The Undersigned affirms and attests that the Contractor has registered with, is authorized to use, and uses the federal work authorization program as the said program is defined in the above-referenced provision of Georgia law. The user identification number of the Contractor for said program is _____ and the date of authorization for the Contractor to use said program is _____. In the event Contractor is awarded a contract for the Project, it will continue to use the federal work authorization program throughout the contract period.
- 3) In the event Contractor is awarded a contract for the Project, it will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the Contractor with the same information required in Paragraph 3 hereinabove.

Executed this _____ day of _____, 20_____.

Contractor: _____

By: _____

Title: _____

Sworn and subscribed before me this _____ of _____, 20_____.

NOTARY PUBLIC / My Commission Expires

END OF SECTION 006113.18

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**Creekland MS Classroom
Addition and Creekview HS
Classroom Addition - Auxiliary
Gym
Cherokee County School
District
2022.N.19.01**



06-22-2023

**SECTION 007213
THE CONTRACT FOR CONSTRUCTION AND INCORPORATED GENERAL CONDITIONS**

Cherokee County Board of Education

1205 Bluffs Parkway

Canton, GA 30114

770.479.1871

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THE CONTRACT FOR CONSTRUCTION AND INCORPORATED GENERAL CONDITIONS

This Agreement is made by and between the CHEROKEE COUNTY SCHOOL SYSTEM (hereinafter referred to as the "Owner") and {} (hereinafter referred to as the "Contractor") under seal for construction of Creekland MS Classroom Addition and Creekview HS Classroom Addition - Auxiliary Gym (hereinafter referred to as the "Project"), the Owner and the Contractor hereby agree as follows:

ARTICLE I - THE CONTRACT AND THE CONTRACT DOCUMENTS

1. The Contract

The Contract between the Owner and the Contractor, of which this Agreement is a part, consists of the Contract Documents. It shall be effective on the date this Agreement is executed by the last party to execute it.

2. The Contract Documents

The Contract Documents consist of this Agreement, the Specifications, the Drawings, Supplemental Conditions, all Change Orders and Field Orders issued hereafter, any other amendments hereto executed by the parties hereafter, together with the following (if any):

| |
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| |

3. Entire Agreement

This Contract, together with the Contractor's performance and payment bonds for the Project, constitute the entire and exclusive agreement between the Owner and the Contractor with reference to the Project. Specifically, but without limitation, this Contract supersedes any bid documents and all prior written or oral communications, representations, and negotiations, if any, between the Owner and Contractor.

4. No Privity with Others

Nothing contained in this Contract shall create or be interpreted to create privity or any other contractual agreement between the Owner and any person or entity other than the Contractor.

5. Intent and Interpretation

.01 The intent of this Contract is to require complete, correct, and timely execution of the Work. Any Work that may be required, implied, or inferred by the Contract Documents, or anyone or more of them, as necessary to produce the intended result shall be provided by the Contract for the Contract Price.

- .02 This Contract is intended to be an integral whole and shall be interpreted as internally consistent. What is required by any one Contract Document shall be considered as required by the Contract.
- .03 When a word, term, or phrase is used in this Contract, it shall be interpreted or construed, first, as defined herein; second, if not defined, according to its generally accepted meaning in the construction industry; and third, if there is no generally accepted meaning in the construction industry, according to its common and customary usage.
- .04 The words "include", "includes", or "including", as used in this Contract, shall be deemed to be followed by the phrase, "without limitation."
- .05 The specification herein of any act, failure, refusal, omission, event, occurrence, or condition as constituting a material breach of this Contract shall not imply that any other non-specified act, failure, refusal, omission, event, occurrence, or condition shall be deemed not to constitute a material breach of this Contract.
- .06 Words or terms used as nouns in this Contract shall be inclusive of their singular and plural forms unless the context of their usage clearly requires a contrary meaning.
- .07 The Contractor shall have a continuing duty to read, carefully study and compare each of the Contract Documents, the Shop Drawings, and the Product Data and shall give written notice to the Owner and the Architect of any inconsistency, ambiguity, error, or omission which the Contractor may discover with respect to these documents before proceeding with the affected Work. The issuance or the express or implied approval by the Owner or the Architect of the Contract Documents, Shop Drawings, or Product Data shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with this Contract. The Owner has requested the Architect to only prepare documents for this Project, including the Drawings and Specifications for the Project, which are accurate, adequate, consistent, coordinated, and sufficient for construction. HOWEVER, THE OWNER MAKES NO REPRESENTATION OR WARRANTY OF ANY NATURE WHATSOEVER TO THE CONTRACTOR CONCERNING SUCH DOCUMENTS. By the execution hereof, the Contractor acknowledges and represents that it has received, reviewed, and carefully examined such documents, has found them to be complete, accurate, adequate, consistent, coordinated, and sufficient for construction and that the Contractor has not, does not, and will not rely upon any representation or warranties by the Owner concerning such documents as no such representation or warranties have been or are hereby made.

- .08 The Contractor herein acknowledges and represents that prior to the submission of its Proposal, and prior to its execution of this Contract, it visited and carefully examined the Project site and any and all structures located thereon, and it thoroughly correlated the results of such visit and examination with the requirements of the Contract Documents. The Contractor further acknowledges that it has become familiar with the local conditions under which the Work is to be performed, and the cost of properly addressing such conditions during performance of the Work is included in the Contract Price set forth hereinbelow.
- .09 Neither the organization of any of the Contract Documents into divisions, sections, paragraphs, articles (or other categories), nor the organization or arrangement of the Design, shall control the Contractor in dividing the Work or in establishing the extent of the scope of the Work to be performed by Subcontractors.

6. Ownership of Contract Documents

The Contract Documents, and each of them, shall remain the property of the Owner. The Contractor shall have the right to keep one record set of the Contract Documents upon completion of the Project; provided, however, that in no event shall Contractor use, or permit to be used, any or all of such Contract Documents on other projects without the Owner's prior written authorization.

7. Hierarchy of Contract Documents

In the event of any conflict, discrepancy, or inconsistency among any of the Contract Documents, the following hierarchy shall control: (a) as between figures given on drawings and the scaled measurements, the figures shall govern; (b) as between large scale drawings and small scale drawings, the large scale shall govern; (c) as between drawings and specifications, the requirements of the specifications shall govern; (d) as between the Contract for Construction and Incorporated General Conditions and the specifications, the requirements of the Contract for Construction and Incorporated General Conditions shall govern; (e) as between any Supplemental Conditions and the Contract for Construction and Incorporated General Conditions, the requirements of the Supplemental Conditions shall govern. As set forth herein above, any and all conflicts, discrepancies, or inconsistencies shall be immediately reported to the Owner and the Architect in writing by the Contractor.

ARTICLE II - THE WORK

1. The Contractor shall perform all of the Work required, implied or reasonably inferable from, this Contract.

2. The term "Work" shall mean whatever is done by or required of the Contractor to perform and complete its duties under this Contract, including the following: construction of the whole or a designated part of the Project; furnishing of any required surety bonds and insurance; and the provision or furnishing of labor, supervision, services, materials, supplies, equipment, fixtures, appliances, facilities, tools, transportation, storage, power, permits and licenses required of the Contractor. Fuel, heat, light, cooling, and all other utilities as required by this Contract shall also be deemed part of the Work. The Work to be performed by the Contractor is generally described as follows:

| |
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| |

ARTICLE III - CONTRACT TIME

1. Time and Damages for Delay

- .01 The Contractor shall commence the Work within 10 days of Notice to Proceed and shall achieve Substantial Completion of the Work no later than April 25, 2025. The number of calendar days from the date on which the Work is permitted to proceed, through the date set forth for Substantial Completion, shall constitute the "Contract Time."
- .02 The Contractor shall pay the Owner the sum of \$5,000.00 per day for each and every calendar day of unexcused delay in achieving Substantial Completion beyond the date set forth herein for Substantial Completion of the Work. Any sums due and payable hereunder by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the Owner, estimated at or before the time of executing this Contract. When the Owner reasonably believes that Substantial Completion will be inexcusably delayed, the Owner shall be entitled, but not required, to withhold from any amounts otherwise due to the Contractor an amount then believed by the Owner to be adequate to cover liquidated damages applicable to such delays. If and when the Contractor overcomes the delay in achieving Substantial Completion, or any part thereof, for which the Owner has withheld payment, the Owner shall promptly release to the Contractor those funds withheld, but no longer applicable, as liquidated damages. Notwithstanding any other provision of this paragraph, the Owner and the Contractor expressly agree that the liquidated damages set forth herein do not contemplate, nor do they cover, any financial delay damages as identified in Article V, Paragraph 6.01.a hereinbelow. Any such Financial Delay Damages shall be in addition to the liquidated damages allowed pursuant to Article III, Paragraph 1.02 contained herein.

2. Substantial Completion

.01 "Substantial Completion" shall mean that stage in the completion of the Work when the Work is sufficiently complete in accordance with this Contract that the Owner can enjoy beneficial use and occupancy of the Work, can utilize the Work for its intended purpose, and a Certificate of Occupancy has been issued allowing full and complete occupancy of the entire Project. Additionally, the Work shall not be deemed to be Substantially Complete until all nonconforming Work specifically rejected by the Architect has been properly completed as required by the Contract and until all warranties, operational manuals, "marked-up" drawings, and similar required documents are delivered to the Architect for transmission to the Owner. Ordinary and customary punch list items shall be completed after Substantial Completion as provided by Article V; Paragraph 5.01 as set forth hereinbelow. Partial use or occupancy of the Project shall not result in the Project being deemed Substantially Complete, and such partial use or occupancy shall not be evidence of Substantial Completion.

.02 In addition to the requirements for Substantial Completion as set forth in Article III, Paragraph 2.01 hereinabove, as an express condition for Substantial Completion, the Contractor shall furnish to the Owner and the Architect, in writing, a detailed list of all incomplete and deficient Work which must be completed and corrected prior to Final Completion of the Project. THIS LIST SHALL BE IN ADDITION TO ALL PUNCH LISTS REQUIRED ELSEWHERE BY THIS CONTRACT.

Furthermore, notwithstanding any other provision of this Agreement, an express condition for Substantial Completion is the submission by the Contractor to the Owner and Architect of any warranties, manuals, drawings, forms, or other documents or things, of any kind or nature, as may be required for Substantial Completion by any of the Contract Documents. In the event the Contract Documents require the submission of any such documents or things in order for the Project to be considered Substantially Complete, receipt of same by Owner and Architect is an express condition precedent to any duty by Owner to make any payment otherwise due Contractor upon Substantial Completion.

3. Time is of the Essence

All limitations of time set forth in the Contract Documents are of the essence of this Contract.

ARTICLE IV - CONTRACT PRICE

1. The Contract Price

The Owner shall pay, and the Contractor shall accept, as full and complete payment for all of the Work required herein, the fixed sum of { }. The sum set forth herein Article IV, Paragraph 1.01 shall constitute the Contract Price which shall not be modified except by Change Order as provided in this Contract.

ARTICLE V - PAYMENT OF THE CONTRACT PRICE

1. Schedule of Values

- .01 Within ten (10) calendar days of the effective date hereof, the Contractor shall submit to the Owner and the Architect a Schedule of Values allocating the Contract Price to the various portions of the Work. The Contractor's Schedule of Values shall be prepared in such form, with such detail, and supported by such data as the Architect or the Owner may require substantiating its accuracy. The Contractor shall not imbalance its Schedule of Values nor artificially inflate any element thereof. The violation of this provision by the Contractor shall constitute a material breach of this Contract. The Schedule of Values shall be used only as a basis for the Contractor's Applications for Payment and shall only constitute such basis after it has been acknowledged in writing by the Architect and the Owner. Receipt of the Schedule of Values as required herein is a condition precedent to payment of any sums due to the Contractor.
- .02 In the event any Work is to be performed under a unit price agreement, the Contractor acknowledges and represents that it has not imbalanced or artificially inflated the unit prices, and, if requested by the Owner or the Architect, the Contractor shall provide such data and supporting documentation as may be requested to support the reasonableness and accuracy of such unit prices. Unit prices establish the complete and total sum to be paid for the unit price work and such unit prices include any and all applicable overhead, profit, and mark-up of every kind and nature.

2. Payment Procedure

- .01 The Owner shall pay the Contract Price to the Contractor as provided below.
- .02 Progress Payments -- Based upon the Contractor's Applications for Payment submitted to the Architect and upon Certificates for Payment subsequently issued to the Owner by the Architect, the Owner shall make progress payments to the Contractor on account of the Contract Price.
- .03 On or before the 5th day of each month after commencement of the Work, the Contractor shall submit an Application for Payment for the period ending the 30th day of the month to the Architect in such form and manner, and with such supporting data and content, as the

Owner or the Architect may require. Therein, the Contractor may request payment for ninety-five percent (95%) of that portion of the Contract Price properly allocable to Contract requirements properly provided, labor, materials, and equipment properly incorporated in the Work plus ninety-five percent (95%) of that portion of the Contract Price properly allocable to materials or equipment stored on-site for subsequent incorporation in the Work, less the total amount of previous payments received from the Owner. Payment for stored materials and equipment shall be conditioned upon the Contractor's proof satisfactory to the Owner, that the Owner has title to such materials and equipment and shall include proof of required insurance. Storage of materials is preferred within the limits of the project site. If necessary due to lead times or other extenuating circumstances materials stored off-site must be housed in a secure location, within fifty (50) miles of the project site. The storage facility must be insured for the balance of the materials stored, and such proof of bond/insurance must be provided to the Owner at the time of payment application. Furthermore, the Contractor must make the storage area available to the Owner/Architect for inspection and verification of materials stored. Such Application for Payment shall be signed by the Contractor and shall constitute the Contractor's representation that the Work has progressed to the level for which payment is requested in accordance with the Schedule of Values, that the Work has been properly installed or performed in full accordance with this Contract, and that the Contractor knows of no reason why payment should not be made as requested. Thereafter, the Architect will review the Application for Payment and may also review the Work at the Project site or elsewhere to determine whether the quantity and quality of the Work is as represented in the Application for Payment and is as required by this Contract. Based on the Architect's evaluations of the Contractor's Application for Payment, the Architect will review and certify the amounts due to the Contractor and will issue Certificates for Payment for such amounts. The Owner shall make partial payments on account of the Contract Price to the Contractor within thirty (30) days following the Architect's receipt of each Application for Payment and its certification of the amount due thereunder. The amount of each partial payment shall be the amount certified for payment by the Architect less such amounts, if any, otherwise owing by the Contractor to the Owner or which the Owner shall have the right to withhold as authorized by this Contract. The Architect's certification of the Contractor's Application for Payment shall not preclude the Owner from the exercise of any of its rights as set forth in Article V, Paragraph 3 hereinbelow and the Architect shall have the right to amend or withdraw any previously executed Certification of Payment if it

determines that such amendment or withdrawal is necessary to protect the interest of the Owner under this Contract. At the discretion of the Owner, and with the approval of the Contractor, the retainage of any subcontractor may be released separately as the subcontractor completes its work. If, however, after discontinuing the retention, the Owner determines that the Work is unsatisfactory or the work has fallen behind schedule, retention will be resumed at the previous level. If retention is resumed by the Owner, the Contractor and subcontractors shall be entitled to resume withholding retainage accordingly. The rights of the Owner set forth herein to retainage are in addition to all of the other rights and remedies of the Owner set forth in this Agreement. Notwithstanding any other provisions herein, the Contractor shall not request, nor shall it be entitled to receive, any reduction in retainage, or any cessation in the withholding of retainage, so long as any Work has been rejected by the Architect and such Work has not been corrected or otherwise performed in accordance with all requirements of the Contract Documents. In the event, retainage has been reduced, or the withholding of retainage has ceased, the rejection of Work by the Architect shall be sufficient cause for the resumption of the withholding of retainage at the full level provided by this Contract.

- .04 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which payments have been received from the Owner shall be free and clear of liens, claims, security interest, or other encumbrances in favor of the Contractor or any other person or entity whatsoever.
- .05 The Contractor shall promptly pay each Subcontractor out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which such Subcontractor is entitled and shall furnish proof of such payment to the Owner and Architect. The Contractor shall also procure and furnish to the Owner and Architect such affidavits of payment, proofs of payment, and lien waivers from subcontractors, suppliers, laborers, and materialmen as the Owner or Architect may require.
- .06 The submission of any Application for Payment by the Contractor to the Architect shall constitute a representation by the Contractor to both the Architect and the Owner that such Application includes any and all sums due the Contractor as of the date of such Application. Payment by the Owner to the Contractor of any sums certified by the Architect pursuant to an Application for Payment shall constitute full and complete payment to the Contractor, save and except for any unpaid retainage, of all sums due to the Contractor from the Owner as of the date of such Application.

.07 No progress payment, nor any use or occupancy of the Project by the Owner, shall be interpreted to constitute an acceptance of any Work not in strict accordance with this Contract.

3. Withheld Payment

.01 The Owner may decline to make payment, may withhold funds, and, if necessary, may demand the return of some or all of the amounts previously paid to the Contractor, to protect the Owner from loss because of:

- a. Work rejected by the Architect or other defective Work not remedied by the Contractor nor, in the opinion of the Owner, likely to be remedied by the Contractor.
- b. Work which requires further testing or inspection to verify that it has been installed in accordance with the requirements of the Contract Documents.
- c. Claims of third parties against the Owner or the Owner's property.
- d. Failure by the Contractor to pay Subcontractors or others in a prompt and proper fashion.
- e. Evidence that the balance of the Work cannot be completed in accordance with the Contract for the unpaid balance of the Contract Price.
- f. Evidence that the Work will not be completed in the time required for substantial or final completion.
- g. Persistent failure to carry out the Work in accordance with the Contract and
- h. Damage to the Owner or a third party to whom the Owner is, or maybe, liable.

In the event that the Owner makes written demand upon the Contractor for amounts previously paid by the Owner as contemplated in this Subparagraph 5.3.1, the Contractor shall promptly comply with such demand.

4. Unexcused Failure to Pay

If within forty-five (45) days after the date established herein for payment to the Contractor by the Owner, the Owner, without cause or basis hereunder, fails to pay the Contractor any amount then due and payable to the Contractor, then the Contractor may after seven (7) additional days' written notice to the Owner and the Architect, and without prejudice to any other available rights or remedies it may have, stop the Work until payment of those amounts due from the Owner has been received. Any payment not made within forty-five (45) days after the date due shall bear interest at the rate of four percent (4%) per annum. No other interest shall be due Contractor.

5. Substantial Completion

- .01 When the Contractor believes that the Work is substantially complete, the Contractor shall submit in writing to the Architect a list of items to be completed or corrected. When the Architect on the basis of an inspection, determines that the Work is in fact Substantially Complete, the Architect will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for Project security, maintenance, heat, utilities, damage to the Work, and insurance, and the Contractor then shall have 30 days to complete the items listed therein. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such certificate. Upon Substantial Completion of the Work, and execution by both the Owner and the Contractor of the Certificate of Substantial Completion, and upon submission to the Owner of a complete set of record drawings illustrating the as-built condition of the Work (including the location of all utilities) along with all maintenance manuals and warranties required by the Contract Documents, the Owner shall pay the Contractor an amount sufficient to increase total payments to the Contractor to one hundred percent (100%) of the Contract Price less two hundred percent (200%) of the reasonable cost as determined by the Owner and the Architect for completing all incomplete Work, correcting and bringing into conformance all defective and nonconforming Work, and handling all unsettled claims. No further payments shall be made until final completion is achieved. In the event the Contractor fails or refuses to complete the incomplete Work, or correct and bring into conformance the defective Work, or resolve any unsettled claims, the Owner, without limitation on any of its other rights or remedies, may complete the Work, remedy any defects in the Work, and resolve any unsettled claims relating to the Work, and the Contractor shall be liable to the Owner for the cost of same. If the Work is completed or corrected by employees of the Owner, the Contractor shall be liable for the reasonable value of the completion or correction based upon the reasonable commercial cost of such Work if performed by an independent contractor. To the extent the amount due to the Owner hereunder exceeds the retainage held by the Owner, the balance due shall be paid by the Contractor within ten (10) days after receipt of an invoice or demand for payment from the Owner.
- .02 With respect to any and all Work performed by the Contractor after Substantial Completion of the Project or after any occupancy of the Project, in whole or in part, by the Owner, absent prior written consent of the Owner, such Work shall not be performed (a)

during normal operating hours of the school; (b) during the installation of any fixtures, furniture, or equipment by the Owner, or, (c) during any cleaning, waxing or other work by the Owner. Furthermore, any such Work shall only be performed in accordance with a detailed schedule indicating the proposed nature and area where the Work will be performed; the specific date and time of the Work; and, the identity of each Subcontractor who will be performing any of the Work. SUCH WORK SHALL NOT COMMENCE UNLESS THE OWNER FIRST APPROVES THE PROPOSED SCHEDULE. All such Work shall be under the supervision of the Contractor, and the Contractor shall be and shall remain, on the Project site during the performance of the Work. If any such Work requires or necessitates the presence of the Owner or the Architect, the Contractor shall be responsible for the cost thus incurred by the Owner or Architect. Each day the area where such Work is located, and any adjacent area impacted by the Work, shall be carefully cleaned by the Contractor and any construction debris shall be properly removed. All such areas shall be left by the Contractor in full operating condition.

- .03 Notwithstanding any other provision of this Agreement, a condition precedent for Substantial Completion of the Project is the successful performance of an operational test on each of the following Project systems: the electrical system; the mechanical system; the fire alarm system; the lighting control system; the sound system; and the energy management system. Each such test shall be conducted in strict accordance with all requirements of the Project specifications, and each such system must operate in full conformity with all requirements of said specifications for not less than forty-five (45) consecutive calendar days prior to the date of Substantial Completion. Before the initiation of the operational test for each such system, and before the commencement of the forty-five (45) day operational period, the Contractor shall first give the Owner and the Architect not less than three (3) days prior written notice.

6. Completion and Final Payment

- .01 When all of the Work is finally complete and the Contractor is ready for a final inspection, it shall notify the Owner and the Architect thereof in writing. Thereupon, the Architect will make a final inspection of the Work and, if the Work is complete in full accordance with this Contract and this Contract has been fully performed, the Architect will promptly issue a final Certificate for Payment certifying to the Owner that the Project is complete and the Contractor is entitled to the remainder of the unpaid Contract Price, less any amount withheld pursuant to this Contract. All Warranties and Guarantees required by the Contract shall commence on the date of Final Completion of the Work. If the Architect is

unable to issue its final Certificate for Payment and is required to repeat its final inspection of the Work, the Contractor shall bear the cost of such repeat final inspection(s) which cost may be deducted by the Owner from the Contractor's final payment.

- a. If the Contractor fails to achieve final completion within the time fixed therefore by the Architect in its Certificate of Substantial Completion, the Contractor shall pay the Owner the sum of \$5,000.00 per day for each and every calendar day of unexcused delay in achieving final completion beyond the date set forth herein for final completion of the Work. Any sums due and payable hereunder by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the Owner, estimated at or before the time of executing this Contract. When the Owner reasonably believes that final completion will be inexcusably delayed, the Owner shall be entitled, but not required, to withhold from any amounts otherwise due to the Contractor an amount then believed by the Owner to be adequate to cover liquidated damages applicable to such delays. If and when the Contractor overcomes the delay in achieving final completion, or any part thereof, for which the Owner has withheld payment, the Owner shall promptly release to the Contractor those funds withheld, but no longer applicable, as liquidated damages. Notwithstanding any other provision of this paragraph, the Owner and the Contractor expressly agree that the liquidated damages set forth herein do not contemplate, nor do they cover, any financial delay damages as identified in Article V, Paragraph 6.01.b hereinbelow. Any such Financial Delay Damages shall be in addition to the liquidated damages allowed pursuant to Article V, Paragraph 6.01.a hereinabove.
- b. The Contractor recognizes and acknowledges that delay in achieving Substantial Completion, Final Completion, or final close-out of the Project could jeopardize the Owner's state or federal funding or other financial support for the Project. Among other things, any such delay could cause the Owner to incur the forfeiture of unspent funds; the cost and expense of premature bond redemption; or, other costs, expense, liability, loss, or damage arising out of or relating to the impairment of Project funding (any and all such potential losses and damages are referred to as "Funding Delay Damages"). The Contractor and the Owner furthermore expressly recognize, acknowledge, and agree that the liquidated damages established in Article III, Paragraph 1.02 and Article V, Paragraph 6.01.a hereinabove do not contemplate or cover Funding Delay Damages and that in the event any such Funding Delay

Damages are suffered or sustained by the Owner as the result of any Project delays caused by the Contractor, or for which the Contractor is otherwise responsible under this Contract, the Owner shall be entitled to recover such Funding Delay Damages from the Contractor, and the Contractor shall be liable to the Owner for same. Nothing contained herein shall preclude the recovery by the Owner of the liquidated damages set forth elsewhere in this Contract.

- .02 The Contractor shall not be entitled to final payment unless and until it submits to the Architect and Owner all documents required by the Contract, including, but not limited to, its affidavit that all payrolls, invoices for materials and equipment, and other liabilities connected with the Work for which the Owner or the Owner's property might be responsible, have been fully paid or otherwise satisfied; releases and waivers of lien from all Subcontractors of the Contractor and of any and all other parties required by the Architect or the Owner; consent of Surety, if any, to final payment; all required maintenance and operation manuals; and, all required record and as-built drawings. If any third party fails or refuses to provide a release of claim or waiver of lien as required by the Owner, the Contractor shall furnish a bond satisfactory to the Owner to discharge any such lien or indemnify the Owner from liability. FULL AND COMPLETE COMPLIANCE WITH ALL TERMS AND CONDITIONS OF THIS PARAGRAPH 6.02 OF ARTICLE V IS A CONDITION PRECEDENT TO FINAL PAYMENT.
- .03 The Owner shall make a final payment of all sums due to the Contractor within thirty (30) days of the Architect's execution of a final Certificate for Payment.
- .04 Acceptance of final payment shall constitute a waiver of all claims against the Owner by the Contractor except for those claims previously made in writing against the Owner by the Contractor, pending at the time of final payment, and identified in writing by the Contractor as unsettled at the time of its request for final payment.
- .05 The Owner and the Contractor expressly agree that the terms of payment, payment periods, and rates of interest herein shall control to the exclusion of any provisions set forth in the Georgia Prompt Pay Act, O.C.G.A. § 13-11-1 et seq., and the provisions of said Act are herein waived.

ARTICLE VI - THE OWNER

1. Information, Services, and Things Required from Owner

- .01 If the Contractor requests in writing, the Owner shall furnish to the Contractor, prior to the execution of this Contract, any and all written and tangible material in its possession

concerning conditions below ground at the site of the Project. Such written and tangible material is furnished to the Contractor only in order to make a complete disclosure of such material and for no other purpose. By furnishing such material, the Owner does not represent, warrant, or guarantee its accuracy either in whole, in part, implicitly or explicitly, or at all, and shall have no liability, therefore. The Owner shall also furnish surveys, legal limitations, and utility locations (if known), and a legal description of the Project site. To the extent the Owner furnishes any information concerning utility locations, the Owner makes no representations or warranties concerning same and shall have no liability to Contractor in the event such information contains discrepancies or is otherwise inaccurate. Nothing contained herein shall limit the Contractor's duties and representations as set forth in Article I, Paragraph 5.08 hereinabove.

.02 Excluding permits and fees normally the responsibility of the Contractor, the Owner shall obtain all approvals, easements, and the like required for construction and shall pay for necessary assessments and charges required for construction, use, or occupancy of permanent structures or for permanent changes in existing facilities.

2. Right to Stop Work

In the event of an emergency threatening injury to person or property, or if the Contractor fails or refuses to perform the Work in accordance with this Contract, the Owner may order the Contractor to stop the Work, or any described portion thereof, until the cause for stoppage has been corrected, no longer exists, or the Owner orders that Work be resumed. In such an event, the Contractor shall immediately obey such an order.

3. Owner's Right to Perform Work

If the Contractor has installed defective or deficient Work which is not in conformity with the requirements of the Contract Documents, or if the Contractor fails or refuses to perform any portion of the Work, then the Owner may, without prejudice to any other rights or remedies the Owner may have against the Contractor, proceed to carry out the subject Work. In such a situation, the Contract Price shall be reduced by the cost of performing the subject Work, plus compensation for the Architect's additional services and expenses necessitated thereby, if any. If such Work is performed by employees of the Owner, the Contract Price reduction shall reflect the reasonable value of such Work based upon the reasonable commercial cost of such Work as if performed by an independent contractor. If the unpaid portion of the Contract Price is insufficient to cover the amount due to the Owner, the Contractor shall pay the difference to the Owner within ten (10) days of receipt of demand from the Owner.

ARTICLE VII - THE CONTRACTOR

1. The Contractor is again reminded of its continuing duty set forth in Article I, Paragraph 5.07. The Contractor shall perform no part of the Work at any time without adequate Contract Documents or, as appropriate, approved Shop Drawings, Product Data, or Samples for such portion of the Work. If the Contractor performs any of the Work knowing it involves a recognized error, inconsistency, or omission in the Contract Documents without such notice to the Architect, the Contractor shall be responsible for such performance and shall pay the cost of correction.
2. The Contractor shall perform the Work strictly in accordance with this Contract.
3. The Contractor shall supervise and direct the Work using the Contractor's best skill, effort, and attention. The Contractor shall be responsible to the Owner for any and all acts or omissions of the Contractor, its employees, and others engaged in the Work on behalf of the Contractor.
4. **Warranty**

The Contractor warrants to the Owner that all labor furnished to progress the Work under this Contract will be competent to perform the tasks undertaken, that the product of such labor will yield only first-class results, that materials and equipment furnished will be of good quality and new unless otherwise permitted by this Contract, and that the Work will be of good quality, free from faults and defects and in strict conformance with this Contract. All Work not conforming to these requirements may be considered defective.
5. The Contractor shall obtain and pay for all permits, inspections, fees, and licenses necessary and ordinary for the Work. The Contractor shall comply with all lawful requirements applicable to the Work and shall give and maintain any notices required by applicable law, ordinance, or regulation pertaining to the Work. The duties and obligations of the Contractor arising hereunder include but are not limited to the full and strict compliance of the Contractor with all rules, regulations, and legal mandates of the United States Department of Labor; the United States Immigration and Naturalization Service; the Georgia Department of Labor; the United States Department of Environmental Protection; and the Georgia Environmental Protection Division of the Department of Natural Resources. The Contractor shall furthermore comply with any and all applicable federal, state, and local tax laws, unemployment compensation acts, and workers' compensation acts, and upon request of the Owner to the Contractor shall furnish written proof of such compliance. The Contractor shall defend, indemnify and hold the Owner harmless from any and all fines or citations issued against Owner arising out of, or relating to, any violations by the Contractor of any law, rule, regulation, or ordinance of any governmental

authority. This duty of indemnification specifically includes, but is not limited to, the duty to indemnify and hold the Owner harmless from any and all attorneys' fees, court costs, expert witness fees, and other expenses arising out of any such fine or citation or otherwise resulting from any such violation by the Contractor.

6. Supervision

- .01 The Contractor shall employ and maintain at the Project site only competent supervisory personnel. Any supervisory or other personnel reasonably objectionable to the Owner shall be removed from the Project. Absent written instruction from the Contractor to the contrary, the superintendent shall be deemed the Contractor's authorized representative at the site and shall be authorized to receive and accept any and all communications from the Owner or the Architect. The Contractor shall attend any job site or other Project meetings as may be requested by the Owner or the Architect and shall have available in person such management personnel at any such meetings as the Owner or the Architect may require.
- .02 Key supervisory personnel assigned by the Contractor to this Project are as follows:

| Name | Function |
|-------------|-----------------|
| { } | Superintendent |
| { } | Project Manager |

7. Schedules

- .01 The Contractor, within ten (10) days of commencing the Work, shall submit to the Owner and the Architect for their information, the Contractor's schedule for completing the Work. Said schedule shall be based on the required Contract completion date and shall include any milestone dates set forth in the Contract Documents. Additionally, within ten (10) days of commencing the Work, the Contractor shall submit to the Owner and the Architect a separate shop drawing and submittal schedule detailing the schedule for the submission to the Architect of all shop drawings, submittals, product data, and other similar documents. Each of the schedules required herein shall be revised no less frequently than monthly (unless the parties otherwise agree in writing) and shall be revised to reflect conditions encountered from time to time and shall be related to the entire Project. Each such revision shall be furnished to the Owner and the Architect. The schedules, and all revisions, shall be in such form and shall contain such detail, as the Owner or the Architect may require. THE PARTIES SPECIFICALLY AGREE THAT ANY FLOAT CONTAINED IN THE SCHEDULES SHALL BELONG TO THE PROJECT AND IN NO EVENT SHALL THE CONTRACTOR MAKE A CLAIM FOR ANY ALLEGED DELAY,

ACCELERATION, OR EARLY COMPLETION SO LONG AS THE PROJECT IS COMPLETED WITHIN THE CONTRACT TIME. Strict compliance with the requirements of this Paragraph is a condition precedent for payment to the Contractor, and failure by the Contractor to strictly comply with said requirements shall constitute a material breach of this Contract.

- .02 In addition to the schedules and revisions required in Paragraph 7.01 of Article VII hereinabove, with the submission of each of its Applications for Payment, the Contractor shall submit a 30-day “look ahead” schedule set forth in detail the Work to be performed during the next 30 days and shall also submit a 30-day “look back” schedule set forth in detail the Work actually performed during the preceding 30 days as compared to the Work scheduled during such period. The “look ahead” and “look back” schedules shall be in such form as the Owner may require, and the timely receipt of such schedules shall be a condition precedent to the Owner’s duty to make payment to the Contractor.
- .03 Without limitation on any other rights or remedies of the Owner in the event Contractor fails or refuses to progress the Work, or any portion thereof, in accordance with the requirements of the Project schedule, the Owner or Architect may order or direct the Contractor to take one or more of the following actions:
- a. Increase the labor force of Contractor and its subcontractors;
 - b. Implement overtime operations;
 - c. Increase the number or duration of shifts;
 - d. Supplement its Project management;
 - e. Furnish additional equipment to its forces;
 - f. Accelerate delivery of material and supplies;
 - g. Take such other action as the Owner reasonably believes necessary to increase the rate of progress.

The Contractor shall proceed with any action ordered or directed by Owner or Architect under this Paragraph within forty-eight (48) hours of receipt of such order or direction. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR MAKE CLAIM FOR, NOR SHALL IT BE ENTITLED TO RECOVER, ANY COST, EXPENSE, LOSS, OR DAMAGE ARISING OUT OF, OR RELATING TO, ANY SUCH ORDER OR DIRECTION OF OWNER OR ARCHITECT OR ANY ACTION TAKEN IN RESPONSE THERETO.

8. The Contractor shall continuously maintain at the site, for the benefit of the Owner and the Architect, one record copy of this Contract marked to record on a current basis changes,

selections, and modifications made during construction. Additionally, the Contractor shall maintain at the site for the Owner and Architect the approved Shop Drawings, Product Data, Samples, and other similar required submittals. Upon final completion of the Work, all of these record documents shall be delivered to the Owner.

9. Shop Drawings, Product Data, and Samples

.01 Shop Drawings, Product Data, Samples, and other submittals from the Contractor do not constitute Contract Documents. Their purpose is merely to demonstrate the manner in which the Contractor intends to implement the Work in conformance with information received from the Contract Documents.

.02 In no event shall the Contractor submit any Shop Drawings, Product Data or Sample which is not in conformity with the requirements of the Contract Documents, and the Contractor shall not perform any portion of the Work requiring submittal and review of Shop Drawings, Product Data or Samples unless and until same shall have been approved by the Architect. Approval by the Architect, however, shall not be evidence that Work installed pursuant thereto conforms with the requirements of this Contract.

10. Cleaning the Site and the Project

The Contractor shall keep the site reasonably clean to the satisfaction of the Owner and Architect during the performance of the Work. Upon final completion of the Work, the Contractor shall clean the site and the Project and remove all waste, together with all of the Contractor's property therefrom.

11. Access to Work

The Owner and the Architect shall have access to the Work at all times from commencement of the Work through final completion. The Contractor shall take whatever steps necessary to provide access when requested.

12. Indemnity

.01 The Contractor shall be responsible from the time of signing the Contract, or from the time of commencement of the Work, whichever shall first occur, for all injury or damage of any kind resulting from the Work, to persons or property, including employees and property of the Owner. The Contractor shall exonerate, indemnify and save harmless the Owner from and against all claims or actions, and all expenses incidental to the defense of any such claims, litigation, and actions, based upon or arising out of damage or injury (including death) to persons or property caused by or sustained in connection with the performance of this Contract or by conditions created thereby or arising out of or any way connected

with the Work performed under this Contract and shall assume and pay for, without cost to the Owner, the defense of any and all such claims, litigation and actions, suffered through any act or omission of the Contractor, or any Subcontractor, or anyone directly or indirectly employed by or under the supervision of any of them. At the option of the Owner, the Contractor expressly agrees to defend against any claims brought or actions filed against the Owner, where such claim or action involves, in whole or in part, the subject of the indemnity contained herein, whether such claims or actions are rightfully or wrongfully brought or filed. In such an event, legal counsel provided by the Contractor shall be subject to the Owner's approval.

.02 To the extent the Owner suffers or sustains any fines, penalties, or assessments as the result of any act or omission of the Contractor, the Contractor shall indemnify and hold harmless the Owner from same and the Contractor shall reimburse the Owner for any and all legal cost and expense, including attorneys' fees, incurred in connection with any such fines, penalties or assessments.

.03 In claims against any person or entity indemnified under this Paragraph 12 of Article VII by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under this Paragraph 12 of Article VII shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

13. Means, Methods, Techniques, Sequences, Procedures, and Safety

The Contractor is fully responsible for and shall have control over, all construction means, methods, techniques, sequences, procedures, and safety, and shall coordinate all portions of the work required by the Contract Documents. Nothing contained herein, however, shall in any manner whatsoever relieve, release, or discharge the Architect from any of its duties, responsibilities, obligations, or liabilities as set forth in its contract with the Owner, or as provided by law.

14. Separate Contracts

.01 The Owner reserves the right to perform work on the premises with its own forces or by the use of other contractors. In such event, the Contractor shall fully cooperate with the Owner and such other contractors and shall coordinate, schedule, and manage its work so as not to hinder, delay or otherwise interfere with the separate work of the Owner or other contractors.

- .02 The Contractor acknowledges that if the Contract Documents provide for the site work for the Project, including but not limited to, clearing and grubbing, rough grading, finish grading, building pad preparation, curbing, gutter installation, and paving to be performed by the Owner or a separate contractor under a contract with the Owner (“the Site Contractor”) then the terms and conditions of this Paragraph 14.02 of Article VII shall be applicable. The Contractor acknowledges that in such an event said site work may proceed simultaneously with the work of the Contractor. With respect to said site work and the Site Contractor, the Contractor agrees as follows:
- a. The Contractor shall coordinate and cooperate fully with the Site Contractor so as to cause no interference with or delay to, the work of the Site Contractor. This duty includes, but is not limited to, the duty to share and coordinate construction schedules, delivery schedules, and any and all other information necessary for the proper and timely performance of the Work or the site work. The Contractor agrees to meet with the Owner, the Architect, or the Site Contractor as may be necessary to avoid and resolve any issues, questions, or problems concerning this duty of coordination and cooperation. Communications by and between the Contractor and Site Contractor shall be initiated in writing, or confirmed in writing, within twenty-four (24) hours of same, and a copy of all such communications shall be immediately furnished to the Owner and the Architect;
 - b. In the event the Contractor contends or asserts that it has suffered or sustained any delay, interference, liability, damage, cost or expense arising out of, or resulting from, any act or omission of the Site Contractor, the Contractor shall provide written notice of same to the Owner, the Architect, and the Site Contractor within twenty-four (24) hours of the act or omission giving rise to such delay, interference, liability, damage, cost or expense. Such notice shall include a description of each act or omission in issue as well as a detailed statement of any actual or anticipated liability, damage, cost, or expense arising therefrom. The Contractor shall further provide such supporting documentation relating to the matters set forth in such notice as the Owner may require;
 - c. THE CONTRACTOR HEREIN ACKNOWLEDGES AND AGREES THAT IT SHALL MAKE NO CLAIM FOR DAMAGES, COST, OR EXPENSE OF ANY KIND OR NATURE AGAINST THE OWNER ARISING OUT OF, OR RESULTING FROM, PERFORMANCE OF ANY OF THE SITE WORK BY THE SITE CONTRACTOR OR ANY ACT OR OMISSION OF THE SITE CONTRACTOR, AND ANY SUCH CLAIM IS

HEREIN EXPRESSLY AND UNCONDITIONALLY WAIVED. THE SOLE AND EXCLUSIVE REMEDY OF THE CONTRACTOR IN THE EVENT OF ANY DELAY, INTERFERENCE, OR OTHER WRONGFUL ACT OR OMISSION OF THE SITE CONTRACTOR SHALL BE AN EXTENSION OF THE CONTRACT TIME PROVIDED, HOWEVER, THAT THE NOTICE REQUIRED BY SUBPARAGRAPH (B) HEREINABOVE IS A CONDITION PRECEDENT TO ANY SUCH EXTENSION OF TIME AND FURTHER PROVIDED THAT THE CONTRACTOR MUST DEMONSTRATE TO THE OWNER THAT THE DELAY, INTERFERENCE OR OTHER WRONGFUL ACT OR OMISSION OF THE SITE CONTRACTOR DID IN FACT DELAY THE PROJECT TO THE EXTENT OF THE TIME REQUESTED BY THE CONTRACTOR.

- d. Should any other provision in the Contract Documents conflict with any of the terms and conditions of this Subparagraph, the terms and conditions of this Subparagraph shall control; Upon completion of the site work, or any portion of same as designated by the Owner or the Architect, the Contractor shall meet with the Owner or the Architect and inspect such site work to determine whether or not it has been installed in accordance with the requirements of the Contract Documents. Upon completion of such inspection, the Contractor shall notify the Owner and the Architect in writing of any and all deviations or variances from the requirements of the site work contract or the Contract Documents. Except as to the extent set forth in such notice, the Contractor shall be deemed to have accepted the site work, or a designated portion of same, and such acceptance shall be deemed an acknowledgment by the Contractor that such work has been installed in full conformity with all requirements of the site work contract and the Contract Documents and that it is suitable, ready and fit to receive the work of the Contractor. Said acceptance shall further constitute an acknowledgment and agreement by the Contractor that it will take and assume full responsibility for any subsequent damage to said site work caused by the Contractor, any of its subcontractors, suppliers, or others on the Project for the benefit of the Contractor.

15. Notice of Commencement

The Contractor shall file a NOTICE OF COMMENCEMENT with the Clerk of the Superior Court of Cherokee County, Georgia no later than fifteen (15) days after the Contractor physically commences work on the site. The Contractor shall furnish a copy of the NOTICE OF COMMENCEMENT to the Architect and to anyone else making a written request.

- .01 The NOTICE OF COMMENCEMENT shall contain the following information:
 - a. The name, address, and telephone number of the Contractor.
 - b. The name and location of the project being constructed and the legal description of the property upon which the improvements are being made.
 - c. The name and address of the true owner.
 - d. The name and address of the surety for the performance and payment bonds.
 - e. Any other requirements called for in the Official Code of Georgia Annotated - Sections 36-91-72 and 44-14-361.5.

16. Compliance with Federal and State Laws

- .01 The Contractor shall register and participate in the electronic verification (“E-Verify”) of the work authorization program operated by the U.S. Department of Homeland Security or any equivalent federal work authorization program operated by the U.S. Department of Homeland Security.
- .02 The Contractor shall verify that all new employees of the Contractor are in compliance with the Immigration Reform and Control Act of 1986, as required by state law, as codified at O.C.G.A. § 13-10-91, et seq.
- .03 The Contractor shall provide the Owner with executed affidavits verifying their compliance with applicable state and federal laws, as identified in Paragraph 16 of Article VII.
- .04 The Contractor agrees that, should it employ or contract with any Subcontractor(s) in connection with the physical performance of services pursuant to this Contract with the Owner, the Contractor will secure from such Subcontractor(s) an executed affidavit verifying the Subcontractor(s)’s compliance with O.C.G.A. § 13-10-91. The Contractor further agrees to maintain records of compliance by said Subcontractor(s) and their Tiers and provide a copy of each such verification to the Owner at the time the Subcontractor(s) is retained to perform such service.
- .05 The Contractor agrees to provide records, in an Excel Format, to the Owner providing the following information:
 - a. Contractor Legal Name
 - b. Contractor Address
 - c. Contractor Federal work authorization program user number (E-Verify Number)
 - d. Date of Contract between the contractor and public employer.

- .06 The contractor also agrees to provide records for Subcontractors and Tiers in the same format and requiring the same information. This information is to be provided when requested by the Owner.
- .07 In order to comply with the provisions of O.C.G.A. § 50-5-85, the contractor by execution hereof represents and warrants that the contractor, including all wholly- owned subsidiaries, majority-owned subsidiaries, parent companies, or affiliates of such entities or business associations, do not participate in a boycott of Israel as the same is defined by O.C.G.A. § 50-5-85(a)(1).

ARTICLE VIII - CONTRACT ADMINISTRATION

1. The Architect

The Architect for this project is Architect. In the event the Owner should find it necessary or convenient to replace the Architect, the Owner shall retain a replacement Architect and the status of the replacement Architect shall be that of the former Architect.

2. Architect's Administration

- .01 The Architect, unless otherwise directed by the Owner in writing, will perform those duties and discharge those responsibilities allocated to the Architect as set forth in this Contract. The Architect shall be the Owner's representative from the effective date of this Contract until final payment has been made. The Architect shall be authorized to act on behalf of the Owner only to the extent provided in this Contract.
- .02 The Owner and the Contractor shall communicate with each other in the first instance through the Architect.
- .03 The Architect shall be the initial interpreter of the requirements of the drawings and specifications and the judge of the performance thereunder by the Contractor. The Architect shall render written or graphic interpretations necessary for the proper execution or progress of the Work with reasonable promptness on request of the Contractor.
- .04 The Architect will review the Contractor's Applications for Payment and will certify to the Owner for payment to the Contractor, those amounts then due to the Contractor as provided in this Contract.
- .05 The Architect shall have authority to reject Work that is defective or does not conform to the requirements of this Contract. If the Architect deems it necessary or advisable, the Architect shall have authority to require additional inspection or testing of the Work for compliance with Contract requirements.

- .06 The Architect will review and approve, or take other appropriate action as necessary, concerning the Contractor's submittals including Shop Drawings, Product Data, and Samples. Such review, approval, or other action shall be for the sole purpose of determining conformance with the design concept and information given through the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the work or in the activities of the Owner, Contractor, or separate Contractor while allowing sufficient time in the Architect's professional judgment to permit adequate review.
- .07 The Architect will prepare Change Orders and may authorize minor changes in the Work by Field Order as provided elsewhere herein.
- .08 The Architect shall, upon written request from the Contractor, conduct inspections to determine the date of Substantial Completion and the date of Final Completion will receive and forward to the Owner for the Owner's review and records, written warranties, and related documents required by this Contract and will issue a final Certificate for Payment upon compliance with the requirements of this Contract. A written request for interpretations (R.F.I.'s) required of the Architect received after noon (12:00 p.m.) on the last working day of the Architect's workweek shall be acknowledged as received on the Architect's following normal working day.
- .09 The Architect's decisions in matters relating to the aesthetic effect shall be final if consistent with the intent of this Contract.
- .10 The Contractor shall make no claim for an extension of the Contract Time or for additional compensation arising out of or relating to any alleged failure by the Architect to timely take any action or render any decision unless and until the Contractor has first provided ten (10) days prior written notice to the Architect identifying therein the specific action or decision which the Contractor contends is necessary to avoid delay or further delay, to the Project. In the event the Architect takes the requested action, or renders the requested decision, within ten (10) days of the receipt of such notice, no claim for an extension of the Contract Time or for additional compensation arising out of, or relating to, such action or decision shall be made by the Contractor and any such claim is expressly waived.
- .11 THE DUTIES, OBLIGATIONS, AND RESPONSIBILITIES OF THE CONTRACTOR UNDER THIS AGREEMENT SHALL IN NO MANNER WHATSOEVER BE CHANGED, ALTERED, DISCHARGED, RELEASED, OR SATISFIED BY ANY DUTY, OBLIGATION, OR RESPONSIBILITY OF THE ARCHITECT. THE CONTRACTOR IS NOT A THIRD-

PARTY BENEFICIARY OF ANY AGREEMENT BY AND BETWEEN THE OWNER AND THE ARCHITECT. IT IS EXPRESSLY ACKNOWLEDGED AND AGREED THAT THE DUTIES OF THE CONTRACTOR TO THE OWNER ARE INDEPENDENT OF, AND ARE NOT DIMINISHED BY, ANY DUTIES OF THE ARCHITECT TO THE OWNER.

3. Claims by the Contractor

- .01 All Contractor claims shall be initiated by written notice and claim to the Owner and the Architect. The notice and claim shall be in such form as required by the Owner and same shall be signed by an officer of the Contractor under oath and under penalty of perjury. Such written notice and claim must be furnished within seven (7) days after the occurrence of the event, or the first appearance of the condition, giving rise to the claim. THE FAILURE BY THE CONTRACTOR TO PROVIDE THE WRITTEN NOTICE AND CLAIM AS PROVIDED IN THIS PARAGRAPH SHALL CONSTITUTE A WAIVER BY THE CONTRACTOR OF ANY SUCH CLAIM AGAINST THE OWNER.
- .02 Pending final resolution of any claim of the Contractor, the Contractor shall diligently proceed with performance of this Contract and the Owner shall continue to make payments to the Contractor in accordance with this Contract. The resolution of any claim under Paragraph 8.3 shall be reflected by a Change Order executed by the Owner, the Architect, and the Contractor.
- .03 Claims for Concealed and Unknown Conditions. Should concealed and unknown conditions be encountered in the performance of the Work (a) below the surface of the ground or (b) in an existing structure be at variance with the conditions indicated by this Contract, or should unknown conditions of an unusual nature differing materially from those ordinarily encountered in the area and generally recognized as inherent in Work of the character provided for in this Contract, be encountered, the Contract Price shall be equitably adjusted by Change Order upon the written notice and claim by either party made within seven (7) days after the first observance of the condition. As a condition precedent to the Owner having any liability to the Contractor for concealed or unknown conditions, the Contractor must give the Owner and the Architect written notice of, and an opportunity to observe, the condition prior to disturbing it. THE FAILURE BY THE CONTRACTOR TO PROVIDE THE WRITTEN NOTICE AND CLAIM AS PROVIDED IN THIS PARAGRAPH SHALL CONSTITUTE A WAIVER BY THE CONTRACTOR OF ANY CLAIM ARISING OUT OF OR RELATING TO SUCH CONCEALED OR UNKNOWN CONDITION.

- .04 Claims for Additional Costs. If the Contractor wishes to make a claim for an increase in the Contract Price, as a condition precedent to any liability of the Owner, therefore, the Contractor shall give the Architect written notice of such claim within seven (7) days after the occurrence of the event, or the first appearance of the condition, giving rise to such claim. Such notice shall be given by the Contractor before proceeding to execute any additional or changed Work. THE FAILURE BY THE CONTRACTOR TO PROVIDE SUCH NOTICE AND TO GIVE SUCH NOTICE PRIOR TO EXECUTING THE WORK SHALL CONSTITUTE A WAIVER OF ANY CLAIM FOR ADDITIONAL COMPENSATION.
- .05 Limitations on Liability. In connection with any claim by the Contractor against the Owner, any liability of the Owner shall be strictly limited to direct costs incurred by the Contractor and shall in no event include indirect costs or consequential damages of the Contractor. Furthermore, in no event shall the Owner be liable to the Contractor for any claim for home office overhead, loss of efficiency or productivity, loss of use of capital, loss of bonding capacity, or loss of business opportunity. Furthermore, the Owner shall have no liability for any claim for acceleration or compression of the schedule. The Owner shall not be liable to the Contractor for claims of third parties, including Subcontractors, unless and until the liability of the Contractor has been established therefore in a court of competent jurisdiction and the Contractor shall vigorously assert any and all valid legal and factual defenses which it may have against such claims. The Contractor shall not serve as a conduit for the claims of subcontractors against the Owner, and any provision in any contract between the Contractor and any subcontractor pursuant to which the Contractor is obligated to present to the Owner any claim of any subcontractor shall be invalid.
- .06 Claims for Additional Time. If the Contractor is delayed in progressing any task which at the time of the delay is then critical or which during the delay becomes critical, as the sole result of any act or neglect to act by the Owner or someone acting in the Owner's behalf, or by changes ordered in the Work, unusual delay in transportation, unusually adverse weather conditions not reasonably anticipatable, fire or any causes beyond the Contractor's control, then the date for achieving Substantial Completion of the Work shall be extended upon the written notice and claim of the Contractor to the Owner and the Architect, for such reasonable time as the Architect may determine. Any notice and claim for an extension of time by the Contractor shall be made not more than seven (7) days after the occurrence of the event or the first appearance of the condition giving rise to the claim and shall set forth in detail the Contractor's basis for requiring additional time in which to complete the Project. In the event the delay to the Contractor is a continuing one,

only one notice and claim for the additional time shall be necessary, provided such notice expressly states the Contractor expects the delay to be continuing and states the basis for such expectation. IF THE CONTRACTOR FAILS TO MAKE SUCH A CLAIM AS REQUIRED IN THIS PARAGRAPH, ANY CLAIM FOR AN EXTENSION OF TIME SHALL BE WAIVED.

.07 Extension of Contract Time for Unusually Adverse Weather Conditions Not Reasonably Anticipated

Pursuant to the provisions of Paragraph 3.05 of Article VIII of this Contract, the contract time may be extended upon written notice and claim of the Contractor to the Owner and the Architect as set forth in such subparagraph and as further set forth herein. It is, however, expressly agreed that the time for completion as stated in the Contract Documents includes a due allowance for calendar days on which work cannot be performed out-of-doors. For purposes of this Contract, and for purposes of extensions of contract time, the Contractor agrees that it anticipates adverse weather sufficient to prevent work in accordance with the schedule set forth hereinbelow, and the Contractor further agrees that unless it encounters actual adverse weather in excess of those days set forth hereinbelow, it shall not make, nor shall it be entitled to, any extension of the contract time:

| | | | | | |
|----------|-----------|--------|-----------|-----------|-----------|
| January | - 12 days | May | - 8 days | September | - 7 days |
| February | - 10 days | June | - 8 days | October | - 9 days |
| March | - 9 days | July | - 11 days | November | - 9 days |
| April | - 8 days | August | - 9 days | December | - 10 days |

Furthermore, in addition to the notice requirements set forth in the aforesaid Paragraph 3.05 of Article VIII, the Contractor agrees that it shall provide written notice to the Owner and the Architect on the day of any adverse weather not anticipated and for which a request for a time extension has been, or will be, made. Said notice shall state with particularity a description of the adverse weather as well as a description of the nature and extent of any delay caused by such weather. Receipt of this notice by the Owner and the Architect is a condition precedent to the submission of any claim for an extension of time as provided by Paragraph 3.05 of Article VIII. Furthermore, as required by Paragraph 3.05 of Article VIII, the Contractor shall submit a written claim for extension of time within seven (7) days after the occurrence of the adverse weather and such claim shall be supported by such documentation including, but not limited to, official weather reports, as the Owner or the Architect may require. To the extent that any of the terms and conditions

set forth in this paragraph are in conflict with any of the terms and conditions of Paragraph 3.05 of Article VIII as identified herein, the terms and conditions of this paragraph shall govern and control. THE FAILURE BY THE CONTRACTOR TO COMPLY WITH ALL REQUIREMENTS OF THIS PARAGRAPH 3.06 OF ARTICLE VIII SHALL PRECLUDE ANY EXTENSION OF THE CONTRACT TIME FOR ADVERSE WEATHER.

.08 NOTWITHSTANDING ANY OTHER PROVISION OF THIS CONTRACT, THE PARTIES SPECIFICALLY AGREE THAT ANY AND ALL-WEATHER DELAYS SHALL BE NONCOMPENSABLE AND THE SOLE AND EXCLUSIVE REMEDY OF THE CONTRACTOR IN THE EVENT OF ANY SUCH DELAY IS AN EXTENSION OF THE CONTRACT TIME AS PROVIDED IN PARAGRAPH 3.06 OF ARTICLE VIII HEREINABOVE.

.09 Legal Action by the Contractor: As a condition precedent to the filing of any legal action by the Contractor against the Owner arising out of or relating to this Contract, the Contractor shall first provide the Owner thirty (30) days prior written notice of its intent to file such action. Such notice shall include an identification of the anticipated parties to said action and a description of all anticipated claims and causes of action to be asserted in said action. Any legal action under this Agreement filed by either the Contractor or the Owner shall be filed in the Superior Court of Cherokee County, Georgia, and said Court shall be the exclusive venue for any such action. The Contractor expressly agrees that it shall be subject to the jurisdiction and venue of said Court for any such action.

ARTICLE IX - SUBCONTRACTORS

1. Definition

A Subcontractor is an entity that has a direct contract with the Contractor to perform a portion of the Work.

2. Award of Subcontracts

.01 Upon execution of the Contract, the Contractor shall furnish the Owner, in writing, the names of persons or entities proposed by the Contractor to act as Subcontractors on the Project. The Owner shall promptly reply to the Contractor, in writing, stating any objections the Owner may have to any of the proposed Subcontractors. The Contractor shall not enter into a Subcontract with a proposed Subcontractor with reference to whom the Owner has made timely objection. The Contractor shall not be required to Subcontract with any party to whom the Contractor has an objection.

.02 All subcontracts shall afford the Contractor rights against the Subcontractor which correspond to those rights afforded to the Owner against the Contractor herein, including those rights afforded to the Owner by Subparagraph 2.01 of Article VII below.

3. **Verification of Subcontractor Payments**

The Owner may in its discretion verify with any Subcontractor the status of payments received or due from the Contractor. Nothing contained herein shall in any manner limit or restrict any other right of the Owner to communicate with a subcontractor.

ARTICLE X - CHANGES IN THE WORK

1. **Changes Permitted**

.01 Changes in the Work within the general scope of this Contract, consisting of additions, deletions, revisions, or any combination thereof, may be ordered without invalidating this Contract, by Change Order, or by Field Order.

.02 Changes in the Work shall be performed under applicable provisions of this Contract and the Contractor shall proceed promptly with such changes.

2. **Change Order Defined**

Change Order shall mean a written order to the Contractor executed by the Owner and the Architect, issued after execution of this Contract, authorizing and directing a change in the Work or an adjustment in the Contract Price or the Contract Time, or any combination thereof. The Contract Price and the Contract Time may be changed only by Change Order.

3. **Changes in the Contract Price**

.01 Any change in the Contract Price resulting from a Change Order shall be determined as follows: (a) by mutual agreement between the Owner and the Contractor as evidenced by (1) the change in the Contract Price being set forth in the Change Order, (2) such change in the Contract Price, together with any conditions or requirements related thereto, being initialed by both parties and (3) the Contractor's execution of the Change Order, or (b) if no mutual agreement occurs between the Owner and the Contractor, then, as provided in Subparagraph 3.02 of Article X below.

.02 If no mutual agreement occurs between the Owner and the Contractor as contemplated in Subparagraph 3.01 of Article X above, the change in the Contract Price, if any, shall then be determined by the Architect on the basis of the reasonable expenditures or savings of those performing, deleting, or revising the Work attributable to the change, including, in the case of an increase or decrease in the Contract Price, a reasonable allowance for

direct job site overhead and profit. In such case, the Contractor shall present, in such form and with such content as the Owner or the Architect requires an itemized accounting of such expenditures or savings, plus appropriate supporting data for inclusion in a Change Order. Reasonable expenditures or savings shall be limited to the following: reasonable costs of materials, supplies, or equipment including delivery costs, reasonable costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance, reasonable rental costs of machinery and equipment exclusive of hand tools whether rented from the Contractor or others, reasonable costs of premiums for all bonds and insurance, permit fees, and sales, use or other taxes related to the Work, and reasonable cost of direct supervision and jobsite field office overhead directly attributable to the change. In the event the Contractor performs the Work required by change order with its own forces, and not the forces of a Subcontractor, the overhead and profit due to the Contractor for such work shall be twenty (20) percent. In the event the change order Work is performed by one or more subcontractors, the Contractor's overhead and profit shall be seven and one-half (7-1/2) percent. In no event shall any expenditure or savings associated with the Contractor's home office or other non-jobsite overhead expense be included in any change in the Contract Price. Pending final determination of reasonable expenditures or savings to the Owner, payments on account shall be made to the Contractor on the Architect's Certificate for Payment.

.03 If unit prices are provided in the Contract, and if the quantities contemplated are so changed in a proposed Change Order that application of such unit prices to the quantities of Work proposed will cause substantial inequity to the Owner or to the Contractor, the applicable unit prices shall be equitably adjusted.

4. Effect of Executed Change Order

The execution of a Change Order by the Contractor shall constitute conclusive evidence of the Contractor's agreement to the ordered changes in the Work, this Contract as thus amended, the Contract Price and the Contract Time. The Contractor, by executing the Change Order, waives and forever releases any claim against the Owner for additional time or compensation for matters relating to or arising out of or resulting from the Work included within or affected by the executed Change Order.

5. Notice to Surety, Consent

The Contractor shall notify and obtain the consent and approval of the Contractor's surety with reference to all Change Orders if such notice, consent, or approval are required by the Contractor's surety or by law. The Contractor's execution of the Change Order shall constitute the Contractor's warranty to the Owner that the surety has been notified of and consents to, such Change Order and the surety shall be conclusively deemed to have been notified of such Change Order and to have expressly consented thereto.

ARTICLE XI - UNCOVERING AND CORRECTING WORK

1. Uncovering Work

- .01 If any of the Work is covered contrary to the Architect's request or to any provisions of this Contract, it shall, if required by the Architect or the Owner, be uncovered for the Architect's inspection and shall be properly replaced at the Contractor's expense without change in the Contract Time.
- .02 If any of the Work is covered not in contradiction to the Architect's request or to any provisions of this Contract, nonetheless, it shall, if required by the Architect or Owner, be uncovered for the Architect's inspection. If such Work conforms strictly with this Contract, costs of uncovering and proper replacement shall by Change Order be charged to the Owner. If such Work does not strictly conform with this Contract, the Contractor shall pay the costs of uncovering and proper replacement.

2. Correcting Work

- .01 The Contractor shall immediately proceed to correct Work rejected by the Architect as defective or failing to conform to this Contract. All such rejected Work shall be corrected in sufficient time so as not to delay either Substantial Completion or Final Completion of the Project, and in any event, such rejected Work shall be corrected within thirty (30) days after issuance of any written rejection notice by the Architect. In the event the Work is not fully corrected within three (3) days from the date of the said rejection notice, the Contractor shall submit to the Owner and the Architect, within seven (7) days of said notice, a detailed written plan of remediation in such form, and in such detail, as the Owner may require. At a minimum, such plan of remediation shall include an identification and location of the Work to be remediated; a detailed description of the process and procedure proposed for the remediation; the name of each Subcontractor involved in performing any of the remediation Work; the proposed schedule for the remediation including start date, hours of operation, and finish date; and, the name of each individual responsible for the management of such Work. The Contractor shall pay all costs and

expenses associated with correcting such rejected Work, including any additional testing and inspections, and reimbursement to the Owner for the Architect's services and expenses made necessary thereby.

- .02 If within one (1) year after Final Completion of the Work, any of the Work is found to be defective or not in accordance with this Contract, the Contractor shall correct it promptly upon receipt of written notice from the Owner. This obligation shall survive final payment by the Owner and termination of this Contract. With respect to Work first performed and completed after Substantial Completion, this one-year obligation to specifically correct defective and nonconforming Work shall be extended by the period of time which elapses between Substantial Completion and completion of the subject Work.
- .03 Nothing contained in this Paragraph 2 of Article XI shall establish any period of limitation with respect to other obligations which the Contractor has under this Contract. The establishment of the one-year time period in Subparagraph 2.02 of Article XI relates only to the duty of the Contractor to specifically correct the Work.

3. Owner May Accept Defective or Nonconforming Work

If the Owner chooses to accept defective or nonconforming Work, the Owner may do so. In such event, the Contract Price shall be reduced by the greater of (a) the reasonable cost of removing and correcting the defective or nonconforming Work, and (b) the difference between the fair market value of the Project as constructed and the fair market value of the Project had it not been constructed in such a manner as to include defective or non-conforming Work. If the remaining portion of the unpaid Contract Price, if any, is insufficient to compensate the Owner for its acceptance of defective or nonconforming Work, the Contractor shall, upon written demand from the Owner, pay the Owner such remaining compensation for accepting defective or non-conforming Work.

ARTICLE XII - CONTRACT TERMINATION

1. Termination by the Contractor

- .01 If the Work is stopped for a period of ninety (90) days by an order of any court or other public authority, or as a result of an act of the Government, through no fault of the Contractor or any person or entity working directly or indirectly for the Contractor, the Contractor may, upon ten (10) days written notice to the Owner and the Architect, terminate performance under this Contract and recover from the Owner payment for the actual reasonable expenditures of the Contractor (as limited in Subparagraph 3.02 of Article X above) for all Work executed and for materials, equipment, tools, construction

equipment, and machinery actually purchased or rented solely for the Work, less any salvage value of any such items.

- .02 If the Owner shall persistently or repeatedly fail to perform any material obligation to the Contractor for a period of thirty (30) days after receiving written notice from the Contractor of its intent to terminate hereunder, the Contractor may terminate performance under this Contract by written notice to the Architect and the Owner. In such event, the Contractor shall be entitled to recover from the Owner as though the Owner had terminated the Contractor's performance under this Contract for convenience pursuant to Subparagraph 2.01 of Article XII hereunder.

2. Termination by the Owner

.01 For Convenience

- a. The Owner may for any reason whatsoever terminate performance under this Contract by the Contractor for convenience. The Owner shall give written notice of such termination to the Contractor specifying when the termination becomes effective.
- b. The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders. The Owner may direct the Contractor to assign the Contractor's right, title, and interest under terminated orders or subcontracts to the Owner or its designee.
- c. The Contractor shall transfer title and deliver to the Owner such completed or partially completed Work and materials, equipment, parts, fixtures, information, and Contract rights as the Contractor has.

.02

- a. Within sixty (60) days after its termination for convenience, the Contractor shall submit a termination claim to the Owner and the Architect specifying the amounts due because of the termination for convenience together with costs, pricing, or other data required by the Architect. The claim shall be signed by an officer of the Contractor under oath and under penalty of perjury. IF THE CONTRACTOR FAILS TO FILE A COMPLETE AND PROPER TERMINATION CLAIM WITHIN THE TIME REQUIRED HEREIN ANY CLAIM FOR TERMINATION SHALL BE DEEMED WAIVED AND NO FURTHER SUMS SHALL BE DUE TO THE CONTRACTOR.

- b. The Owner and the Contractor may agree to the compensation, if any, due to the Contractor hereunder.
- c. Absent agreement to the amount due to the Contractor, and provided Contractor has submitted its claim in accordance with the requirements set forth hereinabove, the Owner shall pay the Contractor the following amounts:
 - 1) Contract prices for labor, materials, equipment, and other services accepted under this Contract;
 - 2) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the Work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided, however, that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss if any;
 - 3) Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to Subparagraph 2.01.b of Article XII of this Paragraph. These costs shall not include amounts paid in accordance with other provisions hereof.

The total sum to be paid the Contractor under this Subparagraph 2.01 of Article XII shall not exceed the total Contract Price, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment.

3. For Cause

- .01 If the Contractor persistently or repeatedly refuses or fails to prosecute the Work in a timely manner, supply enough properly skilled workers, supervisory personnel or proper equipment or materials, or if it fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a material provision of this Contract, then the Owner may by written notice to the Contractor, without prejudice to any other right or remedy, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish

the Work by whatever methods it may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

- .02 If the unpaid balance of the Contract Price exceeds the cost of finishing the work, including compensation for the Architect's additional services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive the termination of the Contract.
- .03 In the event, the employment of the Contractor is terminated by the Owner for cause pursuant to Subparagraph 2.02 of Article XII and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause; such termination shall thereupon be deemed a Termination for Convenience under Subparagraph 2.01 of Article XII and the provisions of Subparagraph 2.01 of Article XII shall apply.

ARTICLE XIII - OWNER'S RIGHT TO SUSPEND CONTRACTOR'S PERFORMANCE

- 1. The Owner shall have the right at any time to direct the Contractor to suspend its performance, or any designated part thereof, for any reason whatsoever, or without reason, for a cumulative period of up to sixty (60) calendar days. If any such suspension is directed by the Owner, the Contractor shall immediately comply with the same.
- 2. In the event the Owner directs a suspension of performance under this Article 13, through no fault of the Contractor, the Owner shall pay the Contractor as full compensation for such suspension the Contractor's reasonable costs, actually incurred, and paid, of:
 - .01 Demobilization and remobilization, including such costs paid to subcontractors;
 - .02 Preserving and protecting work in place;
 - .03 Storage of materials or equipment purchased for the Project, including insurance thereon;
 - .04 Performing in a later, or during a longer, time frame than that contemplated by this Contract.

ARTICLE XIV - INSURANCE

The Contractor shall not commence work until it has obtained all the insurance required in this Article, and such insurance has been approved by Cherokee County School District ("CCSD/Owner").

1. Policies and Coverage

- .01 The Contractor shall obtain and maintain for the term of the Contract the following policies and coverage:

- a. General Liability Insurance, on an occurrence basis, covering work done or to be done by or on behalf of the Contractor and providing insurance for bodily injury, personal injury, property damage, and contractual liability. The aggregate limit shall apply separately to each project. Must include Additional Insured ISO CG2010 and CG2037 or equivalent.
- b. Business Automobile Liability Insurance on an occurrence basis, covering owned, hired, and non-owned automobiles used by or on behalf of the Contractor and providing insurance for bodily injury, property damage, and contractual liability. Such insurance shall include coverage for uninsured and underinsured motorists.
- c. Worker's Compensation including Employers Liability Insurance
- d. Course of Construction Insurance covering all risk of loss maintained at one hundred percent of the completed value based on the insurable portion of the work, including materials at the project site, stored off the project site, and in transit.
- e. Environmental Impairment Liability Insurance
- f. Any other insurance as required by law.

2. Verification of Coverage

The Contractor shall submit certificates of insurance and separate letters of endorsements to the policies of insurance required by the contract to CCSD as evidence of the insurance coverage, naming CCSD's officers, directors, employees, agents, volunteers, and assigns as additional insured.

.01 The scope of coverage and deductible shall be shown on the certificate of insurance. The certificates of insurance and endorsements shall provide for no cancellation or modification of coverage without thirty days' written notice to CCSD. Renewal certifications and endorsements shall be timely filed by the Contractor for all coverage until the work is accepted as complete. CCSD reserves the right to require the Contractor to furnish complete, certified copies of all required insurance policies.

3. Waivers of Subrogation

The Owner and Contractor waive all rights against (1) each other and any of their Subcontractors, Sub-Subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors provided by the Owner, if any, and any of their Subcontractors, Sub-Subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Article, or other property insurance applicable to the Work, except such rights as they have

to proceeds of such insurance held by the Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors provided herein, if any, and the Subcontractors, Sub-Subcontractors, agents, and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policy shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

4. Insurance Provisions

The insurance policies shall contain, or be endorsed to contain, the following provisions:

- .01 For the general, automobile, and umbrella/excess liability policies, CCSD, its officers, employees, representatives, volunteers, and agents are to be covered as additional insureds.
- .02 For any claims related to the work, the Contractor's insurance coverage shall be primary insurance as respect to CCSD/Owner, its officers, employees, representatives, volunteers, and agents. Any insurance or self-insurance maintained by CCSD/Owner, its officers, employees, representatives, volunteers, and agents shall be in excess of the Contractor's insurance and shall not contribute with it.
- .03 Each insurance policy required by this Article shall state that coverage shall not be canceled by either the Contractor or the insurance carrier, except after thirty days prior written notice by certified mail, return receipt requested, has been given to CCSD/Owner.
- .04 CCSD, its officers, employees, representatives, volunteers, and agents shall not by reason of their inclusion as additional insureds incur liability to the insurance carriers for payment of premiums for such insurance.
- .05 Course of construction coverage shall contain the following provisions:
 - a. CCSD shall be named as loss payee;
 - b. The insurer shall waive all rights of subrogation against CCSD/Owner; and
 - c. If required in writing by a party in interest, the Contractor as fiduciary shall, upon the occurrence of an insured loss, give bond for the proper performance of the Contractor's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Contractor shall deposit in separate account proceeds so

received, which the contractor shall distribute in accordance with such agreement as the parties in interest may reach. If after such loss no other special agreement is made, replacement of damaged property shall be covered by appropriate Change Order.

- .06 Partial occupancy or use shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Contractor shall take reasonable steps to obtain the consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance.

5. Amount of Insurance

- .01 For all projects, other than those involving hazardous materials, the insurance furnished by the Contractor under this Article shall provide coverage in amounts not less than the following, unless a different amount is stated in the Supplementary General Conditions.
- a. Comprehensive or Commercial form General Liability Insurance - Limits of Liability
 - 1) \$2,000,000 General Aggregate
 - 2) \$1,000,000 Each Occurrence - combined single limit for bodily injury and property damage.
 - b. Business Automobile Liability Insurance - Limits of Liability
 - 1) \$1,000,000 Each Accident- combined single limit for bodily injury and property damage to include uninsured and underinsured motorist coverage.
 - c. Workers' Compensation limits as required by law with Employers Liability limits of \$1,000,000.
 - d. Umbrella/Excess Liability Insurance \$5,000,000
 - e. Environmental Impairment (pollution) Liability Insurance - Limits of Liability:
 - 1) \$10,000,000 Aggregate
 - 2) \$5,000,000 Each Accident including cleanup costs.
 - f. Course of Construction Insurance - 100% of the completed value of the work.
- .02 For projects involving hazardous materials, only the Contractor and its hazardous materials subcontractor(s) shall provide coverage in amounts not less than the following, unless a different amount is stated in the Supplementary General Conditions:
- a. Comprehensive or Commercial form General Liability Insurance - Limits of Liability

- 1) \$2,000,000 General Aggregate
 - 2) \$1,000,000 Each Occurrence - combined single limit for bodily injury and property damage.
 - b. Business Automobile Liability Insurance - Limits of Liability
 - 1) \$1,000,000 Each Accident- combined single limit for bodily injury and property damage to include uninsured and underinsured motorist coverage.
 - c. Hazardous material transporter services must also have:
 - 1) MCS-90 endorsement
 - 2) Sudden & Accidental Pollution Endorsement-Limits of Liability*
 - (a) \$10,000,000 General Aggregate
 - (b) \$5,000,000 Each Occurrence
- *A higher limit on the MCS-90 endorsement required by law must be matched by the Sudden & Accidental Pollution Insurance.
- d. Workers' Compensation limits as required by law with employers Liability limits of \$1,000,000.
 - e. Umbrella/Excess Liability Insurance \$5,000,000
 - f. Course of Construction Insurance-100% of the completed value of the work
 - g. Environmental Impairment (pollution) Liability Insurance - Limits of Liability:
 - 1) \$10,000,000 Aggregate
 - 2) \$5,000,000 Each Accident including cleanup costs.

6. Acceptability of Insurers

Insurers shall be licensed by the State of Georgia to transact insurance and shall hold a current A.M. Best's rating of A-; VII; or shall be a carrier otherwise acceptable to CCSD.

7. Subcontractor's Insurance

The contractor shall ensure that its subcontractors are covered by insurance of the type and the amounts required by this Article. The contractor shall not allow any subcontractor to commence work on its subcontract until the insurance has been obtained.

8. Miscellaneous

.01 Any deductible under any policy of insurance required in this Article shall be the Contractor's liability.

- .02 Acceptance of certificates of insurance by CCSD/Owner shall not limit the Contractor's liability under the Contract.
- .03 If the General Liability coverage is provided by a Commercial General Liability Policy on a claims-made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverage required to be maintained after the final payment, submit certification that policy is in effect at the time of final payment and will not be canceled or allowed to expire until at least 30 days prior written notice has been given to the Owner.
- .04 In the event the Contractor does not comply with these insurance requirements, CCSD/Owner may, at its option, provide insurance coverage to protect CCSD/owner. The cost of the insurance shall be paid by the Contractor and, if prompt payment is not received, may be deducted from Contract sums otherwise due to the Contractor.
- .05 If CCSD/Owner is damaged by the failure of the Contractor to provide or maintain the required insurance, the Contractor shall pay CCSD/Owner for all such damages.

The Contractor's obligations to obtain and maintain all required insurance are not delegable duties under this Contract.

ARTICLE XV - MISCELLANEOUS

1. Special Stipulations

- .01 Governing Law. The Contract shall be governed by the laws of the State of Georgia, Cherokee County.
- .02 Independent Contractor. The Contractor shall perform the services under this Contract as an independent contractor and nothing contained herein shall be construed to be inconsistent with this relationship or status. Nothing in this Contract shall be interpreted or construed to constitute Contractor or any of its agents or employees to be the agent, employee, or representative of Owner.
- .03 Conflicts of Interest

The Contractor certifies that to the best of its knowledge no circumstances exist which will cause a conflict of interest in performing the services required by this Contract, that no employee of Owner, nor any member thereof, nor any public agency or official affected by this Contract, has any pecuniary interest in the business of the Contractor or its subcontractors and that no person associated with the Contractor or its subcontractors has any interest that would conflict in any manner or degree with

the performance of this Contract.

- a. Should Contractor become aware of any circumstances which may cause a conflict of interest during the term of this Contract, Contractor shall immediately notify Owner. If the Owner determines that a conflict of interest exists, the Owner may require that Contractor take action to remedy the conflict of interest or terminate the Contract without liability. Owner shall have the right to recover any fees paid for services rendered by Contractor which were performed while a conflict of interest existed if Contractor had knowledge of the conflict of interest and did not notify Owner within one week of becoming aware of the existence of the conflict of interest.
 - b. Contractor warrants that Contractor and Contractor's Subcontractors have not employed or retained any company or person other than a bona fide employee, working solely for Contractor or its Subcontractor(s) to solicit or secure this Contract and that Contractor and Contractor's Subcontractor(s) have not paid or agreed to pay any person, company, corporation, individual, or firm other than a bona fide employee working solely for Contractor or its Subcontractor(s) any fee, commission, percentage, gift or another consideration contingent upon or resulting from the award of this Contract. For any breach or violation of this provision, the Owner shall have the right to terminate the Contract without liability and, at its discretion, to deduct from the price, or otherwise recover, the full amount of such fee, commission, percentage, gift, payment or consideration.
 - c. The contractor shall include the terms and conditions of Paragraph 1.03 of Article XV and all subparagraphs thereof in all subcontractor agreements for work to be performed under this Contract.
- .04 Equal Employment Opportunity. During the performance of this Contract, Contractor agrees as follows: (a) Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, or national origin; (b) Contractor will, in all solicitations or advertisements for employees placed by qualified applicants, receive consideration for employment without regard to race, creed, color, sex or national origin; (c) Contractor will cause the foregoing provisions to be inserted in all subcontracts for any work covered by the Contract so that such provision will be binding upon each Subcontractor, provided that the foregoing provision shall not apply to contracts or subcontracts for standard commercial supplies of raw materials.

2. Successors and Assigns

The Owner and Contractor bind themselves, their successors, assigns, and legal representatives to the other party hereto and to successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in this Contract. The Contractor shall not assign this Contract without the written consent of the Owner.

3. Surety Bonds

The Contractor shall furnish separate performance and payment bonds to the Owner. Each bond shall set forth a penal sum in an amount not less than the Contract Price. Each bond furnished by the Contractor shall incorporate by reference the terms of this Contract as fully as though they were set forth verbatim in such bonds. In the event, the Contract Price is adjusted by Change Order executed by the Contractor, the penal sum of both the performance bond and the payment bond shall be deemed increased by a like amount. The performance and payment bonds furnished by the Contractor shall be in a form suitable to the Owner and shall be executed by a surety, or sureties, reasonably suitable to the Owner. At the delivery of such bonds to the Owner, the Contractor shall also furnish in writing to the Owner the name, address, telephone number, email address, and facsimile number of the person employed by the surety to whom any claims, notices, requests, or other communications from the Owner are to be submitted. If requested by the Owner or the Architect, the Contractor shall procure and furnish to the Owner and Architect the written consent of surety to any proposed Change Order, contract payment, or other contemplated action under this Contract. The Contractor shall provide a contact name, phone number, and address at the signing of this contract.

4. Entire Agreement

5. This Contract constitutes the sole and entire agreement between the parties. No representations either oral or written not incorporated herein shall be binding on the parties. No amendment or modification of this Contract shall be enforceable unless the same is in writing duly executed by the parties. In the event, any term, condition, clause, or provision of this Contract is held or determined to be invalid by any Court of competent jurisdiction, any and all remaining terms, conditions, clauses, and provisions of the Contract shall remain in full force and effect.

This Contract is executed under seal on the date set forth hereinbelow.

**CHEROKEE COUNTY BOARD
OF EDUCATION**

Cherokee County School System

CONTRACTOR

**Creekland MS Classroom
Addition and Creekview HS
Classroom Addition - Auxiliary
Gym
Cherokee County School
District
2022.N.19.01**



06-22-2023

**CHEROKEE COUNTY BOARD
OF EDUCATION**

Signature
Dr. Brian V. Hightower
Superintendent of Schools
1205 Bluffs Parkway
Canton, GA 30114

CONTRACTOR

Signature
Principal
Contractor
Address
Address

Date of Execution

Date of Execution

Approved as to Form:

Legal Counsel for the Cherokee County Board of Education

END OF SECTION 007213

SECTION 01 10 00

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Contractor duties.
5. Work by Owner.
6. Work under separate contracts.
7. Owner-furnished, Contractor-installed products.
8. Access to site.
9. Protection of persons, work, and property.
10. Coordination with occupants.
11. Work restrictions.
12. Specification and Drawing conventions.
13. Provisions for electronic media.

B. Related Requirements:

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

1.2 PROJECT INFORMATION

A. Project Identification: Creekland Middle School.

1. Project Location: 1555 Owens Store Rd, Canton, GA 30115

B. Owner: Cherokee County School District.

1. Owner's Representative: Trey Moores.

C. Architect Identification: The Contract Documents were prepared for the Project by Perkins&Will, 1315 Peachtree Street NE, Atlanta, GA 30309.

D. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Refer to Drawing Title Page.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
 - 1. Creekland Middle School – Addition and Renovations scope of work includes the construction of a new two-story, 20 classroom addition. The existing cafeteria and band room gets an addition in order to create a new Platform for performances in the cafeteria. Additional interior renovation work is indicated in the Contract Documents.
- B. Type of Contract:
 - 1. Project will be constructed under a single prime contract.

1.4 PHASED CONSTRUCTION

- A. The Work shall be conducted in several phases, with each phase substantially complete as indicated:
 - 1. Phasing schedule will be developed by the contractor with approval from the owner in order to maintain school operations during normal business hours / dates.
- B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.
- C. Secure individual permits and inspections for each separate portion of each building, as necessary to allow for completion of separate portions of the work, Certificate of Occupancy for that portion of the work, and Owner's occupancy and use of that portion of the work prior to Substantial Completion of the entire contract's work.
 - 1. Coordinate the construction schedule and the incremental sequence of completion with the Owner prior to obtaining permits.
 - 2. Execute Certificate of Substantial Completion for each designated portion of the Work prior to Owner occupancy. Allow access for Owner personnel and operation of HVAC, Plumbing, Electrical, and Communication Systems.

1.5 CONTRACTOR DUTIES

- A. VOC Compliance: Ensure that all assemblies, components, and systems comply with all VOC (Volatile Organic Components) requirements and regulations of the Environmental Protection Agency (EPA), Occupational Safety Health Administration (OSHA), State, County, City, and Local Air Control District.
 - 1. See Divisions 02 through 28 for Project VOC Restrictions.
- B. Except as specifically noted, provide and pay for:
 - 1. Labor, materials, and equipment.
 - 2. Tools, construction equipment and machinery.
 - 3. Water, heat, and utilities required for construction.

4. Other facilities and services necessary for proper execution and completion of work.
 - C. Secure and pay for, as necessary for proper execution and completion of Work, and as applicable at time of receipt of bids:
 1. Building Permit.
 2. Licenses.
 - D. Give required notices.
 - E. Comply with all applicable local Building Codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of Work.
 - F. Promptly submit written notice to Architect of observed variance of Contract Documents from requirements of authorities having jurisdiction. Assume responsibility for Work known to be contrary to code or regulatory requirements performed without such notice.
- 1.6 WORK UNDER SEPARATE CONTRACTS
- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.
 - B. Concurrent Work: Owner will award separate contract(s) for the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract.
 1. Creekland Middle School – HVAC Replacement: A separate Contractor will be responsible for the replacement of existing HVAC systems within the existing school.
- 1.7 OWNER-FURNISHED, CONTRACTOR-INSTALLED PRODUCTS
- A. Owner will furnish products indicated in Documents. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products and making building services connections.
 - B. Owner-Furnished Products:
 1. Toilet, bath and laundry accessories, See Section 10 28 00 "Toilet, Bath and Laundry Accessories."
 - C. Owner Responsibilities: For Owner-furnished, Contractor-installed products, the Owner will:
 1. Arrange for Shop Drawings, Product Data, and Samples and deliver to the Contractor
 2. Arrange and pay for delivery of Owner-furnished items according to Contractor's construction schedule
 3. Inspect delivered items for damage.

4. Arrange for replacement of Owner-furnished items that are damaged, defective, or missing when delivered to Contractor.
 5. Arrange for manufacturer's field services for delivery of manufacturer's warranties to the Contractor.
 6. Furnish the Contractor the earliest possible delivery date for Owner-furnished products.
- D. Contractor Responsibilities: For Owner-furnished, Contractor-installed products, the Contractor shall:
1. Provide support systems to receive Owner's equipment as well as provide plumbing, HVAC, and electrical connections.
 2. Be present for delivery and assist the Owner's inspection.
 3. Use Owner-furnished delivery dates in Contractor's construction schedule
 4. Review Shop Drawings, Product Data, Samples, and other submittals, and return to the Architect, noting discrepancies or anticipated problems regarding incorporation of the product.
 5. Be responsible for receiving, unloading, handling, and storing Owner-furnished items at Project site.
 6. Protect Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
 7. Repair or replace items damaged because of Contractor's operations with new items matching originally specified items.
 8. Install and incorporate Owner-furnished items into the work, in accordance with manufacturer's installation instructions, and make building utility services connections.

1.8 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section and by Owner's right to perform work or retain other contractors on portions of the project.
1. During construction, allow for Owner occupancy and public use of, and access to, existing facilities.
 2. Make each entity engaged in work on the Project aware that the existing facilities house operating functions that must remain in operation during the construction period, except as the Owner may otherwise direct. Plumbing, heating, ventilating, electrical, fire alarm, and telephone systems are to be functional throughout the construction period with a minimum of interruptions in service. Do not block any required fire exits.

3. Confine operations at Project site to areas permitted by law, ordinances, permits, and Contract Documents.
 4. Do not unreasonably encumber site with materials or equipment that hinders access.
 5. Protect and keep safe products stored on premises.
 6. Products and materials are to be stored to not interfere with operations of Owner or other contractors.
 7. Obtain and pay for use of additional storage or work areas needed for operations.
- C. Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Limit use of site for work and storage as follows:
 - a. Do not use completed paved areas for storage without Owner's approval.
 - b. Do not store materials within canopy of new or existing trees.
 - c. Restrict Work and storage to areas indicated on Drawings or approved by Owner.
 - d. Limit site access to locations approved by Owner.
 - e. Restrict parking to areas approved by Owner.
 - f. Do not perform operations that would interrupt or delay Owner's daily operations.
 2. Limits: Limit site disturbance, including earthwork and clearing of vegetation, to 40 feet beyond building perimeter; 10 feet beyond surface walkways, patios, surface parking, and utilities less than 12 inches in diameter; 15 feet beyond primary roadway curbs and main utility branch trenches; and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas in order to limit compaction in the constructed area.
 3. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment onsite.
- D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- E. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.9 PROTECTION OF PERSONS, WORK, AND PROPERTY

- A. Contractor shall maintain adequate protection of the Work from damage and shall protect the Owner's and adjacent property from injury or loss arising from the Work.
 - 1. Repair damage to existing buildings, property, and site caused by employees, subcontractors, or consultants.
- B. Contractor shall provide and always maintain OSHA-required danger signs, guards, and obstructions necessary to protect the public and construction personnel from any dangers inherent with or created by the construction of the Work.
 - 1. Comply with federal, state, and city rules and requirements pertaining to safety, and all EPA standards, OSHA standards, and NESHAP regulations pertaining to asbestos and other hazardous materials.

1.10 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.
- B. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- C. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.

2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.11 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 7 p.m., Monday through Friday, unless otherwise indicated.
 1. Hours for Core Drilling and other noisy activities: Coordinate with Owner. Perform during hours when building is least occupied.
 2. Obtain approval from Owner for work outside of these hours.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Owner not less than 72 hours in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 1. Notify Owner not less than 72 hours in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Property: Smoking is not permitted within the building or on Owner's property.
- F. Restricted Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- G. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
 1. Maintain list of approved screened personnel with Owner's representative.

1.12 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specifications Format: The Specifications are organized into Divisions and Sections using CSI/CSC's "MasterFormat 2020" 50-Division numbering system.
1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence, without all numbers included in the sequence. Consult the Table of Contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.
 2. The order of articles, paragraphs, subparagraphs, and sub-subparagraphs within the text of any Specification section is defined by a sequence of indentations.
 - a. Article, paragraph and subparagraph titles, and other identifications of subject matter in the Specifications, are intended as an aid in locating and recognizing various requirements in the beginning words of a sentence.
 - b. Specification text shall govern over titling and shall be understood to be interpreted as a whole. Where a title establishes the subject, the titles are subordinate to and do not define, limit, or otherwise restrict the Specification text.
 3. The captions and headings of various subdivisions of the Contract Documents are intended only as a matter of reference and convenience for describing the Work and in no way define, prescribe, or limit the scope or intent of the Contract Documents or any subdivision thereof.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - b. Contract Documents may omit modifying words such as "all" or "any," and articles such as "the" or "an." The absence of a modifier or article from one statement that appears in another is not intended to affect the interpretation of either statement.
 3. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

4. The Specifications do not:
 - a. Establish trade jurisdictions or divisions of responsibility.
 - b. Define subcontract scopes of work.
 - C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
 - D. Work specified in any one Section is related to, and dependent upon, Work specified in other Sections, whether or not specific reference is made to the Work of other Sections. Cross-references in the Specifications are general references intended as a matter of convenience for aiding in the location general information and are not all-inclusive.
 - E. Names, telephone numbers, and website addresses and other contact information listed in the Contract Documents are for convenience only, are subject to change, and are believed to be accurate and up to date as of the printing of the Contract Documents.
 - F. Use of the word "including," when following any general statement, shall not be construed to limit such statement to specific items or matters listed, whether or not non-limiting language (such as "without limitation," "but not limited to," or other words of similar import) is used with reference thereto; but rather, shall be deemed to refer to all other items or matters that could reasonably fall within the broadest possible scope of such general statement.
 - G. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.
- 1.13 PROVISIONS FOR ELECTRONIC MEDIA
- A. Digital Data Files: Electronic drawing/model files of the Contract Drawings will not be furnished by Architect for Contractor's use in preparing submittals unless procedures stated within Section 01 33 00 – "Submittal Procedures" are agreed to and Contractor executes the Agreement Form, and the Contractor properly prepares and submits the Submittals Schedule as indicated in Division 01 Section "Construction Progress Documentation."
 - B. For the duration of this Project, it is the intent to distribute information in electronic format where allowable. Drawings, Specifications, Contract Document Modifications, memoranda, letters or other documents issued in the normal course of execution of the Work will be issued and distributed in electronic format (.pdf).
 1. Costs associated with printing and distribution of the project information shall be included in the Contract Sum.

2. Printed documents will be provided and expected only for documents that are required to be in paper format by this Contract, Authorities Having Jurisdiction, or other statutory requirements.
 - a. Drawings that require revision will be reissued for replacement as full-size sheets.
 - b. Specifications that require revision will be reissued as complete replacement Specification Sections.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 13 00

DELEGATED DESIGN REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for assemblies and construction systems provided by the Contractor as delegated design.

1.2 DEFINITIONS

- A. Delegated: Means delegated by the Owner and Architect to the Contractor.
- B. Design: Means the planning, coordination, and graphic and written communication of a portion of the Work, including determination and engineering of system or assembly or system organization and structure, in response to functional requirements, arrangement and performance criteria indicated in the Contract Documents.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Portions of the Contract Documents delegate the design of certain components, assemblies or systems to the Contractor, or may otherwise specify "delegated design requirements" in individual specification Sections.
- B. The Contractor is to be responsible for delegated design Work, including design, engineering and performance.
- C. Drawings of delegated design portions of Work are diagrammatic and are intended only to show:
 - 1. Design intent of finished materials, profiles, shapes and forms.
 - 2. Relationships between elements.
 - 3. Location, identification, dimension and size of components, assemblies and accessories.
 - 4. Schematic attachment details and diagrams of fasteners and connections.
- D. Specifications for delegated design portions of the Work establish performance criteria for materials, products, systems, and methods of execution, along with minimum performance requirements for indicated portions of the Work.
- E. The Architect will review informational submittals specified herein to determine whether or not the delegated component, assembly or system design complies with the following.
 - 1. That the Contractor's engineering shows substantiation of the specified performance criteria.
 - 2. Conforms to specified performance requirements, including those subsequent modifications.

3. Complies with the overall project design.
 4. Can be appropriately integrated into the overall design of the project.
 5. Review by the Architect does not relieve the Contractor from compliance with the requirements of the delegated component.
- F. In the event of conflicts regarding the Contractor's proposed delegated design solutions and the design intent of the Contract Documents, the decision of the Architect will be final.

1.4 PROCEDURAL REQUIREMENTS

- A. Design Requirements: Proposed delegated design solutions are to demonstrate compliance with the original design intent of the Contract Documents, as determined by the Architect.
1. Unless otherwise defined by the Contract Documents, appearance of exposed elements, including member sizes, profiles and alignment of components, are to be within dimensional limits of section profiles indicated on the Drawings, and are to be consistent throughout the Project. Do not deviate from profiles, layouts or arrangements indicated without prior written approval from the Architect.
 2. Proposed delegated design solutions that exactly follow details indicated on the Drawings do not relieve Contractor of responsibility for design and performance of delegated design portions of Work.
- B. Engineering Requirements: Engineer delegated design portions of the Work to meet or exceed specified performance requirements, to satisfy the requirements of the authorities having jurisdiction, and to provide structurally sound, water and weathertight assemblies capable of withstanding the specified in-service loads without failure.
- C. Additional Requirements:
1. Fabricate, assemble and install delegated design portions of the Work to accommodate the full range of manufacturing, operating and field installation tolerances of adjacent work specified in other Sections.
 2. If required by the authorities having jurisdiction, submit shop drawings, specifications, calculations and other supporting data necessary for obtaining jurisdiction approval after they have been reviewed by the Architect and prior to beginning installation. Pay fees incurred.

1.5 INFORMATIONAL SUBMITTALS

- A. General: Coordinate and process submittals for delegated design portion of Work in same manner as for other portions of Work.
- B. Design Data:
1. Submit engineering calculations demonstrating compliance with the requirements of Contract Documents and of the authorities having jurisdiction.
 - a. Provide calculations legible and that incorporate sufficient cross-references to shop drawings to make calculations readily understandable and reviewable.

- b. Test reports are not acceptable as a substitute for calculations.
- 2. Structural Calculations: Include the following:
 - a. Analysis of framing members.
 - b. Section property computations for framing members.
 - c. Analysis of anchors, including anchors embedded in concrete
 - d. Signature and seal of the qualified Engineer responsible for their preparation.
- C. Furnish appropriate certification from licensed fabricator shop or complete detailed inspection reports signed by each inspector performing unlicensed shop inspection to the Architect before the Work affected by these inspections is delivered to the site.

1.6 QUALITY ASSURANCE

- A. Engineer Qualifications: Unless stated otherwise in other sections, provide the following:
 - 1. Professional Engineer legally licensed and qualified to practice in the State of Georgia and experienced in and having a minimum of 10 consecutive years providing the type of engineering services indicated in the Contract Documents.
 - 2. Engineering services are defined as those performed for the design, fabrication and installation of components and assemblies similar in material, design, complexity and extent to those indicated in the Contract Documents for this Project.
- B. Fabricator/Installer Qualifications: Firm with a minimum of 10 consecutive years' experience in the design, testing, fabrication, assembly, installation and coordination of specified components, assemblies and systems on projects similar in material, design, complexity and extent to this Project, and whose work has resulted in applications with a record of successful in-service performance. Submit evidence demonstrating the following:
 - 1. The ability to coordinate and work with a qualified testing agency for testing exterior building envelope assemblies utilizing the recognized test standards of the industry on projects similar in material, design, complexity and extent of this Project.
 - 2. The experience in managing, scheduling, coordinating, and maintaining on-time performance in conjunction with the successful projects and for the proposed project.
 - 3. An in-place, comprehensive quality assurance and quality control program and procedures that demonstrates how it is being applied on the project. Describe and demonstrate how the proposed comprehensive quality assurance and quality control program has been successful on other projects.
 - 4. The current resources, including currently employed personnel, to produce the Work to the specified requirements.
 - 5. The ability to produce proposal drawings, accommodate plant visits, and mockups, organization plans, project management plans and proposed schedules in conjunction with the bidding for this Project.
 - 6. The ability to warranty curtain wall systems for 5 years and the curtain wall finishes for 20 years.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide products, materials, components and accessories required for a complete installation and operation in the proposed design, whether or not such items are indicated in the Contract Documents.
- B. Provide anchors, attachments, hardware, inserts, fasteners, clips, bracing, framework, and similar items as required to meet specified design and performance requirements, and to anchor delegated design Work to adjacent supports, or to related adjoining work, whether or not such items are indicated in the Contract Documents.

PART 3 - EXECUTION

3.1 DESIGN

- A. Unless otherwise indicated or specified, maintain design intent and specified performance requirements of the Contract Documents.
 - 1. If certain fabrication or erection methods, minor dimensional changes and detailing adjustments to the original design in the Contract Documents are required, indicate such on submitted Shop Drawings.
 - 2. Prior to shop drawing submittal, obtain written approval from the Architect for proposed changes and adjustments.
- B. Engage a qualified Engineer to design connection details and determine fastener types and sizes.
 - 1. Fasteners or connections are not to conflict with or require revision to the design profiles indicated on the Drawings or to the supporting work.
 - 2. Connections are not to impose eccentric loading, nor induce twisting or warping to supporting structure.
 - 3. Design connections to accommodate potential and actual misalignment of adjacent work within tolerances specified in other Sections.

END OF SECTION

SECTION 01 21 00

ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Quantity allowances.
 - 4. Testing and inspecting allowances.
 - 5. Payment and modification procedures related to allowances.
- C. Related Requirements:
 - 1. Section 00 42 13 "Proposal Form" for Schedule of Allowances.
 - 2. Section 01 22 00 "Unit Prices" for procedures for using unit prices.
 - 3. Section 01 26 00 "Contract Modifications" for change orders incorporating allowances.
 - 4. Section 01 29 00 "Payment Procedures" for incorporating alternates into the Schedule of Values.
 - 5. Section 01 40 00 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
 - 6. Section 01 60 00 "Product requirements" for product selection procedures.
 - 7. Divisions 02 through 51 Sections for items of Work covered by Allowances.

1.2 DEFINITIONS

- A. Allowance: An amount established in the contract documents to include in the total contract price intended to cover the cost of prescribed items that are not specified in enough detail.
- B. Allowance Expenditure Authorization (AEA): Form signed by Architect, Owner, and Contractor authorizing Contractor to proceed with a predetermined item of work, for an agreed-upon price.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Proposal Request.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 UNIT-COST AND QUANTITY ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes not specifically exempted by Project's tax exempt status, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 TESTING AND INSPECTING ALLOWANCES

- A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.
- C. Costs of services not required by the Contract Documents are not included in the allowance.

- D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.9 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
 - 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Refer to 00 42 13 "Proposal Form" for schedule of allowances.

3.4 ATTACHMENTS

- A. Allowance Expenditure Authorization Form (AEA).

END OF SECTION

Allowance Expenditure Authorization Form

To Contractor: _____ **AEA Number:** **001**

Date of Issuance: _____

Project Name: Creekland Middle School Classroom Addition **P&W Project Number:** 801873.001

Contractor is hereby authorized to perform the following item(s) of work and to adjust the Cash Allowance Sum accordingly:

| Contractor's COR or Proposal Number | Description | Amount |
|-------------------------------------|-------------|--------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | Total: | |

Attachments:

THIS IS NOT A CHANGE ORDER AND DOES NOT CHANGE THE CONTRACT SUM OR CONTRACT TIME

- The original Cash Allowance was \$
 Cash Allowance Expenditures prior to this Authorization \$
 Cash Allowance balance prior to this Authorization \$
 Cash Allowance will be **increased / decreased** by this Authorization \$
 The new Cash Allowance balance will be \$
- The Contract Time is proposed to **remain unchanged**.

| APPROVAL RECOMMENDED: | OWNER APPROVAL: | CONTRACTOR ACCEPTANCE: |
|------------------------------|-------------------------|-------------------------------|
| _____ <i>Architect</i> | _____ <i>Owner</i> | _____ <i>Contractor</i> |
| _____ <i>Address</i> | _____ <i>Address</i> | _____ <i>Address</i> |
| _____ <i>By</i> | _____ <i>By</i> | _____ <i>By</i> |
| _____ <i>Date</i> | _____ <i>Date</i> | _____ <i>Date</i> |

SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 00 42 13 "Proposal Form" for schedule of Unit Prices.
 - 2. Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 3. Section 01 40 00 "Quality Requirements" for general testing and inspecting requirements.

1.2 DEFINITIONS

- A. Unit price as is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

- A. Unit prices include materials, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL

- A. Refer to individual Sections of Specifications for the descriptions of units of work where the establishment of unit prices is required; the methods of measurement and pricing are specified therein.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Acceptance of Alternates: Alternates will be reviewed and accepted or rejected at Owner's option. Execute accepted alternates under the same conditions as other work of the Contract.
 - 1. Owner Review Time: Provide **60** days for Owner review and decision of acceptance or rejection of Alternates.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ADD ALTERNATES

- A. Add Alternate No. 1 – Building addition to Cafeteria and Band Room and associated sitework.
 - 1. Base Bid: Omit Building Addition and associated MEP, structural, and sitework in its entirety.
 - 2. Alternate: Construct Building addition to Cafeteria and Band Room and associated sitework as shown in construction documents.
 - 3. References:
 - a. Drawing: Sheets A01-01, Area "D"-Series drawings.

END OF SECTION

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for submitting and processing requests for product substitutions after the award of the construction contract.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for products selected under an allowance.
 - 2. Section 01 26 00 "Contract Modification Procedures" for determining which modification method and forms are appropriate.
 - 3. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Electronically submit a PDF copy of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form provided at the end of this Section.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product, fabrication, or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable

- Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from model code organization acceptable to the authorities having jurisdiction.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- B. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
1. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 2. Acceptance, if granted, will be based on reliance upon data submitted and the opinion, knowledge, information, and belief of the Architect at the time decision is rendered. Approval therefore is interim in nature and subject to reevaluation and reconsideration as additional data, materials, workmanship, and coordination with other work are observed and reviewed.
 3. In proposing items for consideration, Contractor assumes all risk, costs, and responsibility for item's final acceptance, compliance with Contract Documents, integration into the Work, and performance.
 4. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.
- B. A Substitution Request for products, assemblies, and equipment constitutes a representation that the Contractor:
 - 1. Has investigated the proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Has confirmed that the proposed substitution does not affect dimensions or functional clearances.
 - 3. Agrees to provide the same warranty for the substitution as for the specified product.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for no additional cost to the Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution provides sustainable design characteristics that specified product provided.
 - c. Substitution request is fully documented and properly submitted.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is

uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed unless otherwise indicated.

1.7 ATTACHMENTS

- A. Post-Award Substitution Request Form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SUBSTITUTION REQUEST FORM
(For use after Procurement phase)

TO: Perkins&Will
1315 Peachtree St NE
Atlanta, GA 30309

From: _____

Substitution Request No: _____ DATE: _____

Contractor hereby requests acceptance of the following product or system as a substitution in accordance with provisions of Division 01 Section "Substitution Procedures:"

PROJECT SPECIFICATION

Specification Name/Number: _____
Article, Paragraph, Page Number: _____
Item/System to be Substituted: _____

REASON FOR SUBSTITUTION REQUEST

SPECIFIED PRODUCT . . .

- Is no longer available.
- Is unable to meet project schedule.
- Is unsuitable for the designated application.
- Cannot interface with adjacent materials.
- Is not compatible with adjacent materials.
- Cannot provide the specified warranty.
- Cannot be constructed as indicated.
- Other: _____

PROPOSED PRODUCT . . .

- Will reduce the Contract Time
by _____ days.
- Will reduce the Contract Sum
by \$ _____.
- Is an Owner-initiated substitution

- Cannot be obtained due to one or more of the following:
 - Strike
 - Bankruptcy of manufacturer or supplier
 - Lockout
 - Similar occurrence

Explanation of each item marked above (attach documentation):

EFFECT OF SUBSTITUTION

Proposed substitution affects other work or trades: No Yes (if yes, explain)

Proposed substitution requires dimensional revisions or redesign of architectural, structural, mechanical, electrical, plumbing, life safety, or other work:

No Yes (if yes, attach data explaining revisions)

PRODUCT COMPARISON

Provide side-by-side comparison between proposed substitution and specified product to facilitate review of Substitution Request:

SPECIFIED PRODUCT:

PROPOSED PRODUCT:

Manufacturer: _____

Name / Brand: _____

Catalog No.: _____

Supplier: _____

Features: _____

Variations: _____

(Attach additional sheets if necessary)

(Attach additional sheets if necessary)

Local Distributor or Supplier: _____

Manufacturer's Representative: _____

Maintenance Service Available: Yes No

Spare Parts Source and Location: _____

Warranty Available is equivalent to the specified warranty: Yes No _____ Years

Describe any variation from specified warranty: _____

Product Manufacturing History New 2-5 yrs 6-10 yrs More than 10 yrs old

SUPPORTING DATA ATTACHED (REQUIRED WHERE APPLICABLE)

Point-by-point comparison of performance criteria, materials, and components of specified product with proposed substitution.

Drawings Specifications Product Data Samples

Tests Reports LEED Compliance Warranty

REFERENCED INSTALLATIONS

Identify at least **three** similar local projects on which proposed substitution was used:

PROJECT #1:

Project: _____ **Date Installed:** _____

Address: _____

Owner: _____

Contact: _____ **Telephone:** _____

Architect: _____

Contact: _____ **Telephone:** _____

Contractor: _____

Contact: _____ **Telephone:** _____

PROJECT #2:

Project: _____ **Date Installed:** _____

Address: _____

Owner: _____

Contact: _____ **Telephone:** _____

Architect: _____

Contact: _____ **Telephone:** _____

Contractor: _____

Contact: _____ **Telephone:** _____

PROJECT #3:

Project: _____ **Date Installed:** _____

Address: _____

Owner: _____

Contact: _____ **Telephone:** _____

Architect: _____

Contact: _____ **Telephone:** _____

Contractor: _____

Contact: _____ **Telephone:** _____

ACKNOWLEDGEMENTS: The undersigned certify that:

- **Performance:** Proposed substitution has been fully investigated and determined to be equal or superior in all respects to the specified product, including appearance, quality, performance, code compliance, and sustainability compliance.
- **Warranty:** Same warranty will be furnished for proposed substitution as for specified product.
- **Operations and Maintenance:** Same maintenance service and source of replacement parts, as applicable, are available locally for the proposed substitution.
- **No Adverse Effect:** Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- **No Adverse Time or Cost:** Cost data and time as stated above are complete. Contractor bears all costs for labor and materials associated with fully integrating proposed substitution into the Project. Claims for additional costs or time related to accepted substitution which may subsequently become apparent are waived.
 - Payment will be made to the Owner for changes to the project design, including Architect's and Engineer's redesign fees and engineering, detailing, special inspection, and construction costs incurred by the Owner caused by acceptance of the substitution.
 - Coordination necessary to fully integrate the proposed substitution, and any associated modifications to related or adjacent Work, have been or will be performed.
- **Dimensions and Clearances:** Proposed substitution does not affect dimensions or functional clearances.
- **Conditions of Acceptance:** The Architect's recommendation for approval, if granted, relies on data submitted and the opinion and knowledge of the Architect at the time decision is rendered. The approval is conditional in nature and subject to reevaluation and reconsideration if additional data or materials are submitted, or coordination with other work is observed to invalidate claims that substitution is equal to item originally specified.

Contractor: _____
(Name of Contractor)

Date: _____ By: _____

Subcontractor: _____
(Name of Subcontractor)

Date: _____ By: _____

Note: *Substitution requests are not part of the standard submittal process and shall not be submitted as part of Shop Drawings, Product Data, or Samples submittals. Substitution requests must be filled out completely. Unresponsive or incomplete requests will be rejected and returned without review.*

ARCHITECT'S REVIEW AND ACTION

- Substitution acceptance is recommended.
- Substitution acceptance is recommended, with the following comments: _____

- Architect's additional services proposal attached.
- Resubmit Substitution Request:
 - Provide the following: _____
 - Provide proposal indicating amount of savings / credit to Owner
- Substitution acceptance is not recommended:
 - Substitution Request received too late.
 - Substitution Request received directly from subcontractor or supplier.
 - Substitution Request not submitted in accordance with requirements.
 - Substitution Request Form is not properly executed.
 - Substitution Request does not indicate what item is being proposed.
 - Insufficient information submitted to facilitate proper evaluation.
 - Proposed product does not appear to comply with specified requirements.
 - Design Team has no experience with product / manufacturer and is therefore unable to comment on the track record of quality, performance, or reliability.
 - Proposed product will require substantial revisions to Contract Documents.

PERKINS&WILL

Perkins&Will acknowledges its reliance upon information provided by the Contractor, and makes no claim as to the accuracy, completeness, or validity of such information. If an accepted substitution is later found to not comply with requirements of the Contract Documents, the Contractor shall be solely responsible for performance of the work in accordance with requirements of the Contract Documents.

By: _____ Date: _____

OWNER'S REVIEW AND ACTION

- Substitution is accepted; Architect to prepare Change Order.
- Substitution is not accepted.

By accepting this substitution, Owner agrees to compensate Perkins+Will for additional services, if any, necessary to implement the substitution.

Additional Services: \$ _____

By: _____ Date: _____

(Owner's Representative)

END OF FORM

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for procedural requirements for handling and processing allowances.
 - 2. Section 01 22 00 "Unit Prices" for administrative requirements for using unit prices.
 - 3. Section 01 25 00 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.
 - 4. Section 01 31 00 "Project Management and Coordination for Requests for Interpretation" for administrative procedures for handling RFIs.

1.2 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions," or substantially similar form generated by the Architect.

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Contractor's Action: Within 15 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

- c. Include separate costs of labor, materials, equipment and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms provided by Owner. Sample copies are included in Project Manual.
 - B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include separate costs of labor, materials, equipment and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use form provided by Owner. Sample copy is included in Project Manual.
- 1.4 ADMINISTRATIVE CHANGE ORDERS
 - A. Allowance Adjustment: See Section 01 21 00 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
 - B. Unit-Price Adjustment: See Section 01 22 00 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.
- 1.5 CHANGE ORDER PROCEDURES
 - A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 01 22 00 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 3. Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 4. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's Construction Schedule.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:

- a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
2. Submit draft schedule of values using AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance that covers items stored at a bonded warehouse, and during transport to the project site.
 5. Provide separate line items in the Schedule of Values for each part of the Work where Applications for Payment may include cost of submittals.
 - a. Cost for submittals shall represent true cost of submittals preparation, as evidenced by subcontractor invoices, but not to exceed 5 percent of the total value of that item of work line item.
 6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 7. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.
 8. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 9. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.

10. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is the 20th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 15 days before the date for each progress payment.
- C. Payment Application Times: On or before the 20th day of the month, Contractor may submit to Architect itemized Application for Payment for work completed during previous calendar month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
 1. Other Application for Payment forms proposed by the Contractor shall be acceptable to Architect and Owner. Submit forms for approval with initial submittal of schedule of values.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit PDF of Application for Payment to Architect within 24 hours. Include waivers of lien and similar attachments if required.
 1. Provide transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- I. Preparation and Submittal of Draft of Initial Application for Payment (Pencil Copy):
 1. Prepare draft copy of Application for Payment and meet with Owner and Architect to review the draft copy prior to submittal of the Application for Payment.
 2. Provide four (4) draft (pencil) copies within two (2) business days before the day of the review meeting with Owner and Architect. Submit substantiating data with each application copy: subcontractor applications for payment, copies of invoices, storage receipts, and data required by Owner
 3. After review of draft (pencil) copy by Owner, Architect, and Contractor, prepare Application for Payment, using agreed-upon data on Owner/Architect-reviewed schedule of values and Owner/Architect-reviewed pencil draft.
 4. Include specified information required for application preparation.
- J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 1. Copy of executed Agreement between Owner and Contractor.
 2. List of subcontractors.

3. Schedule of values.
 4. Contractor's construction schedule (preliminary if not final).
 5. Products list (preliminary if not final).
 6. Schedule of unit prices.
 7. Submittal schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 12. Initial progress report.
 13. Report of preconstruction conference.
 14. Certificates of insurance and insurance policies.
 15. Performance and payment bonds.
 16. Data needed to acquire Owner's insurance.
- K. Payment Applications During Construction: Submit changes in submittals schedule, construction schedule, and other schedules with each application for payment.
- L. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- M. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. Evidence that claims have been settled.
 5. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 6. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Digital project management procedures.
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.2 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request from Owner, Architect, or Contractor seeking information required for clarifications of the Contract Documents.
- C. PIMS: Web-based Project Information Management System managed by the Contractor and for use by Owner, Owner's Consultants, Architect and Architect's Consultants.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.
 4. Post list on PIMS and always keep current.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
1. Post copies of list in project meeting room, in temporary field office, on PIMS and in prominent location in each built facility. Always keep list current.
- C. Administrative and Personnel: In addition to Project superintendent, identify other administrative and supervisory personnel as required for proper performance of the Work. Identify individuals and their duties and responsibilities; list their addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
1. Include personnel required for coordination of operations with other contractors.
- D. Coordination Drawings:
1. Contractor's stamped, dated and approved Coordination Drawings.
 - a. Retain on site, transmittals and one copy of Contractor's Coordination Drawings.
- 1.4 GENERAL COORDINATION PROCEDURES
- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
 4. Where availability of space is limited, coordinate installation of components to ensure maximum performance and accessibility for required maintenance, service, and repair of components, including mechanical and electrical.

- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work.
- C. Conservation: Coordinate construction activities to ensure operations are carried out with consideration given to conservation of energy, water, and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 COORDINATION DRAWINGS

- A. Coordination Meetings: Conduct coordination meetings with subcontractors. Owner and Architect may or may not be present at such meetings.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and time a minimum of three days prior to the meeting date.
- B. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
- C. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
- D. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
 - 1. File Preparation and Submittal Format: Same digital data software program, version, and operating system as original Drawings.
 - 2. BIM File Incorporation: Develop and incorporate coordination drawing files into BIM established for Project.
 - a. Perform three-dimensional component conflict analysis as part of the preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification for design requirements by Architect.
 - 3. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
 - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of Electronic File Transfer Agreement included in this Project Manual or a Digital Execution Plan agreed to by the Owner, Contractor and Architect.

1.6 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarifications or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Contractor shall submit RFIs to Architect using PIMS.
 2. Architect shall provide Contractor with a list of design team contacts by discipline for RFI distribution.
 3. Concurrent with submission to the Architect, Contractor shall also distribute RFIs to appropriate design team professionals, using PIMS, based on the disciplines affected by the RFI.
 4. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 5. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
 6. Include only one subject or item per RFI. RFIs that include more than one subject or item will be returned without review to the Contractor.
- B. Contractor's failure to report discrepancies or omissions in the Contract Documents, or Contractor- or Subcontractor-generated assumptions, in lieu of Architect-issued clarifications regarding the intent of the Contract Documents, shall not be used as a basis for future claims once the apparent discrepancies or omissions have been reconciled by appropriate interpretation issued by the Architect.
- C. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject or item.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

- a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- D. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
1. Attachments shall be electronic files in PDF format.
- E. RFI Submission Procedure:
1. Post electronic submittals as PDF electronic files directly to the Contractor's PIMS as described below.
- F. Architect's Action: Architect will review each RFI, determine action required, and respond as indicated in the project General Conditions. Allow 10 working days for Architect's response for each RFI.
1. RFIs received by Architect after 1:00 p.m. in Architect's time zone will be considered as received the following working day.
 2. Where the due date for an action or response occurs on a Saturday, Sunday, or legal holiday, such action or response shall be considered due on the next day that is not a Saturday, Sunday, or legal holiday.
 3. The following RFIs will be returned without action:
 - a. RFIs addressing more than one subject or item.
 - b. Requests for approval of submittals.
 - c. Requests for approval of substitutions.
 - d. Requests for approval of Contractor's means and methods.
 - e. Requests for approval of nonconforming Work.
 - f. Requests for coordination information already indicated in the Contract Documents.
 - g. Requests for adjustments in the Contract Time or the Contract Sum.
 - h. Requests for interpretation of Architect's actions on submittals.
 - i. Incomplete RFIs or inaccurately prepared RFIs.
 4. Architect's action may include a request for additional information, in which case Architect's time for response will begin at the time of receipt by Architect of additional information.
 5. RFIs involving requests for recommendations or design assistance on how to address remediation or correction of nonconforming work are not eligible for an increase in Contract Sum or an extension of Contract Time, regardless of when the RFIs are returned, or the corrective action proposed therein.
 6. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
 - 1) If Contractor's notification is submitted more than 21 days after receipt of the RFI response, any work resulting from the RFI response is not eligible for an increase in Contract Sum or an extension of Contract Time.

7. In the event Contractor requests an accelerated RFI review and response by Architect, Architect will endeavor to accommodate Contractor's request. However, any such desired accelerated review times shall not supersede the requirements of the Contract, and no extension of Contract Time will be authorized because of Architect's failure or inability to adhere to Contractor's desired accelerated review times.
 8. Architect will return a response to the RFI via the PIMS.
- G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Software log with not less than the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date the RFI response is due.
 8. List of parties the RFI was distributed to.
 9. Date Architect's response was received.
 10. Date the RFI was closed by the Contractor.
 11. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
- H. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- 1.7 DIGITAL PROJECT INFORMATION MANAGEMENT
- A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model will be provided by Architect for Contractor's use during construction.
1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project record Drawings.
 2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 3. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.
- B. Web-Based Project Information System (PIMS): Provide, administer, and use web-based Project software for purposes of hosting and managing Project communication and documentation until Final Completion.
1. PIMS shall be similar to Procore, Ebuilder, Autodesk Construction Cloud or Plangrid but shall include, at a minimum, the following features:

- a. Project Directory, including Contractor, subcontractors, Architect, Architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
 - b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
 - c. Document workflow planning, allowing customization of workflow between project entities.
 - d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
 - e. Track status of each Project communication in real time, and log time and date when responses are provided.
 - f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
 - g. Processing and tracking of payment applications.
 - h. Processing and tracking of contract modifications.
 - i. Creating and distributing meeting minutes.
 - j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
 - k. Management of construction progress photographs.
 - l. Mobile device compatibility, including smartphones and tablets.
 - m. Creating and exporting editable logs for all PIMS functions including, but not limited to: RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders. Owner, Architect and Architect's Consultants shall have rights and ability to download logs at any time.
2. Provide up to 20 user licenses for use of Owner, Architect, and Architect's consultants. Provide eight hours of software training at Architect's office for web-based Project software users.
 3. At completion of Project, change of PIMS or end of Owner-Contractor Contract, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.
- C. PDF Document Preparation:
1. Assemble each RFI package into a single indexed file incorporating all information required in this section.
 2. Assemble each submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form.
 3. Name file with a unique identifier, including revision identifier.
 4. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and time a minimum of **3** days prior to the meeting date.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees using PIMS.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes using PIMS to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including but not limited to the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Digital Execution Plan and associated procedures.
 - m. Preparation of record documents.
 - n. Use of the premises and existing building.
 - o. Work restrictions.
 - p. Working hours.
 - q. Owner's occupancy requirements.
 - r. Responsibility for temporary facilities and controls.
 - s. Procedures for moisture and mold control.
 - t. Procedures for disruptions and shutdowns.
 - u. Construction waste management and recycling.
 - v. Parking availability.

- w. Office, work, and storage areas.
 - x. Equipment deliveries and priorities.
 - y. First aid.
 - z. Security.
 - aa. Progress cleaning.
 - bb. Special procedural, inspection and submittal requirements of the Authorities Having Jurisdiction.
 - cc. County Health Services inspection and submittal requirements.
4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes using PIMS.
- C. Digital Execution Conference: schedule and conduct a digital execution conference before starting construction, at a time convenient to Owner Architect, and Contractor.
- 1. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent and; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss items of significance that could affect the exchange of digital information, including but not limited to the following:
 - a. Electronic file transfer requirements and protocols.
 - b. Right of reliance on Architect's and Architect's Consultants digital files.
 - c. Schedule of digital file transfers and periodic updates.
 - 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes using PIMS.
- D. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity as indicated in individual Sections.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.

- m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information using PIMS.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- E. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including but not limited to the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owner's partial occupancy requirements.

- i. Installation of Owner's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
 - n. Close of PIMS and export of data to Owner and Architect.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes using PIMS.
- F. Progress Meetings: Conduct progress meetings at biweekly intervals.
 1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of proposal requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information using PIMS.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Construction schedule updating reports.
 - 3. Daily construction reports.
 - 4. Material location reports.
 - 5. Site condition reports.
 - 6. Special reports.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for submitting the Schedule of Values.
 - 2. Section 01 31 00 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 3. Section 01 32 33 "Photographic Documentation" for submitting construction photographs.
 - 4. Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.
 - 5. Section 01 40 00 "Quality Requirements" for submitting a schedule of tests and inspections.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.

- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Major Area: A story of construction, a separate building, a separate wing, a major department, or a similar significant construction element.
- G. Milestone: A key or critical point in time for reference or measurement.
- H. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

1.3 INFORMATIONAL SUBMITTALS

- A. Submittals Format: Reference Section 01 33 00 "Submittal Procedures" for requirements.
- B. Submittal Schedule: Arrange the following information in a tabular format:
 - 1. Specification Section number and title.
 - 2. Submittal category (action or informational).
 - 3. Name of subcontractor.
 - 4. Description of the Work covered.
 - 5. Scheduled date for first submittal.
 - 6. Date of submission.
 - 7. Scheduled date for Architect and Owner's final release or approval.
 - 8. Fabrication and delivery time frame.
 - 9. Required on job date.
 - 10. Approval date.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule. Include type of schedule (initial or updated) and date on label.
- D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 2. Logic Report: List of preceding and succeeding activities for activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 3. Total Float Report: List of activities sorted in ascending order of total float.
- E. Construction Schedule Updating Reports: Submit with Applications for Payment.
- F. Daily Construction Reports: Submit at weekly intervals.
- G. Material Location Reports: Submit as required with monthly payment application.
- H. Site Condition Reports: Submit immediately at time of discovery of differing conditions.
- I. Special Reports: Submit at time of unusual event.

1.4 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to Contractor's construction schedule, including, but not limited to, the following:
 1. Review format for reports.
 2. Verify availability of qualified personnel needed to develop and update schedule.
 3. Discuss constraints, including phasing, area separations, and partial Owner occupancy.
 4. Review delivery dates for Owner-furnished products.
 5. Review schedule for work of Owner's separate contracts.
 6. Review submittal requirements and procedures.
 7. Review time required for review of submittals and resubmittals.
 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
 9. Review time required for Project closeout and Owner startup procedures.
 10. Review and finalize list of construction activities to be included in schedule.
 11. Review procedures for updating schedule.

1.5 COORDINATION

- A. Coordinate Contractor's construction schedule with the submittal schedule, progress reports, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTAL SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for initial review, at least one resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.
- B. Restrictions and Limitations:
 - 1. Submittal review and processing times listed in Division 01 Section "Submittal Procedures" shall be considered baselines and shall take precedence over any lesser times promulgated by Contractor in the Submittal Schedule or Construction Schedule.
 - 2. No delay claim will be entertained, and no extension of the Contract Time will be authorized due to Contractor's failure to transmit submittals enough in advance of the Work to permit proper and reasonable processing.
 - 3. If the Contractor fails to submit a Submittal Schedule or fails to provide submittals in accordance with the approved Submittal Schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion and final completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an earlier or later completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.
 2. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect and Owner.
 3. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 4. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 5. Startup and Testing Time: Include time as required by Owner for startup and testing. Startup and Testing must be completed by Substantial Completion.
 6. Commissioning: Include time as required by Owner for commissioning, startup, and testing. Commissioning must be completed by Substantial Completion.
 7. Substantial Completion: Indicate date established for Substantial Completion. Allow time for Architect and Owner's administrative procedures necessary for certification of Substantial Completion.
 8. Punch List and Final Completion: Include time as required by Owner for completion of punch list items and final completion.
 9. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.

- d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion, and the following interim milestones:
1. Permanent enclosure as defined in Section 01 50 00 "Temporary Facilities and Controls."
 2. Commencement of space conditioning.
 3. Structural completion.
 4. Temporary enclosure and space conditioning.
 5. Permanent space enclosure.
 6. Completion of mechanical installation.
 7. Completion of electrical installation.
 8. Substantial Completion.
- E. Upcoming Work Summary/Look-Ahead Schedule: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and Contract Time.

- F. Recovery Schedule: When periodic update indicates the Work is **14** or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using the Critical Path Method.
- B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's construction schedule using a time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect and Owner's approval of the schedule.
 - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
- D. CPM Schedule Preparation: Prepare a list of activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing.
 - j. Punch list and final completion.
 - k. Activities occurring following final completion.

2. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 3. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
- E. Contract Modifications: For each proposed contract modification, if applicable and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.
- F. Initial Issue of Schedule: Prepare diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
 8. Changes in scheduled early completion of areas in accordance with Phasing requirements. Refer to Section 01 10 00 "Summary of Work."
- 2.4 REPORTS
- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.

4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Accidents.
 8. Meetings and significant decisions.
 9. Unusual events (see special reports).
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.
 14. Change Orders received and implemented.
 15. Construction Change Directives received and implemented.
 16. Services connected and disconnected.
 17. Equipment or system tests and startups.
 18. Partial completions and occupancies.
 19. Substantial Completions authorized.
 20. Construction photographs with descriptions.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information in accordance with RFI provisions of Section 01 31 00 "Project Management and Coordination." Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- 2.5 SPECIAL REPORTS
- A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report immediately. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule with application for payment.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect and Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

END OF SECTION

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Concealed Work photographs.
 - 3. Periodic construction photographs.
 - 4. Final Completion construction photographs.
 - 5. Construction webcam.
 - 6. Aerial photography.
- B. Related Requirements:
 - 1. Section 01 22 00 "Unit Prices" for procedures for unit prices for extra photographs.
 - 2. Section 01 33 00 "Submittal Procedures" for submitting photographic documentation.
 - 3. Section 01 77 00 "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.
 - 4. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Construction photographs may not be used for Contractor's marketing materials or social media unless approved by Owner.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- B. Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Submit photos electronically. Include copy of key plan indicating each photograph's location and direction.
 - 2. Identification: Provide the following information with each image description in web-based Project management software site:

- a. Name of Project.
- b. Name of Contractor.
- c. Date photograph was taken.
- d. Description of location, vantage point, and direction.
- e. Unique sequential identifier keyed to accompanying key plan.

1.4 QUALITY ASSURANCE

- A. Construction Webcam Service Provider: A firm specializing in providing photographic equipment, web-based software, and related services for construction projects, with a record of providing satisfactory services similar to those required for Project.

1.5 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format. Photographs should be clear, free from obstruction with appropriate lighting, and easily viewable.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1.6 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs with maximum depth of field and in focus.
 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Preconstruction Photographs: Before commencement of the Work, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
 1. Flag excavation areas before taking construction photographs.
 2. Take photographs to show existing conditions adjacent to property before starting the Work.
 3. Take photographs of existing buildings either on or adjoining property, to accurately record physical conditions at start of construction.
 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- C. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, take photographs sufficient in number, with annotated descriptions, to record nature and location of concealed Work, including, but not limited to, the following:
 1. Underground utilities.
 2. Underslab services.
 3. Piping.
 4. Electrical conduit.
 5. Waterproofing and weather-resistant barriers.

- D. Periodic Construction Photographs: Take photographs at weekly intervals coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- E. Final Completion Construction Photographs: Take photographs after date of Substantial Completion for submission as Project Record Documents. Architect will inform photographer of desired vantage points.
- F. Additional Photographs: Architect may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.
 - 1. Three days' notice will be given, where feasible.
 - 2. In emergency situations, take additional photographs within 24 hours of request.

1.7 CONSTRUCTION WEBCAM

- A. Webcam: Provide one fixed-location camera(s) with weatherproof housing, mounted to provide unobstructed view of construction site from location approved by Architect, with the following characteristics:
- B. Live Streaming Images: Provide web-accessible image of current site image.
- C. Web-Based Interface: Provide online interface to allow viewing of each high-definition digital still image captured and stored during construction, from the Internet.
- D. Maintain cameras and web-based access in good working order, according to web-based construction photographic documentation service provider's written instructions until Final Completion. Provide for service of cameras and related networking devices and software.

1.8 AERIAL PHOTOGRAPHY

- A. Service Provider: Drone construction monitoring shall be provided by a certified construction drone pilot and Visual Observer team trained in construction data capture techniques. Provider shall acquire all necessary waivers, complying with all aviation regulations, and adhere insurance requirements.
 - 1. The service provider shall have a minimum of five years of experience.
- B. Provide aerial scans of the following:
 - 1. Aerial Monthly site progression,
 - 2. Final aerial over-all site view (panoramas).
- C. Upload photos, videos, and panoramas to a web-based platform for anytime access by the Project Team.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
 - 2. Section 01 31 00 "Project Management and Coordination"; for submitting RFIs, issuing meeting minutes, and submitting Coordination Drawings requirements.
 - 3. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule.
 - 4. Section 01 32 33 "Photographic Documentation" for submitting construction photographs.
 - 5. Section 01 40 00 "Quality Requirements" for submitting test and inspection reports.
 - 6. Section 01 77 00 "Closeout Procedures" for submitting warranties.
 - 7. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 8. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 9. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

- A. Submittals: Written and graphic information and physical samples.
- B. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users can access files.
- C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 10 business days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Resubmittal Review: Allow 10 business days for review of each resubmittal.
- C. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
 - 3. Use submittal schedule to permanently record Contractor's review and approval markings and action taken by Architect and Owner.
 - 4. Transmittal Form for Electronic Submittals: Use software-generated form from electronic project management software acceptable to Owner.
- D. Options: Identify options requiring selection by the Architect and Owner.
- E. Deviations: Identify deviations from the Contract Documents on submittals.

1. Clearly identify deviations from the Contract Documents by clouding or other suitable means acceptable to Architect and Owner.
 - a. Provide accompanying detailed written explanation for each deviation.
 - b. Provide the corresponding specification Section labeled with compliance and non-compliance.
- F. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- G. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- H. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 1. Post electronic submittals as PDF electronic files directly to FTP site specifically established for Project as agreed to by Architect and Owner.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 3. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Equipment dimensional drawings.
 - b. Wiring diagrams showing factory-installed wiring.
 - c. Printed performance curves.
 - d. Operational range diagrams.
 - e. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data concurrent with Samples.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based upon Architect's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 3. Number and title of applicable Specification Section.
 4. Number of Samples: Submit samples as required in individual Specification Sections.

5. Disposition: When possible, maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the responsibility of Contractor.
- E. Coordination Drawing Submittals: Comply with requirements specified in Section 01 31 00 "Project Management and Coordination."
- F. Contractor's Construction Schedule: Comply with requirements specified in Section 01 32 00 "Construction Progress Documentation."
- G. Application for Payment: Comply with requirements specified in Section 01 29 00 "Payment Procedures."
- H. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- I. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.
- J. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- K. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- L. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- M. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- N. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- O. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- P. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

- Q. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- R. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- S. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- T. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.
- C. BIM File Incorporation: Incorporate delegated-design drawing and data files into Building Information Model established for Project.
- D. Provide delegated-design drawings to Owner in electronic format.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Section 01 77 00 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are not acceptable, will be considered non-responsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

3.3 ATTACHMENTS

- A. Appendix A – Electronic Drawing File Transfer Agreement Form.
- B. Appendix B – Submittal Transmittal Form.

END OF SECTION

Electronic File Transfer Agreement (Contractor – BIM Files)

| | | |
|---------------------------------|----------------------|---|
| Name | Date: | [Publish Date] |
| Address | Project Name: | Creekland Middle School Classroom Addition |
| Description of Data: | Project No: | 801873.001 |

The undersigned is a contractor (the “Contractor”) performing services and/or directly or indirectly providing goods and material related to the subject project (the “Project”). The undersigned hereby requests that Perkins&Will and its consultants provide electronic files prepared by Perkins&Will and its consultants for the Project in the form of an electronic model (the “Model Files”). The undersigned acknowledges and agrees that Perkins&Will has no contractual obligation, or any other obligation, to provide the Model Files to the contractor. Perkins&Will agrees to provide the Model Files in consideration for the undertakings of the undersigned. The undersigned agrees that the Contract Documents that Perkins&Will is contractually obligated to prepare and/or deliver are hardcopy drawings and specifications only. The undersigned additionally agrees that the Model Files are not Contract Documents (as that term is defined in or understood to mean in the Owner-Contractor Agreement), do not represent Contract Document modifications, and are not intended to be a substitute for or a supplement to the hardcopy drawings and specifications, or to necessarily represent actual physical conditions on the Project site.

Model Files to be furnished include work prepared by Perkins&Will and its consultant(s) only. The Model Files were prepared by Perkins&Will using the Autodesk® Revit® software platform. Model Files will be furnished in that software platform’s standard format without modifications for the Contractor’s convenience. One set of electronic Model Files will be furnished to the Contractor. The Contractor assumes responsibility for distributing pertinent files to the subcontractors.

The undersigned agrees that the request to provide the Model Files is purely for the convenience of the undersigned and does not constitute the rendering of professional services. Perkins&Will has prepared the Model Files to facilitate the production of the Contract Documents, which are reasonably accurate and complete to the extent of the standard of professional care. The undersigned acknowledges that Perkins&Will does not represent the furnished Model Files as being accurate or complete, as being suitable for the Contractor’s purpose, or as identifying or containing any issue, anomaly, omission, or concern with reference to the Project.

The undersigned agrees and understands that the Model Files, except as expressly set forth above, are not fit for any particular purpose, including but not limited to quantity take-offs; pricing; clash detection; ascertainment of construction or installation tolerances and clearances; preparation of shop drawings, coordination drawings, or fabrication drawings; construction sequencing; or the manufacture of any building component or system. As such, the Model Files, and the information contained in them, and the information that may have been omitted from them, shall not be used as a basis for an increase in the Contract Sum or Contract Time.

The undersigned acknowledges that the Model Files have not necessarily been developed with the assistance or specific expertise of the individual subcontractors and installers, and therefore do not account for or incorporate means and methods required by individual subcontractors for their scope of the

finished Work. Modifications to the information about the components included in the Model Files may be required and are the responsibility of the Contractor to ascertain, coordinate, and implement. All such modifications are part of the scope of Work of this Project and shall be provided at no additional cost to Owner.

The undersigned further acknowledges that Perkins&Will has made no representations to the undersigned that the Model Files are suitable for any purpose other than as expressly set forth above, or will be usable by the undersigned's systems, infrastructure, or software. The undersigned also understands and agrees that the Model Files may be subject to anomalies, errors, viruses, malware, or other unintended defects, and that Perkins&Will has not reviewed or determined whether such defects may be present in any electronic files. Use of these electronic files is solely at the risk of the undersigned.

The undersigned agrees to release any and all claims that they may have at any time against Perkins&Will or its consultants arising out of the use of the Model Files by the undersigned or by any other individual or entity. The undersigned agrees to hold harmless and indemnify Perkins&Will and its consultants from and against all claims, liabilities, losses, damages, and costs, including but not limited to attorney's fees arising from or in any way connected with the provision of the Model Files by Perkins&Will or the use, modification, misinterpretation, misuse, or reuse by others of the Model Files provided by Perkins&Will. The undersigned shall not use, modify, or reproduce any of the Model Files without first removing identifying information for Perkins&Will and its consultants that may be incorporated in the furnished Model Files.

The undersigned confirms that it will use the Model Files only with reference to the Project and shall not copy or distribute the Model Files, or permit the Model Files to be copied or distributed by others, except for use on this Project. The undersigned shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms and conditions of this Agreement, and to assume toward the Contractor all the obligations and responsibilities that the Contractor, by this Agreement, assumes toward the Owner and Perkins&Will. The undersigned Contractor assumes responsibility for the breach of this Agreement by any Subcontractor to whom the Contractor distributes the Model Files.

Upon return receipt of this signed Agreement, the Model Files will be transmitted to the undersigned through electronic mail, or be posted on the Perkins&Will file transfer protocol site or the Project web site.

This Agreement may be executed in counterpart, and the parties agree that the individual counterparts, taken together, shall constitute a binding agreement.

The undersigned agrees that they are authorized to bind the company indicated below to the obligations of this Agreement, and understands that Perkins&Will is relying upon this representation in agreeing to enter into this Agreement. In addition to any rights that Perkins&Will may have against the company, the undersigned agrees that Perkins&Will shall have rights personally against the undersigned if this apparent authority is questioned or disputed by the company in any way.

The undersigned agrees that any violation of this Agreement by the undersigned or the company, or any of the agents, representatives, officers, or employees of either, will result in irreparable harm to Perkins&Will that cannot be entirely compensated by money damages. Therefore, the undersigned and the company agree that Perkins&Will may seek any and all equitable remedies that may be available to Perkins&Will, including but not limited to a temporary or permanent injunction in the event of any breach or threatened breach of the terms of this Agreement.

The undersigned shall reimburse Perkins&Will for any cost or expense, including attorney's fees and all labor and expenses (including those of in-house counsel), related to the enforcement of the terms of this Agreement.

Perkins&Will

Acknowledged and Accepted

Signature

Signature of Recipient

Name

Name

Title

Company

Date

Title

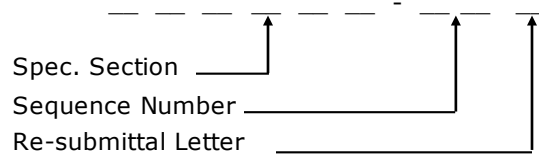
END OF AGREEMENT

SUBMITTAL TRANSMITTAL

SUBMITTAL NUMBER:

PROJECT: _____

P&W Proj. No: _____



SPECIFICATION SECTION:

Number: _____

Title: _____

DESCRIPTION OF PRODUCT:

NOTES:

1. Submittal Transmittal to Architect indicates Construction Manager's, Contractor's, and Subcontractor's Approval of Submittal.
2. This Transmittal Form shall stay with Submittal throughout routing. Copy for your file.

| ROUTING SEQUENCE | CHECKED BY | DATE REC'D. | DATE SENT | No. of COPIES | ACTION TAKEN* |
|-------------------------|------------|-------------|-----------|---------------|----------------------|
| SUBCONTRACTOR OR VENDOR | | N/A | | | A (See Note 1 above) |
| CONTRACTOR | | | | | A (See Note 1 above) |
| ARCHITECT | | | | | |
| CONSULTANT | | | | | |
| ARCHITECT | | | | | |
| CONTRACTOR | | | | | |
| SUBCONTRACTOR OR VENDOR | | | N/A | | |
| OWNER | N/A | | N/A | | N/A |

ACTION LEGEND: (*Indicate in ACTION TAKEN column above.)

- | | |
|-------------------------|---|
| A - NO EXCEPTIONS | E - FOR INFORMATION ONLY |
| B - EXCEPTIONS AS NOTED | F - NOT REVIEWED |
| C - REVISE AND RESUBMIT | 1 Submittal is not required. |
| D - REJECTED | 2 Submittal was not reviewed by Contractor. |

REMARKS:

- [] SEE ATTACHED COMMENTS [] SEE ENCLOSED SUBMITTAL FOR COMMENTS
[] LANGUAGE ON CONTRACTOR'S SUBMITTAL STAMP IS NOT CONSISTENT WITH CONTRACT REQUIREMENTS

SECTION 01 35 16

ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes special procedures for alteration work.

1.2 DEFINITIONS

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Consolidate: To strengthen loose or deteriorated materials in place.
- C. Design Reference Sample: A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- K. Retain: To keep an element or detail secure and intact.
- L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.3 COORDINATION

- A. Alteration Work Subschedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.
1. Schedule construction operations in sequence required to obtain best Work results.
 2. Coordinate sequence of alteration work activities to accommodate the following:
 - a. Owner's continuing occupancy of portions of existing building.
 - b. Owner's partial occupancy of completed Work.
 - c. Other known work in progress.
 - d. Tests and inspections.
 3. Detail sequence of alteration work, with start and end dates.
 4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
 5. Use of elevator and stairs.
 6. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.
- B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project building(s) and site. Some work is near circulation patterns and adjacent to restricted areas. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work. Access to restricted areas may not be obstructed. Plan and execute the Work accordingly.

1.4 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.
1. Attendees: In addition to representatives of Owner, Architect, and Contractor, testing service representative, specialists, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
 - a. Alteration Work Subschedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Fire-prevention plan.
 - c. Governing regulations.
 - d. Areas where existing construction is to remain and the required protection.
 - e. Hauling routes.

- f. Sequence of alteration work operations.
 - g. Storage, protection, and accounting for salvaged and specially fabricated items.
 - h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
 - i. Qualifications of personnel assigned to alteration work and assigned duties.
 - j. Requirements for extent and quality of work, tolerances, and required clearances.
 - k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.
3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.
- B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at monthly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner, Architect, and Contractor, each specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to alteration work.
 2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
 - a. Alteration Work Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
 - b. Schedule Updating: Revise Contractor's Alteration Work Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each entity present, including review items listed in the "Preliminary Conference for Alteration Work" Paragraph in this article and the following:
 - 1) Interface requirements of alteration work with other Project Work.
 - 2) Status of submittals for alteration work.
 - 3) Access to alteration work locations.
 - 4) Effectiveness of fire-prevention plan.
 - 5) Quality and work standards of alteration work.
 - 6) Change Orders for alteration work.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.5 INFORMATIONAL SUBMITTALS

- A. Alteration Work Subschedule:
 1. Submit alteration work subschedule within seven days of date established for commencement of alteration work.
- B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.
- C. Alteration Work Program: Submit 30 days before work begins.
- D. Fire-Prevention Plan: Submit 30 days before work begins.

1.6 QUALITY ASSURANCE

- A. Specialist Qualifications: An experienced firm regularly engaged in specialty work similar in nature, materials, design, and extent to alteration work as specified in each Section and that has completed a minimum of five recent projects with a record of successful in-service performance that demonstrates the firm's qualifications to perform this work.
 1. Field Supervisor Qualifications: Full-time supervisors experienced in specialty work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on-site when specialty work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.
- B. Title X Requirement: Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40 CFR 745, Subpart E, and use only workers that are trained in lead-safe work practices.
- C. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.
 1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
 2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
- D. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

- E. Safety and Health Standard: Comply with ANSI/ASSP A10.6.

1.7 STORAGE AND HANDLING OF SALVAGED MATERIALS

A. Salvaged Materials:

1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site.
5. Protect items from damage during transport and storage.

B. Salvaged Materials for Reinstallation:

1. Repair and clean items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

- C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.

- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.

1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
2. Secure stored materials to protect from theft.
3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F or more above the dew point.

E. Storage Space:

1. Owner will arrange for limited on-site location(s) for free storage of salvaged material. This storage space includes security for stored material.
2. Arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.

1.8 FIELD CONDITIONS

- A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of measured drawings and preconstruction photographs.
 - 1. Comply with requirements specified in Section 01 32 33 "Photographic Documentation."
- B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- C. Owner's Removals: Before beginning alteration work, verify in correspondence with Owner for items to be removed.
- D. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.
 - 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
 - 3. Erect temporary barriers to form and maintain fire-egress routes.
 - 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
 - 5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
 - 6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
 - 7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
 - 8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.
- B. Temporary Protection of Materials to Remain:
 - 1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.

2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
 - C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
 - D. Utility and Communications Services:
 1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
 2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
 3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.
 - E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.
 1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
- 3.2 PROTECTION FROM FIRE
- A. General: Follow fire-prevention plan and the following:
 1. Comply with NFPA 241 requirements unless otherwise indicated.
 2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
 - a. If combustible material cannot be removed, provide fire blankets to cover such materials.
 - B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:
 1. Obtain Owner's approval for operations involving use of welding or other high-heat equipment. Use of open-flame equipment is not permitted. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
 2. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.

3. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
 4. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
 5. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
 - a. Train each fire watch in the proper operation of fire-control equipment and alarms.
 - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
 - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
 - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
 - e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.
- 3.3 PROTECTION DURING APPLICATION OF CHEMICALS
- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
 - B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
 - C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
 - D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

- E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

- A. Have specialty work performed only by qualified specialists.
- B. Ensure that supervisory personnel are present when work begins and during its progress.
- C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs. Comply with requirements in Section 01 32 33 "Photographic Documentation."
- D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.
- E. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.
 - 1. Do not proceed with the work in question until directed by Architect.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for testing and inspecting allowances.
 - 2. Section 01 43 39 "Mockup Requirements" for mockup requirements.
 - 3. 01 45 33 "Structural Testing and Special Inspection Services" for administrative and procedural requirements for special inspections.
 - 4. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

- C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged.
- D. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- F. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- G. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

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

1.4 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
- D. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
- C. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- D. Monitoring and Documentation: Maintain inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

- A. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- B. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
 - D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance. Where required by individual Specification Sections, Installer employing workers trained and approved by manufacturer, Installer being acceptable to manufacturer, and/or Installer being an authorized representative of manufacturer for both installation and maintenance.
 - E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
 - F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and engaged in the activities indicated.
 - 1. Requirements of authorities having jurisdiction supersede requirements for specialists.
 - G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
 - H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
 - 1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - I. Mockups: Refer to Section 01 43 19 and individual sections of the Specifications for mockup requirements.
- 1.9 QUALITY CONTROL
- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.

2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Submit schedule within 30 days of date established for commencement of the Work. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 42 00

REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract, without any implied meaning extending the Architect's responsibility into the Contractor's area of Contractor coordination, supervision, or means and methods of construction as outlined in the Conditions of the Contract.
 - 1. In no situation will an approval by Architect release Contractor from responsibility to fulfill requirements of the Contract Documents.
- C. "Authorities Having Jurisdiction" (AHJ): Means the agencies, either individually or collectively, charged by statute with administration and enforcement of the requirements of building codes and other regulations at the Project location.
 - 1. For purposes of this Project, AHJ shall mean Cherokee County, Georgia "Office of Building and Development Services".
- D. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- E. "General Requirements":
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions (if any) and other Division 01 General Requirement Sections, apply to all sections of the work.
 - 2. The provisions or requirements of Division 01 Sections apply to entire Work of the Contract and where so indicated, to other elements which are included in the Project.
- F. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- G. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- H. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- I. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

- J. "Provide": Furnish and install, complete and ready for the intended use.
- K. "Installer": Means the Contractor or other entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor to perform a particular construction operation at the Project site, including preparation, erection, installation, application, construction, re-installation, and similar operations required for execution of the Work.
 - 1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
 - 2. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.
- L. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

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

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits.
2. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to Architect for a decision before proceeding.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 43 39
MOCKUP REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for constructing mockups.
 - 1. Integrated Exterior Mockups.
- B. Related Sections include the following:
 - 1. Section 01 40 00 "Quality Requirements" for administrative requirements pertaining to project quality assurance.
 - 2. Divisions 02 through 33 Sections for specific material mockups unique to individual work results.

1.2 DEFINITIONS

- A. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
 - 1. Indicate manufacturer and model number of individual components.
 - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.4 QUALITY ASSURANCE

- A. Coordinate with trades affected in completion of required mockups at location designated by Owner.
- B. Complete each item or system of the mockup by the tradesmen who will provide the actual work.

- C. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
 - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 - 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- D. Integrated Exterior Mockups: Construct integrated exterior mockup as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

1.5 PROJECT CONDITIONS

- A. Coordinate with trades affected in completion of required mockups at location designated by Owner.
- B. Complete each item or system of the mockup by the respective trades and subcontractors who will be performing the actual Work.
- C. Before installing portions of the work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by the Owner and Architect.
 - 2. Notify Owner and Architect five days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Owner's and Architect's approval of mockups before starting fabrication, or construction of remaining work represented by the mockup.
 - a. Allow five days for initial review and each re-review of each mockup
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- D. Use the same installation methods and materials as required for the Work. Schedule construction so that it may be reviewed, and any necessary adjustments made, prior to commencing fabrication of the Work. When accepted, mock-up shall serve as the standard for materials, workmanship, and appearance throughout the Project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 INTEGRATED EXTERIOR MOCKUPS

- A. General: Mockup components shall be full size, using the same materials as those to be used in the actual Work, including details and methods of construction.
- B. Exterior Wall System Mockup:
 - 1. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 2. Fabricate exterior wall mockup in accordance with approved Shop Drawings.
 - 3. Prepare each mockup from completely detailed drawings incorporating architectural and structural features in accordance with the Contract Documents. Mockup shall include components of both vertical and corner wall sections including insulation, glazing, metal panels and coping. The mockup shall include all types of glass units specified.
 - 4. Provide full size mockup of portion of exterior wall system as indicated on Drawings, to include the following:
 - a. Structural metal framing backup wall, including sheathing and air/weather barrier.
 - b. Masonry veneer, including veneer ties and reinforcing.
 - c. Exterior window assembly, with specified glazing, and including all related flashings and sealant.
 - 5. Fabricate and erect each mockup under manufacturer's / installer's direct supervision and employ workmen as they would be employed during the actual erection at the job site. Employ same supervisory personnel who will perform site erection.
 - 6. Tolerance: Exterior wall systems shall be fabricated and installed with sufficient tolerances to provide for such expansion and/or contraction as will be caused by an exterior ambient temperature ranging from -0°F to an exterior metal surface temperature of 160°F without causing harmful buckling, opening of joints, undue stress of fastenings or other detrimental effects.
 - 7. Demolish and remove mockups when directed, unless otherwise indicated.

END OF SECTION

SECTION 01 45 33

STRUCTURAL TESTING AND SPECIAL INSPECTION SERVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section summarizes the responsibility of the Contractor and the Testing/Inspection Agency in the performance of the testing/inspection specified in the Contract Documents.
- B. Neither the observations of the Architect in the administration of the contract, nor tests/inspections by the Testing/Inspection Agency, nor approvals by persons other than the Architect shall relieve the Contractor from his obligation to perform the work in accordance with the Contract Documents.
- C. Special Inspection reports and a final report in accordance with Section 1704.2.4 of the 2018 International Building Code shall be submitted to the Building Official and Architect prior to the time that phase of work is approved for occupancy.

1.2 REFERENCES

- A. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.
- C. American Council of Independent Laboratories - Recommended Requirements for Independent Laboratories Qualifications.

1.3 SELECTION AND PAYMENT

- A. The Owner will select the Testing/Inspection Agency and will pay for the structural testing and special inspection services that are required by the Contract Documents.
- B. Contractor shall pay for any additional structural testing/inspection required for work or materials not complying with Contract Documents due to negligence or nonconformance.
- C. Contractor shall pay for any additional structural testing/inspection required for his convenience.

1.4 SUBMITTALS

- A. Submit Certificates of Compliance for the following:
 - 1. Structural steel.
 - 2. Steel joists.

1.5 QUALITY ASSURANCE

- A. Testing/Inspection Agency Qualifications: In accordance with the Minimum Special Inspector Qualifications Table and identified on the "List of Eligible Firms" maintained by the Georgia State Financing and Investment Commission.

1.6 STRUCTURAL TESTING AND SPECIAL INSPECTION REQUIRED FORMS

- A. Specific structural testing and special inspection forms are included in this specification section as follows:
 - 1. Minimum Special Inspector Qualifications Table
 - 2. Statement of Special Inspections
 - 3. Schedule of Special Inspections Services
 - 4. Fabricator Certificate of Compliance
 - 5. Final Report of Special Inspections

PART 2 - MATERIALS

-- NOT USED --

PART 3 - EXECUTION

3.1 STRUCTURAL PRECONSTRUCTION MEETING

- A. A structural preconstruction meeting may be conducted at the construction site by the Architect to discuss quality issues. The parties involved may be the Architect, Structural Engineer, Contractor, Structural Testing/Inspection Agency, appropriate subcontractors, suppliers, and detailers.

3.2 STRUCTURAL TESTING/INSPECTION AGENCY'S RESPONSIBILITIES

- A. Cooperate with the Contractor and provide timely service.
- B. Upon arriving at the construction site, sign in and notify the Contractor of presence.
- C. Select the representative samples that are to be tested/inspected.
- D. Perform tests/inspections as outlined in Contract Documents, the applicable code referenced standards, and as directed by the Architect.

- E. Report work and materials not complying with Contract Documents immediately to the Contractor and Architect.
- F. Leave copies of field notes with the Contractor prior to leaving the construction site. Field notes shall include the message given to the Contractor, date, time of message, name of Contractor's representative informed, type and location of work or materials tested/inspected, whether the work or materials complies with Contract Documents and name of the Structural Testing/Inspection Agency's representative.
- G. Report and distribute results of tests/inspections promptly in the form of written reports as directed by the Architect.
- H. Promptly report any non-conforming work in separate discrepancy reports indicating description, location, reference to applicable Contract Documents, resolution or corrective action taken and date.
- I. Structural Testing/Inspection Agency shall not alter requirements of Contract Documents, approve or reject any portion of the work, or perform duties of the Contractor.
- J. Initial and date the "Date Completed" box in the Schedule of Special Inspections as the inspection and testing activities are completed.
- K. Submit a completed Final Report of Special Inspections at the completion of the special inspection activities.

3.3 CONTRACTOR'S RESPONSIBILITIES

- A. Provide copy of Contract Documents to the Structural Testing/Inspection Agency.
- B. Arrange the preconstruction meeting to discuss quality issues.
- C. Notify the Structural Testing/Inspection Agency 48 hours in advance of operations to allow assignment of personnel and scheduling of tests.
- D. Cooperate with Structural Testing/Inspection Agency and provide access to work.
- E. Provide samples of materials to be tested in required quantities.
- F. Furnish copies of mill test reports when requested.
- G. Provide storage space for Structural Testing/Inspection Agency's exclusive use, such as for storing and curing concrete testing samples.
- H. Provide labor to assist the Structural Testing/Inspection Agency in performing tests/inspections.

END OF SECTION

MINIMUM SPECIAL INSPECTOR QUALIFICATIONS

| Category of Testing and Inspection | Minimum Qualifications (refer to key at end of Table) | | |
|---|---|-----------------------------|--|
| | Shop Testing or Inspection | Field Testing or Inspection | Review Testing, Certification, & Lab Reports |
| 1704.2.5 Inspection of Fabricators | | | |
| 1. Pre-cast concrete | A, C, E | | |
| 2. Structural steel construction | C, F, G | | |
| 3. Wood construction | A | | |
| 4. Cold formed metal construction | A | | |
| 1705.2, 1705.10, 1705.11& 1705.12 Steel Construction | | | |
| 1. Verification of welding consumables, filler metals, procedure specifications, procedure qualification records and personnel performance qualification records | | | C, F |
| 2. Nondestructive testing of welding | G | G | |
| 3. Inspection of welding | C, F | C, F | |
| 4. Verification of fabricator and erector documents as listed in AISC 360, chapter N, paragraph 3.2 | | | A, C |
| 5. Material verification of weld filler materials | | | C, F |
| 6. Inspection of high strength bolting and steel frame joint details | | A, C | |
| 7. Inspection of embedments and erection of fabricated steel and steel frame elements | | A, C, F | |
| 8. Inspection of steel elements of composite construction | | A, C, F | |
| 9. Verification of reinforcing steel, cold formed steel deck and truss materials | | | A, C, F |
| 10. Inspection of reinforcing steel, cold formed steel deck and trusses | | A, C | |
| 1705.3 & 1705.12 Concrete Construction | | | |
| 1. Reinforcing placement, cast-in-place bolts, post installed anchors concrete and shotcrete placement and curing operations. Inspection of formwork for shape, location and dimensions | | A, C, H | |
| 2. Pre-stressing steel installation | | A, C, D, E | |
| 3. Erection of pre-cast concrete members | | A, C, H | |
| 4. Concrete field sampling and testing | | J | |
| 5. Concrete strength testing | | P | |
| 6. Review certified mill reports | | | A, C |
| 7. Verify use of required design mix | | A, I, J, H, C | |
| 8. Pre-stressed (pre-tensioned) concrete force application | A, C, E | | |
| 9. Post-tensioned concrete force application | | A, C, D | |
| 10. Review of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs | | A, C, D, H | |
| 11. Reinforcing steel weldability, reinforcing welding, weld filler material | | C, F | |
| 12. Testing of welding of reinforcing steel | | G | |

| (Minimum Special Inspector Qualifications Continued) | | | |
|--|---|-----------------------------|--|
| Category of Testing and Inspection | Minimum Qualifications (refer to key at end of Table) | | |
| | Shop Testing or Inspection | Field Testing or Inspection | Review Testing, Certification, & Lab Reports |
| 1705.4 Masonry | | | |
| 1. Verification of f'_m and f'_{AAC} | | A, C, L, M | |
| 2. Mortar joint construction, grout protection and placement, materials proportion, type/size/location of reinforcement, structural elements, anchorage, and connectors | | A, C, K | |
| 3. Sampling/testing of grout/mortar specimens | | A, C, L, M | |
| 4. Observe preparation of masonry prisms for testing of compressive strength of masonry, f'_m and f'_{AAC} | | A, C, K, L, M | |
| 5. Inspection of welding of reinforcing steel | | C, F | |
| 6. Testing of welding of reinforcing steel | | G | |
| 1705.6 & 1804 Soils | | | |
| 1. Observe site preparation, fill placement testing of compaction for compliance with the construction documents for the project | | A, C, I, N | |
| 2. Observe test bearing materials below shallow foundations for ability to achieve design bearing capacity | | A, C, N, I (Level III) | |
| 3. Review compaction testing for compliance with the construction documents for the project | | | A |
| 1705.5, 1705.10, 1705.11 & 1705.12 Wood Construction | | | |
| 1. Observe structural panel sheathing, size of framing members, nail or staple diameter and length, number of fastener lines, and spacing of fastener lines and fasteners for compliance with construction documents for the project | | A | |
| 2. Observe temporary and permanent truss member restraint/bracing, field gluing of elements. Observe bolting, anchoring or other fastening of: shear walls, diaphragms, drag struts, braces and hold-downs. | | A | |
| 1705.7, 1705.8, 1705.9 & 1810 Pile and Pier Foundations | | | |
| 1. Observe installation | | A, N | |
| 2. Observe load tests | | A | |
| 1705.13 Sprayed Fire-Resistant Materials | | | |
| 1. Observe surface conditions, application, average thickness and density of applied material, and cohesive/adhesive bond | | A, C | |
| 1705.14 Mastic and Intumescent Fire-Resistant Coatings | | | |
| 1. Observe application compliance with AWCI 12-B | | A, C | |
| 1705.15 Exterior Insulation and Finish Systems | | | |
| 1. Inspect EIFS systems | | A, B, C, O | |
| 1705.1 Special Cases | | | |
| 1. Work of unusual or special nature | | A, B, O | |

| (Minimum Special Inspector Qualifications Continued) | | | |
|--|---|------------------------------------|---|
| Category of Testing and Inspection | Minimum Qualifications (refer to key at end of Table) | | |
| | Shop Testing or Inspection | Field Testing or Inspection | Review Testing, Certification, & Lab Reports |
| 1705.16 Fire-Resistant Penetrations and Joints | <i>See Requirements of IBC Sections 1705.16.1 and 1705.16.2</i> | | |
| 1705.17 Smoke Control | <i>See Requirements of IBC Section .1705.17.2</i> | | |
| 1705.10, 1705.11, 1705.12, Seismic and Wind Resistance | | | |
| 1. Periodic inspection of fabrication, installation and/or anchorage of building systems and components | | A | |
| <p>KEY:</p> <ul style="list-style-type: none"> A. Georgia Professional Engineer (GA PE) competent in the specific task area or graduate of accredited engineering/engineering technology program under the direct supervision of a GA PE. B. Georgia Registered Architect (GA RA) or graduate of accredited architecture/architecture technology program under the direction of a GA RA. C. International Code Council (ICC) Special Inspector Certification specific to the particular material and testing methodology applicable to each Category of Testing and Inspection listed in the table. D. Post-tensioning Institute (PTI) Certification, Level 2, bonded or unbonded as applicable. E. Pre-stressed Concrete Institute (PCI) Certified Inspector. F. American Welding Society (AWS) Certified Welding Inspector (CWI) or AWS Certified Associate Welding Inspector working under the direct on-site supervision of a CWI. G. American Society for Nondestructive Testing (ASNT) Level II certification, or a Level III certification if previously certified as a Level II in the particular material and testing methodology applicable to each Category of Testing and Inspection listed in the table. H. American Concrete Institute (ACI) Concrete Construction Special Inspector. I. National Institute for Certification in Engineering Technologies (NICET) Level II or higher certification specific to the particular material and testing methodology applicable to each Category of Testing and Inspection listed in the table. J. ACI Concrete Field Testing Technician with Grade 1 certification. K. Georgia Concrete and Products Association (GC&PA) – Masonry Association of Georgia (MAG) Masonry Construction Inspector Certification. L. National Concrete Masonry Association (NCMA) Concrete Masonry Testing Procedures certification. M. GC&PA – MAG Masonry Testing Technician certification. N. NICET Certified Engineering Technologist (CT). O. Other Qualified Special Inspector as approved by the Building Official. P. American Concrete Institute (ACI) Strength Testing Technician. <p>Notes:</p> <ul style="list-style-type: none"> 1. <i>The Special Inspector shall meet one of the minimum qualifications listed for the applicable Category of Testing and Inspection.</i> 2. <i>Materials testing shall be done by an Approved Testing Agency meeting the requirements of IBC Section 1703 and ASTM E 329.</i> | | | |

STATEMENT OF SPECIAL INSPECTIONS

PROJECT: Creekland Middle School Addition, Cherokee County School District

LOCATION: Canton, GA

PERMIT APPLICANT: _____

APPLICANT'S ADDRESS: _____

ARCHITECT OF RECORD: _____

STRUCTURAL ENGINEER OF RECORD: John T. Hutton SE, Uzun+Case

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE: John Hutton SE, Uzun+Case

This Statement of Special Inspections is submitted in accordance with Section 1704.3 of the 2018 International Building Code. It includes a *Schedule of Special Inspection Services* applicable to the above-referenced Project as well as the identity of the individuals, agencies, or firms intended to be retained for conducting these inspections. If applicable, it includes *Special Inspections for Seismic Resistance* and/or *Special Inspections for Wind Resistance*.


Are *Special Inspections for Seismic Resistance* included in the *Statement of Special Inspections*? Yes No
Are *Special Inspections for Wind Resistance* included in the *Statement of Special Inspections*? Yes No

The Special Inspector(s) shall keep records of all inspections and shall furnish interim inspection reports to the Building Official and to the Registered Design Professional in Responsible Charge at a frequency agreed upon by the Design Professional and the Building Official prior to the start of work. Discrepancies shall be brought to the immediate attention of the Contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Registered Design Professional in Responsible Charge prior to completion of that phase of work. A *Final Report of Special Inspections* documenting required special inspections and corrections of any discrepancies noted in the inspections shall be submitted to the Building Official and the Registered Design Professional in Responsible Charge at the conclusion of the project.

Frequency of interim report submittals to the Registered Design Professional in Responsible Charge:
 Weekly Bi-Weekly Monthly Other; specify: _____

The Special Inspection program does not relieve the Contractor of the responsibility to comply with the Contract Documents. Jobsite safety and means and methods of construction are solely the responsibility of the Contractor.

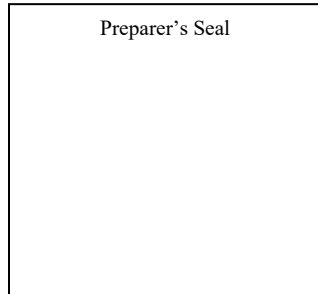
Statement of Special Inspections Prepared by:
John T. Hutton, PE, Uzun+Case
Type or print name



Signature

06/22/2023

Date



SCHEDULE OF SPECIAL INSPECTIONS

| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
|---|---|----------------------------|---------------------------------|--------|----------------|
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 1705.1.1 Special Cases | | | | | |
| 1. Inspection of anchors post-installed in solid grouted masonry: Per research reports including verification of anchor type, anchor dimensions, hole dimensions, hole cleaning procedures, anchor spacing, edge distances, masonry unit, grout, masonry compressive strength, anchor embedment and tightening torque | Field inspection | Y | Field inspection | 1 | |
| 1705.2.1 Steel Construction | | | | | |
| 1. Fabricator and erector documents (Verify reports and certificates as listed in AISC 360, Section N 3.2, for compliance with construction documents) | Submittal Review | Y | Each submittal | 1 | |
| 2. Material verification of structural steel | Shop (3) and field inspection | Y | Periodic | 1 | |
| 3. Structural steel welding: | | | | | |
| a. Inspection tasks Prior to Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-1) | Shop (3) and field inspection | Y | Observe or Perform as noted (4) | 1 | |
| b. Inspection tasks During Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-2) | Shop (3) and field inspection | Y | Observe (4) | 1 | |
| c. Inspection tasks After Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-3) | Shop (3) and field inspection | Y | Observe or Perform as noted (4) | 1 | |
| d. Nondestructive testing (NDT) of welded joints: | | | | | |
| 1) Complete penetration groove welds 5/16" or greater in risk category II, III or IV | Shop (3) or field ultrasonic testing - 100% | Y | Periodic | 1 | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|--|-----------------------------------|---------------------------------|---------------|-----------------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 2) Welded joints subject to fatigue when required by AISC 360, Appendix 3, Table A-3.1 . | Shop (3) or field radiographic or Ultrasonic testing | N | Periodic | | |
| 3) Fabricator's NDT reports when fabricator performs NDT | Verify reports | Y | Each submittal (5) | 1 | |
| 4. Structural steel bolting: | Shop (3) and field inspection | | | | |
| a. Inspection tasks Prior to Bolting (Observe, or perform tasks for each bolted connection, in accordance with QA tasks listed in AISC 360, Table N5.6-1) | | Y | Observe or Perform as noted (4) | 1 | |
| b. Inspection tasks During Bolting (Observe the QA tasks listed in AISC 360, Table N5.6-2) | | | Observe (4) | | |
| 1) Pre-tensioned and slip-critical joints | | | | | |
| a) Turn-of-nut with matching markings | | | Periodic | | |
| b) Direct tension indicator | | Y | Periodic | 1 | |
| c) Twist-off type tension control bolt | | Y | Periodic | 1 | |
| d) Turn-of-nut without matching markings | | | Continuous | | |
| e) Calibrated wrench | | | Continuous | | |
| 2) Snug-tight joints | | Y | Periodic | 1 | |
| c. Inspection tasks After Bolting (Perform tasks for each bolted connection in accordance with QA tasks listed in AISC 360, Table N5.6-3) | | Y | Perform (4) | 1 | |

| (Schedule of Special Inspections Continued) | | | | | |
|--|-------------------------------|----------------------------|----------------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 5. Visual inspection of exposed cut surfaces of galvanized structural steel main members and exposed corners of the rectangular HSS for cracks subsequent to galvanizing | Shop (3) or field inspection | N | Periodic | | |
| 6. Embedments (Verify diameter, grade, type, length, embedment. See 1705.3 for anchors) | Field inspection | Y | Periodic | 1 | |
| 7. Verify member locations, braces, stiffeners, and application of joint details at each connection comply with construction documents | Field inspection | Y | Periodic | 1 | |
| 1705.2.2 Cold-Formed Steel Deck | | | | | |
| 1. Manufacturer documents (Verify reports and certificates as listed in SDI QA/QC, Section 2, Paragraphs 2.1 and 2.2 for compliance with construction documents) | Submittal Review | N | Each submittal | | |
| 2. Material verification of steel deck, mechanical fasteners and welding materials | Shop (3) and field inspection | Y | Periodic | 1 | |
| 3. Cold-formed steel deck placement: | Shop (3) and field inspection | | | | |
| a. Inspection tasks Prior to Deck Placement (Perform the QA tasks listed in SDI QA/QC, Appendix 1 Table 1.1) | | Y | Perform (4) | 1 | |
| b. Inspection tasks After Deck Placement (Perform the QA tasks listed in SDI QA/QC, Appendix 1 Table 1.2) | | Y | Perform (4) | 1 | |
| 4. Cold-formed steel deck welding: | Shop (3) and field inspection | | | | |
| a. Inspection tasks Prior to Welding (Observe the QA tasks listed in SDI QA/QC, Appendix 1 Table 1.3) | | Y | Observe (4) | 1 | |
| b. Inspection tasks During Welding (Observe the QA tasks listed in SDI QA/QC, Appendix 1 Table 1.4) | | Y | Observe (4) | 1 | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|-------------------------------|----------------------------|-------------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| c. Inspection tasks After Welding (Perform the QA tasks listed in SDI QA/QC, Appendix 1 Table 1.5) | | Y | Perform (4) | 1 | |
| 5. Cold-formed steel deck mechanical fastening: | Shop (3) and field inspection | | | | |
| a. Inspection tasks Prior to Mechanical Fastening (Observe the QA tasks listed in SDI QA/QC, Appendix 1 Table 1.6) | | Y | Observe (4) | 1 | |
| b. Inspection tasks During Mechanical Fastening (Observe the QA tasks listed in SDI QA/QC, Appendix 1 Table 1.7) | | Y | Observe (4) | 1 | |
| c. Inspection tasks After Mechanical Fastening (Perform the QA tasks listed in SDI QA/QC, Appendix 1 Table 1.8) | | Y | Perform (4) | 1 | |
| 1705.2.3 Open-Web Steel Joists and Joist Girders | | | | | |
| 1. Installation of open-web steel joists and joist girders. | | | | | |
| a. End connections - welding or bolted. | per SJI CJ or SJI 100 | Y | Periodic | 1 | |
| b. Bridging - horizontal or diagonal. | | | | | |
| 1) Standard bridging. | per SJI CJ or SJI 100 | Y | Periodic | 1 | |
| 2) Bridging that differs from the specifications listed in SJI CJ or SJI 100. | | N | Periodic | | |
| 1705.2.4 Cold-Formed Trusses Spanning 60 feet or Greater | | | | | |
| 1. Verify temporary and permanent restraint/bracing are installed in accordance with the approved truss submittal package | Field inspection | N | Periodic | | |
| 1705.3 Concrete Construction | | | | | |
| 1. Inspection and placement verification of reinforcing steel and prestressing tendons. | Shop (3) and field inspection | Y | Periodic | 1 | |
| 2. Reinforcing bar welding: | | | | | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|-------------------------------|----------------------------|---|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| a. Verification of weldability of bars other than ASTM A706. | | N | Periodic | | |
| b. Inspection of single-pass fillet welds 5/16 or less in size. | | Y | Periodic | 1 | |
| c. Inspection of all other welds. | | Y | Continuous | 1 | |
| 3. Inspection of anchors cast in concrete. | Shop (3) and field inspection | Y | Periodic | 1 | |
| 4. Inspection of anchors and reinforcing steel post-installed in hardened concrete members per research reports, or, if no specific requirements are provided, requirements shall be provided by the Architect and approved by the Building Official, including verification of anchor type, anchor dimensions, hole dimensions, hole cleaning procedures, anchor spacing, edge distances, concrete minimum thickness, anchor embedment and tightening torque | Field inspection | | Periodic or as required by the research report issued by an approved source | | |
| a. Adhesive anchors installed in horizontal or upward-inclined orientation that resist sustained tension loads. | | Y | Continuous | 1 | |
| b. Mechanical and adhesive anchors not defined in 4a. | | Y | Periodic | 1 | |
| 5. Verify use of approved design mix | Shop (3) and field inspection | Y | Periodic | 1 | |
| 6. Prior to placement, fresh concrete sampling, perform slump and air content tests and determine temperature of concrete and perform any other tests as specified in construction documents. | Shop (3) and field inspection | Y | Continuous | 1 | |
| 7. Inspection of concrete and shotcrete placement for proper application techniques | Shop (3) and field inspection | Y | Continuous | 1 | |
| 8. Verify maintenance of specified curing temperature and techniques | Shop (3) and field inspection | Y | Periodic | 1 | |

| (Schedule of Special Inspections Continued) | | | | | |
|--|--|----------------------------|-----------------------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 9. Inspection of prestressed concrete: | Shop (3) and field inspection | N | | | |
| a. Application of prestressing force | | | Continuous | | |
| b. Grouting of bonded prestressing tendons | | | Continuous | | |
| 10. Erection of precast concrete members | | N | | | |
| 11. Verification of in-situ concrete strength, prior to stressing of tendons in post tensioned concrete and prior to removal of shores and forms from beams and structural slabs | Review field testing and laboratory reports | N | Periodic | | |
| 12. Inspection of formwork for shape, lines, location and dimensions | Field inspection | Y | Periodic | 1 | |
| 13. Testing of concrete floor flatness as required per construction documents. | Field testing | Y | Periodic | 1 | |
| 14. Concrete strength testing and verification of compliance with construction documents | Field testing and review of laboratory reports | Y | Periodic | 1 | |
| 1705.4 Masonry Construction | | | | | |
| Levels are defined in TMS 402, table 3.1. QA requirements defined in TMS 602 tables 3 and 4. | | | | | |
| MINIMUM VERIFICATION REQUIREMENTS | | | | | |
| (A) Level 1, 2, and 3 Quality Assurance: | | | | | |
| 1. Prior to construction, verification of compliance of submittals | Submittal Review | Y | Prior to Construction | 1 | |
| (B) Level 2 and 3 Quality Assurance: | | | | | |
| 1. Prior to construction verification of fm and fAAC | Testing by unit strength method or prism test method | Y | Prior to Construction | 1 | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|--|----------------------------|----------------------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 2. During construction, verification of Slump Flow and Visual Stability Index (VSI) when self-consolidating grout is delivered to project site. | Testing by unit strength method or prism test method | Y | Periodic | 1 | |
| (C) Level 3 Quality Assurance: | | | | | |
| 1. During construction, verification of fm and fAAC for every 5,000 square feet | Testing by unit strength method or prism test method | Y | Periodic | 1 | |
| 2. During construction, verification of proportions of materials as delivered to the project site for premixed or preblended mortar, prestressing grout, and grout other than self-consolidating grout. | Field inspection | Y | Periodic | 1 | |
| MINIMUM SPECIAL INSPECTION REQUIREMENTS | | | | | |
| (D) Level 2 and 3 Quality Assurance: | | | | | |
| 1. As masonry construction begins, verify that the following are in compliance: | | | | | |
| a. Proportions of the site-prepared mortar | Field inspection | Y | Periodic | 1 | |
| b. Grade and size of prestressing tendons and anchorages | Field inspection | N | Periodic | | |
| c. Grade, type, and size of reinforcement, anchor bolts, and prestressing tendons and anchorages | Field inspection | Y | Periodic | 1 | |
| d. Prestressing technique | Field inspection | N | Periodic | | |
| e. Properties of thin-bed mortar for AAC masonry | Field inspection | N | Level 2 - Periodic | | |
| | | N | Level 3 - Continuous | | |
| f. Sample panel construction | Field inspection | N | Level 2 - Periodic | | |
| | | N | Level 3 - Continuous | | |
| 2. Prior to grouting, verify that the following are in compliance: | | | | | |

| (Schedule of Special Inspections Continued) | | | | | |
|--|------------------|----------------------------|----------------------|--------|----------------|
| PROJECT | | CREEKLAND MIDDLE SCHOOL | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| a. Grout space | Field inspection | Y | Level 2 - Periodic | 1 | |
| | | N | Level 3 - Continuous | | |
| b. Placement of prestressing tendons and anchorages | Field inspection | N | Periodic | | |
| c. Placement of reinforcement, connectors, and anchor bolts | Field inspection | Y | Level 2 - Periodic | 1 | |
| | | N | Level 3 - Continuous | | |
| d. Proportions of site-prepared grout and prestressing grout for bonded tendons | Field inspection | Y | Periodic | 1 | |
| 3. Verify compliance of the following during construction: | | | | | |
| a. Materials and procedures with the approved submittals | Field inspection | Y | Periodic | 1 | |
| b. Placement of masonry units and mortar joint construction | Field inspection | Y | Periodic | 1 | |
| c. Size and location of structural members | Field inspection | Y | Periodic | 1 | |
| d. Type, size, location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction | Field inspection | Y | Level 2 - Periodic | 1 | |
| | | N | Level 3 - Continuous | | |
| e. Welding of reinforcement | Field inspection | N | Continuous | | |
| f. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F) | Field inspection | Y | Periodic | 1 | |
| g. Application and measurement of prestressing force | Field inspection | N | Continuous | | |
| h. Placement of grout and prestressing grout for bonded tendons is in compliance | Field inspection | N | Continuous | | |
| i. Placement of AAC masonry units and construction of thin-bed mortar joints | Field inspection | N | Level 2 - Periodic | | |
| | | N | Level 3 - Continuous | | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|-------------------------|----------------------------|----------------------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 4. Observe preparation of grout specimens, mortar specimens, and/or prisms | Field inspection | Y | Level 2 - Periodic | 1 | |
| | | N | Level 3 - Continuous | | |
| <p>1705.5 Wood Construction Special inspections of the fabrication process of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.5. High-load diaphragms designed in accordance with Section 2306.2 shall be installed with special inspections as indicated in Section 1704.2. Exception: Special inspections are not required for portions of structures designed and constructed in accordance with IBC Section 2308 unless the approved construction documents indicate otherwise.</p> | | | | | |
| 1. For prefabricated wood structural elements, inspection of the fabrication process and assemblies in accordance with Section 1704.2.5. | In-plant review (3) | N | Periodic | | |
| 2. For high-load diaphragms, verify grade and thickness of structural panel sheathing agree with approved building plans | Field inspection | N | Periodic | | |
| 3. For high-load diaphragms, verify nominal size of framing members at adjoining panel edges, nail or staple diameter and length, number of fastener lines, and that spacing between fasteners in each line and at edge margins agree with approved building plans | Field inspection | N | Periodic | | |
| 4. Metal-plate-connected wood trusses: | | N | | | |
| a. Verification that permanent individual truss member restraint/bracing has been installed in accordance with the approved truss submittal package when the truss height is greater than or equal to 60". | Field inspection | N | Periodic | | |
| b. For trusses spanning 60 feet or greater: verify temporary and permanent restraint/bracing are installed in accordance with the approved truss submittal package | Field inspection | N | Periodic | | |
| 1705.6 Soils | | | | | |

| (Schedule of Special Inspections Continued) | | | | | |
|--|--------------------------------|-----------------------------------|--------------------|---------------|-----------------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity. | Field inspection | Y | Periodic | 1 | |
| 2. Verify excavations are extended to proper depth and have reached proper material. | Field inspection | Y | Periodic | 1 | |
| 3. Perform classification and testing of controlled fill materials. | Field inspection | Y | Periodic | 1 | |
| 4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill | Field inspection | Y | Continuous | 1 | |
| 5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly | Field inspection | Y | Periodic | 1 | |
| 1705.7 Driven Deep Foundations | | | | | |
| 1. Verify element materials, sizes, and lengths comply with requirements | Field inspection | N | Continuous | | |
| 2. Determine capacities of test elements and conduct additional load tests, as required | Field inspection | N | Continuous | | |
| 3. Inspect driving operations and maintain complete and accurate records for each element | Field inspection | N | Continuous | | |
| 4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element | Field inspection | N | Continuous | | |
| 5. For steel elements, perform additional inspections per Section 1705.2 | See Section 1705.2 | N | See Section 1705.2 | | |
| 6. For concrete elements and concrete-filled elements, perform additional inspections per Section 1705.3 | See Section 1705.3 | N | See Section 1705.3 | | |

| (Schedule of Special Inspections Continued) | | | | | |
|--|-------------------------|----------------------------|---|--------------------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge | Field inspection | N | In accordance with construction documents | | |
| 1705.8 Cast-in-Place Deep Foundations | | | | | |
| 1. Inspect drilling operations and maintain complete and accurate records for each element | Field inspection | N | Continuous | | |
| 2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes | Field inspection | N | Continuous | | |
| 3. For concrete elements, perform additional inspections in accordance with Section 1705.3 | See Section 1705.3 | N | See Section 1705.3 | | |
| 1705.9 Helical Pile Foundations | | | | | |
| 1. Verify installation equipment, pile dimensions, tip elevations, final depth, final installation torque and other data as required. | Field inspection | N | Continuous | | |
| 1705.10 Fabricated Items | | | | | |
| 1. List of fabricated items requiring special inspection during fabrication: | Shop inspection | N | As noted in each applicable shop activity | | |
| | | | | | |
| 2. List of fabricated items to be fabricated on the premises of a fabricator approved to perform such work without special inspection | | | | | |
| Structural Steel Framing | | Y | | AISC Certification | |
| Steel Joists | | Y | | SJI Certification | |
| | | | | | |
| 1705.11.1 Structural Wood Special Inspections For Wind Resistance | | | | | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|-------------------------------|----------------------------|-----------------------------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 1. Inspection of field gluing operations of elements of the main wind force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs. | Field inspection | N | Continuous | | |
| 2. Inspection of nailing, bolting, anchoring and other fastening of components within the main wind force-resisting system | Shop (3) and field inspection | N | Periodic | | |
| 1705.11.2 Cold-formed Steel Special Inspections For Wind Resistance | | | | | |
| 1. Inspection during welding operations of elements of the main wind force-resisting system. | Shop (3) and field inspection | N | Periodic | | |
| 2. Inspections for screw attachment, bolting, anchoring and other fastening of components within the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs. | Shop (3) and field inspection | N | Periodic | | |
| 1705.11.3 Wind-resisting Components | | | | | |
| 1. Roof covering, roof deck and roof framing connections. | Shop (3) and field inspection | N | Periodic | | |
| 2. Exterior wall covering and wall connections to roof and floor diaphragms. | Shop (3) and field inspection | N | Periodic | | |
| 1705.12.1 Structural Steel Special Inspections for Seismic Resistance | | | | | |
| 1. Seismic force-resisting systems in SDC B, C, D, E, or F. | Shop (3) and field inspection | N | In accordance with AISC 341 | | |
| 2. Structural steel elements in SDC B, C, D, E, or F other than those in Item 1. including struts, collectors, chords and foundation elements. | Shop (3) and field inspection | N | In accordance with AISC 341 | | |
| 1705.12.2 Structural Wood Special Inspections for Seismic Resistance | | | | | |
| 1. Field gluing operations of elements of the seismic-force resisting system for SDC C, D, E or F. | Field inspection | N | Continuous | | |

| (Schedule of Special Inspections Continued) | | | | | |
|--|-------------------------------|----------------------------|----------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 2. Nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system including wood shear walls, wood diaphragms, drag struts, shear panels and hold-downs for SDC C, D, E or F. | Shop (3) and field inspection | N | Periodic | | |
| 1705.12.3 Cold-formed Steel Light-Frame Construction Special Inspections for Seismic Resistance | | | | | |
| 1. During welding operations of elements of the seismic-force-resisting system for SDC C, D, E or F. | Shop (3) and field inspection | N | Periodic | | |
| 2. Screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs for SDC C, D, E or F. | Shop (3) and field inspection | N | Periodic | | |
| 1705.12.4 Designated Seismic Systems Verification Designed Seismic Systems: | | | | | |
| 1. For SDC C, D, E or F, inspect and verify that that the component label, anchorage or mounting conforms to the certificate of compliance in accordance with ASCE 7 Section 13.2.2. | Field inspection | N | Periodic | | |
| 1705.12.5 Architectural Components Special Inspections for Seismic Resistance | | | | | |
| 1. For SDC D, E or F, inspection during the erection and fastening of exterior cladding and interior or exterior veneer more than 30 feet above grade or walking surface and weighing more than 5 psf. | Field inspection | N | Periodic | | |
| 2. For SDC D, E or F, inspection during the erection and fastening of interior nonbearing walls more than 30 feet above grade or walking surface and weighing more than 15 psf. | Field inspection | N | Periodic | | |
| 3. For SDC D, E or F, inspection during the erection and fastening of exterior nonbearing walls more than 30 feet above grade or walking surface. | Field inspection | N | Periodic | | |

| (Schedule of Special Inspections Continued) | | | | | |
|--|-------------------------|----------------------------|----------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 4. For SDC D, E or F, inspection during anchorage of access floors | Field inspection | N | Periodic | | |
| 1705.12.6 Plumbing, Mechanical, and Electrical Components Special Inspections for Seismic Resistance | | | | | |
| 1. Inspection during the anchorage of electrical equipment for emergency or standby power systems in SDC C, D, E or F | Field inspection | N | Periodic | | |
| 2. Inspection during the anchorage of other electrical equipment in SDC E or F | Field inspection | N | Periodic | | |
| 3. Inspection during installation and anchorage of piping systems designed to carry hazardous materials, and their associated mechanical units in SDC C, D, E or F | Field inspection | N | Periodic | | |
| 4. Inspection during the installation and anchorage of HVAC ductwork designed to contain hazardous materials in SDC C, D, E or F | Field inspection | N | Periodic | | |
| 5. Inspection during the installation and anchorage of vibration isolation systems in SDC C, D, E or F where nominal clearance of 1/4 inch or less is required by the approved construction documents | Field inspection | N | Periodic | | |
| 6. Inspection during installation of mechanical and electrical equipment, including duct work, piping systems and their structural supports, where automatic fire sprinkler systems are installed in structures assigned to SDC C, D, E, or F to verify one of the following unless flexible sprinkler hose fittings are used: | | N | | | |
| a. ASCE 7, Section 13.2.3 minimum required clearances have been provided. | Field inspection | | Periodic | | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|---------------------------|----------------------------|----------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| b. A three inch or greater nominal clearance has been provided between fire protection sprinkler system drops and sprigs and: structural members not used collectively or independently to support the sprinklers; equipment attached to the building structure; and other systems' piping. | Field inspection | | Periodic | | |
| 1705.12.7 Storage Racks Special Inspections for Seismic Resistance | | | | | |
| 1. Inspection during the anchorage of storage racks 8 feet or greater in height in structures assigned to SDC D, E or F. | Field inspection | N | Periodic | | |
| 1705.12.8 Seismic Isolation Systems | | | | | |
| 1. Inspection during the fabrication and installation of isolator units and energy dissipation devices used as part of the seismic isolation system in structures assigned to SDC B, C, D, E or F. | Shop and field inspection | N | Periodic | | |
| 1705.12.9 Cold-formed Steel Special Bolted Moment Frames | | | | | |
| 1. Inspection of installation of cold-formed steel special bolted moment frames in the seismic force-resisting systems in structures assigned to SDC D, E or F. | Field inspection | N | Periodic | | |
| 1705.13.1 Structural Steel Testing for Seismic Resistance | | | | | |
| 1. Nondestructive testing of structural steel in the seismic force-resisting systems in accordance with AISC 341 in structures assigned to SDC B, C, D, E or F. | Field test | N | Periodic | | |
| 2. Nondestructive testing of structural steel elements in the seismic force-resisting systems not covered in 1 above including struts, collectors, chords and foundation elements in accordance with AISC 341 in structures assigned to SDC B, C, D, E or F. | Field test | N | Periodic | | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|----------------------------------|----------------------------|---------------------------|--------|----------------|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 1705.13.2 Seismic Certification of Nonstructural Components | | | | | |
| 1. Review certificate of compliance for designated seismic system components in structures assigned to SDC B, C, D, E or F. | Certificate of compliance review | N | Each submittal | | |
| 1705.13.3 Seismic Certification of Designated Seismic Systems | | | | | |
| 1. Review certificate of compliance for designated seismic system components in structures assigned to SDC C, D, E or F | Certificate of compliance review | N | Each submittal | | |
| 1705.13.4 Seismic Isolation Systems | | | | | |
| 1. Test seismic isolation system in accordance with ASCE 7 Section 17.8 in structures assigned to SDC B, C, D, E or F. | Prototype testing | N | Per ASCE 7 | | |
| 1705.14 Sprayed Fire-resistant Materials | | | | | |
| 1. Verify surface condition preparation of structural members | Field inspection | Y | Periodic | 1 | |
| 2. Verify minimum thickness of sprayed fire-resistant materials applied to structural members | Field inspection | Y | Periodic | 1 | |
| 3. Verify density of the sprayed fire-resistant material complies with approved fire-resistant design | Field inspection and testing | Y | Per IBC Section 1705.14.5 | 1 | |
| 4. Verify the cohesive/adhesive bond strength of the cured sprayed fire-resistant material | Field inspection and testing | Y | Per IBC Section 1705.14.6 | 1 | |
| 5. Condition of finished application | Field inspection | Y | Periodic | 1 | |
| 1705.15 Mastic and Intumescent Fire-Resistant Coatings | | | | | |
| 1. Inspect and test mastic and intumescent fire-resistant coatings applied to structural elements and decks per AWCI 12-B | Field inspection and testing | Y | Periodic | 1 | |
| 1705.16 Exterior Insulation and Finish Systems (EIFS) | | | | | |
| 1. Inspection of water-resistive barrier over sheathing substrate | Field inspection | N | Periodic | | |

| (Schedule of Special Inspections Continued) | | | | | |
|---|-------------------------|----------------------------|----------------|------------------------------|--|
| PROJECT | CREEKLAND MIDDLE SCHOOL | | | | |
| MATERIAL / ACTIVITY | SERVICE | APPLICABLE TO THIS PROJECT | | | |
| | | Y/N | EXTENT | AGENT* | DATE COMPLETED |
| 1705.17 Fire-Resistant Penetrations and Joints | | | | | |
| 1. Inspect penetration firestop systems | Field testing | Y | Per ASTM E2174 | 1 | |
| 2. Inspect fire-resistant joint systems | Field testing | Y | Per ASTM E2393 | 1 | |
| 1705.18 Smoke Control Systems | | | | | |
| 1. Leakage testing and recording of device locations prior to concealment | Field testing | N | Periodic | | |
| 2. Prior to occupancy and after sufficient completion, pressure difference testing, flow measurements, and detection and control verification | Field testing | N | Periodic | | |
| * INSPECTION AGENTS | FIRM | ADDRESS | | PHONE NO. | |
| 1. Qualified Testing Agent (TBD) | | | | | |
| <p><i>NOTES:</i></p> <ol style="list-style-type: none"> <i>The inspection and testing agent(s) shall be engaged by the Owner and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, Architect and Owner prior to commencing work. The qualifications of the Special Inspector(s) and/or testing agencies may be subject to the approval of the Building Official and the Architect.</i> <i>The list of Special Inspectors may be submitted as a separate document, if noted so above.</i> <i>Shop Inspections of fabricated items are not required where the fabricator is approved in accordance with IBC Section 1704.2.5.1 and listed in activity 1709.2.</i> <i>“Observe”: Observe on a random basis, operations need not be delayed pending these inspections. “Perform”: Perform these tasks for each welded joint, bolted connection, or steel element.</i> <i>NDT of welds completed in an approved fabricator's shop may be performed by that fabricator's qualified Quality Control Inspector per when approved by the Building Official. Refer to AISC 360, N6.</i> | | | | | |
| Are Special Inspections for Seismic Resistance included in the Statement of Special Inspections? | | | | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| Are Special Inspections for Wind Resistance included in the Statement of Special Inspections? | | | | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |

FABRICATORS CERTIFICATE OF COMPLIANCE

Each approved fabricator that is exempt from Special Inspection of shop fabrication and implementation procedures per section 1704.2.5.1 of the International Building Code must submit *Fabricator's Certificate of Compliance* at the completion of fabrication.

Project: Creekland Middle School Addition, Cherokee County School District

Fabricator's Name: _____

Address: _____

Certification or Approval Agency: _____

Certification Number: _____

Date of Last Audit or Approval: _____

Description of structural members and assemblies that have been fabricated:

I hereby certify that items described above were fabricated in strict accordance with the approved construction documents.

Name and Title (type or print)

Signature

Date

Attach copies of fabricator's certification or building code evaluation service report and fabricator's quality control manual.

FINAL REPORT OF SPECIAL INSPECTIONS

PROJECT: Creekland Middle School Addition, Cherokee County School District

LOCATION: Canton, GA

PERMIT APPLICANT: _____

APPLICANT'S ADDRESS: _____

ARCHITECT OF RECORD: _____

STRUCTURAL ENGINEER OF RECORD: John T. Hutton SE, Uzun+Case

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE: John Hutton SE, Uzun+Case

To the best of my information, knowledge, and belief, which are based upon observations or diligent supervision of our inspection services for the above-referenced Project, I hereby state that the special inspections or testing required for this Project, and designated for this Agent in the *Schedule of Special Inspection Services*, have been completed in accordance with the Contract Documents.

The Special Inspection program does not relieve the Contractor of the responsibility to comply with the Contract Documents. Jobsite safety and means and methods of construction are solely the responsibility of the Contractor.

Interim reports submitted prior to this final report and numbered ___ to ___ form a basis for, and are to be considered an integral part of this final report. The following discrepancies that were outstanding since the last interim report dated _____ have been corrected:

(Attach 8 1/2"x11" continuation sheet(s) if required to complete the description of corrections)

Prepared By:

Special Inspection Agent/Firm

Type or print name

Signature

Date

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection of facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.
 - 2. Section 01 56 39 "Temporary Tree and Plant Protection" for protection of trees and vegetation in work areas.
 - 3. Section 01 57 13 "Temporary Erosion and Sediment Control" for temporary measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties.
 - 4. Section 32 12 16 "Asphalt Paving" for construction and maintenance of asphalt pavement for temporary roads and paved areas.
 - 5. Section 32 13 13 "Concrete Paving" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

1.2 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, includes as a minimum, the following:
 - 1. Permanent or temporary roofing is complete, insulated, and weathertight, including parapets and roof edge terminations.
 - a. Roof insulation is fully protected from getting wet.
 - b. Roof drains are fully functional.
 - 2. Exterior walls are insulated, weathertight, and UV-resistant.
 - 3. All openings are closed with permanent construction or substantial weathertight temporary closures.
 - 4. Permanent enclosure envelope shall be capable of retaining controlled interior temperature and humidity levels.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections, backflow preventers, and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established from commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- E. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- F. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistant materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- G. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.

3. Location of proposed air-filtration system discharge.
 4. Waste handling procedures.
 5. Other dust-control measures.
- H. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by the Owner. Include the following:
1. Methods used to meet the goals and requirements of the Owner.
 2. Concrete cutting method(s) to be used.
 3. Location of construction devices on the site.
 4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
 5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with the Owner.
 6. Indicate Locations of sensitive equipment areas or other areas requiring special attention as identified by Owner. Indicate means for complying with Owner's requirements.
- 1.5 QUALITY ASSURANCE
- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
 - B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
 - C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.
- 1.6 PROJECT CONDITIONS
- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch-OD top rails.
- B. Lumber and Plywood: Comply with requirements in Section 06 10 00 "Rough Carpentry."
- C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- D. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.
- E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rockwool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- F. Paint: Comply with requirements in Division 09 Section "Painting."
- G. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
 - 1. Office shall be of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate project meetings specified in other Division 01 Sections.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- B. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- C. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction and marked for intended location and application.
 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00 "Closeout Procedures".
- D. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.
- E. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- F. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

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

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- E. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- G. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- H. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
 2. Provide warning signs at power outlets other than 110 to 120 V.
 3. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
 4. Provide metal conduit enclosures or boxes for wiring devices.
 5. Provide 4-gang outlets, spaced so 100-foot (30-m) extension cord can reach each area for power hand tools and task lighting. Provide a separate 125-V ac, 20-A circuit for each outlet.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 2. Install lighting for Project identification sign.
- J. Electronic Communication (E-mail) Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities.
1. Provide broadband in primary field office.
 2. Provide for connection of communication devices Owner, Architect and Contractor by Wi-Fi, or wired connections.
- 3.4 SUPPORT FACILITIES INSTALLATION
- A. General: Comply with the following:
1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
 2. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 3. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.

2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 31 20 00 "Earth Moving."
 3. Recondition base after temporary use, including removing contaminated material, regrading, proof-rolling, compacting, and testing.
 4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Section 32 12 16 "Asphalt Paving."
- C. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- D. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- F. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 3. Maintain and touchup signs so they are legible at all times.
- G. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- J. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.

1. Do not load elevators beyond their rated weight capacity.
 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- L. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.
- M. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
1. Comply with work restrictions specified in Section 01 10 00 "Summary."
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Section 31 10 00 "Site Clearing."
- D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.
1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- F. Tree and Plant Protection: Comply with requirements specified in Section 01 56 39 "Temporary Tree and Plant Protection."
- G. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- H. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- I. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- J. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Coordinate and provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- K. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- L. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- M. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.
 1. Construct covered walkways using scaffold or shoring framing.
 2. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
 3. Paint and maintain appearance of walkway for duration of the Work.

- N. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- O. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 2. Construct dustproof partitions with two layers of 6-mil (0.14-mm) polyethylene sheet on each side. Cover floor with two layers of 6-mil (0.14-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
 - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
 3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 4. Insulate partitions to control noise transmission to occupied areas.
 5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 6. Protect air-handling equipment.
 7. Provide walk-off mats at each entrance through temporary partition.
- P. Temporary Fire-Rated Partitions: Erect and maintain dustproof fire-rated partitions and temporary enclosures to limit dust and dirt migration and to separate occupied areas from construction, fumes, and noise. Fire-rated partitions shall be provided to separate existing occupied areas from construction areas in accordance with NFPA 241.
1. Construct fire-rated dustproof partitions of not less than nominal 4-inch studs, 1/2-inch or 5/8-inch Type X gypsum wallboard on both sides, with joints taped.
 2. Extend partitions up to underside of existing structure to the greatest extent possible.
 3. Insulate partitions to provide noise protection to occupied areas.
 4. Seal joints and perimeter with fire-resistant joint sealant.
 5. Equip partitions with dustproof doors and security locks.
 - a. Protect openings in 1-hour fire-rated partitions with 45-minute hollow metal or solid core wood doors.
 6. Protect air-handling equipment.

7. Weatherstrip openings.

Q. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
 - a. Field Offices: Class A stored-pressure water-type extinguishers.
 - b. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
 - c. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
6. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
7. Prohibit smoking in construction areas.
8. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
9. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
10. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.
 - 4. Discard or replace water-damaged material.
 - 5. Do not install material that is wet.
 - 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 - 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 - 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 - 2. Use permanent HVAC system to control humidity.
 - 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 - 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

SECTION 01 57 20

TEMPORARY NOISE AND DUST MITIGATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for control of construction noise and dust generation during performance of the Work.
- B. Related Requirements:
 - 1. Section 01 50 00 "Temporary Facilities and Controls".
 - 2. Section 01 57 13 "Temporary Erosion and Sediment Control".

1.2 DEFINITIONS

- A. Fugitive Dust: Dust particles which are introduced into the air through certain activities such as soil cultivation, off-road vehicles, or any vehicles operating on open fields or dirt roadways.
- B. PM (Particulate Matter): Solid or liquid particles of soot, dust, smoke, fumes, and aerosols.
- C. PM10 (Particulate Matter less than 10 microns): A major air pollutant consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and aerosols. The size of the particles (10 microns or smaller, about 0.0004 inches or less) allows them to easily enter the air sacs in the lungs where they may be deposited, resulting in adverse health effects. PM10 also causes visibility reduction and is a criteria air pollutant.
- D. VOCs (Volatile Organic Compounds): Hydrocarbon compounds that exist in the ambient air. VOCs contribute to the formation of smog and/or may themselves be toxic. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Paint Coating Products: Unless otherwise indicated, provide low-VOC or ultra-low VOC paints that produce no more than 6.66 VOC lbs per 1,000 square feet of architectural coating.

PART 3 - EXECUTION

3.1 TEMPORARY NOISE MITIGATION

- A. General: Contractor shall implement, but not be limited to, the following best management practices for noise mitigation, in accordance with Rule 403.
- B. Construction equipment with a high noise generating potential, including all equipment powered by internal combustion engines, shall be muffled or controlled.
- C. Stationary noise generating equipment, such as compressors, shall be located as far as possible from the site.
- D. Machinery, including motors, shall be turned off when not in use.
- E. Mobile equipment shall not be allowed to run idle near the site.

3.2 TEMPORARY DUST MITIGATION

- A. Water trucks shall be utilized on the site and shall be available to be used throughout the day during site grading and excavation to keep the soil damp enough to prevent PM10 levels raised by activities associated with project construction.
- B. Areas that are to be graded or that are being graded and / or excavated shall be wetted down in the late morning and after work is completed for the day.
- C. Unpaved parking or staging areas, or unpaved road surface shall be watered three times daily or have chemical soil stabilizers applied according to manufacturer's specifications.
- D. Enclose, cover, water twice daily, or apply approved soil binders to exposed piles (i.e., gravel, sand, and dirt) according to manufacturer's specifications.
- E. The construction disturbance area shall be kept as small as possible.
- F. Trucks hauling dirt, sand, soil, or other loose materials shall be covered or have water applied to the exposed surface prior to leaving the site to prevent PM10 from reaching the surrounding areas.
- G. Wheel washers shall be installed where vehicles enter and exit unpaved roads onto paved roads and used to wash off trucks and any equipment leaving the site each trip.
- H. Sweep street adjacent to project site at end of day if visible soil material is carried over to adjacent roads.
- I. Excavating and grading operations shall be suspended when wind speeds exceed 25 miles per hour over a 3-minute period.

3.3 ENFORCEMENT

- A. Process: Failure to maintain mitigation measures will result in issuance of written warning; if situation is not corrected within 8 hours of receipt of warning, Owner will have cause to stop the Work.

1. Failure of Contractor to correct deficiencies will result in corrective action taken by the Owner, and all costs associated therewith will be deducted from the Contract Sum.
- B. The following will be performed by Owner's Representative:
1. Periodic Rounds: A photograph will be taken to document each violation.
 2. A record of all violations will be maintained by the Owner.

END OF SECTION

SECTION 01 58 13

TEMPORARY PROJECT IDENTIFICATION SIGN

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes temporary project identification sign.
- B. Related Requirements:
 - 1. Section 01 50 00 "Temporary Facilities and Controls".

1.2 ACTION SUBMITTALS

- A. Shop Drawings: Show text and graphics layout for signs. Provide message list, typestyles, graphic elements, and layout for sign at a scale of not less than 1 1/2 inches per foot.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Professional sign painter with a minimum of five years experience in the painting of graphics and signs of the type similar to that specified.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.
- B. Lumber and Plywood: Comply with requirements in Division 06 Section "Miscellaneous Carpentry."
 - 1. Sign: 3/4-inch thick, A-B grade EXT - APA plywood sheet.
 - 2. Posts: Pressure treated 4-inch by 4-inch No. 2 yellow pine.
 - 3. Braces: Pressure treated 2-inch by 4-inch No. 2 yellow pine.
- C. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.

2.2 FABRICATION

- A. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.

- B. Engage an experienced sign painter to apply graphics for Project identification signs. Generally the sign shall indicate project name, Owner's name, Contractor's name and Architect's name and logo.
- C. Prepare temporary signs to provide directional information to construction personnel and visitors.
- D. Construct signs of exterior-type high-density concrete form overlay plywood in sizes and thicknesses indicated. Support on posts or framing of preservative-treated wood or steel.
 - 1. Project Identification Sign: 8-feet wide by 4-feet high.
 - 2. Temporary Signs: Size as required to accommodate actual text.
- E. Project Identification Sign Text and Graphics: Include the following:
 - 1. Name of Project.
 - 2. Name of Owner.
 - 3. Name of Contractor.
 - 4. Name of Architect.
- F. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.

PART 3 - EXECUTION

3.1 GENERAL

- A. Project identification sign shall be located as shown on the Drawings or as directed by the Architect.
- B. Contractor may install their own separate job sign with the approval of the Owner and Architect, and in location as directed.

3.2 INSTALLATION

- A. Excavation: In firm, undisturbed or compacted soil, drill or (using a post-hole digger) hand-excavate holes for posts to diameters and spacing required to accommodate signs.
- B. Project identification sign, Contractor's job sign, and Architect's job sign shall each be installed and erected in a substantial manner.
- C. Signs shall be installed with the bottom edge a minimum of 3'-0" above the ground.
- D. Posts shall be set at a minimum of 3'-0" into the ground and each post braced with 2 x 4 lumber braces to resist anticipated wind loads.
- E. Install signposts and sign panels plumb, level, and square and in proper planes with other work.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for products selected under an allowance.
 - 2. Section 01 25 00 "Substitution Procedures" for requests for substitutions after bid /pricing.
 - 3. Section 01 42 00 "References" for applicable industry standards for products specified.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.
- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.3 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 1. Identification of basis-of-design product, fabrication, or installation method to be replaced, including Specification Section number and title, and Drawing numbers and titles.
- B. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
- C. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.
- D. Substitution: Refer to Section 01 25 00 "Substitution Procedures" for definition and limitations on substitutions.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 1. Each Contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.

2. If a dispute arises between Contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.5 COORDINATION

- A. Coordinate affected Work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

- B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

- C. Storage:

1. Provide a secure location and enclosure at Project site, at location approved by Owner for storage of materials and equipment.
2. Store products to allow for inspection and measurement of quantity or counting of units.
3. Store materials in a manner that will not endanger Project structure.
4. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
5. Store cementitious products and materials on elevated platforms.
6. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
7. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
8. Protect stored products from damage and liquids from freezing.
9. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

1.8 PROHIBITION ON INCORPORATION OF HAZARDOUS MATERIALS

- A. Owner is responsible for ascertaining that materials within the existing facility, which will be disturbed as part of the work, are free of asbestos containing materials and for performing surveys and/or providing certifications attesting regarding this.
- B. Architect and its consultants have not knowingly specified for incorporation into the work, materials or products containing hazardous materials or toxic substances (including asbestos).
- C. Contractor (including its subcontractors, sub-subcontractors, and material suppliers/fabricators under its control) is prohibited from incorporating any material or products into the work containing hazardous materials or toxic substances.
- D. As part of completed materials and products list required herein, Contractor shall assemble, for the Owner's records, the Material Safety Data Sheets (MSDS) for all materials and products incorporated into the work. These MSD sheets shall be updated upon final completion of the work to incorporate changes which have occurred during the course of the work due to approved substitution requests and other modifications. Architect will not review, nor approve, the MSD sheets. The Contractor, also as a pre-requisite to achieving final completion, shall provide a certificate to the Owner indicating that no hazardous or toxic materials or products were incorporated into the work.
- E. Architect and its consultants are not responsible for the presence of hazardous materials or toxic substances in or around the work, nor the exposure to persons

who construct or subsequently occupy the work. The Architect will not provide certifications regarding the presence or absence of such materials or substances.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Substitutions may be considered, unless otherwise indicated, when submitted in accordance with provisions of Section 01 25 00.
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Substitutions may be considered, unless otherwise indicated, when submitted in accordance with provisions of Section 01 25 00.
 3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

- 1) Substitutions may be considered, unless otherwise indicated, when submitted in accordance with provisions of Section 01 25 00.
4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
 - 1) Substitutions may be considered, unless otherwise indicated, when submitted in accordance with provisions of Section 01 25 00.
5. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
6. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer.
 - a. Submitted in accordance with provisions of Section 01 25 00.
7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. Substitutions may be considered, unless otherwise indicated, when submitted in accordance with provisions of Section 01 25 00.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

1. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
 2. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.
 3. Full Industry Range: Where Specifications include the phrase "full industry range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from any listed manufacturer's product line that includes both standard and premium items.
 4. "Custom Color as selected by Architect" or "to match color on file in Architect's office", "match Architect's sample" means that the color selected is custom and requires custom formulations and submissions of color to obtain Architect's approval prior to application.
- E. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division 01 for allowances that control product selection and for procedures required for processing such selections.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.
- B. Submitted in accordance with provisions of Section 01 25 00.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 73 00

EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Coordination of Owner-installed products.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for limits on use of Project site.
 - 2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
 - 3. Section "01 73 29 "Cutting and Patching".
 - 4. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 5. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the building.
 - 6. Section 07 84 13 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.2 DEFINITIONS

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

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

- C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- D. Certified Surveys: Submit two copies signed by land surveyor.
- E. Final Property Survey: Submit 2 copies showing the Work performed and record survey data.

1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination of the Site and Records of Existing Construction and Conditions: Examine the site, the records of existing construction, and the conditions under which the Work is to be performed. Notify the Architect immediately if existing conditions discovered will affect the Work as shown on the Contract Documents
- B. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping, underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

- C. Existing Conditions Depicted in the Contract Documents: The Contract Documents are based upon the information furnished to the Architect by the Owner. Such information is available from the Owner. The records are furnished for information only and may not represent all conditions that will be encountered. The records of existing construction represent conditions known to the Owner. Other construction, of which no records are available, may be encountered. Dimensions of existing construction are based on information provided to the Architect by the Owner. The Contractor and each subcontractor shall field verify dimensions of existing conditions.
- D. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- E. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- F. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to

Architect according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.
- B. Precautions Against Movement or Settlement: The Contractor shall take precautions, including bracing, shoring, underpinning, or other retaining structures, to guard against movement or settlement of existing or new construction. Assume

responsibility for the design, safety, and support of such construction, and for movement, settlement, damage, or injury resulting from the construction.

- C. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
 - D. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
 - E. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
 - F. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
 - G. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
 - H. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
 - I. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
 - J. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
 - K. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.
- 3.6 OWNER-INSTALLED PRODUCTS
- A. Site Access: Provide access to Project site for Owner's construction personnel.
 - B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.

2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in 01 74 19 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements for cutting and patching.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.
- C. Cutting and patching is performed for coordination of the Work, to uncover Work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.
- D. Restoring or removing and replacing non-complying work is specified separately from cutting-and-patching but may require cutting-and-patching operations as specified herein.

1.3 SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Coordinate with Owner if Cutting and Patching Plan will be required.
 - 2. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 3. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 4. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 5. Dates: Indicate when cutting and patching will be performed.
 - 6. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

1.4 QUALITY ASSURANCE

- A. Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Owner and Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Temporary Support: Provide temporary support of Work to be cut.
- C. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- E. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate, and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- D. Fire Rated Construction: At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 13 "Penetration Firestopping", to full thickness of the penetrated element.
- E. Roofing: Where penetrations are made through the roof system to accommodate mechanical, electrical, or plumbing systems, or any other reason associated with the Work, repair in accordance with the original manufacturer's requirements. Install curbs, cants, flashing and other roof system components in accordance with Specifications within this Project Manual and recommendations by the manufacturer of the roof system presently in place. Return assembly to weather-tight condition. Also refer to Division 07 section on roof modifications or repairs.
- F. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 02 41 19 "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvement, and for disposition of hazardous waste.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.
- G. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable and reusable material.
- H. Waste Management Plan: A project-related plan for the collection, transportation and disposal of waste generated at the construction site. The purpose of the plan is to ultimately reduce the amount of material becoming landfill.

1.3 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan prior to commencement of the Work.

1.4 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- C. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- D. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Qualification Data: For waste management coordinator and refrigerant recovery technician.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference(s): Discuss waste management plan during preconstruction conference. Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

5. Review waste management requirements for each trade.

1.6 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan in accordance with Owner requirements.
- B. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.
- C. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- D. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work in compliance with Section 02 41 19 "Selective Demolition."
 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

1.7 PROJECT MEETINGS

- A. Waste management plans and implementation shall be discussed at the following meetings:
 1. Pre-demolition meeting.
 2. Pre-construction meeting.
 3. Regular job-site meetings.

4. Subcontractor toolbox meetings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Practice efficient waste management in the use of materials in the course of the Work. Use reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials.

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. If applicable, designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.

5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area on-site designated by Owner.
 5. Protect items from damage during transport and storage.
 - C. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
 - D. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
 - E. Plumbing Fixtures: Separate by type and size.
 - F. Lighting Fixtures: Separate lamps by type and protect from breakage.
 - G. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- 3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL
- A. General:
 1. If applicable, comply with Owner's recycling program.
 2. Recycle as much non-hazardous demolition and construction waste material as possible.
 - a. Recycle paper and beverage containers used by on-site workers.
 - B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner.
 - C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
 - D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Grind asphalt to maximum 1-1/2-inch size.
 1. Crush asphaltic concrete paving and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as general fill.
- B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Pulverize concrete to maximum 1-1/2-inch size.
 2. Crush concrete and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as satisfactory soil for fill or subbase.
- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Pulverize masonry to maximum 1-1/2-inch (38-mm) size.
 - a. Crush masonry and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as general fill.
 - b. Crush masonry and screen to comply with requirements in Section 32 93 00 "Plants" for use as mineral mulch.
 2. Clean and stack undamaged, whole masonry units on wood pallets.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
 1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

- J. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- L. Carpet Tile: Remove debris, trash, and adhesive.
 - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- N. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
 - a. Comply with requirements in Section 32 93 00 "Plants" for use of clean sawdust as organic mulch.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
 - 1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
 - a. Comply with requirements in Section 32 93 00 "Plants" for use of clean ground gypsum board as inorganic soil amendment.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - B. Burning: Do not burn waste materials.
 - C. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.
 - D. Disposal: Remove waste materials from Owner's property and legally dispose of them.
- 3.7 ATTACHMENTS
- A. Form CWM-1: Construction Waste Reduction Progress Report.

END OF SECTION

| FORM CWM-1: CONSTRUCTION WASTE REDUCTION PROGRESS REPORT | | | | | | | | |
|---|------------------|--|----------------------------|-----------------------------|----------------------------|-----------------------------|--|--|
| MATERIAL CATEGORY | GENERATION POINT | TOTAL QUANTITY OF WASTE TONS (TONNES) (A) | QUANTITY OF WASTE SALVAGED | | QUANTITY OF WASTE RECYCLED | | TOTAL QUANTITY OF WASTE RECOVERED TONS (TONNES) (D = B + C) | TOTAL QUANTITY OF WASTE RECOVERED % (D / A x 100) |
| | | | ESTIMATED TONS (TONNES) | ACTUAL TONS (TONNES) (B) | ESTIMATED TONS (TONNES) | ACTUAL TONS (TONNES) (C) | | |
| Packaging: Cardboard | | | | | | | | |
| Packaging: Boxes | | | | | | | | |
| Packaging: Plastic Sheet or Film | | | | | | | | |
| Packaging: Polystyrene | | | | | | | | |
| Packaging: Pallets or Skids | | | | | | | | |
| Packaging: Crates | | | | | | | | |
| Packaging: Paint Cans | | | | | | | | |
| Packaging: Plastic Pails | | | | | | | | |
| Site-Clearing Waste | | | | | | | | |
| Masonry or CMU | | | | | | | | |
| Lumber: Cut-Offs | | | | | | | | |
| Lumber: Warped Pieces | | | | | | | | |
| Plywood or OSB (scraps) | | | | | | | | |
| Wood Forms | | | | | | | | |
| Wood Waste Chutes | | | | | | | | |
| Wood Trim (cut-offs) | | | | | | | | |
| Metals | | | | | | | | |
| Insulation | | | | | | | | |
| Roofing | | | | | | | | |
| Joint Sealant Tubes | | | | | | | | |
| Gypsum Board (scraps) | | | | | | | | |
| Carpet and Pad (scraps) | | | | | | | | |
| Piping | | | | | | | | |
| Electrical Conduit | | | | | | | | |
| Other: | | | | | | | | |

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 01 31 00 "Project Management and Coordination" for Web-based Project Information Management System.
 - 2. Section 01 32 33 "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 3. Section 01 73 00 "Execution" for progress cleaning of Project site.
 - 4. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 5. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 6. Section 01 79 00 "Demonstration and Training" for requirements for instructing Owner's personnel.
 - 7. Divisions 03 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 DEFINITIONS

- A. List of Incomplete Items: Contractor prepared list of items to be completed or corrected, prepared for the Architect's use prior to Owner, Owner's Agent, and Architect's inspection (Design Team Punchlist), to determine if the Work is substantially complete.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at time of request for Substantial Completion Inspection.

- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. "Substantial Completion" is the stage in the progress of Work when Work or designated portion thereof is sufficiently complete in accordance with Contract Documents so Owner can occupy or utilize Work for use which it is intended.
 - 1. Work will not be considered suitable for Substantial Completion review until all systems and equipment are operational; all designated or required governmental inspections and certifications have been made and posted, designated instruction of Owner's personnel in operation of systems and equipment has been completed, operation and maintenance data has been satisfactorily turned over to the Owner, and all finishes are in place. In general, the only remaining Work shall be minor in nature, such that the Owner could occupy project or designated portion thereof on following day, and completion of Work by Contractor would not materially interfere or hamper Owner's normal business operations.
 - 2. Contractor shall certify that all remaining Work will be completed within a reasonable time, agreed upon by Owner, following date of Substantial Completion. Failure of the Contractor to complete the Work within the stipulated time shall automatically re-institute the provisions for liquidated damages due Owner as contained elsewhere in Contract Documents, or as provided by law for such period of time as may be required by Contractor to fully complete Work whether Owner has occupied the Project or not.
- B. Contractor's List of Incomplete Items: Using Web-based Project Information Management Systems, prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- C. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - a. State and County accessibility standards inspection.

- b. Accessibility standard inspection for compliance with ANSI A117.1, Americans with Disabilities Act Accessibility Guidelines (ADAAG) and local requirements if more stringent.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
 5. Submit test/adjust/balance records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- D. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
 6. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs and photographic negatives, damage or settlement surveys, property surveys, and similar final record information.
 7. Advise Owner of changeover in heat and other utilities.
 8. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 10. Complete final cleaning requirements, including touchup painting.

11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- E. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request and the Contractor's list of incomplete items, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 01 29 00 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A or substantially similar form, and forward to Architect at time of request for Substantial Completion inspection. Architect may use same form for Architect's supplemental items to Contractor.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
4. Submit list of incomplete items in the following format:
 - a. PDF electronic file. Architect will return annotated file.

1.9 ACCESSIBILITY STANDARD INSPECTION

- A. Provide inspection at Substantial Completion of facility in accordance with rules and regulations of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) for the purpose of determining compliance with ADAAG. Inspector must be licensed with the state fire marshal to perform the required inspection.
- B. Upon receipt of Inspector's report, immediately make corrections of any reported non-compliant items. Provide documentation to Owner of completed corrective measures.

1.10 OPERATION AND MAINTENANCE MANUALS

- A. Refer to Section 01 78 23.

1.11 PROJECT RECORD DOCUMENTS

- A. Refer to Section 01 78 39.

1.12 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.

- e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- 3.2 REPAIR OF THE WORK
- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
 - B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.2 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.

- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

1.4 COORDINATION

- A. Where operation and maintenance documentation include information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 - 1. List of documents.
 - 2. List of systems.
 - 3. List of equipment.
 - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Construction Manager.
 - 7. Name and contact information for Architect.
 - 8. Name and contact information for Commissioning Authority.
 - 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 - 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.

2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

2.3 EMERGENCY PROCEDURES MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

2.4 OPERATION AND MAINTENANCE MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Digital Data Files.
 - 3. Record Specifications.
 - 4. Record Product Data.
 - 5. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
 - 2. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Initial Submittal:
 - a. Submit PDF electronic files of Contractor's paper-copy set(s) of marked-up record prints.
 - b. Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - 2. Final Submittal:
 - a. Submit PDF electronic files of scanned record prints.
 - b. Print each drawing, whether or not changes and additional information were recorded.
 - 3. Final Submittal:
 - a. Submit record digital data files.
 - b. Plot each drawing file, whether or not changes and additional information were recorded.
- B. Record Model: Comply with Owner's requirements.
- C. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

- D. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- E. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

4. Mark record sets in red. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Architect for resolution.
 4. Architect will furnish Contractor with digital data files of the original Contract Drawings for use in recording information.
 - a. Architect makes no representations as to the accuracy or completeness of Electronic Drawings as they relate to the Contract Drawings.
 - b. Digital Data Software Program: The electronic files will be made available in the digital data software program in which they were produced by the Architect. Contractor is responsible for any necessary conversions to an alternate software program.
 - c. See Section 01 33 00 "Submittal Procedures" for requirements related to use of Architect's digital data files.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 3. Identification: As follows:
 - a. Project name.
 - b. Date.

- c. Designation "PROJECT RECORD DRAWINGS."
- d. Name of Architect.
- e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders and record Drawings where applicable.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.
 - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

- B. Format: Submit miscellaneous record submittals as scanned PDF electronic file(s) of marked-up miscellaneous record submittals.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION

SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration and training video recordings.
 - 3. Descriptions and responsibilities for commissioning demonstration and training requirements.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products.
- B. Attendance Record: For each training module, submit list of participants.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit within seven days of end of each training module.
 - 1. At completion of training, submit complete training manual(s) for Owner's use prepared in same PDF file format required for operation and maintenance manuals specified in Section 01 78 23 "Operation and Maintenance Data."

1.4 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect and Owner.

1.5 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project Record Documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 - 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.

- f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
- 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
 - 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
 - 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
 - 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.
- 1.6 PREPARATION
- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."
 - B. Set up instructional equipment at instruction location.
- 1.7 INSTRUCTION
- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
 - B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Owner will furnish Contractor with names and positions of participants.
 - C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 1. Schedule training with Owner with at least 10 days' advance notice.
 - D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
 - E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
 - F. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.
- 1.8 DEMONSTRATION AND TRAINING VIDEO RECORDINGS
- A. General: Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - B. Digital Video Recordings:
 1. Submit video recording by method acceptable to Owner.
 2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
 3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.

END OF SECTION

SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 01 10 00 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 01 73 00 "Execution" for cutting and patching procedures.
3. Section 01 35 16 "Alteration Project Procedures" for general protection and work procedures for alteration projects.
4. Section 31 10 00 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.

B. Engineering Survey: Submit engineering survey of condition of building.

C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and , for noise control. Indicate proposed locations and construction of barriers.

D. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

E. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Comply with Section 01 32 33 "Photographic Documentation." Submit before Work begins.

F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

G. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 QUALITY ASSURANCE

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

1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove any items deemed necessary.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.10 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.
 - 1. Inventory and record the condition of items to be removed and salvaged.
 - 2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 2. Arrange to shut off utilities with utility companies.
 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."

- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain fire watch during and for at least 1 hour after flame-cutting operations.
 - 6. Maintain adequate ventilation when using cutting torches.
 - 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 10. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section 07 54 23 – TPO Roofing for new roofing requirements.
 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 2. Remove existing roofing system down to substrate.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction. and recycle or dispose of them according to Section 01 74 19 "Construction Waste Management and Disposal."
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Form-facing material for cast-in-place concrete.
2. Form liners.
3. Shoring, bracing, and anchoring.

B. Related Requirements:

1. Division 01 Section "Structural Testing and Special Inspection Services" for field quality control.
2. Division 03 Section "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
3. Division 03 Section "Cast-in-place Concrete" for concrete materials, mixture design, placement procedures, and finishes.

1.3 DEFINITIONS

- A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.
- B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Refer to Division 03 Section "Cast-in-Place Concrete".

1.5 ACTION SUBMITTALS

- A. Product Data: For each of the following:

1. Exposed surface form-facing material.

2. Concealed surface form-facing material.
3. Forms for cylindrical columns.
4. Pan-type forms.
5. Void forms.
6. Form liners.
7. Form ties.
8. Form-release agent.

B. Formwork Shop Drawings: Design and engineering of formwork, shoring and reshoring are the Contractor's responsibility.

1. Indicate:
 - a. Form materials, types, and thicknesses.
 - b. Form tying system and layout.
 - c. Form accessories.
 - d. Form liners.
 - e. Details to be used at sleeves, blockouts, and slab penetrations.
 - f. Type and capacity of shores, supports, and reshores.
 - g. Reshoring procedure.

C. Samples:

1. For Form Liners: 12-inch by 12-inch sample, indicating texture.

1.6 INFORMATIONAL SUBMITTALS

- A. See Division 03 Section "Cast-in-Place Concrete" for MEP sleeve and penetration coordination submittal information.
- B. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5 and Section 7, "Lightweight Concrete."
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Form Liners: Store form liners under cover to protect from sunlight.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.
1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
 2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.

2.2 FORM-FACING MATERIALS

- A. As-Cast Surface Form-Facing Material:
1. Provide continuous, true, and smooth concrete surfaces.
 2. Furnish in largest practicable sizes to minimize number of joints.
 3. Acceptable Materials: As required to comply with Surface Finish designations specified in Division 03 Section "Cast-In-Place Concrete", and as follows:
 - a. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - 1) APA Plyform Class I, B-B or better; mill oiled and edge sealed.
- B. Concealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or another approved material.
1. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces without spiral or vertical seams not exceeding specified formwork surface class.
1. Provide forms with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- E. Form Liners: As indicated.

2.3 RELATED MATERIALS

- A. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
 - 2. Form release agent for form liners shall be acceptable to form liner manufacturer.
- F. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine substrate and conditions under which concrete formwork is to be performed. Have the installer notify the Contractor in writing, with a copy to the Architect, if substrate is unsatisfactory.
 - 2. Do not begin the work until unsatisfactory conditions have been corrected in a manner that is acceptable to installer. Beginning of work indicates acceptance of the substrate as satisfactory by the installer.

3.2 INSTALLATION OF FORMWORK

- A. Comply with ACI 301.

- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Division 03 Section "Cast-In-Place Concrete" for as-cast finishes.
- C. Limit concrete surface irregularities as follows:
 - 1. Surface Finish-1.0: ACI 117 Class D, 1 inch.
 - 2. Surface Finish-2.0: ACI 117 Class B, 1/4 inch.
 - 3. Surface Finish-3.0: ACI 117 Class A, 1/8 inch.
- D. Construct forms tight enough to prevent loss of concrete mortar.
 - 1. Minimize joints.
 - 2. Exposed Concrete: Symmetrically align joints in forms.
- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
 - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
 - 2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 3. Install keyways, reglets, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.
- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
 - 1. Provide and secure units to support screed strips
 - 2. Use strike-off templates or compacting-type screeds.
- H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.
 - 1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
 - 2. Locate temporary openings in forms at inconspicuous locations.
- I. Chamfer exterior corners and edges of permanently exposed concrete.
- J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.
- K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.
 - 1. Determine sizes and locations from trades providing such items.
 - 2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.
- L. Construction Joints:

1. Construct joints true to line with faces perpendicular to surface plane of concrete.
 2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 3. Place joints perpendicular to main reinforcement.
 4. Locate joints for beams, slabs, joists, and girders in the middle third of spans.
 - a. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 6. Space vertical joints in walls as indicated on Drawings.
 - a. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
- M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.
1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
 2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.
- N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.
- ### 3.3 INSTALLATION OF EMBEDDED ITEMS
- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 4. Install dovetail anchor slots in concrete structures, as indicated on Drawings.
 5. Clean embedded items immediately prior to concrete placement.

3.4 REMOVING AND REUSING FORMS

- A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
 - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work.
 - 1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
 - 2. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.
 - 1. Align and secure joints to avoid offsets.
 - 2. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
 - 1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Steel reinforcement bars.
- 2. Welded-wire reinforcement.

B. Related Requirements:

- 1. Division 01 Section "Structural Testing and Special Inspection Services" for field quality control.
- 2. Division 03 Section "Concrete Forming and Accessories" for form-facing materials and form liners.
- 3. Division 03 Section "Cast-In-Place Concrete" for concrete, concrete materials, mixture design, placement procedures and finishes.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Refer to Division 03 Section "Cast-in-Place Concrete".

1.4 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.5 ACTION SUBMITTALS

A. Product Data: For the following:

- 1. Each type of steel reinforcement.
- 2. Bar supports.
- 3. Mechanical splice couplers.

B. Shop Drawings:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
3. For structural thermal break insulated connection system, indicate general configuration, insulation dimensions, tension bars, compression pads, shear bars, and dimensions.

C. Construction Joint Layout: Refer to Division 03 Section "Cast-in-Place Concrete".

1.6 INFORMATIONAL SUBMITTALS

A. See Division 03 Section "Cast-in-Place Concrete" for MEP sleeve and penetration coordination submittal information.

B. Welding certificates.

1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M

C. Material Test Reports: For the following, from a qualified testing agency:

1. Steel Reinforcement:

- a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.

2. Mechanical splice couplers.

D. Field quality-control reports.

E. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5 and Section 7, "Lightweight Concrete".
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

B. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.
 - 1. Store reinforcement to avoid contact with earth.
 - 2. Do not allow epoxy-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, deformed, Grade 60, unless noted otherwise.
- B. Low-Alloy Steel Reinforcing Bars: ASTM A706/A706M, deformed.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

2.2 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Joint Plate Dowels:
 - 1. Material:
 - a. ASTM A36/A36M, saw cut steel plate.
 - b. Pocket former: High density plastic with internal collapsible fins and spacer that hold load plate in correct position and allows for perpendicular and longitudinal movement at joint.
 - 2. Available Products:
 - a. PNA, 1/4" x 4 1/2" x 4 1/2" Diamond Dowel.
 - b. Greenstreak, 1/4" x 4" x 6" Speed Plate Dowel.
 - c. McTech Group, 1/4" x 3 1/2" x 6 1/2" EZdowel.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
 - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

- a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
- D. Mechanical Splice Couplers: ACI 318 Type 1, same material of reinforcing bar being spliced.
 - 1. Available Manufacturers:
 - a. Erico International, Inc.
 - b. Dayton Superior Corp.
 - c. BarSplice Products, Inc.
- E. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.
 - 1. Plain finish for uncoated reinforcing bars.
 - 2. Galvanized finish for galvanized reinforcing bars.
 - 3. ASTM A884/A884M, Class A, Type 1, epoxy coated, with less than 2 percent damaged coating in each 12-inch wire length for epoxy coated reinforcing bars.

2.3 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Do not cut or puncture vapor barrier.
 - 2. Repair damage and reseal vapor barrier before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
 - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
 - 2. Do not tack weld crossing reinforcing bars.

- C. Preserve clearance between single bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater. Bundled bar clearances shall be increased per ACI requirements.
- D. Provide concrete coverage as indicated on Drawings. If not indicated, provide concrete coverage in accordance with ACI 301.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
 - 1. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
 - 2. Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings.
- G. Install welded-wire reinforcement in longest practicable lengths.
 - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
 - a. For reinforcement less than W4.0 or D4.0, continuous support spacing shall not exceed 12 inches.
 - 2. Lap edges and ends of adjoining sheets at least two mesh spacings.
 - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
 - 4. Lace overlaps with wire.
- H. Steel Pan Stairs: Reinforce landings with 4x4-W2.9xW2.9 WWF or #3@12" each way, 1" clear from top of slab. Reinforce treads with 4x4-W2.9xW2.9 WWF or 2#3 long way, 1" clear from top of slab.

3.3 JOINTS

- A. Doweled Joints: Install dowel bars, plate dowels and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel bar length, to prevent concrete bonding to one side of joint.

3.4 INSTALLATION TOLERANCES

- A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

- B. Inspections: See Division 01 Section “Structural Testing and Special Inspection Services”. For each concrete placement, special inspector shall inspect the following for compliance with post-tensioning installation drawings and the Contract Documents:
1. Steel-reinforcement placement.
 2. Steel-reinforcement mechanical splice couplers and mechanical end anchorage.
 3. Steel-reinforcement welding.
 4. Headed bolts and studs.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

- 1. Division 03 Section "Concrete Forming and Accessories" for form-facing materials and form liners.
- 2. Division 03 Section "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
- 3. Division 31 Section "Earth Moving" for drainage fill under slabs-on-ground.
- 4. Division 32 Section "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

- 1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

- a. Contractor's superintendent.
- b. Independent testing agency responsible for concrete design mixtures.
- c. Ready-mix concrete manufacturer.
- d. Concrete Subcontractor.

2. Review the following:
 - a. Design mixtures including porosity inhibiting admixture.
 - b. Special inspection and testing and inspecting agency procedures for field quality control.
 - c. Construction joints, contraction joints, isolation joints, and joint-filler strips.
 - d. Vapor barrier installation.
 - e. Waterstop installation.
 - f. Anchor rod, embedded item and anchorage device installations and tolerances.
 - g. Steel reinforcement installation.
 - h. Cold and hot weather concreting procedures.
 - i. Concrete finishes and finishing.
 - j. Curing procedures.
 - k. Forms and form-removal limitations.
 - l. Shoring and reshoring procedures.
 - m. Methods for achieving specified floor and slab flatness and levelness.
 - n. Floor and slab flatness and levelness measurements.
 - o. Concrete repair procedures.
 - p. Concrete protection.
 - q. Initial curing and field curing of field test cylinders.
 - r. Protection of field cured field test cylinders.

1.5 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Aggregates.
7. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
8. Vapor barriers.
9. Waterstops
10. Curing materials.
 - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
11. Joint fillers.
12. Repair materials.

- B. Design Mixtures: For each concrete mixture, include the following:
1. Mixture identification. For each design mixture, indicate applicable area or project element intended for design mix placement.
 2. Minimum 28-day compressive strength.
 3. Durability exposure class.
 4. Maximum w/cm.
 5. Fresh density and calculated equilibrium unit weight, for lightweight concrete.
 6. Slump limit.
 7. Air content.
 8. Nominal maximum aggregate size.
 9. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
 10. Intended placement method.
 11. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 12. Submit back-up data for mix designs per ACI 301.
- C. Shop Drawings:
1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect.
 2. Indicate location of waterstops.

1.6 INFORMATIONAL SUBMITTALS

- A. MEP Sleeve and Penetrations: A minimum of seven days prior to placement of slab, provide digital AutoCAD files, inclusive of all MEP sleeve and penetrations, showing maximum sleeve size and locations for each level.
- B. Qualification Data: For the following:
1. Installer: Include copies of applicable ACI certificates.
 2. Ready-mixed concrete manufacturer.
- C. Material Certificates: For each of the following, signed by manufacturers:
1. Cementitious materials.
 2. Admixtures.
 3. Curing compounds.
 4. Bonding agents.
 5. Adhesives.
 6. Vapor barriers.
 7. Joint-filler strips.
 8. Repair materials.
- D. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement.
7. Aggregates.
8. Admixtures:
 - a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.

E. Product data and setting plans for nonstructural embedded items.

F. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
2. For sheet vapor barrier/termite barrier, showing compliance with ICC AC380.

G. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5 and Section 7, "Lightweight Concrete" .

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.9 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- ### A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
3. Obtain aggregate from single source.
4. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I, Type II, Type I/II, Type III.
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C595/C595M, Type IL, portland-limestone cement.
5. Silica Fume: ASTM C1240 amorphous silica.

- C. Normal-Weight Aggregates: ASTM C33/C33M, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Alkali-Silica Reaction: Comply with one of the following:
 - a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
 - b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
 - c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.
 - 2. Nominal maximum Coarse-Aggregate Size: 1 inch for foundations and slabs on ground and 3/4 inch for all other applications unless noted otherwise.
 - 3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Lightweight Aggregate: ASTM C330/C330M, 3/4-inch nominal maximum aggregate size.
- E. Air-Entraining Admixture: ASTM C260/C260M.
- F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 - 2. Retarding Admixture: ASTM C494/C494M, Type B.
 - 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 - 4. Water-Reducing and Accelerating Admixture, ASTM C494/C494M, Type E.
 - 5. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 - 6. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 - 7. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
 - 8. Retain "Non-Set-Accelerating Corrosion-Inhibiting Admixture" Subparagraph below if corrosion inhibitors that do not affect concrete setting time are required.
 - 9. Porosity Inhibiting Admixture: ASTM C494/C494M, Type S, Barrier One PIA
- G. Water and Water Used to Make Ice: ASTM C1602/C1602M, potable.

2.3 VAPOR BARRIERS

- A. Sheet Vapor Barrier, Class A: ASTM E1745, Class A, except with maximum water-vapor permeance rating of less than 0.01 and not less than 15 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Fortifiber Building Systems Group; Moistop Ultra 15.
 - b. Raven Industries, Inc; VaporBlock VB15.
 - c. Reef Industries, Inc; Griffolyn 15 Mil.
 - d. Stego Industries, LLC; Stego Wrap Vapor Barrier (15-Mil).
 - e. W.R. Meadows, Inc; Perminator 15 mil.

2.4 WATERSTOPS

- A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.
 1. Available Products:
 - a. Colloid Environmental Technologies Company; Waterstop-RX.
 - b. Concrete Sealants Inc.; Conseal CS-231.
 - c. Sika; Swellstop.
 - d. Henry Company; Hydro-Flex.
 - e. JP Specialities, Inc.; Earthshield Type 20.
 - f. Tremco; Superstop.
 - g. Carlisle Coatings & Waterproofing; Mirastop.

2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation; MasterKure ER 50.
 - b. ChemMasters, Inc.; Spray-Film.
 - c. Dayton Superior Corporation; AquaFilm Concentrate J74.
 - d. Euclid Chemical Company (The); an RPM company; Eucobar.
 - e. Kaufman Products, Inc.; Vapor Aid.
 - f. Lambert Corporation; Lambco Skin.
 - g. Metalcrete Industries; Waterhold.
 - h. Nox-Crete Products Group; Monofilm.
 - i. Sika Corporation; SikaFilm.
 - j. SINAK Corporation.; Anti Vap.
 - k. SpecChem, LLC.; Spec Film.
 - l. Vexcon Chemicals Inc.; Certi-Vex EnvioAssist.
 - m. W.R. Meadows, Inc.; Sealtight Evapre.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

- D. Water: Potable or complying with ASTM C1602/C1602M.
- E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
 - b. ChemMasters, Inc.; Safe-Cure Clear.
 - c. Dayton Superior Corporation; Clear Resin Cure J11W.
 - d. Euclid Chemical Company (The); an RPM company; Kurez DR VOX.
 - e. Kaufman Products, Inc.; Thinfilm 420.
 - f. Lambert Corporation; Aqua Kure-Clear.
 - g. Nox-Crete Products Group; Res-Cure DH 100.
 - h. Vexcon Chemicals Inc.; Certi-Vex Envio Cure 100.
 - i. W.R. Meadows, Inc.; 1150 Clear.
- F. Clear, Waterborne, Membrane-Forming, Nondissipating Curing Compound: ASTM C309, Type 1, Class B, certified by curing compound manufacturer to not interfere with bonding of floor covering.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Anti-Hydro International, Inc; AH Clear Cure WB.
 - b. BASF Corporation; MasterKure CC 1315WB.
 - c. ChemMasters, Inc; Safe-Cure & Seal 309.
 - d. Dayton Superior; Safe Cure and Seal J-18.
 - e. Euclid Chemical Company (The); an RPM company; Aqua Cure VOX.
 - f. Kaufman Products, Inc; Krystal 15 Emulsion.
 - g. Lambert Corporation; Crystal Clear Seal WB.
 - h. Laticrete International, Inc.; Dress & Seal WB.
 - i. Metalcrete Industries; Metcure.
 - j. Nox-Crete Products Group; Cure & Seal 150 E.
 - k. SpecChem, LLC; Cure & Seal WB.
 - l. TK Products; TK-Kure & Seal WB.
 - m. Vexcon Chemicals Inc.; StarSeal 309.
 - n. W.R. Meadows, Inc; Vocomp-20.
- G. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. ChemMasters, Inc; Polyseal WB.
 - b. Dayton Superior; Cure & Seal 1315 EF.
 - c. Euclid Chemical Company (The); an RPM company; Super Diamond Clear VOX.
 - d. Kaufman Products, Inc; Krystal 25 Emulsion.
 - e. Lambert Corporation; Crystal Clear Seal 1315 WB.
 - f. Laticrete International, Inc.; L&M Dress & Seal WB 25.

- g. Metalcrete Industries; Metcure 30.
- h. Nox-Crete Products Group; Cure & Seal 250E.
- i. Right Pointe; Right Sheen WB30.
- j. SpecChem, LLC; Cure & Seal WB 25.
- k. TK Products; TK-Bright Kure & Seal 1315 VOC.
- l. Vexcon Chemicals Inc.; StarSeal 1315.
- m. W.R. Meadows, Inc; Vocomp-30.

2.6 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.
- B. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- D. Polystyrene fill for overbuild slabs: ASTM C578, cellular polystyrene boards, 40 psi compressive resistance (minimum).
 - 1. Type VI extruded expanded polystyrene (XPS).
 - 2. Type XIV molded expanded polystyrene (EPS).

2.7 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand, as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C109/C109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.

2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
 4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.
- C. Structural Repair Mortar: Polymer-Modified, Cementitious Patching Mortar. Packages, dry mix complying with ASTM C928/C928M, that contains a non-redispersible latex additive as either a dry powder or a separate liquid that is added during mixing.
1. Available Products:
 - a. Euclid Chemical Company (The); DuralTop Gel.
 - b. MBT Protection and Repair, Div. of BASF; Emaco N350 CI.
 - c. Sika Corporation; SikaTop-123 Plus.
 - d. Sto Corp., Concrete Restoration Division; Sto Overhead Mortar with CI.

2.8 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Slump Limit: 4 inches plus or minus 1 inch for concrete containing a Type A water reducing admixture; 9 inches for concrete with a verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
- C. Air Content: Add air-entraining in all concrete exposed to weather at manufacturer's prescribed rate to result in concrete at point of placement having an air content in accordance with ACI 301 Table 4.2.2.7(b)1 for Exposure Class F1, unless otherwise indicated.
 1. Do not air-entrain or allow entrapped air to exceed 3 percent for normal-weight concrete interior slabs to receive a troweled finish.
 2. Contractor shall provide air content that complies with floor system fire rating requirements.
- D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent and 0.06 percent by weight of cement in reinforced and prestressed concrete, respectively.
- E. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, concrete for parking structure slabs, and concrete with a w/cm below 0.50.
4. Use porosity inhibiting admixture in slabs-on-ground and elevated slabs which receive floor coverings.

2.9 CONCRETE MIXTURES

- A. Refer to General Notes of Contract Drawings for specific concrete mix requirements.

2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and ASTM C1116/C1116M, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
 2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
 1. Daily access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
 4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
4. Install dovetail anchor slots in concrete structures as indicated on the Drawings.

3.4 INSTALLATION OF VAPOR BARRIER

- A. Sheet Vapor Barriers: Place, protect, and repair sheet vapor barrier in accordance with ASTM E1643 and manufacturer's written instructions.
1. Install vapor barrier with longest dimension parallel with direction of concrete pour.
 2. Face laps away from exposed direction of concrete pour.
 3. Lap vapor barrier over footings and grade beams not less than 6 inches, sealing vapor barrier to concrete.
 4. Lap joints 6 inches and seal with manufacturer's recommended tape.
 5. Terminate vapor barrier at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
 6. Seal penetrations in accordance with vapor barrier manufacturer's instructions.
 7. Protect vapor barrier during placement of reinforcement and concrete.
 - a. Repair damaged areas by patching with vapor barrier material, overlapping damages area by 6 inches on all sides, and sealing to vapor barrier.

3.5 INSTALLATION OF WATERSTOPS

- A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated on Drawings, according to manufacturer's written instructions, by adhesive bonding, mechanically fastening, and firmly pressing into place.
1. Install in longest lengths practicable.
 2. Locate waterstops in center of joint unless otherwise indicated on Drawings.
 3. Protect exposed waterstops during progress of the Work.

3.6 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
 2. Place joints perpendicular to main reinforcement.

- a. Continue reinforcement across construction joints unless otherwise indicated.
 - b. Do not continue reinforcement through sides of strip placements of floors and slabs.
3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
 7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Ground: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Bar Joints:
1. Install dowel bars and support assemblies at joints where indicated on Drawings.
 2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.
- F. Dowel Plate Joints: Install dowel plates at joints where indicated on Drawings.

3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor barrier is complete and that required inspections are completed.
 - 1. Immediately prior to concrete placement, inspect vapor barrier for damage and deficient installation, and repair defective areas.
 - 2. Provide continuous inspection of vapor barrier during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
 - 1. If a section cannot be placed continuously, provide construction joints as indicated.
 - 2. Deposit concrete to avoid segregation.
 - 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Do not place concrete floors and slabs in a checkerboard sequence.

2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.8 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
 - a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
 - b. Remove projections larger than 1 inch.
 - c. Tie holes do not require patching.
 - d. Surface Tolerance: ACI 117 Class D.
 - e. Apply to concrete surfaces not exposed to public view.
 - f. Mockup not required.
2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/4 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class B.
 - e. Locations: Apply to concrete surfaces exposed to public view and not to receive a rubbed finish or to be covered with a coating or covering material applied directly to concrete, or as indicated by the Architect.
 - f. Unless otherwise specified, provide mockup of concrete surface appearance and texture.
3. ACI 301 Surface Finish SF-3.0:
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/8 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class A.
 - e. Locations: Apply to concrete surfaces exposed to public view and to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete, or as indicated by the Architect.
 - f. Provide mockup of concrete surface appearance and texture.

B. Rubbed Finish: Apply the following to as cast surface finishes where indicated on Drawings:

1. Smooth-Rubbed Finish:
 - a. Perform no later than one day after form removal.
 - b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
 - c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.

C. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.
3. Apply scratch finish to surfaces to receive concrete floor toppings or mortar setting beds for bonded cementitious floor finishes.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.

3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 4. Do not add water to concrete surface.
 5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
 6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface exceeding 360 square feet and 8 feet in width:
 - a. Unless noted otherwise, specified overall values of flatness, F_F 25; and of levelness, F_L 20; with minimum local values of flatness, F_F 17; and of levelness, F_L 15.
 - b. At floors to be covered with resilient flooring, thin-set tile, epoxy terrazzo or other thin-film finishing coating systems, specified overall values of flatness, F_F 35; and of levelness, F_L 25; with minimum local values of flatness, F_F 23; and of levelness, F_L 17.
 - c. At gymnasium floors, specified overall values of flatness, F_F 45; and of levelness, F_L 35; with minimum local values of flatness, F_F 30; and of levelness, F_L 23. Provide entire top of slabs, before removal of shoring, within $\pm 1/2"$ of the top of slab elevation shown on the Drawings.
 - d. At polished floors, specified overall values of flatness, F_F 50 and of levelness, F_L 30 with minimum local values of flatness, F_F 35 and of levelness, F_L 20.
 - e. F_L levelness shall not apply to slabs placed on unshored formed surfaces.
 - f. Concrete slabs on steel deck shall be placed at a constant thickness, with a thickness tolerance of $+1/2"$, $-1/4"$.
 - g. Provide entire top of formed slabs, before removal of shoring, within $\pm 3/4"$ of the top of slab elevation shown on Drawings.
 8. Finish sloped surfaces and surfaces less than or equal to 360 square feet or 8 feet in width within $\pm 1/4"$ in 10 feet (as measured by placing a freestanding (unleveled) 10 ft. straightedge anywhere on the slab and allowing it to rest upon two high spots with a maximum gap of $1/2"$ within 72 hr after slab concrete placement).
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated on Drawings or where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
1. Coordinate required final finish with Architect before application.
 2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
 2. Coordinate required final finish with Architect before application.

3.10 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete base heights as indicated on Drawings and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Install #4 dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, cast dowel rods on 18-inch centers around the full perimeter of concrete base.
4. Prior to pouring concrete, place and secure anchorage devices.
 - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Cast anchor-bolt insert into bases.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items.

1. Cast-in inserts and accessories, as shown on Drawings.
2. Screed, tamp, and trowel finish concrete surfaces.

3.11 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
 2. If forms remain during curing period, moist cure after loosening forms.
 3. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
 - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
 - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
 - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
 - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
 - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
 - 2) Maintain continuity of coating and repair damage during curing period.
- C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
1. Begin curing immediately after finishing concrete.
 2. Curing Methods:
 - a. Concrete surfaces to receive floor coverings: Cure with either moisture curing, moisture-retaining-cover curing, a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on the Project, or a dissipating curing compound.
 - b. Concrete surfaces to be polished, or to receive penetrating liquid floor treatments or toppings: cure with either moisture curing, or moisture-retaining-cover curing.
 - c. Concrete surfaces not designated to receive floor coverings, penetrating liquid floor treatments or toppings: cure with curing and sealing compound.
- D. Cure concrete according to ACI 308.1, by one or a combination of the following methods, as designated above:
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with

sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.12 TOLERANCES

- A. Conform to ACI 117.

3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
 1. Repair and patch defective areas when approved by Architect.
 2. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
 - a. Limit cut depth to 3/4 inch.
 - b. Make edges of cuts perpendicular to concrete surface.
 - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
 - d. Fill and compact with patching mortar before bonding agent has dried.
 - e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
 - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces:
1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
 - a. Correct low and high areas.
 - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 3. After concrete has cured at least 14 days, correct high areas by grinding.
 4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
 - a. Finish repaired areas to blend into adjacent concrete.
 5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
 - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - b. Feather edges to match adjacent floor elevations.
 6. Correct other low areas scheduled to remain exposed with repair topping.
 - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
 - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.

- b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
 - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
 - d. Place, compact, and finish to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
- a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
 - b. Dampen cleaned concrete surfaces and apply bonding agent.
 - c. Place patching mortar before bonding agent has dried.
 - d. Compact patching mortar and finish to match adjacent concrete.
 - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

- A. Testing and Special Inspections: Owner will engage a qualified Testing/Inspection Agency and a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency:
1. Testing agency shall be responsible for verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
 2. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
 3. Testing agency shall report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports shall include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
 - 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.

- 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.
 - 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results.
 - 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
 - 14) Type of fracture and compressive break strengths at seven days and 28 days.
- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.
- D. Inspections:
1. Headed bolts and studs.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:
1. Contractor shall provide and maintain concrete cylinder initial curing storage for use of the Testing Agency which provides an environment with a temperature range between 60 and 80 degrees F (68 and 78 degrees F for concrete strength specified to be 6000 psi or greater), shielded from direct sunlight, prevents the loss of moisture, and is in accordance with ASTM C31/C31M. This storage must not be disturbed by construction activity or personnel.
 2. Testing Frequency: Obtain one composite sample of each concrete mixture placed each day not less than once a day, nor less than once for each 100 cubic yard or fraction thereof nor less than once for each 5000 square feet of surface area for slabs and walls.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 3. Slump: ASTM C143/C143M:
 - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests when concrete consistency appears to change.
 4. Slump Flow: ASTM C1611/C1611M:

- a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests when concrete consistency appears to change.
5. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; ASTM C173/C173M volumetric method, for structural lightweight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 6. Concrete Temperature: ASTM C1064/C1064M:
 - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 7. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 8. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and laboratory cure one set of four 6-inch by 12-inch or five 4-inch by 8-inch cylinder specimens for each composite sample.
 - b. Cast, initial cure, and field cure standard cylinder specimens for each composite sample as required for construction activities including but not limited to formwork stripping and post-tension stressing.
 9. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one laboratory specimen at seven days for information, one set of two 6-inch by 12-inch or three 4-inch by 8-inch specimens at 28 days and hold one cylinder in reserve.
 - b. A compressive-strength test shall be the average compressive strength from the set of specimens obtained from same composite sample and tested at 28 days.
 10. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 11. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
 12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 13. Additional Tests:

- a. Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
 - 1) Acceptance criteria for concrete strength shall be in accordance with ACI 301, section 1.6.6.3.
 - c. Porosity inhibiting admixture cylinders:
 - 1) Collect one additional cylinder for testing by Barrier One each day that concrete slabs with porosity inhibiting admixture is placed, or as otherwise requested by Barrier One.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

END OF SECTION

SECTION 03 51 13

CEMENTITIOUS WOOD FIBER DECKING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cementitious wood fiber plank roof deck and form system

B. Related Sections:

1. Division 5 Sections: Steel Framing.
2. Division 7 Sections: Roofing.

1.2 REFERENCES

A. ASTM International:

1. ASTM C177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
2. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
3. ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
4. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
5. ASTM D2842 Standard Test Method for Water Absorption of Rigid Cellular Plastics.
6. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.

B. Underwriters Laboratories, Inc. (UL):

1. UL 580 Standard for Safety for Tests for Uplift Resistance of Roof Assemblies.

1.3 SYSTEM DESCRIPTION

A. Design Requirements: Provide roof deck assembly designed and tested according to the following:

1. Underwriters Laboratories UL 580 (UL Class 90 Design): Design No. NM504.

B. Performance Requirements:

1. Provide a roof deck system that has been manufactured, fabricated and installed to provide deflection of less than L/240 at design load.
2. Noise Reduction Coefficient (NRC): NRC 0.80; ASTM C423.
3. Light Reflectance: 60 percent; ASTM E1349.

1.4 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

- ###### B. Product Data: Submit manufacturer's product data and installation instructions.

- C. Shop Drawings: Provide drawings indicating locations and spacing of planks.
 - D. Samples: Submit selection and verification samples as follows:
 - 1. Set of 6-inch square samples for each wood fiber deck unit required, showing full range of exposed texture to be expected in completed work.
 - 2. Labeled set of all accessories required for a complete installation.
 - E. Quality Assurance/Control Submittals: Submit the following:
 - 1. Test Reports: Upon request, submit certified test reports from recognized test laboratories.
 - 2. Certificates: Submit manufacturer’s certificate that products meet or exceed specified requirements.
 - F. Closeout Submittals: Submit the following:
 - 1. Warranty documents specified herein.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.
 - B. Regulatory Requirements and Approvals: [Comply with requirements below.] [Specify applicable requirements of regulatory agencies].
 - 1. International Code Council (ICC):
 - a. ICC-ES Evaluation Report ESR-1112.
 - C. Certifications: [Specify requirement for certifications].
 - D. Preinstallation Meetings
- 1.6 DELIVERY, STORAGE & HANDLING
- A. General: Comply with Division 1 Product Requirement Section.
 - B. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.
 - 1. Provide labels indicating brand name, deck style, plank size and plank thickness.
 - C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
 - 1. Prevent soiling, physical damage or wetting.
 - 2. Store cartons open at each end to stabilize moisture content and temperature.
- 1.7 WARRANTY
- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
 - B. Manufacturer’s Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty document executed by authorized company official. Manufacturer’s warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.
 - 1. Warranty Period: 15 years beginning with date of substantial completion.

PART 2 - PRODUCTS

2.1 ROOF DECK AND FORM SYSTEMS

- A. Manufacturer: Tectum Inc.
 - 1. Armstrong World Industries
- B. Proprietary Systems. Cementitious deck form board systems, including the following configurations:
 - 1. Tectum Roof Deck Plank.

2.2 ROOF DECK PANEL COMPONENTS

- A. Proprietary Products. Cementitious deck form board products, including the following:
 - 1. Tectum I Roof Deck Panels:
 - a. Material: Aspen wood fibers bonded with inorganic hydraulic cement.
 - b. Nominal Panel Thickness: [1½ inches (38 mm)] [2 inches (51 mm)] [2½ inches (64 mm)] [3 inches (76 mm)].

2.3 ACCESSORIES – Tectum Roof Deck System(s) I

- A. Provide accessories as follows:
 - 1. Tectum Screws:
 - a. Material: Steel.
 - b. Type: 14 gauge Dekfast screw with 2 inch (51 mm) diameter washer
 - 2. Low VOC Adhesive:
 - a. Manufacturer: BASF
 - b. Type: BASF MasterWeld 948

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the instructions and recommendations of the roof deck panel manufacturer.

3.2 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Verify that site conditions are acceptable for installation of roof deck panel system.
 - 2. Do not proceed with installation of roof deck panel system until unacceptable conditions are corrected.

3.3 INSTALLATION

- A. Roof Deck Plank Installation:
 - 1. Place planks on joists with square cut ends butted tightly together.
 - a. Stagger end joints.
 - b. Tectum panels must be supported by bent plates (steel or other support) at all transitions of the roof. This includes but is not limited to the ridge, valleys, perimeter and panel direction change. Panels must have a minimum of 1 inch bearing and should be glued and screwed at these transitions.
 - c. Panel ends must fall over structural supports and have a minimum of 1

inch bearing.

2. Secure planks to joists with screws and spacing recommended by plank manufacturer.
 3. Do not allow foot traffic on planks until after screws are installed.
 4. Apply adhesive recommended by manufacturer to ensure diaphragm performance as designed.
- B. Roof Deck Long Span Plank Installation:
1. Cut plank neatly to abut parapets, around openings and penetrations.
 2. Apply adhesive recommended by manufacturer to ensure diaphragm performance as designed.

3.4 CLEANING

- A. Clean exposed surfaces of all deck surfaces.
- B. Remove and replace work that cannot be successfully repaired to eliminate evidence of structural damage.

3.5 PROTECTION

- A. Protect installed work from damage due to weather related moisture.
- B. Protect installed work from damage due to subsequent construction activity on the site so that the work will be without damage and deterioration at the time of acceptance by the Owner.
- C. Clean exposed bottom surfaces of completed deck and touch up minor damage to surfaces as approved by Architect.
- D. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensures that cementitious wood-fiber deck is without damage or deterioration at time of Substantial Completion.
- E. Remove and replace deteriorated and damaged deck units.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Lintels.
3. Brick.
4. Mortar and grout materials.
5. Reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Accessories.
9. Mortar and grout mixes.

B. Products Installed but not Furnished under This Section:

1. Cast-stone trim in unit masonry.
2. Steel lintels in unit masonry.
3. Steel shelf angles for supporting unit masonry.
4. Cavity wall insulation adhered to masonry backup.

C. Related Requirements:

1. Section 01 43 39 "Mockups" for integrated exterior mockup requirements.
2. Section 03 10 00 "Concrete Forms and Accessories" for installing dovetail or channel slots for masonry-veneer anchors.
3. Section 05 12 00 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
4. Section 07 21 00 "Thermal Insulation" for cavity wall insulation.
5. Section 07 62 00 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.2 DEFINITIONS

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

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
 - 1. Masonry Units: Indicate sizes, profiles, coursing, and locations of special shapes.
 - 2. Reinforcing Steel: Indicate bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315R. Indicate elevations of reinforced walls.
 - 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Initial Selection:
 - 1. Clay face brick, in the form of straps of five or more bricks.
 - 2. Colored mortar.

1.4 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
 - 1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Material Certificates: For each type of the following:
 - 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For exposed brick, include test report for efflorescence in accordance with ASTM C67/C67M.
 - d. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 - 2. Cementitious materials. Include name of manufacturer, brand name, and type.
 - 3. Mortar admixtures.
 - 4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 - 5. Grout mixes. Include description of type and proportions of ingredients.
 - 6. Reinforcing bars.
 - 7. Joint reinforcement.

8. Anchors, ties, and metal accessories.
 - C. Qualification Statements: For testing agency.
 - D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 1. Include test reports for mortar mixes required to comply with property specification. Test in accordance with ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
 2. Include test reports, in accordance with ASTM C1019, for grout mixes required to comply with compressive strength requirement.
 - E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined in accordance with TMS 602.
 - F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.
- 1.5 QUALITY ASSURANCE
- A. Qualifications:
 1. Installers: All masonry flashing installers must complete the International Masonry Institute Flashing Upgrade training course.
- 1.6 MOCKUPS
- A. Wall Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, to set quality standards for materials and execution, and, to set quality standards for installation. See Section 01 43 39 "Mockups" for additional construction requirements for integrated exterior mockups.
 1. Build mockup as indicated on Drawings.
 2. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
 3. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
 4. Protect accepted mockups from the elements with weather-resistant membrane.
 5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations by Change Order.
 6. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. 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.
- 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. Store preblended, dry mortar mix in delivery containers on elevated platforms 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.

1.8 FIELD 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.
 - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. 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.
- D. 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 602.
 - 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 seven days after completing cleaning.

- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain exposed masonry units, cementitious mortar components, and mortar aggregate from single source, producer, or manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
 - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) in accordance with TMS 602.

2.3 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 ft. vertically and horizontally of a walking surface.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
 - 1. Where fire-resistance-rated construction is indicated, use the equivalent thickness method for masonry units in accordance with ACI 216.1.

2.4 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 bullnose units for outside corners unless otherwise indicated.
- B. Integral Water Repellent: Provide units made with integral water repellent for exposed units.
 - 1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested in accordance with ASTM E514/E514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, will show no visible water or leaks on the back of test specimen.

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) ACM Chemistries.
 - 2) Euclid Chemical Company (The); an RPM company.
 - 3) GCP Applied Technologies Inc.
 - 4) Master Builders Solutions.
 - 5) Moxie International.
- C. CMUs: ASTM C90, light weight unless otherwise indicated.
 1. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
 2. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

2.5 LINTELS

- A. Solid Concrete Masonry Lintels: ASTM C1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength of not less than that of CMUs.
- B. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 03 20 00 "Concrete Reinforcing," and with reinforcing bars indicated.
- C. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.
- D. Offset Angle Supports: Steel plate brackets anchored to structure, allowing continuous insulation behind shelf angle supporting veneer. Component and anchor size and spacing engineered by manufacturer.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. FERRO Corporation.
 - b. Halfen USA, Inc.
 - c. Hohmann & Barnard, Inc.
 2. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304.

2.6 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.

2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
- B. Clay Face Brick: Facing brick complying with ASTM C216, Grade MW or Grade SW, Type FBS.
1. Type "A" Brick - Basis-of-Design Product: Provide Interstate Brick; Smokey Mountain or comparable product acceptable to the Architect which meets the design criteria and color indicated.
 - a. Acme Brick Company.
 - b. Boral Bricks, Inc; Boral Limited.
 - c. Endicott Clay Products Co.
 - d. General Shale Brick.
 - e. Belden Brick Company (The).
 2. Type "B" Brick - Basis-of-Design Product: Provide Interstate Brick; Almond or comparable product acceptable to the Architect which meets the design criteria and color indicated.
 - a. Acme Brick Company.
 - b. Boral Bricks, Inc; Boral Limited.
 - c. Endicott Clay Products Co.
 - d. General Shale Brick.
 - e. Belden Brick Company (The).
 3. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested in accordance with ASTM C67/C67M.
 4. Efflorescence: Provide brick that has been tested in accordance with ASTM C67/C67M and is rated "not effloresced."
 5. Surface Coating: Brick with colors or textures produced by application of coatings withstand 50 cycles of freezing and thawing in accordance with ASTM C67/C67M with no observable difference in the applied finish when viewed from 10 ft..
 6. Size (Actual Dimensions): Utility: 3-5/8 inches wide by 3-5/8 inches high by 11-5/8 inches long.
 7. Application: Use where brick is exposed unless otherwise indicated.
 8. Where shown to "match existing," provide face brick matching color range, texture, and size of existing adjacent brickwork.

2.7 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, 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.

1. Alkali content will not be more than 0.1 percent when tested in accordance with ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Davis Colors.
 - b. Euclid Chemical Company (The); an RPM company.
 - c. Lanxess Corporation.
 - d. Solomon Colors Inc.
- E. Colored Cement Products: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 1. Colored Portland Cement-Lime Mix:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Argos USA LLC.
 - 2) Holcim (US) Inc.
 - 3) Lehigh Hanson; HeidelbergCement Group.
 2. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
 3. Pigments do not exceed 10 percent of portland cement by weight.
- F. Preblended Dry Mortar Mix: Packaged blend made from portland cement and hydrated lime, sand, mortar pigments, water repellents, and admixtures and complying with ASTM C1714/C1714M.
 1. Preblended Dry Portland Cement Mortar Mix:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Amerimix.
 - 2) QUIKRETE.
 - 3) SAKRETE of North America LLC.
 - 4) SPEC MIX, LLC.
- G. Aggregate for Mortar: ASTM C144.
 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- H. Aggregate for Grout: ASTM C404.
- I. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Euclid Chemical Company (The); an RPM company.
 - b. GCP Applied Technologies Inc.
- J. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACM Chemistries.
 - b. Euclid Chemical Company (The); an RPM company.
 - c. GCP Applied Technologies Inc.
 - d. Master Builders Solutions.
- K. Water: Potable.
- 2.8 REINFORCEMENT
- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Heckmann Building Products, Inc.
 - b. Hohmann & Barnard, Inc.
 - c. Wire-Bond.
- C. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
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: 0.187-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 ft., with prefabricated corner and tee units.
- D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hohmann & Barnard, Inc.
 - b. Wire-Bond.
- E. Masonry-Joint Reinforcement for Multiwythe Masonry:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Heckmann Building Products, Inc.
 - b. Hohmann & Barnard, Inc.
 - c. Wire-Bond.
 2. Ladder type with one side rod at each face shell of hollow masonry units more than 4 inches wide, plus one side rod at each wythe of masonry 4 inches wide or less.
 3. Tab type, either ladder or truss design, with one side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe, but with at least 5/8-inch cover on outside face.
 4. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of 1/16 inch and maximum vertical adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face. Ties have hooks or clips to engage a continuous horizontal wire in the facing wythe.

2.9 TIES AND ANCHORS

- A. General: Ties and anchors extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A1064/A1064M, with ASTM A153/A153M, Class B-2 coating.
 2. Stainless Steel Wire: ASTM A580/A580M, Type 304.
 3. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
 4. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.

5. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
 6. Stainless Steel Bars: ASTM A276 or ASTM A666, Type 304.
- C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.
1. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long for masonry constructed from solid units.
 2. Where wythes do not align or are of different materials, use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches.
 3. Wire: Fabricate from 1/4-inch- diameter, hot-dip galvanized steel wire. Mill-galvanized wire ties may be used in interior walls unless otherwise indicated.
- D. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch-diameter, hot-dip galvanized steel wire.
 2. Tie Section: Triangular-shaped wire tie made from .25-inch- diameter, hot-dip galvanized steel wire.
- E. Partition Top Anchors: 0.105-inch-thick metal plate with a 3/8-inch-diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.
- F. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated.
1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A153/A153M.
- G. Adjustable Masonry-Veneer Anchors:
1. General: Provide anchors that allow vertical adjustment but resist a 100 lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
 2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.1084-inch-thick steel sheet, galvanized after fabrication.
 3. Fabricate wire ties from 0.25-inch- diameter, hot-dip galvanized-steel wire unless otherwise indicated.
 4. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.
 5. Masonry-Veneer Anchors; Vertical Slotted L-Plate: Rib-stiffened, sheet metal anchor section with screw holes at top and bottom, projecting vertical leg with slotted hole for wire tie and washer at face of insulation.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) FERO Corporation.
 - 2) Hohmann & Barnard, Inc.

- 3) PROSOCO, Inc.
 - 4) Wire-Bond.
6. Masonry-Veneer Anchors; Double-Pintle Plate: Rib-stiffened, sheet metal anchor section with screw holes at top and bottom, projecting horizontal leg with slots for vertical legs of double pintle wire tie.
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Heckmann Building Products, Inc.
 - 2) Hohmann & Barnard, Inc.
 - 3) Quality Steel and Wire LLC.
 - 4) Wire-Bond.
7. Masonry-Veneer Anchors; Slotted Plate: Sheet metal anchor section, with screw holes at top and bottom; and raised rib-stiffened strap, stamped into center to provide a slot between strap and base for wire tie. Use self-adhering tape to seal penetration behind anchor plate.
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Heckmann Building Products, Inc.
 - 2) Hohmann & Barnard, Inc.
 - 3) Quality Steel and Wire LLC.
 - 4) Wire-Bond.
8. Masonry-Veneer Anchors; Slotted Plate with Prongs: Sheet metal anchor section, with screw holes at top and bottom; top and bottom ends bent to form pronged legs of length to match thickness of insulation; and raised rib-stiffened strap, stamped into center to provide a slot between strap and base for wire tie. Use self-adhering tape to seal penetration behind anchor plate.
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hohmann & Barnard, Inc.
 - 2) Wire-Bond.

2.10 EMBEDDED FLASHING

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 316, 0.016 inch thick.
 2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 ft.. Provide splice plates at joints of formed, smooth metal flashing.
 3. Fabricate through-wall metal flashing embedded in masonry from stainless steel, with sawtooth ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Cheney Flashing Company.
 - 2) Hohmann & Barnard, Inc.

- 3) Keystone Flashing Company, Inc.
 4. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
 5. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
 6. Fabricate through-wall flashing with sealant stop where indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
 7. Fabricate metal drip edges for sawtooth metal flashing from plain metal flashing of same metal as sawtooth flashing and extending at least 3 inches into wall with hemmed inner edge to receive sawtooth flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam sheds water.
 8. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
 9. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
 10. Fabricate metal expansion-joint strips from stainless steel to shapes indicated.
 11. Solder metal items at corners.
- B. Flexible Flashing: Use the following unless otherwise indicated:
1. Stainless Steel Fabric Flashing: Composite, flashing product consisting of 2-mil of Type 304 stainless steel sheet, bonded to a layer of polymeric fabric, to produce an overall thickness of 40-mil.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Fiberweb, Clark Hammerbeam Corp.
 - 2) Hohmann & Barnard, Inc.
 - 3) STS Coatings, Inc.
 - 4) Wire-Bond.
 - 5) York Manufacturing, Inc.
 2. Self-Adhering, Stainless Steel Fabric Flashing: Composite, flashing product consisting of 2 mil of Type 304 stainless steel sheet, bonded to a layer of polymeric fabric with a permanent, clear adhesive, to produce an overall thickness of 10 mil.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hohmann & Barnard, Inc.
 - 2) STS Coatings, Inc.
 - 3) VaproShield LLC.
 - 4) Wire-Bond.
 - 5) York Manufacturing, Inc.

- b. Applications: Use 10-mil-thick flashing at windows, doors, and small wall penetrations; not at base of walls. Use 40-mil-thick flashing at base of walls.
- C. Drainage Plane Flashing: Fabricate from stainless steel and drainage membrane to shapes indicated, including weep tabs, termination bar, and drip edge. Provide flashing materials as follows:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Mortar Net Solutions.
 - b. STS Coatings, Inc.
 - c. York Manufacturing, Inc.
 - 2. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.016 inch thick.
 - 3. Fabricate continuous flashings in sections 60 inches long, minimum.
 - 4. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
- D. Solder and Sealants for Sheet Metal Flashings: As specified in Section 07 62 00 "Sheet Metal Flashing and Trim."
- E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
- F. Termination Bars for Flexible Flashing: Stainless steel bars 1/8 inch by 1-1/8 inch.
- G. Termination Bars for Flexible Flashing, Flanged: Stainless steel sheet 0.019 inch by 1-1/2 inches with a 3/8-inch flange at top and bottom.

2.11 ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).
- D. Weep/Cavity Vents: Use the following unless otherwise indicated:
 - 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Advanced Building Products Inc.
 - 2) Heckmann Building Products, Inc.
 - 3) Hohmann & Barnard, Inc.
 - 4) Mortar Net Solutions.
 - 5) Wire-Bond.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Mortar Deflector: Strips, full depth of cavity and 10 inches high, with dovetail-shaped notches that prevent clogging with mortar droppings.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Advanced Building Products Inc.
 - 2) Hohmann & Barnard, Inc.
 - 3) Keene Building Products.
 - 4) Mortar Net Solutions.
 - 5) Wire-Bond.
 - 6) York Manufacturing, Inc.
- F. Proprietary Acidic Masonry Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Diedrich Technologies, Inc.; a Hohmann & Barnard company.
 - b. EaCo Chem, Inc.
 - c. PROSOCO, Inc.
- 2.12 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. Use portland cement-lime or mortar cement mortar unless otherwise indicated.
 3. 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. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
 - C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

1. For masonry below grade or in contact with earth, use Type M.
 2. For reinforced masonry, use Type S.
 3. For exterior, above-grade, load-bearing, nonload-bearing walls, and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
 4. For interior nonload-bearing partitions, Type O may be used instead of Type S.
- D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
1. Pigments do not exceed 10 percent of portland cement by weight.
 2. Mix to match Architect's sample.
- E. Grout for Unit Masonry: Comply with ASTM C476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602 for dimensions of grout spaces and pour height.
 2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.1.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
 3. Provide grout with a slump of 10 to 11 inches as measured in accordance with ASTM C143/C143M.

PART 3 - EXECUTION

3.1 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 the Work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
 4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.

- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- D. 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.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

3.3 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 ft., 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 ft., 1/4 inch in 20 ft., or 1/2-inch maximum.
- 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., 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 ft., 1/4 inch in 20 ft., or 1/2-inch maximum.
- 5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., 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 ft., or 1/2-inch maximum.
- 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

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. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 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 bond pattern indicated on Drawings; 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 stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- I. Build nonload-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. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors, and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.

3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 07 84 43 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

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. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Allow cleaned surfaces to dry before setting.
3. Wet joint surfaces thoroughly before applying mortar.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

E. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

F. Cut joints flush where indicated to receive waterproofing, cavity wall insulation, and air barriers unless otherwise indicated.

3.6 CAVITY WALLS

A. Bond wythes of cavity walls together using one of the following methods:

1. Individual Metal Ties: Provide ties as indicated installed in horizontal joints, but not less than one metal tie for 2.67 sq. ft. of wall area spaced not to exceed 24 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.
 - a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.

- b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.
2. Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.
 - B. Bond wythes of cavity walls together using bonding system indicated on Drawings.
 - C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
 - D. Parge cavity face of backup wythe in a single coat approximately 3/8 inch thick. Trowel face of parge coat smooth.
 - E. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as indicated.
 1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.7 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to wall framing and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
 1. Fasten screw-attached anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
 2. Embed tie sections in masonry joints.
 3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 4. Space anchors as indicated, but not more than 18 inches o.c. vertically and 24 inches o.c. horizontally, with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.
 5. Space anchors as indicated, but not more than 16 inches o.c. vertically and 25 inches o.c. horizontally, with not less than one anchor for each 2.67 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.
 6. Space anchors as indicated, but not more than 18 inches o.c. vertically and horizontally. Install additional anchors within 12 inches of openings and at intervals, not exceeding 24 inches, around perimeter.
- B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.8 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. Space reinforcement not more than 16 inches o.c.
 2. Space 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.

3.9 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
 1. Provide an open space not less than 2 inches wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.10 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.
- B. Form control joints in concrete masonry as follows:
 1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
 2. Install preformed control-joint gaskets designed to fit standard sash block.

3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
 4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.
- C. Form expansion joints in brick as follows:
1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
 2. Build flanges of factory-fabricated, expansion-joint units into masonry.
 3. Build in compressible joint fillers where indicated.
 4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 07 92 00 "Joint Sealants."
- D. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 07 92 00 "Joint Sealants," but not less than 3/8 inch.
1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.
- 3.11 LINTELS
- A. Install steel lintels where indicated.
 - B. Provide concrete, masonry, or offset angle support lintels where indicated and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are indicated without structural steel or other supporting lintels.
 - C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.
- 3.12 FLASHING, WEEP HOLES, AND CAVITY VENTS
- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
 - B. Install flashing as follows unless otherwise indicated:
 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under air barrier, lapping at least 4 inches. Fasten upper edge of flexible flashing to sheathing through termination bar.

3. At lintels and shelf angles, extend flashing 6 inches minimum, to edge of next full unit at each end. At heads and sills, extend flashing 6 inches minimum, to edge of next full unit and turn ends up not less than 2 inches to form end dams.
 4. Interlock end joints of sawtooth sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 07 92 00 "Joint Sealants" for application indicated.
 5. Install metal drip edges with sawtooth sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 07 92 00 "Joint Sealants" for application indicated.
 6. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
 7. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
 8. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
- D. Install reglets and nailers for flashing and other related construction where they are indicated to be built into masonry.
- E. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
1. Use specified weep/cavity vent products to form weep holes.
 2. Space weep holes 24 inches o.c. unless otherwise indicated.
- F. Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches, to maintain drainage.
- G. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Accessories" Article.
- H. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products or open-head joints to form cavity vents.
1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.
- 3.13 REINFORCED UNIT MASONRY
- 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 that of other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602.
- 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 602 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.
- 3.14 FIELD QUALITY CONTROL
- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements will be at Contractor's expense.
- B. Inspections: Special inspections in accordance with Level 2 in TMS 402.
1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- E. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, in accordance with ASTM C780.
- F. Grout Test (Compressive Strength): For each mix provided, in accordance with ASTM C1019.
- 3.15 REPAIRING, POINTING, 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. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. 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 nonmasonry 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 brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 - 6. Clean masonry with a proprietary acidic masonry cleaner applied according to manufacturer's written instructions.

3.16 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. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 31 20 00 "Earth Moving."
 - 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Structural steel.
- 2. Shrinkage-resistant grout.

- B. Related Requirements:

- 1. Division 01 Section "Structural Testing and Special Inspection Services" for Fabricator's Certificate of Compliance and quality control.
- 2. Division 05 Section "Steel Decking" for field installation of shear stud connectors through deck.
- 3. Division 05 Section "Metal Fabrications" for other steel items not defined as structural steel.
- 4. Division 09 painting Sections for surface-preparation, priming and shop painting requirements.

1.3 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:

- 1. ANSI/AISC 303.
- 2. ANSI/AISC 360.
- 3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

- B. Connection design information: in accordance with ANSI/AISC 303, structural steel connections are a deferred submittal per Option 3B, except where indicated Option 1 or Option 2, including comprehensive engineering design by a qualified professional engineer licensed in the project state.

1. Option 1: Connection designs which have been completed and are indicated as such on the Drawings.
2. Option 2: Connections which can be selected or completed by an experienced steel detailer.
3. Option 3 and 3B: Connection designs and final configurations of member reinforcement at connections designed by fabricator's qualified professional engineer.
 - a. Use Load and Resistance Factor Design; data is given at factored-load level.

C. Moment Connections: Type FR, fully restrained.

D. Construction: Moment frames, braced frames, and shear walls].

1.5 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.6 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
 1. Require representatives of each entity directly concerned with structural steel to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for field quality control.
 - c. Steel Fabricator.
 - d. Steel Erector.
 - e. Structural engineer of record.
 2. Review special inspection and Testing/Inspecting Agency procedures for the following
 - a. Field quality control.
 - b. Survey of anchor rod placements.
 - c. Configuration of delegated connections.
 - d. Bolt pretensioning.
 - e. Qualified welders' certifications and preheat for welding.
 - f. Resolution of misfabricated steel.
 - g. Composite stud and deformed bar anchor placement.
 - h. Slab construction including construction joints in slabs on steel deck, welded wire reinforcing and miscellaneous rebar placement, and floor flatness.

- i. Intermediate elevator rail supports.
- j. Joist erection procedures, joist panel point reinforcement.
- k. Roof deck attachment including fasteners/welds and spacing.
- l. Support of mechanical equipment.
- m. Delegated design items including but not limited to metal stairs, canopies and tie backs.

1.7 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.
 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 2. Include embedment Drawings.
 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
- C. Delegated-Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Include letter from the qualified professional engineer responsible for the connection design that they have reviewed and confirmed that the approval documents properly incorporate the connection designs.

1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified professional engineer, installer and fabricator, including copies of fabricator's AISC Certification.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural-steel materials, including chemical and physical properties.
- E. Product Test Reports: For the following:
 1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
 2. Direct-tension indicators.
 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 4. Shear stud connectors.

5. Anchor Rods.
6. Welding Consumables for Field Welds
7. Shop primers
8. Nonshrink grout

- F. Source quality-control reports including nondestructive testing (NDT) reports and AISC 360, Section N3.2 items (a) through (m).
- G. Fabricator Certificates: Fabricator's Certificate of Compliance per Division 1 Section "Special Inspections" at completion of fabrication signed by fabricator certifying that structural steel was fabricated in accordance with construction documents.
- H. Minutes of preinstallation conference

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).
- B. Installer Qualifications: A company specializing in performing the work of this Section with a minimum of 10 years documented experience.
- C. Steel Detailer Qualifications: Connections not detailed on the Drawings shall be designed by the fabricator under the direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the Project state.
- D. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M
- B. Channels, Angles, M-Shapes, S-Shapes: ASTM A36/A36M.
- C. Plate and Bar: ASTM A36/A36M Use ASTM A572/A572M, Grade 50 where indicated on the Drawings.
- D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing.
- E. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B.
 - 1. Weight Class: As indicated on the Drawings.
 - 2. Finish: Black except where indicated to be galvanized.
- F. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS AND ANCHORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 , Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH , heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.
- B. High-Strength A490 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A490, Type 1, heavy-hex steel structural bolts or Grade F2280 tension-control, bolt-nut-washer assemblies with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 490-1, compressible-washer type with plain finish.
- C. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 , Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH , heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers.
 - 1. Finish: Hot-dip zinc coating.
 - 2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating finish.
- D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125, Grade F1852, Type 1, heavy-hex head assemblies, consisting of steel structural bolts

with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.

1. Finish: Plain, unless noted otherwise.
- E. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B, with arc shields.
- F. Deformed Bar Anchors (DBA): ASTM A1064, Grade 60 minimum.
- G. Unheaded Anchor Rods: ASTM F 1554, Grade 36, ASTM F 1554, Grade 55, weldable, or ASTM F 1554, Grade 105, as indicated on the Drawings.
1. Configuration: Straight.
 2. Nuts: ASTM A 563 heavy-hex carbon steel.
 3. Plate Washers: ASTM A 36/A 36M carbon steel.
 4. Washers: ASTM F 436, Type 1, hardened carbon steel.
 5. Finish: Plain, unless noted otherwise.
 6. Anchor rods to be galvanized shall have the end of the anchor rod intended to project from the concrete die stamped with the grade identification as required by supplement S3.
- H. Threaded Rods: ASTM A36/A36M.
1. Nuts: ASTM A63 heavy-hex carbon steel.
 2. Washers: ASTM F436, Type 1, hardened carbon steel.
 3. Finish: Plain, unless noted otherwise.
- I. Clevises and Turnbuckles: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1035.
- J. Eye Bolts and Nuts: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1030.
- K. Sleeve Nuts: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1018.

2.3 PRIMER

- A. Primer for High Performance Coatings or other finish coats: Comply with Division 09 painting Sections.
- B. Primer for all other uses: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- C. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

2.4 SHRINKAGE-RESISTANT GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
 - 1. Camber structural-steel members where indicated.
 - 2. Fabricate beams with rolling camber up.
 - 3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
 - 4. Mark and match-mark materials for field assembly.
 - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 2, "Hand Tool Cleaning".
- F. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: As indicated on the Drawings.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.7 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 2. Galvanize lintels, shelf angles, and attached to structural-steel frame and located in exterior walls.
 3. Galvanize exposed structural steel where indicated on drawings.

2.8 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 2. Surfaces to be field welded.
 3. Surfaces to receive composite shear studs.
 4. Surfaces to be high-strength bolted with slip-critical connections.
 5. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 6. Galvanized surfaces.
- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:
 1. SSPC-SP 3, "Power Tool Cleaning." For steel not receiving a finish coat and not subjected to extended weathering.
 2. SSPC-SP 6 (WAB)/NACE WAB-3, "Commercial Blast Cleaning." For steel receiving a finish coat or subject to extended weathering.
- C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.9 SOURCE QUALITY CONTROL

- A. Fabricator Quality Control: Fabricator quality control shall be in accordance with AISC 360, Chapter N. Submit test reports and certifications listed in AISC 360, Section N3.2 for review by Special Inspector. Fabricator shall pay for and provide nondestructive testing (NDT) of all complete joint penetration shop welds by

ultrasonic inspection per ASTM E 164. NDT shall be performed by NDT testing personnel qualified in accordance with AISC 360 Section N4.3. Submit NDT reports.

- B. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
 - 1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
 - 2. Bolted Connections: Inspect and test shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E165/E165M.
 - b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E164.
 - d. Radiographic Inspection: ASTM E94/E94M.
 - 4. In addition to visual inspection, test and inspect shop-welded shear stud connectors in accordance with requirements in AWS D1.1/D1.1M for stud welding and as follows:
 - a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear stud connector.
 - b. Conduct tests in accordance with requirements in AWS D1.1/D1.1M on additional shear stud connectors if weld fracture occurs on shear stud connectors already tested.
 - 5. Prepare test and inspection reports.
- C. Correct deficiencies in Work that test reports and inspections indicated does not comply with the Contract Documents.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 - 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.
 - 1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate where indicated.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303. Edge angles and bent plates, masonry ledgers and other miscellaneous fascia support steel shall be erected to meet the tolerance requirements for Adjustable Items
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

- H. Shear Connectors and Deformed Bar Anchors (DBA): Prepare steel surfaces as recommended by manufacturer. Use automatic end welding according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
 - 1. Joint Type: As indicated on the Drawings.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.5 REPAIR

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.
- B. Touchup Painting:
 - 1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections in accordance with Division 01 Section "Structural Testing and Special Inspection Services" and AISC 360, Chapter N.
 - 1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1.

- a. In addition to visual inspection, test and inspect all field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1) Liquid Penetrant Inspection: ASTM E165/E165M.
 - 2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - 3) Ultrasonic Inspection: ASTM E164.
 - 4) Radiographic Inspection: ASTM E94/E94M.

- B. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
 2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

- C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION

SECTION 05 21 00
STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. K-series steel joists.
- 2. KCS-type K-series steel joists.
- 3. K-series steel joist substitutes.
- 4. Long-span steel joists.
- 5. Steel joist accessories.

B. Related Requirements:

- 1. Division 01 Section "Structural Testing and Special Inspection Services" for Fabricator's Certificate of Compliance and quality control.
- 2. Division 03 Section "Cast-in-Place Concrete" for installing bearing plates in concrete.
- 3. Division 04 Section "Unit Masonry" for installing bearing plates in unit masonry.
- 4. Division 05 Section "Structural Steel Framing" for bearing plates and anchor rods.

1.3 DEFINITIONS

- A. SJI "Specifications": Steel Joist Institute's "Standard Specification for K-Series, LH-Series, and DLH-Series Open Web Steel Joists and for Joist Girders."
- B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.

- B. Design special joists to withstand design loads with live-load deflections no greater than the following:
 - 1. Floor Joists: Vertical deflection of $1/360$ of the span.
 - 2. Roof Joists: Vertical deflection of $1/240$ of the span.
- C. Design all joists to withstand a two-hundred-pound vertical concentrated live bend load at any location along the top or bottom chord, acting concurrently with all other design loads.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product indicated.
- B. Shop Drawings: Show layout, designation, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, joist accessories; splice and connection locations and details; and attachments to other construction.
 - 1. Indicate locations and details of bearing plates to be embedded in other construction.
 - 2. Show loading diagrams for all special joists, indicating the magnitude and location of all distributed and concentrated loads.
 - 3. Provide comprehensive engineering analysis signed and sealed by the qualified professional engineer responsible for its preparation and licensed in the project state for the following:
 - a. Special joists.
 - b. Bridging that differs from SJI Specifications.
 - c. Connections that differ from SJI Specifications.
 - d. Field-spliced connections.
 - e. Joist headers.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and professional engineer.
- B. Welding certificates.
- C. Manufacturer Certificates: Fabricator's Certificate of Compliance per Division 1 Section "Special Inspections" at completion of fabrication signed by manufacturer certifying that joists were fabricated in accordance with construction documents.
- D. Mill Certificates: Signed by bolt manufacturers certifying that bolts comply with requirements.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."

1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
 - B. SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated.
 - C. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
 - B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.
- 1.9 SEQUENCING
- A. Deliver steel bearing plates to be built into cast-in-place concrete and masonry construction.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- A. Steel: Comply with SJI's "Specifications" for web and steel angle chord members.
 - B. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A, carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.
 1. Finish: Plain, uncoated
 - C. Welding Electrodes: Comply with AWS standards.
- 2.2 STEEL JOISTS
- A. K-Series Steel Joist: Manufactured steel joists of type indicated according to "Standard Specification for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
 1. Joist Type: K-series steel joists and KCS-type K-series steel joists.
 2. K-Series Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

3. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
 4. No penetrations, other than by approved deck fasteners, shall be made in joist members without the written approval of the joist manufacturer's professional engineer.
 5. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated on Drawings, complying with SJI's "Specifications."
 6. Extended Ends: Extend bearing ends of joists with SJI's Type R or S extended ends where indicated on Drawings, complying with SJI's "Specifications."
 7. Camber joists according to SJI's "Specifications" or as otherwise noted.
 8. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.
- B. Long-Span Steel Joist: Manufactured steel joists according to "Standard Specification for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as follows:
1. Joist Type: LH-series steel joists.
 - a. End Arrangement: Underslung.
 - b. Top-Chord Arrangement: Parallel unless otherwise indicated
 2. Joist Type: DLH-series steel joists.
 - a. End Arrangement: Underslung.
 - b. Top-Chord Arrangement: As indicated
 - c. Web Arrangement: Align panel points between all adjacent joists where indicated on drawings to allow ductwork to pass uninterrupted.
- C. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- D. No penetrations, other than by approved deck fasteners, shall be made in joist members without the written approval of the joist manufacturer's professional engineer.
- E. Camber long-span steel joists according to SJI's "Specifications." or as otherwise indicated.
1. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).
- 2.3 PRIMERS
- A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.4 STEEL JOIST ACCESSORIES

- A. Bridging: Fabricate as indicated and according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
- B. Steel bearing plates with integral anchorages are specified in Section 055000 "Metal Fabrications."
- C. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface, unless otherwise indicated.
- D. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.5 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.
- C. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written instructions, and requirements in this Section.
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.

3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
 4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.
- C. Field weld joists to supporting steel bearing plates and] framework where indicated. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework using carbon-steel bolts.
- E. Install and connect bridging concurrently with joist erection before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 REPAIRS AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists, bearing plates, abutting structural steel, and accessories.
1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
 2. Apply a compatible primer of same type as primer used on adjacent surfaces.
- C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, which ensures that joists and accessories are without damage or deterioration at time of Material Completion.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing agency to perform tests and inspections and prepare test and inspection reports in accordance with Division 01 Section "Structural Testing and Special Inspection Services".
- B. Visually inspect field welds according to AWS D1.1/D1.1M.
- C. Visually inspect bolted connections.
- D. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- E. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.
- F. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

END OF SECTION

SECTION 05 31 00

STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Roof deck.
- 2. Composite floor deck.
- 3. Noncomposite form deck.

- B. Related Requirements:

- 1. Division 01 Section "Structural Testing and Special Inspection Services" for field quality control.
- 2. Division 03 Section "Cast-in-Place Concrete" for concrete fill.
- 3. Division 05 Section "Structural Steel Framing" for steel angle framing and shop- and field-welded shear connectors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated:

- B. Shop Drawings:

- 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

- C. Mechanical Fasteners: Proposed alternate fastener size, spacing and load capacity data.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

- B. Product Certificates: For each type of steel deck, signed by product manufacturer.
- C. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
 - 1. Powder-actuated mechanical fasteners.
 - 2. Acoustical roof deck.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A Member of the Steel Deck Institute.
- B. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and AWS D1.3, "Structural Welding Code - Sheet Steel."
- D. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Manufacturers offering products that may be incorporated into the Work include the following:
 - 1. Steel Deck:
 - a. Canam Steel Corporation; Canam Group, Inc.
 - b. Epic Metals Corporation.
 - c. New Millennium Building Systems, LLC.
 - d. Nucor Corp.; Vulcraft Division.

- e. Valley Joist.

2.2 ROOF DECK

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), G60 zinc coating.
 - a. Color: Manufacturer's standard.
 - b. Material Strength: Grade 80 Minimum for Type 'B' Roof Deck, Grade 50 minimum otherwise.
 - 2. Deck Profile: As indicated on the Drawings.
 - 3. Profile Depth: As indicated on the Drawings.
 - 4. Design Uncoated-Steel Thickness: As indicated on the Drawings.
 - 5. Span Condition: As indicated on the Drawings.
 - 6. Side Laps: Overlapped.

2.3 COMPOSITE FLOOR DECK

- A. Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with SDI C, with the minimum section properties indicated, and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 50, G60 zinc coating.
 - 2. Profile Depth: As indicated on the Drawings.
 - 3. Design Uncoated-Steel Thickness: As indicated on the Drawings.
 - 4. Span Condition: As indicated on the Drawings.

2.4 NONCOMPOSITE FORM DECK

- A. Noncomposite Form Deck: Fabricate ribbed-steel sheet noncomposite form-deck panels to comply with SDI NC, with the minimum section properties indicated, and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33 G60 zinc coating.
 - 2. Profile Depth: As indicated on the Drawings.
 - 3. Design Uncoated-Steel Thickness: As indicated on the Drawings.
 - 4. Span Condition: As indicated on the Drawings.
 - 5. Side Laps: Overlapped.

2.5

2.6 ACCESSORIES

- A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- E. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI standards for overhang and slab depth.
- F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- G. Hips, Valleys, Ridge and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, 6" minimum in width, unless otherwise indicated.
- H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch thick, with factory-punched hole of 3/8-inch minimum diameter.
- I. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- J. Galvanizing Repair Paint: ASTM A780/A780M.
- K. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
 - 1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Provide hip, valley and ridge plates at all changes in deck plane orientation unless otherwise noted. Fasten to supporting deck at 12 inches on center, each side, unless noted otherwise.
- I. Provide cover plates where deck span changes direction unless otherwise noted. Fasten to supporting deck at 12 inches on center, each side, unless noted otherwise.
- J. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- K. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions. Diaphragm shear and uplift load capacity of alternate mechanical fasteners shall meet or exceed the capacity of specified welded fasteners. Submit proposed fastener size, spacing and load capacity data.

3.3 ROOF DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
 - 1. Weld Diameter: 5/8 inch, nominal.

2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated on the Drawings.
 3. Weld Washers: Install weld washers at each weld location if minimum uncoated steel thickness is less than 0.028 inch (22 ga).
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals as indicated on the Drawings but not exceeding the lesser of one-half of the span or 24 inches, and as follows:
1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
 2. Fasten with a minimum of 1-1/2-inch- long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
1. End Joints: Lapped 2 inches minimum.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches apart with at least one fastener at each corner.
1. Install reinforcing channels or zees in ribs to span between supports and mechanically fasten.
- E. Miscellaneous Roof-Deck Accessories: Install hip, ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions unless noted otherwise. Weld or mechanically fasten to substrate to provide a complete deck installation.
- F. Roof Deck Openings: Steel deck openings shall be reinforced as follows:
1. Steel deck openings 6" or less in size do not require reinforcing.
 2. Steel deck openings greater than 12" in size shall be reinforced with a structural steel frame as indicated on the Drawings.
 3. Steel deck openings greater than 6 inches but less than 12 inches in size shall be reinforced as follows, unless specifically detailed otherwise on the Drawings:
 - a. Install 24"x24"x16 gauge galvanized steel plate to the top of steel deck, centered on the opening.
 - b. Fasten steel plate to steel deck with #10 screws around perimeter at 6" maximum on center.
- G. Hanging Loads: Do not hang loads from roof deck.

3.4 FLOOR DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
1. Weld Diameter: 5/8 inch, nominal.

2. Weld Spacing: Space and locate welds as indicated.
 3. Weld Washers: Install weld washers at each weld location if minimum uncoated steel thickness is less than 0.028 inch (22 ga).
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 36 inches, and as follows:
1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
 2. Fasten with a minimum of 1-1/2-inch- long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
1. End Joints: Butted.
- D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
- E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.5 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.
1. Touch-up all welds with galvanizing repair paint.
- B. Repair Painting:
1. Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation and apply repair paint.
 2. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
- C. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Material Completion.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections. See Division 01 Section "Structural Testing and Special Inspection Services."
- B. Field welds will be subject to inspection.

- C. Testing/Inspection Agency will report inspection results promptly and in writing to Contractor and Architect.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional inspections, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

END OF SECTION

SECTION 05 40 00
COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior non-load-bearing wall framing.
2. Soffit framing.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for miscellaneous steel shapes, masonry shelf angles, and connections used with cold-formed metal framing.
2. Section 09 22 16 "Non-Structural Metal Framing" for standard, interior non-load-bearing, metal-stud framing, with height limitations and ceiling-suspension assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Cold-formed steel framing materials.
2. Exterior non-load-bearing wall framing.
3. Vertical deflection clips.
4. Single deflection track.
5. Double deflection track.
6. Drift clips.
7. Soffit framing.
8. Post-installed anchors.
9. Power-actuated anchors.
10. Sill sealer gasket.

B. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

C. Delegated Design Submittal: For cold-formed steel framing.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Product Certificates: For each type of code-compliance certification for studs and tracks.
- C. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.
 - 6. Horizontal drift deflection clips
 - 7. Miscellaneous structural clips and accessories.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- C. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association or the Supreme Steel Framing System Association.
- D. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling as required in AISI S202.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. AllSteel & Gypsum Products, Inc.
2. CEMCO; California Expanded Metal Products Co.
3. ClarkDietrich.
4. Consolidated Fabricators Corp.; Building Products Division.
5. Craco Manufacturing, Inc.
6. Custom Stud.
7. Design Shapes in Steel.
8. Formetal Co. Inc. (The).
9. Jaimes Industries.
10. MarinoWARE.
11. MBA Building Supplies.
12. MRI Steel Framing, LLC.
13. Olmar Supply, Inc.
14. Quail Run Building Materials, Inc.
15. SCAFCO Steel Stud Company.
16. Southeastern Stud & Components, Inc.
17. State Building Products, Inc.
18. Steel Construction Systems.
19. Steel Structural Systems.
20. Steeler, Inc.
21. Super Stud Building Products Inc.
22. Telling Industries.
23. The Steel Network, Inc.
24. United Metal Products, Inc.
25. United Steel Deck, Inc.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design cold-formed steel framing.
- B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
 1. Design Loads: As indicated on Drawings.
 2. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors,

or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.

3. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 1/2 inch.
 4. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing complies with AISI S100 and ASTM C955.
- D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.

2.3 COLD-FORMED STEEL FRAMING MATERIALS

- A. Framing Members, General: Comply with AISI S240 for conditions indicated.
- B. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
1. Grade: ST33H.
 2. Coating: G90.
- C. Steel Sheet for Drift Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 50.
 2. Coating: G90.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0329 inch.
 2. Flange Width: 1-3/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0329 inch.
 2. Flange Width: 1-1/4 inches.
- C. Vertical Deflection Clips, Exterior: Manufacturer's standard bypass clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0428 inch.
 - 2. Flange Width: 1 inch plus the design gap for one-story structures and 1 inch plus twice the design gap for other applications.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
 - 1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0329 inch.
 - b. Flange Width: 1 inch plus the design gap for one-story structures and 1 inch plus twice the design gap for other applications.
 - 2. Inner Track: Of web depth indicated, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0428 inch.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.5 SOFFIT FRAMING

- A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0329 inch.
 - 2. Flange Width: 1-5/8 inches, minimum.

2.6 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Foundation clips.
 - 7. Gusset plates.

8. Stud kickers and knee braces.
9. Hole-reinforcing plates.
10. Backer plates.

2.7 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel bolts, with encased end threaded, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A153/A153M, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC58 or ICC-ES AC308 as appropriate for the substrate.
 1. Uses: Securing cold-formed steel framing to structure.
 2. Type: Torque-controlled expansion anchor or adhesive anchor.
 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
 4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.
- D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.8 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M or SSPC-Paint 20.
- B. Cement Grout: Portland cement, ASTM C150/C150M, Type I; and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.

- D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.
- E. Sill Sealer Gasket: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.
- F. Sill Sealer Gasket/Termite Barrier: Minimum 68-mil nominal thickness, self-adhering sheet consisting of 64 mils of rubberized asphalt laminated on one side to a 4-mil- thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.
 - 1. Physical Properties:
 - a. Peel Adhesion: 17.0 lb/in of width when tested in accordance with ASTM D412.
 - b. Low-Temperature Flexibility: Pass at minus 25 deg F when tested in accordance with ASTM D146/D146M.
 - c. Water Vapor Permeance: 0.05 perm maximum when tested in accordance with ASTM E96/E96M, Method B.
 - d. Resistance to Termite Penetration: Comply with ICC-ES AC380.

2.9 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.
- C. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sill sealer gasket at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 1. Cut framing members by sawing or shearing; do not torch cut.

2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
 - E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
 - F. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
 - G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
 - H. Install insulation, specified in Section 07 21 00 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
 - I. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- 3.4 INSTALLATION OF EXTERIOR NONLOADBEARING WALL FRAMING
- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
 - B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
 1. Stud Spacing: 16 inches.
 - C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
 - D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 1. Install single deep-leg deflection tracks and anchor to building structure.
 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
 - E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.

1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
1. Install solid blocking at centers indicated on Shop Drawings.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 INSTALLATION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.6 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

3.7 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous framing and supports.
2. Shelf angles.
3. Metal ladders.
4. Elevator pit sump covers.
5. Miscellaneous steel trim.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.
3. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

C. Related Requirements:

1. Section 04 20 00 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
2. Section 05 12 00 "Structural Steel Framing" for steel framing, supports, elevator machine beams, hoist beams, divider beams, door frames, and other steel items attached to the structural-steel framing.
3. Section 07 72 00 "Roof Accessories" for manufactured metal roof walkways and metal roof stairs.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Nonslip aggregates and nonslip-aggregate surface finishes.
 - 2. Fasteners.
 - 3. Shop primers.
 - 4. Shrinkage-resisting grout.
 - 5. Manufactured metal ladders.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
 - 1. Miscellaneous framing and supports for applications where framing and supports are not specified in other Sections.
 - 2. Elevator machine beams, hoist beams, and divider beams.
 - 3. Steel shapes for supporting elevator door sills.
 - 4. Shelf angles.
 - 5. Metal ladders.
 - 6. Elevator pit sump covers.
 - 7. Miscellaneous steel trim.
 - 8. Loose steel lintels.
- C. Delegated Design Submittals: For ladders, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Certificates:
 - 1. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.
 - 2. Welding certificates.
 - 3. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- B. Research Reports: For post-installed anchors.
- C. Delegated design engineer qualifications.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design ladders.
- B. Structural Performance of Aluminum Ladders: Ladders are to withstand the effects of loads and stresses within limits and under conditions specified in ANSI/ASC A14.3.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 304.
- D. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 304.
- E. Rolled-Stainless Steel Floor Plate: ASTM A793.
- F. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- G. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- H. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.
- I. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
- J. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.
- K. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or

ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless steel fasteners for fastening aluminum, stainless steel, or nickel silver.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, heavy-hex carbon-steel nuts; and where indicated, flat washers.
- D. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 1.
- E. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- F. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- G. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.
- H. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.
- I. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 09 96 00 "High-Performance Coatings."
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

- C. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.
- D. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- F. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- H. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- I. Concrete: Comply with requirements in Section 03 30 00 "Cast-in-Place Concrete" for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Galvanize exterior miscellaneous framing and supports where indicated.
- D. Prime miscellaneous framing and supports with primer specified in Section 09 96 00 "High-Performance Coatings" where indicated.

2.7 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
 - 1. Provide mitered and welded units at corners.
 - 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with primer specified in Section 09 96 00 "High-Performance Coatings."
- E. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.8 METAL LADDERS

- A. General:
 - 1. Comply with ANSI A14.3, except for elevator pit ladders.

2. For elevator pit ladders, comply with ASME A17.1/CSA B44.

B. Steel Ladders:

1. Space siderails 18 inches apart unless otherwise indicated.
2. Siderails: Continuous, 1/2-by-2-1/2-inch steel flat bars, with eased edges.
3. Rungs: 3/4-inch- diameter, steel bars.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
6. Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) IKG.
 - 2) SlipNOT Metal Safety Flooring, division of Traction Technologies Holdings, LLC.
7. Source Limitations: Obtain nonslip surfaces from single source from single manufacturer.
8. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted steel brackets.
9. Galvanize exterior ladders, including brackets.
10. Prime interior ladders, including brackets and fasteners, with specified in Section 09 96 00 "High-Performance Coatings."

2.9 ELEVATOR PIT SUMP COVERS

- A. Fabricate from welded or pressure-locked steel bar grating. Limit openings in gratings to no more than 1 inch in least dimension.
- B. Provide steel angle supports unless otherwise indicated.

2.10 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Galvanize exterior miscellaneous steel trim.
- D. Prime miscellaneous steel trim with primer specified in Section 09 96 00 "High-Performance Coatings."

2.11 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches unless otherwise indicated.
- C. Galvanize loose steel lintels located in exterior walls.
- D. Prime loose steel lintels located in exterior walls with primer specified in Section 09 96 00 "High-Performance Coatings."

2.12 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.13 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.14 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with primers specified in Section 09 96 00 "High-Performance Coatings".
- D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

3. Items Indicated to Receive Primers Specified in Section 09 96 00 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 4. Other Steel Items: SSPC-SP 3, "Power Tool Cleaning."
 5. Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
- 2.15 ALUMINUM FINISHES
- A. As-Fabricated Finish: AA-M12.
 - B. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for overhead doors securely to, and rigidly brace from, building structure.
- C. Anchor shelf angles securely to existing construction with expansion anchors.
- D. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
 - 1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.
- E. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installation of Bearing and Leveling Plates" Article.
 - 1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLATION OF SHELF ANGLES

- A. Install shelf angles as required to keep masonry level, at correct elevation, and flush with vertical plane.

3.4 INSTALLATION OF METAL LADDERS

- A. Secure ladders to adjacent construction with the clip angles attached to the stringer.
- B. Install brackets as required for securing of ladders welded or bolted to structural steel or built into masonry or concrete.

3.5 INSTALLATION OF ELEVATOR PIT SUMP COVERS

- A. Install tops of elevator sump pit cover plates and frames flush with finished surface. Adjust as required to avoid lippage that could present a tripping hazard.

3.6 INSTALLATION OF MISCELLANEOUS STEEL TRIM

- A. Anchor to concrete construction to comply with manufacturer's written instructions.

3.7 INSTALLATION OF LOOSE BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.8 REPAIRS

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
 - 2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 23 "Interior Painting."
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION

SECTION 05 51 13

METAL PAN STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preassembled steel stairs with concrete-filled treads.
2. Aluminum handrails and steel guards attached to metal stairs.
3. Aluminum handrails attached to walls.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs, railings, and guards.
 1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
 2. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.
- D. Schedule installation of railings and guards so wall attachments are made only to completed walls.
 1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For metal pan stairs and the following:

1. Shop primer products.
2. Handrail wall brackets.
3. Grout.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachments to other work.

2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
 3. Include plan at each level.
 4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.
- C. Delegated Design Submittal: For stairs, railings and guards, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- 1.4 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For professional engineer's experience with providing delegated design engineering services of the kind indicated, including documentation that engineer is licensed in the State in which Project is located.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: Fabricator of products.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Store materials to permit easy access for inspection and identification.
1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
 2. Protect steel members and packaged materials from corrosion and deterioration.
 3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.
 - a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design stairs, railings and guards, including attachment to building construction.
- B. Structural Performance of Stairs: Metal stairs withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Uniform Load: 100 lbf/sq. ft.
 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
 3. Uniform and concentrated loads need not be assumed to act concurrently.
 4. Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.

5. Limit deflection of treads, platforms, and framing members to $L/360$ or $1/4$ inch, whichever is less.
- C. Structural Performance of Railings and Guards: Railings and guards, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.
- 2.2 METALS
- A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
 - B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
 - C. Steel Tubing for Railings and Guards: ASTM A500/A500M (cold formed) or ASTM A513/A513M.
 - D. Uncoated, Cold-Rolled Steel Sheet: ASTM A1008/A1008M, either commercial steel, Type B, or structural steel, Grade 25, unless another grade is required by design loads; exposed.
 - E. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
- 2.3 FASTENERS
- A. General: Provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5 where built into exterior walls.
 1. Select fasteners for type, grade, and class required.
 - B. Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.
 - C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
 - D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
 - E. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined

by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

- A. Handrail Wall Brackets: Cast aluminum, center of rail 2-1/2 inches from face of wall.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Blum, Julius & Co., Inc.
 - b. The Wagner Companies.
- B. Welding Electrodes: Comply with AWS requirements.
- C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- D. Zinc-Rich Primer: Comply with SSPC-Paint 20, Type II, Level 2, and compatible with topcoat.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- F. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings and guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 1. Join components by welding unless otherwise indicated.
 2. Use connections that maintain structural value of joined pieces.
- B. Assemble stairs, railings, and guards in shop to greatest extent possible.
 1. Disassemble units only as necessary for shipping and handling limitations.
 2. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately.
 1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
 2. Remove sharp or rough areas on exposed surfaces.

- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 - Completely sanded joint with some undercutting and pinholes okay.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
 - 1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
 - 2. Locate joints where least conspicuous.

2.6 FABRICATION OF STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Commercial Class, unless more stringent requirements are indicated.
- B. Stair Framing:
 - 1. Stringers: Fabricate of steel channels or rectangular steel tubes.
 - a. Stringer Size: As required to comply with "Performance Requirements" Article.
 - b. Provide closures for exposed ends of channel and rectangular tube stringers.
 - c. Finish: Shop primed.
 - 2. Platforms: Construct of steel channel or rectangular steel tube headers and miscellaneous framing members as required to comply with "Performance Requirements" Article.
 - a. Provide closures for exposed ends of channel and rectangular tube framing.
 - b. Finish: Shop primed.
 - 3. Weld stringers to headers; weld framing members to stringers and headers.
 - 4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch.
 - 1. Steel Sheet, Uncoated: Cold-rolled steel sheet unless otherwise indicated.

2. Directly weld metal pans to stringers; locate welds on top of subreads where they will be concealed by concrete fill. Do not weld risers to stringers.

2.7 FABRICATION OF STAIR RAILINGS AND GUARDS

- A. Fabricate railings and guards to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.
 1. Rails, Posts, and Picket Infill: 1/2-inch by 2 inch. Pickets shall prohibit the passage of a 4-inch diameter sphere.
- B. Welded Connections: Fabricate railings and guards with welded connections.
 1. Fabricate connections that are exposed to weather in a manner that excludes water.
 2. Cope components at connections to provide close fit, or use fittings designed for this purpose.
 3. Weld all around at connections, including at fittings.
 4. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 5. Obtain fusion without undercut or overlap.
 6. Remove flux immediately.
 7. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 - Completely sanded joint, some undercutting and pinholes are okay as shown in NAAMM AMP 521.
- C. Form changes in direction of railings and guards as follows:
 1. As detailed.
- D. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Close exposed ends of railing and guard members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
 1. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- G. Connect posts to stair framing by direct welding unless otherwise indicated.
- H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
 1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.

2. For nongalvanized railings and guards, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
3. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.8 FINISHES

- A. Finish metal stairs after assembly.
- B. Preparation for Shop Priming: Prepare uncoated, ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
- C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedment for compliance with requirements.
 1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF METAL PAN STAIRS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.
 1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
 1. Grouted Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates.
 - a. Clean bottom surface of plates.
 - b. Set plates for structural members on wedges, shims, or setting nuts.
 - c. Tighten anchor bolts after supported members have been positioned and plumbed.

- d. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
- e. Promptly pack grout solidly between bearing surfaces and plates so no voids remain.
 - 1) Neatly finish exposed surfaces; protect grout and allow to cure.
 - 2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints.
 - 1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
 - 2. Comply with requirements for welding in "Fabrication, General" Article.
- F. Place and finish concrete fill for treads and platforms to comply with Section 03 30 00 "Cast-in-Place Concrete."

3.3 INSTALLATION OF RAILINGS AND GUARDS

- A. Adjust railing and guard systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.
 - 1. Space posts at spacing indicated or, if not indicated, as required by design loads.
 - 2. Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails and guards so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet.
 - 4. Secure posts, rail ends, and guard ends to building construction as follows:
 - a. Anchor posts to steel by welding to steel supporting members.
 - b. Anchor aluminum handrail and guard ends to concrete and masonry with round flanges welded to rail and guard ends and anchored with post-installed anchors and bolts.
- B. Attach Aluminum handrails to wall with wall brackets.
 - 1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
 - 2. Secure wall brackets to building construction as required to comply with performance requirements.

3.4 REPAIR

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

- a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood products.
2. Fire-retardant-treated lumber.
3. Miscellaneous lumber.
4. Plywood backing panels.

B. Related Requirements:

1. Section 06 16 00 "Sheathing" for sheathing, subflooring, and underlayment.

1.2 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. Lumber grading agencies, and abbreviations used to reference them, include the following:
 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 2. NLGA: National Lumber Grades Authority.
 3. SPIB: The Southern Pine Inspection Bureau.
 4. WCLIB: West Coast Lumber Inspection Bureau.
 5. WWPA: Western Wood Products Association.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply

with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates:

1. For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
2. For preservative-treated wood products. Indicate type of preservative used and net amount of preservative retained.

1.5 DELIVERY, STORAGE, AND HANDLING

- ##### A.
- Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS

- ##### A.
- Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
 3. Dress lumber, S4S, unless otherwise indicated.
- ##### B.
- Maximum Moisture Content:
1. Boards: 15 percent.
 2. Dimension Lumber: 15 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED LUMBER

- A. General: Where fire-retardant-treated materials are indicated, materials are to comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Treatment is not to promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials are to comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering in accordance with ASTM D2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials are to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber is to be tested according to ASTM D5664 and design value adjustment factors are to be calculated according to ASTM D6841.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency and other information required by authorities having jurisdiction.
- E. Application: Treat all miscellaneous carpentry used within the building envelope.

2.3 MISCELLANEOUS LUMBER

- A. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
 - 4. Cants.
 - 5. Furring.
 - 6. Grounds.
- B. Concealed Boards: 15 percent maximum moisture content and any of the following species and grades:
 - 1. Mixed southern pine or southern pine; No. 2 grade; SPIB.

2. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
 3. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
 4. Eastern softwoods; No. 2 Common grade; NeLMA.
 5. Northern species; No. 2 Common grade; NLGA.
- C. Roofing Nailers: Structural- or No. 2-grade lumber or better; kiln-dried Douglas fir, southern pine, or wood having similar decay-resistant properties.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.
- 2.4 PLYWOOD BACKING PANELS
- A. Equipment Backing Panels: Plywood, DOC PS 1, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.
- 2.5 FASTENERS
- A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC308 as appropriate for the substrate.
- 2.6 METAL FRAMING ANCHORS
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cleveland Steel Specialty Co.
 2. MiTek Industries, Inc.
 3. Phoenix Metal Products, Inc.
 4. Simpson Strong-Tie Co., Inc.
 5. Tamlyn.

- B. Wall Bracing:
 - 1. T-shaped bracing made for letting into studs in saw kerf, 1-1/8 inches wide by 9/16 inch deep by 0.034 inch thick with hemmed edges.
 - 2. Angle bracing made for letting into studs in saw kerf, 15/16 by 15/16 by 0.040 inch thick with hemmed edges.
- C. Materials: Unless otherwise indicated, fabricate from the following materials:
 - 1. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 coating designation.
 - a. Use for interior locations unless otherwise indicated.
 - 2. Heavy-Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
 - 3. Stainless steel bars and shapes complying with ASTM A276/A276M, Type 304.
 - a. Use for exterior locations and where indicated.

2.7 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets:
 - 1. Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.
 - 2. Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.
 - 3. Self-adhering sheet consisting of 64 mils of rubberized asphalt laminated on one side to a 4-mil- thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.
- C. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.
- D. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- F. Install sill sealer gasket/termite barrier in accordance with manufacturer's written instructions at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.
- G. Do not splice structural members between supports unless otherwise indicated.
- H. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- I. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
 - 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
 - 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.
- J. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

- K. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
 - L. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. ICC-ES evaluation report for fastener.
 - M. Securely attach roofing nailers to substrates by anchoring and fastening to withstand bending, shear, or other stresses imparted by Project wind loads and fastener-resistance loads as designed in accordance with ASCE/SEI 7.
 - N. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- 3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS
- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
 - B. Attach wood blocking to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
 - C. Attach wood roofing nailers securely to substrate to resist the designed outward and upward wind loads indicated on Drawings and in accordance with ANSI/SPRI ED-1, Tables A6 and A7.
- 3.3 INSTALLATION OF WOOD FURRING
- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
 - B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- size furring horizontally and vertically at 24 inches o.c.
 - C. Furring to Receive Gypsum Board or Plaster Lath: Install 1-by-2-inch nominal- size furring vertically at 16 inches o.c.
- 3.4 PROTECTION
- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 06 16 00

SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Parapet sheathing.
3. Sheathing joint-and-penetration treatment materials.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. For air-barrier and water-resistant glass-mat gypsum sheathing, include manufacturer's technical data and tested physical and performance properties of products.

B. Shop Drawings: For air-barrier and water-resistant glass-mat gypsum sheathing assemblies.

1. Show locations and extent of sheathing, accessories, and assemblies specific to Project conditions.
2. Include details for sheathing joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
3. Include details of interfaces with other materials that form part of air barrier.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer. including list of ABAA-certified installers and supervisors employed by Installer, who work on Project.

B. Evaluation Reports: For the following, from ICC-ES:

1. Air-barrier and water-resistant glass-mat gypsum sheathing.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer of air-barrier and water-resistant glass-mat gypsum sheathing.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: As tested in accordance with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WALL SHEATHING

- A. Glass-Mat Gypsum Sheathing, Walls: ASTM C1177/C1177M.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Certainteed; SAINT-GOBAIN.
 - b. Continental Building Products Inc.
 - c. National Gypsum Company.
 - d. USG Corporation.
 - 2. Type and Thickness: Type X, 5/8 inch thick.
 - 3. Size: 48 by 96 inches for vertical installation.

2.3 PARAPET SHEATHING

- A. Glass-Mat Gypsum Sheathing, Parapets: ASTM C1177/C1177M.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Certainteed; SAINT-GOBAIN.
 - b. National Gypsum Company.
 - c. USG Corporation.
 - 2. Type and Thickness: Type X, 5/8 inch thick.
 - 3. Size: 48 by 96 inches for vertical installation.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For parapet and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.
 - 1. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C954.

2.5 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
 - 1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in the ICC's International Building Code.
 - 2. ICC-ES evaluation report for fastener.
- D. Coordinate wall and parapet sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 INSTALLATION OF GYPSUM SHEATHING

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.
 - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
- D. Seal sheathing joints according to sheathing manufacturer's written instructions.
 - 1. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.
- E. Air-Barrier and Water-Resistant Glass-Mat Gypsum Sheathing:
 - 1. Install accessory materials according to sheathing manufacturer's written instructions and details to form a seal with adjacent construction, to seal fasteners, and ensure continuity of air and water barrier.
 - a. Coordinate the installation of sheathing with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - b. Install transition strip on roofing membrane or base flashing, so that a minimum of 3 inches of coverage is achieved over each substrate.
 - 2. Connect and seal sheathing material continuously to air barriers specified under other Sections as well as to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
 - 3. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
 - 4. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip, so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.

- a. Transition Strip: Roll firmly to enhance adhesion.
5. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, doors, and miscellaneous penetrations of sheathing material with foam sealant.
6. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
7. Seal top of through-wall flashings to sheathing with an additional 6-inch-, transition strip.
8. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
9. Repair punctures, voids, and deficient lapped seams in strips and transition strips extending 6 inches beyond repaired areas in strip direction.

3.3 FIELD QUALITY CONTROL

- A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.
- B. Inspections: Air-barrier and water-resistant glass-mat gypsum sheathing, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 2. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 3. Termination mastic has been applied on cut edges.
 4. Strips and transition strips have been firmly adhered to substrate.
 5. Compatible materials have been used.
 6. Transitions at changes in direction and structural support at gaps have been provided.
 7. Connections between assemblies (sheathing and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
 8. All penetrations have been sealed.
- C. Air barriers will be considered defective if they do not pass tests and inspections.
- D. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- E. Prepare test and inspection reports.

END OF SECTION

SECTION 06 41 13

WOOD-VENEER-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood cabinets for transparent finish.
2. Cabinet hardware and accessories.
3. Miscellaneous materials.
4. Shop finishing.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets that are concealed within other construction before cabinet installation.
2. Section 08 14 16 "Flush Wood Doors" for Teacher Cabinet Doors.
3. Section 08 71 00 "Door Hardware" for Teacher Cabinet Door Hardware.

1.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Section 08 71 00 "Door Hardware" to manufacturer of architectural cabinets; coordinate Shop Drawings and fabrication with hardware requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For architectural cabinets.

1. Include plans, elevations, sections, and attachment details.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for items installed in architectural cabinets.
4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

- C. Samples: For each exposed product and for each color and finish specified, in manufacturer's standard size.
- D. Samples for Initial Selection: For each type of exposed finish.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Certificates: For each type of product.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Manufacturer of products.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

- A. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.
- B. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET MANUFACTURERS

- A. Source Limitations: Engage a qualified woodworking firm to assume responsibility for production of architectural cabinets with sequence-matched wood veneers wood doors with face veneers that are sequence matched with architectural cabinets and transparent-finished wood doors that are required to be of same species as architectural cabinets.

2.2 CABINETS, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of architectural cabinets indicated for construction, finishes, installation, and other requirements.

2.3 WOOD CABINETS FOR TRANSPARENT FINISH

- A. Architectural Woodwork Standards Grade: Premium.
- B. Type of Construction: Frameless.
- C. Door and Drawer-Front Style: Flush overlay.
- D. Wood for Exposed Surfaces:
 - 1. Species: White oak. Veneer to match existing cabinets.
 - 2. Blueprint Matching: Comply with veneer and other matching requirements indicated for blueprint-matched paneling.
 - 3. Cut: Rift cut/rift sawn.
 - 4. Grain Direction: Vertically for drawer fronts, doors, and fixed panels.
 - 5. Matching of Veneer Leaves: Book match.
 - 6. Veneer Matching within Panel Face: Center-balance match.
 - 7. Veneer Matching within Room: Provide cabinet veneers in each room or other space from a single flitch with doors, drawer fronts, and other surfaces matched in a sequenced set with continuous match where veneers are interrupted perpendicular to the grain.
- E. Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: Same species and cut indicated for exposed surfaces.
 - 2. Edges of Thermally Fused Laminate Panel Shelves: PVC or polyester edge banding.
 - 3. Drawer Subfronts, Backs, and Sides: Solid-hardwood lumber, same species indicated for exposed surfaces.
 - 4. Drawer Bottoms: Hardwood plywood.
- F. Dust Panels: 1/4-inch plywood or tempered hardboard above compartments and drawers unless located directly under tops.
- G. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.
- H. Door Construction for Teacher Cabinets: Provide wood doors as specified in 08 14 16 – Flush Wood Doors.

2.4 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches wide.
 - 2. Wood Moisture Content: 4 to 9 percent.
- B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 - 1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.
 - 2. Particleboard (Medium Density): ANSI A208.1, Grade M-2.
 - 3. Softwood Plywood: DOC PS 1, medium-density overlay.
 - 4. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

2.5 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Accuride International Inc.
 - b. CompX International, Inc.
 - c. Grass America.
 - d. Hardware Resources.
 - e. Hettich America L.P.
 - f. Julius Blum & Co., Inc.
 - g. Knape & Vogt Manufacturing Company.
- B. Butt Hinges: 2-3/4-inch, five-knuckle steel hinges made from 0.095-inch-thick metal, and as follows:
 - 1. Semiconcealed Hinges for Flush Doors: ANSI/BHMA A156.9, B01361.
 - 2. Semiconcealed Hinges for Overlay Doors: ANSI/BHMA A156.9, B01521.
- C. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 135 degrees of opening, self-closing.
 - 1. Products: Provide one of the following:
 - a. Grass America; G393.
 - b. Salice; Series 200.
 - c. Julius Blum & Co., Inc; Clip Top Press-In 71T6580
- D. Back-Mounted Pulls: ANSI/BHMA A156.9, B02011.
- E. Wire Pulls: Back mounted, solid metal 4 inches long, 5/16 inch in diameter.
- F. Catches: Magnetic catches, ANSI/BHMA A156.9, B03141.

G. Adjustable Shelf Standards and Supports:

1. Provide product listed below or comparable product by one of the following:
 - a. Julius Blum & Co., Inc.
 - b. Grass America.
 - c. E-Z Shelving Systems, Inc.
 - d. Hafele America Co.
2. Basis-of-Design: Knape & Vogt Manufacturing Company (standards and support clips) BHMA A156.9, B04071; with shelf rests, B04081:
 - a. Standards: 255E, zinc coated steel standards.
 - b. Shelf supports: 256R ZC, zinc coated steel standards with rubber cushion.
3. Basis-of-Design: Knape & Vogt Manufacturing Company (standards and brackets) BHMA A156.9, B04102; with shelf brackets, B04112:
 - a. Standards: 87 ANO, satin finish extra heavy duty.
 - b. Brackets: 187 LL ANO 16" long for 18" shelves. 186 LL ANO 10" long for 12" shelves.

H. Shelf Rests: ANSI/BHMA A156.9, B04013; metal.

1. Basis-of-Design: Knape & Vogt Manufacturing Company (drilled side supports) BHMA A156.9, B04013; metal:
 - a. Shelf Rests: 333 or 346 supports.

I. Drawer Slides: ANSI/BHMA A156.9.

1. Box Drawer Slides: Grade 1HD-100; for drawers not more than 6 inches high and 24 inches wide.
 - a. Provide Accuride International Inc; 7432 or comparable product by one of the following:
 - 1) Julius Blum & Co., Inc.
 - 2) Grass America.
 - 3) Hafele America Co.
 - 4) Knape & Vogt Manufacturing Company.
2. File Drawer Slides: Grade 1HD-100; for drawers more than 6 inches high or 24 inches wide.
 - a. Provide Accuride International Inc; 4034 or comparable product by one of the following:
 - 1) Julius Blum & Co., Inc.
 - 2) Grass America.
 - 3) Hafele America Co.
 - 4) Knape & Vogt Manufacturing Company.
3. Pencil Drawer Slides: Grade 1; for drawers not more than 3 inches high and 24 inches wide.
 - a. Sidewall mount 100 lb.: Provide Accuride International Inc; 3832 or comparable product by one of the following:
 - 1) Julius Blum & Co., Inc.
 - 2) Grass America.
 - 3) Hafele America Co.
 - 4) Knape & Vogt Manufacturing Company.
 - b. Top mount 45 lb.: Provide Accuride International Inc; 2006 or comparable product by one of the following:
 - 1) Julius Blum & Co., Inc.

- 2) Grass America.
 - 3) Hafele America Co.
 - 4) Knape & Vogt Manufacturing Company.
4. For computer keyboard shelves, provide Grade 1HD-100.
 5. For trash bins not more than 20 inches high and 16 inches wide, provide Grade 1HD-100.
- J. Door Locks: ANSI/BHMA A156.11, E07121.
1. Corbin: 0737 lock with 12-S and 2540 strikes.
 2. CompX International, Inc: CB-290.
 3. Yale: 9780 lock with related strikes.
- K. Door Locks for Teacher (Tall) Cabinets: Refer to 08 71 00 – Door Hardware.
- L. Drawer Locks: BHMA A156.11, E07041.
1. Knape & Vogt Manufacturing Company: 986 lock.
 2. CompX International, Inc: CB-280.
 3. Yale: drawer lock.
- M. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.
- N. Tempered Float Glass for Cabinet Doors: ASTM C1048, Kind FT, Condition A, Type I, Class 1 (clear), Quality-Q3, 6 mm thick unless otherwise indicated.
- O. Grommets for Cable Passage: 2-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
1. Color: Black.
- P. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA finish number indicated.
1. Satin Chromium Plated: ANSI/BHMA 626 for brass or bronze base; ANSI/BHMA 652 for steel base.
 2. Bright Chromium Plated: ANSI/BHMA 625 for brass or bronze base; ANSI/BHMA 651 for steel base.
 3. Satin Stainless Steel: ANSI/BHMA 630.
- Q. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.
- 2.6 MISCELLANEOUS MATERIALS
- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.7 FABRICATION

- A. Fabricate architectural cabinets to dimensions, profiles, and details indicated. Ease edges and corners to 1/16-inch radius unless otherwise indicated.
- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
- D. Install glass to comply with applicable requirements in Section 08 80 00 "Glazing" and in GANA's "Glazing Manual."
 1. For glass in wood frames, secure glass with removable stops.

2.8 SHOP FINISHING

- A. Finish architectural cabinets at manufacturer's shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Shop-finish transparent-finished architectural cabinets at manufacturer's shop as specified in this Section.
- C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural cabinets, as applicable to each unit of work.
 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of cabinets.
- D. Transparent Finish:
 1. Architectural Woodwork Standards Grade: Same as item to be finished.
 2. Wash Coat for Closed-Grain Woods: Apply wash-coat sealer to cabinets made from closed-grain wood before staining and finishing.
 3. Sheen: Flat, 15-30 gloss units measured on 60-degree gloss meter per ASTM D523.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION

- A. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.
- B. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails for exposed fastening, countersunk and filled flush with cabinet surface.
 - 1. For shop-finished items, use filler matching finish of items being installed.
- C. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches using concealed shims.
 - 1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 - 2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 3. Maintain veneer sequence matching of cabinets with transparent finish.
 - 4. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.
- D. Shop Finishes: Touch up finishing after installation of architectural cabinets. Fill nail holes with matching filler.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semi exposed surfaces. Touch up finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 07 01 50.19

PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of This Section Includes:

1. Full roof tear-off.
2. Temporary roofing.
3. Base flashing removal.
4. Fastener pull-out testing.
5. Disposal.

B. Related Requirements:

1. Section 01 10 00 "Summary" for use of premises and for phasing requirements.
2. Section 01 50 00 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.

1.2 ALLOWANCES

- A. Allowance for removal of existing wet insulation, and replacement with new insulation, is specified under Section 01 21 00 "Allowances."
- B. Allowance for removal of existing deteriorated metal roof deck, and replacement with new metal roof deck, is specified under Section 01 21 00 "Allowances."
- C. Allowance for removal of existing deteriorated wood nailers and curbs, and replacement with new wood, is specified under Section 01 21 00 "Allowances."
- D. Allowance for removal of existing deteriorated parapet wall sheathing, and replacement with new sheathing, is specified under Section 01 21 00 "Allowances."

1.3 DEFINITIONS

- A. EPS: Molded (expanded) polystyrene.
- B. Full Roof Tear-off: Removal of existing roofing system down to existing roof deck.
- C. OSB: Oriented strand board.
- D. Partial Roof Tear-off: Removal of selected components and accessories from existing roofing system.
- E. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.
- F. Roof Re-Cover Preparation: Existing roofing system is to remain and be prepared for new roof installed over it.

1.4 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:
 - a. Reroofing preparation, including roofing system manufacturer's written instructions.
 - b. Temporary protection requirements for existing roofing system components that are to remain.
 - c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
 - d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
 - e. Existing roof deck conditions requiring Architect notification.
 - f. Existing roof deck removal procedures and Owner notifications.
 - g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
 - h. Structural loading limitations of roof deck during reroofing.
 - i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
 - j. HVAC shutdown and sealing of air intakes.
 - k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
 - l. Asbestos removal and discovery of asbestos-containing materials.
 - m. Governing regulations and requirements for insurance and certificates if applicable.
 - n. Existing conditions that may require Architect notification before proceeding.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Temporary Roofing Submittal: Product data and description of temporary roofing system.
 - 1. If temporary roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer stating acceptance of the temporary roof and that its inclusion does not adversely affect the new roofing system's resistance to fire and wind or specified special warranty.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
 - 1. Include certificate that Installer is licensed to perform asbestos abatement.

- B. Field Test Reports: Fastener pull-out test report.
- C. Photographs or Video: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.
 - 1. Submit before Work begins.
- D. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Licensed to perform asbestos abatement in the state or jurisdiction where Project is located.
- B. Regulatory Requirements:
 - 1. Comply with governing EPA notification regulations before beginning roofing removal.
 - 2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.8 FIELD CONDITIONS

- A. Existing Roofing System: SBS-modified bituminous roofing.
- B. Owner will occupy portions of building immediately below reroofing area.
 - 1. Conduct reroofing so Owner's operations are not disrupted.
 - 2. Provide Owner with not less than 72 hours' written notice of activities that may affect Owner's operations.
 - 3. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
 - 4. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area.
 - a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
 - 1. A roof moisture survey of existing roofing system is available for Contractor's reference.

2. The results of an analysis of test cores from existing roofing system are available for Contractor's reference.
 3. Construction Drawings for existing roofing system are provided for Contractor's convenience and information, but they are not a warranty of existing conditions. They are intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.
- F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
1. Remove only as much roofing in one day as can be made watertight in the same day.
- G. Hazardous Materials:
1. It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.
 - a. Hazardous materials will be removed by Owner before start of the Work.
 - b. Existing roof will be left no less watertight than before removal.
 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
 - a. Hazardous materials will be removed by Owner under a separate contract.
 3. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - a. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - b. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.
 - c. Coordinate reroofing preparation with hazardous material remediation to prevent water from entering existing roofing system or building.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

- A. EPS Insulation: ASTM C578.
- B. Plywood: DOC PS 1, Grade CD, Exposure 1.
- C. OSB: DOC PS 2, Exposure 1.

2.2 TEMPORARY ROOFING MATERIALS

- A. Design and selection of materials for temporary roofing are Contractor's responsibilities.
- B. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft..

- C. Base Sheet: ASTM D4601/D4601M, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet.
- D. Glass-Fiber Felts: ASTM D2178/D2178M, Type IV, asphalt-impregnated, glass-fiber felt.
- E. Asphalt Primer: ASTM D41/D41M.
- F. Roofing Asphalt: ASTM D312/D312M, Type III or IV.
- G. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Approvals' RoofNav.

2.3 INFILL AND REPLACEMENT MATERIALS

- A. Use infill materials matching existing roofing system materials unless otherwise indicated.
 - 1. Infill materials are specified in Section 07 54 23 "Thermoplastic-Polyolefin (TPO) Roofing" unless otherwise indicated.
- B. Steel deck is specified in Section 05 31 00 "Steel Decking."
- C. Wood blocking, curbs, and nailers are specified in Section 06 10 00 "Rough Carpentry."
- D. Parapet sheathing is specified in Section 06 16 00 "Sheathing."
- E. Fasteners: Factory-coated steel fasteners with metal or plastic plates listed in FM Approvals' RoofNav, and acceptable to new roofing system manufacturer.

2.4 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Protect existing roofing system that is not to be reroofed.
 - 2. Loosely lay 1-inch- minimum thick, EPS insulation over existing roofing in areas not to be reroofed.
 - a. Loosely lay 15/32-inch plywood or OSB panels over EPS. Extend EPS past edges of plywood or OSB panels a minimum of 1 inch.
 - 3. Limit traffic and material storage to areas of existing roofing that have been protected.
 - 4. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.

- B. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.
- C. Shut off rooftop utilities and service piping before beginning the Work.
- D. Test existing roof drains to verify that they are not blocked or restricted.
 - 1. Immediately notify Architect of any blockages or restrictions.
- E. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
 - 1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- F. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- G. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
 - 1. Prevent debris from entering or blocking roof drains and conductors.
 - a. Use roof-drain plugs specifically designed for this purpose.
 - b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
 - a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

- A. Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing using a power broom.
- D. Full Roof Tear-off: Where indicated on Drawings, remove existing roofing and other roofing system components down to the existing roof deck or concrete fill.
 - 1. Remove substrate board, roof insulation, and cover board.
 - 2. Remove base flashings and counter flashings.
 - 3. Remove perimeter edge flashing and gravel stops.
 - 4. Remove copings.
 - 5. Remove expansion-joint covers.
 - 6. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
 - 7. Remove wood blocking, curbs, and nailers.

8. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry.
 - a. Remove unadhered bitumen, unadhered felts, and wet felts.
9. Remove excess asphalt from steel deck.
 - a. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.
10. Remove fasteners from deck.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.
 1. Do not proceed with installation until directed by Architect.
- C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.
 1. Do not proceed with installation until directed by Architect.
- D. Provide additional deck securement as indicated on Drawings.
- E. Replace steel deck as directed by Architect.
 1. Deck replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
- F. Replace plywood roof sheathing as indicated on Drawings.
- G. Replace plywood roof sheathing as directed by Architect.
 1. Roof sheathing replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

3.4 INFILL MATERIALS INSTALLATION

- A. Immediately after roof tear-off, and inspection and repair, if needed, of deck, fill in tear-off areas to match existing roofing system construction.
 1. Installation of infill materials is specified in Section 07 54 23 "Thermoplastic-Polyolefin (TPO) Roofing."
 2. Installation of wood blocking, curbs, and nailers is specified in Section 06 10 00 "Rough Carpentry."
- B. Install new roofing patch over roof infill area.
 1. If new roofing is installed the same day tear-off is made, roofing patch is not required.

3.5 TEMPORARY ROOFING

- A. Install approved temporary roofing over area to be reroofed.

- B. Install temporary roofing over area to be reroofed.
 - 1. Install two glass-fiber felts lapping each sheet 19 inches over preceding sheet.
 - 2. Embed glass-fiber felt in a solid mopping of hot roofing asphalt applied within equiviscous temperature range.
 - 3. Glaze-coat completed surface with hot roofing asphalt.
- C. Remove temporary roofing before installing new roofing.
- D. Prepare temporary roof to receive new roofing according to approved temporary roofing proposal.
 - 1. Restore temporary roofing to watertight condition.
 - 2. Obtain approval for temporary roof substrate from roofing manufacturer and Architect before installing new roof.

3.6 BASE FLASHING REMOVAL

- A. Remove existing base flashings.
 - 1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain.
 - 1. Replace metal counterflashings damaged during removal with counterflashings specified in Section 07 62 00 "Sheet Metal Flashing and Trim."
- C. Inspect parapet sheathing, wood blocking, curbs, and nailers for deterioration and damage.
 - 1. If parapet sheathing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
- D. Remove existing parapet sheathing and replace with new parapet sheathing to comply with Section 06 16 00 "Sheathing."
 - 1. If parapet framing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
- E. When directed by Architect, replace parapet framing, wood blocking, curbs, and nailers to comply with Section 05 40 00 "Cold-Formed Metal Framing." and Section 06 10 00 "Rough Carpentry."

3.7 FASTENER PULL-OUT TESTING

- A. Perform fastener pull-out tests according to SPRI FX-1, and submit test report to Architect and roofing manufacturer before installing new roofing system.
 - 1. Obtain roofing manufacturer's approval to proceed with specified fastening pattern.
 - a. Roofing manufacturer may furnish revised fastening pattern commensurate with pull-out test results.

3.8 DISPOSAL

- A. Collect demolished materials and place in containers.
 - 1. Promptly dispose of demolished materials.
 - 2. Do not allow demolished materials to accumulate on-site.
 - 3. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION

SECTION 07 11 13
BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold-applied, emulsified-asphalt dampproofing.

B. Related Requirements:

1. Section 03 30 00 "Cast-in-Place Concrete" for bituminous vapor retarders under slabs-on-grade.
2. Section 04 20 00 "Unit Masonry" for mortar parge coat on masonry surfaces.
3. Section 07 13 26 "Self-Adhering Sheet Waterproofing" for waterproofing.

1.2 ACTION SUBMITTALS

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

1.3 FIELD CONDITIONS

- A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Source Limitations: Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide auxiliary materials recommended in writing by manufacturer of primary materials.

2.2 PERFORMANCE REQUIREMENTS

- A. VOC Content: Products are to comply with VOC content limits of authorities having jurisdiction unless otherwise indicated.

2.3 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. APOC, Inc; a division of Gardner Industries.

2. Brewer Company (The).
 3. ChemMasters, Inc.
 4. Euclid Chemical Company (The); an RPM company.
 5. Henry Company.
 6. Karnak Corporation.
 7. Mar-flex Waterproofing & Building Products.
 8. Master Builders Solutions.
 9. W. R. Meadows, Inc.
- B. Trowel Coats: ASTM D1227, Type II, Class 1.
- C. Fibered Brush and Spray Coats: ASTM D1227, Type II, Class 1.
- D. Brush and Spray Coats: ASTM D1227, Type III, Class 1.
- 2.4 AUXILIARY MATERIALS
- A. Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.
 - B. Emulsified-Asphalt Primer: ASTM D1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.
 - C. Patching Compound: Epoxy or latex-modified repair mortar of type recommended in writing by dampproofing manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for surface smoothness, maximum surface moisture content, and other conditions affecting performance of the Work.
- B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for dampproofing application.
- B. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- C. Clean substrates of projections and substances detrimental to dampproofing work; fill voids, seal joints, and remove bond breakers if any.
- D. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections.

3.3 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless otherwise indicated.
 - 1. Apply dampproofing to provide continuous plane of protection.
 - 2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches over outside face of footing.
 - 1. Extend dampproofing 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
 - 2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where indicated as "reinforced," by embedding an 8-inch- wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.
- C. Where dampproofing exterior face of inner wythe of exterior masonry cavity walls, lap dampproofing at least 1/4 inch onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.
 - 1. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe.
 - 2. Lap dampproofing at least 1/4 inch onto shelf angles supporting veneer.
- D. Where dampproofing interior face of above-grade, exterior masonry walls, continue dampproofing through intersecting walls by keeping vertical mortar joints at intersection temporarily open or by dampproofing wall before constructing intersecting walls.

3.4 INSTALLATION OF COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Concrete Foundations Walls: Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft. for second coat.
- B. Masonry Backup for Masonry Veneer Assemblies: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft.
- C. Exterior Face of Inner Wythe of Cavity Walls: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft.

3.5 PROTECTION

- A. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where panels are subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 07 13 26

SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sheet waterproofing.

B. Related Requirements:

1. Section 07 95 13.16 "Exterior Expansion Joint Cover Assemblies" for exterior-wall expansion-joint assemblies that interface with waterproofing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, expansion joints, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

C. Samples: For each exposed product and for each color and texture specified, including the following products:

1. 8-by-8-inch square of waterproofing and flashing sheet.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Research Reports: For modified bituminous sheet waterproofing/termite barrier, showing compliance with ICC AC380.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

- B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.
 - 1. Build for each typical waterproofing installation including accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.
 - a. Size: As indicated on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
 - 1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.6 WARRANTY

- A. Manufacturer's Warranty:
 - 1. Waterproofing Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
 - a. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials from single source from single manufacturer.

2.2 SHEET WATERPROOFING

- A. Modified Bituminous Sheet Waterproofing: Minimum 60-mil nominal thickness, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated on one side to a 4-mil- thick, polyethylene-film reinforcement, and with release liner on adhesive side.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Hydrotech, Inc.
 - b. CETCO is a subsidiary of Minerals Technologies Inc.
 - c. Carlisle Coatings & Waterproofing Inc.
 - d. GCP Applied Technologies Inc.
 - e. Henry Company.

- f. Mar-flex Waterproofing & Building Products.
 - g. Polyguard Products, Inc.
 - h. Protecto Wrap Company.
 - i. Soprema, Inc.
 - j. Tamko Building Products LLC.
 - k. W. R. Meadows, Inc.
 - l. York Manufacturing, Inc.
2. Physical Properties:
- a. Tensile Strength, Membrane: 250 psi minimum; ASTM D412, Die C, modified.
 - b. Ultimate Elongation: 300 percent minimum; ASTM D412, Die C, modified.
 - c. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D1970/D1970M.
 - d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch movement; ASTM C836/C836M.
 - e. Puncture Resistance: 40 lbf minimum; ASTM E154/E154M.
 - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D570.
 - g. Water Vapor Permeance: 0.05 perm maximum; ASTM E96/E96M, Water Method.
 - h. Hydrostatic-Head Resistance: 200 feet minimum; ASTM D5385.
3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.3 ACCESSORIES

- A. Furnish accessory materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
 - 1. Furnish liquid-type accessory materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne primer recommended for substrate by sheet waterproofing material manufacturer.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet waterproofing material manufacturer.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
- E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.
- F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch, predrilled at 9-inch centers.
- G. Protection Course, Asphaltic: ASTM D6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
 - 1. Thickness: Nominal 1/8 inch for vertical applications; 1/4 inch elsewhere.

2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of waterproofing.
 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method in accordance with ASTM D4263.
 3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections.
- E. Fill form tie holes, honeycomb, aggregate pockets, holes, and other voids.
- F. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks in accordance with ASTM D4258.
 1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.
- G. Bridge and cover isolation joints, expansion joints, and discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips of widths according to manufacturer's written instructions.
 1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.
- H. Corners: Prepare, prime, and treat inside and outside corners in accordance with manufacturer's instructions.
 1. Install membrane strips centered over vertical inside corners. Install 3/4-inch fillets of liquid membrane on horizontal inside corners and as follows:

- a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
 - I. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions.
- 3.3 INSTALLATION OF SHEET WATERPROOFING
- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions.
 - B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
 - C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
 1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F.
 - D. Two-Ply Application: Install sheets to form a membrane with lap widths not less than 50 percent of sheet widths, to provide a minimum of two thicknesses of sheet membrane over areas to receive waterproofing.
 - E. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.
 - F. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
 - G. Seal edges of sheet waterproofing terminations with termination bar and sealant.
 - H. Install sheet waterproofing and accessory materials to tie into adjacent waterproofing.
 - I. Roll waterproofing membrane to firmly adhere to substrate. Roll seams and terminations.
 - J. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.
 - K. Immediately install protection course with butted joints over waterproofing membrane.
- 3.4 FIELD QUALITY CONTROL
- A. Testing Agency: Owner will engage a qualified testing agency to perform tests, and to furnish reports to Architect.
 - B. Waterproofing will be considered defective if it does not pass tests and inspections.

3.5 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mineral-wool board insulation.

B. Related Requirements:

1. Section 06 16 00 "Sheathing" for foam-plastic board sheathing installed directly over wood or steel framing.
2. Section 07 54 23 "Thermoplastic-Polyolefin (TPO) Roofing" for insulation specified as part of roofing construction.
3. Section 09 29 00 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Mineral-wool board insulation.

1.3 INFORMATIONAL SUBMITTALS

A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.

1. Sign, date, and post the certification in a conspicuous location on Project site.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Research Reports: For foam-plastic insulation, from ICC-ES.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 MINERAL-WOOL BOARD INSULATION

- A. Mineral-Wool Board Insulation, Type II, Unfaced: ASTM C612, Type II; passing ASTM E136 for combustion characteristics.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. Rockwool International.
 - c. Thermafiber, Inc.; an Owens Corning company.
 - 2. Nominal Density: 6 lb/cu. ft.
 - 3. Flame-Spread Index: Not more than 15 when tested in accordance with ASTM E84.
 - 4. Smoke-Developed Index: Not more than zero when tested in accordance with ASTM E84.
 - 5. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

2.2 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AGM Industries, Inc.
 - b. Gemco.
 - 2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 - 3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
- B. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AGM Industries, Inc.
 - b. Gemco.
- C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AGM Industries, Inc.
 - b. Gemco.

2.3 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Install insulation with manufacturer's R-value label exposed after insulation is installed.
- D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.
- F. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

- A. Mineral-Wool Board Insulation: Install insulation fasteners 4 inches from each corner of board insulation, at center of board, and as recommended by manufacturer.
 1. Fit courses of insulation between masonry wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.

2. Press units firmly against inside substrates.

3.4 INSTALLATION OF CURTAIN-WALL INSULATION

- A. Install board insulation in curtain-wall construction according to curtain-wall manufacturer's written instructions.
 1. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass.
 2. Maintain cavity width of dimension indicated on Drawings between insulation and glass.
 3. Install insulation to fit snugly without bowing.

3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 07 24 19

WATER-DRAINAGE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. EIFS-clad drainage-wall assemblies that are field applied over substrate.

B. Related Requirements:

1. Section 07 27 26 "Fluid-Applied Membrane Air Barriers" for fluid-applied, synthetic polymer air barriers applied over sheathing behind EIFS-clad wall assemblies.

1.2 DEFINITIONS

A. Definitions in ASTM E 2110 apply to Work of this Section.

B. EIFS: Exterior insulation and finish system(s).

C. IBC: International Building Code.

1.3 ACTION SUBMITTALS

A. Product Data: For each EIFS component, trim, and accessory.

B. Shop Drawings:

1. Include details for EIFS buildouts.
2. Include details for parapet cap flashing.

C. Samples: For each exposed product and for each color and texture specified, 8 inches in size.

D. Samples for Initial Selection: For each type of finish-coat color and texture indicated.

1. Include similar Samples of exposed accessories involving color selection.

1.4 INFORMATIONAL SUBMITTALS

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For EIFS to include in maintenance manuals.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.
- B. Store materials inside and under cover; keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.
 - 1. Stack insulation board flat and off the ground.
 - 2. Protect plastic insulation against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
 - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air, humidity, and substrate temperatures permit EIFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.
 - 1. Proceed with installation of adhesives or coatings only when ambient temperatures have remained, or are forecast to remain, above 40 deg F (4.4 deg C) for a minimum of 24 hours before, during, and after application. Do not apply EIFS adhesives or coatings during rainfall.

1.8 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of EIFS-clad drainage-wall assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Bond integrity and weathertightness.
 - b. Deterioration of EIFS finishes and other EIFS materials beyond normal weathering.
 - 2. Warranty coverage includes the following components of EIFS-clad drainage-wall assemblies:
 - a. EIFS finish, including base coats, finish coats, and reinforcing mesh.
 - b. Insulation installed as part of EIFS including foam buildouts.
 - c. Insulation adhesive and mechanical fasteners.
 - d. EIFS accessories, including trim components and flashing.
 - e. EIFS drainage components.
 - 3. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Sto Corp; StoTherm ci Classic, or comparable product by one of the following:
1. Acrocrete; BASF Corp.
 2. BASF Corporation; Wall Systems.
 3. Dryvit Systems, Inc.
 4. Finestone; BASF Corp.
 5. Master Wall Inc.
 6. Omega Products International, Inc.
 7. Parex USA, Inc.
 8. Pleko LLC.
 9. Senergy; BASF Corp.
 10. Stuc-O-Flex International, Inc.
 11. Total Wall, Inc.
- B. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with EIFS components.

2.2 PERFORMANCE REQUIREMENTS

- A. EIFS Performance: Comply with ASTM E 2568 and with the following:
1. Weathertightness: Resistant to uncontrolled water penetration from exterior, with a means to drain water entering EIFS to the exterior.
 2. Structural Performance of Assembly and Components:
 - a. Wind Loads: Uniform pressure as indicated on Drawings.
 3. Impact Performance: ASTM E 2568, High impact resistance.
 4. Abrasion Resistance of Finish Coat: Sample consisting of 1-inch-thick EIFS mounted on 1/2-inch-thick gypsum board; cured for a minimum of 28 days and shows no cracking, checking, or loss of film integrity after exposure to 528 quarts of sand when tested according to ASTM D 968, Method A.
 5. Mildew Resistance of Finish Coat: Sample applied to 2-by-2-inch clean glass substrate; cured for 28 days and shows no growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274.
 6. Drainage Efficiency: 90 percent average minimum when tested according to ASTM E 2273.

2.3 EIFS MATERIALS

- A. Water-Resistive Barrier Coating: EIFS manufacturer's standard formulation and accessories for use as water-resistive barrier coating; compatible with substrate.
 - 1. Water-Resistance: Comply with physical and performance criteria of ASTM E 2570/E 2570M.
- B. Flexible-Membrane Flashing: Cold-applied, self-adhering, self-healing, rubberized-asphalt, and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.
- C. Insulation Adhesive: EIFS manufacturer's standard formulation designed for indicated use; [specifically formulated to be applied to back side of insulation in a manner that creates open vertical channels designed to serve as an integral part of the water-drainage system of the EIFS-clad drainage-wall assembly;]compatible with substrate; and complying with[one of] the following:
 - 1. Factory-mixed noncementitious formulation designed for adhesive attachment of insulation to substrates of type indicated, as recommended by EIFS manufacturer.
- D. Molded, (Expanded) Rigid Cellular Polystyrene Board Insulation: Comply with ASTM E 2430/E 2430M, unless otherwise noted, and the following:
 - 1. Flame-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, according to ASTM E 84.
 - 2. Dimensions: Provide insulation boards of not more than 24 by 48 inches, with thickness indicated on Drawings.
 - 3. Channeled Board Insulation: EIFS manufacturer's standard factory-fabricated profile with linear, vertical-drainage channels, slots, or waves on the back side of board.
 - 4. Foam Buildouts: Provide with profiles and dimensions indicated on Drawings.
- E. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multiend strands with retained mesh tensile strength of not less than 120 lbf/in. according to ASTM E 2098/E 2098M and the following:
 - 1. Reinforcing Mesh for EIFS, General: Not less than weight required to comply with impact-performance level specified in "Performance Requirements" Article.
 - 2. Strip-Reinforcing Mesh: As recommended by EIFS manufacturer.
 - 3. Detail-Reinforcing Mesh: As recommended by EIFS manufacturer.
 - 4. Corner-Reinforcing Mesh: As recommended by EIFS manufacturer.
- F. Base Coat: EIFS manufacturer's standard mixture complying with the following:
 - 1. Factory-mixed noncementitious formulation of polymer-emulsion adhesive and inert fillers that is ready to use without adding other materials.
- G. Water-Resistant Base Coat: EIFS manufacturer's standard water-resistant formulation complying with the following:

1. Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.
 - H. Mechanical Fasteners: EIFS manufacturer's standard corrosion-resistant fasteners, consisting of thermal cap, standard washer and shaft attachments, and fastener indicated below; designed to resist Project's design loads; capable of pulling fastener head below surface of insulation board; and complying with the following:
 1. For attachment to steel studs from 0.033 to 0.112 inch in thickness, provide steel drill screws complying with ASTM C 954.
 - I. Primer: EIFS manufacturer's standard factory-mixed, elastomeric-polymer primer for preparing base-coat surface for application of finish coat.
 - J. Finish Coat: EIFS manufacturer's standard acrylic-based coating with enhanced mildew resistance complying with the following:
 1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.
 2. Colors: As selected by Architect from manufacturer's full range.
 3. Textures: As selected by Architect from manufacturer's full range.
 - K. Sealer: Manufacturer's waterproof, clear acrylic-based sealer for protecting finish coat.
 - L. Water: Potable.
- 2.4 MIXING
- A. Comply with EIFS manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials, except as recommended by EIFS manufacturer. Mix materials in clean containers. Use materials within time period specified by EIFS manufacturer or discard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
 1. Begin coating application only after surfaces are dry.
 2. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
- B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind drainage plane of EIFS and deterioration of substrates.
- C. Prepare and clean substrates to comply with EIFS manufacturer's written instructions to obtain optimum bond between substrate and adhesive for insulation.
 - 1. Concrete Substrates: Provide clean, dry, neutral-pH substrate for insulation installation. Verify suitability of substrate by performing bond and moisture tests recommended by EIFS manufacturer.

3.3 EIFS INSTALLATION, GENERAL

- A. Comply with ASTM C 1397, ASTM E 2511, and EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate indicated.

3.4 SUBSTRATE PROTECTION APPLICATION

- A. Water-Resistive Barrier Coating: Apply over sheathing to provide a water-resistive barrier.
 - 1. Tape and seal joints, exposed edges, terminations, and inside and outside corners of sheathing unless otherwise indicated by EIFS manufacturer's written instructions.
- B. Flexible-Membrane Flashing: Install over water-resistive barrier coating, applied and lapped to shed water; seal at openings, penetrations, and terminations. Prime substrates with flashing primer if required and install flashing.

3.5 INSULATION INSTALLATION

- A. Board Insulation: Adhesively and mechanically attach insulation to substrate in compliance with ASTM C 1397 and the following:
 - 1. Press and slide insulation into place. Apply pressure over entire surface of insulation to accomplish uniform contact, high initial grab, and overall level surface.
 - 2. Mechanically attach insulation to substrate. Install top surface of fastener heads flush with plane of insulation. Install fasteners into or through substrates with the following minimum penetration:
 - a. Steel Framing: 5/16 inch.
 - 3. Apply insulation over substrates in courses with long edges of boards oriented horizontally.
 - 4. Begin first course of insulation from a level base line and work upward.
 - 5. Stagger vertical joints of insulation boards in successive courses to produce running bond pattern. Locate joints, so no piece of insulation is less than 12

- inches wide or 6 inches high. Offset joints not less than 6 inches from corners of window and door openings and not less than 4 inches from aesthetic reveals.
- a. Adhesive Attachment: Offset joints of insulation not less than 6 inches from horizontal and 4 inches from vertical joints in sheathing.
 - b. Mechanical Attachment: Offset joints of insulation from horizontal joints in sheathing.
6. Apply channeled insulation, with drainage channels aligned vertically.
 7. Interlock ends at internal and external corners.
 8. Abut insulation tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between boards. If gaps greater than 1/16 inch occur, fill with insulation cut to fit gaps exactly; insert insulation without using adhesive or other material.
 9. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes complying with details indicated.
 10. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/16-inch from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch. Prevent airborne dispersal and immediately collect insulation raspings or sandings.
 11. Cut aesthetic reveals in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that comply with profiles and locations indicated. Do not reduce insulation thickness at aesthetic reveals to less than 3/4 inch.
 12. Install foam buildouts and attach to structural substrate by adhesive and mechanical fastening.
 13. Interrupt insulation for expansion joints where indicated.
 14. Form joints for sealant application by leaving gaps between adjoining insulation edges and between insulation edges and dissimilar adjoining surfaces. Make gaps wide enough to produce joint widths indicated after encapsulating joint substrates with base coat and reinforcing mesh.
 15. Form joints for sealant application with back-to-back casing beads for joints within EIFS and with perimeter casing beads at dissimilar adjoining surfaces. Make gaps between casing beads and between perimeter casing beads and adjoining surfaces of width indicated.
 16. Before installing insulation and before applying field-applied reinforcing mesh, fully wrap board edges. Cover edges of board and extend encapsulating mesh not less than 2-1/2 inches over front and back face unless otherwise indicated on Drawings.
 17. Treat exposed edges of insulation as follows:
 - a. Except for edges forming substrates of sealant joints, encapsulate with base coat, reinforcing mesh, and finish coat.
 - b. Encapsulate edges forming substrates of sealant joints within EIFS or between EIFS and other work with base coat and reinforcing mesh.

- c. At edges trimmed by accessories, extend base coat, reinforcing mesh, and finish coat over face leg of accessories.
 18. Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and water-resistive barrier coating.
 - B. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, and as follows:
 1. At expansion joints in substrates behind EIFS.
 2. Where EIFS adjoin dissimilar substrates, materials, and construction, including other EIFS.
 3. At floor lines in multilevel wood-framed construction.
 4. Where wall height or building shape changes.
 5. Where EIFS manufacturer requires joints in long continuous elevations.
- 3.6 BASE-COAT APPLICATION
- A. Base Coat: Apply full coverage to exposed insulation with not less than 1/16-inch dry-coat thickness.
 - B. Reinforcing Mesh: Embed reinforcing mesh in wet base coat to produce wrinkle-free installation with mesh continuous at corners, overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C 1397. Do not lap reinforcing mesh within 8 inches of corners. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are invisible.
- 3.7 FINISH-COAT APPLICATION
- A. Primer: Apply over dry base coat.
 - B. Finish Coat: Apply full-thickness coverage over dry primed base coat, maintaining a wet edge at all times for uniform appearance, to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.
 1. Embed aggregate in finish coat to produce a uniform applied-aggregate finish of color and texture matching approved sample.
 - C. Sealer Coat: Apply over dry finish coat, in number of coats and thickness required by EIFS manufacturer.
- 3.8 FIELD QUALITY CONTROL
- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 1. Water-resistive barrier coatings applied over sheathing.
 - B. EIFS will be considered defective if it does not pass tests and inspections.
 - C. Prepare test and inspection reports.

3.9 CLEANING AND PROTECTION

- A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive EIFS coatings.

END OF SECTION

SECTION 07 27 26

FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vapor-permeable, fluid-applied air barriers.
- B. Related Requirements:
 - 1. Section 06 16 00 "Sheathing" for wall sheathings and wall sheathing joint-and-penetration treatments.

1.2 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.
- B. Shop Drawings: For air-barrier assemblies.
 - 1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions.
 - 2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - 3. Include details of interfaces with other materials that form part of air barrier.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer. Include list of ABAA-certified installers and supervisors employed by Installer, who work on Project.

- B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
 - 1. Installer to be licensed by ABAA according to ABAA's Quality Assurance Program and to employ ABAA-certified installers and supervisors on Project.
- B. Mockups: Build mockups to set quality standards for materials and execution.
 - 1. Build integrated mockups of exterior wall assembly as indicated on Drawings, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.
 - 1. Protect substrates from environmental conditions that affect air-barrier performance.
 - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.
- B. Low-Emitting Materials: Verify products comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction to be capable of performing as a continuous air barrier. Air-barrier assemblies to be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E2357.

2.3 HIGH-BUILD AIR BARRIERS, VAPOR PERMEABLE

- A. High-Build, Vapor-Permeable Air Barrier Modified Bituminous Type: Modified Bituminous membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrates.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Mar-flex Waterproofing & Building Products.
 - b. Tremco Incorporated.
- B. High-Build, Vapor-Permeable Air Barrier Synthetic Polymer Type: Synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrates.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. DuPont de Nemours, Inc.
 - b. GCP Applied Technologies Inc.
 - c. Henry Company.
 - d. Tremco Incorporated.
- C. Physical and Performance Properties:
 - 1. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E2178.
 - 2. Vapor Permeance: Minimum 5 perms; ASTM E96/E96M, Procedure A, Desiccant Method.

3. Ultimate Elongation: Minimum 200 percent; ASTM D412, Die C.
4. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D4541.
5. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
6. UV Resistance: Can be exposed to sunlight for 30 days according to manufacturer's written instructions.

2.4 ACCESSORY MATERIALS

- A. Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.
- B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer.
- C. Stainless Steel Sheet: ASTM A240/A240M, Type 304, 0.0187 inch thick, and Series 300 stainless steel fasteners.
- D. Preformed Silicone Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. GE Construction Sealants; Momentive Performance Materials Inc.
 - b. Pecora Corporation.
 - c. The Dow Chemical Company.
 - d. Tremco Incorporated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
 3. Verify that substrates are visibly dry and free of moisture.
 4. Verify that masonry joints are flush and completely filled with mortar.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.
- H. Bridge expansion joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

3.3 ACCESSORIES INSTALLATION

- A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
 - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
 - 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.

- D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
 - E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
 - 1. Transition Strip: Roll firmly to enhance adhesion.
 - 2. Preformed Silicone Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.
 - F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
 - G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
 - H. Seal top of through-wall flashings to air barrier with an additional 6-inch- wide, transition strip.
 - I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
 - J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.
- 3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION
- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.
 - B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.
 - 1. Vapor-Permeable, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils, applied in one or more equal coats.
 - C. Do not cover air barrier until it has been tested and inspected by testing agency.
 - D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

- A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Air-barrier dry film thickness.
 - 3. Continuous structural support of air-barrier system has been provided.
 - 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 - 5. Site conditions for application temperature and dryness of substrates have been maintained.
 - 6. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 7. Surfaces have been primed, if applicable.
 - 8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 - 9. Termination mastic has been applied on cut edges.
 - 10. Strips and transition strips have been firmly adhered to substrate.
 - 11. Compatible materials have been used.
 - 12. Transitions at changes in direction and structural support at gaps have been provided.
 - 13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
 - 14. All penetrations have been sealed.
- D. Tests: As determined by testing agency from among the following tests:
 - 1. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E1186, chamber pressurization or depressurization with smoke tracers.
 - 2. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D4541 for each 600 sq. ft. of installed air barrier or part thereof.
- E. Air barriers will be considered defective if they do not pass tests and inspections.
 - 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.

2. Remove and replace deficient air-barrier components for retesting as specified above.
- F. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
 - G. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION

SECTION 07 42 13.13

FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concealed-fastener, lap-seam metal wall panels.

B. Related Requirements:

1. Section 07 42 13.23 "Metal Composite Material Wall Panels" for metal-faced composite wall panels.
2. Section 07 42 93 "Soffit Panels" for metal panels used in horizontal soffit applications.

1.2 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

1. Concealed-fastener, lap-seam metal wall panels.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For concealed-fastener, lap-seam metal wall panels, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.

1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.8 COORDINATION

- A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.

- c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
 1. Wind Loads: As indicated on Drawings.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- C. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

- A. Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.
- B. MWP-1, Flush-Profile, Concealed-Fastener Metal Wall Panels: Formed with vertical panel edges and flat pan between panel edges; with flush joint between panels.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide PAC-CLAD; Petersen Aluminum Corporation; Precision Series; HWP profile or comparable product by one of the following:
 - a. AEP Span a brand of ASC Profiles LLC, a part of BlueScope.
 - b. ATAS International, Inc.
 - c. Architectural Building Components.
 - d. Berridge Manufacturing Company.
 - e. CENTRIA Architectural Systems.
 - f. Dimensional Metals, Inc.
 - g. Fabral; a brand of OmniMax International.
 - h. MBCI; Cornerstone Building Brands.
 - i. Metal Sales Manufacturing Corporation.
 - j. Morin - A Kingspan Group Company.
 - k. Ultra Seam, Inc.

2. Aluminum Sheet: Coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 - a. Thickness: 0.032 inch.
 - b. Surface: Smooth, flat finish.
 - c. Exterior Finish: Three-coat fluoropolymer.
 - d. Color: As selected by Architect from manufacturer's full range.
3. Panel Coverage: 12 inches.
4. Panel Height: 7/8 inch.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

- A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. 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.
- C. Aluminum Panels and Accessories:
 - 1. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 - 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF METAL PANELS

- A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Shim or otherwise plumb substrates receiving metal panels.
 - 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.

3. Install screw fasteners in predrilled holes.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Install flashing and trim as metal panel work proceeds.
 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
- B. Fasteners:
1. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
 5. Flash and seal panels with weather closures at perimeter of all openings.
- E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.
- F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 42 13.23

METAL COMPOSITE MATERIAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal composite material (MCM) panels.

1.2 DEFINITIONS

- A. MCM: Metal composite material; cladding material formed by joining two thin metal skins to polyethylene or fire-retardant core and bonded under precise temperature, pressure, and tension.

1.3 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel, system, and accessory.
 - 1. Metal composite material (MCM) panels.
- B. Shop Drawings:
 - 1. Include fabrication and installation layouts of MCM system; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, accessories, and special details.
 - 2. Accessories: Include details of flashing, trim, and anchorage, at a scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Initial Selection: For each type of MCM panel indicated, with factory-applied color finishes.
 - 1. Size: Manufacturers' standard size.
 - 2. Include Samples of trim and accessories involving color selection.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For MCM panels.
- B. Warranty Documentation:
 - 1. Manufacturers' special warranties.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 years' experience.

- B. Fabricator Qualifications: Approved by MCM panel manufacturer.

1.6 MOCKUPS

- A. Build mockups to demonstrate aesthetic effects.
 - 1. Build mockup as indicated on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, MCM panels, and other manufactured items so as not to be damaged or deformed. Package MCM panels for protection during transportation and handling.
- B. Unload, store, and erect MCM panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack MCM panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store MCM panels to ensure dryness, with positive slope for drainage of water. Do not store MCM panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on MCM panels during installation.

1.8 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of MCM panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

- A. Coordinate MCM panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

- A. Panel Integrity Warranty: Manufacturer agrees to repair or replace components of MCM panels that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: 10 years from date of Substantial Completion.
- B. Panel Finish Warranty: Manufacturer agrees to repair finish or replace MCM panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: **10** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: MCM systems to withstand the effects of the following loads, based on testing in accordance with ASTM E330/E330M:
 1. Wind Loads: As indicated on Drawings.
 2. Deflection Limits: For wind loads, no greater than 1/240 of the span.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested in accordance with ASTM E283/E283M at the following test-pressure difference:
 1. Test-Pressure Difference: 1.57 lbf/sq. ft.
 2. ASTM E331 in "Water Penetration under Static Pressure" Paragraph below indicates that "water contained within drainage flashings, gutters, and sills is not considered failure."
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METAL COMPOSITE MATERIAL (MCM) WALL PANELS

- A. Metal Composite Material (MCM) Wall Panels: Provide MCM panels fabricated from two metal facings bonded to a solid, extruded thermoplastic core.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide ALUCOBOND; 3A Composites USA, Inc. or comparable product by one of the following:
 - a. ALPOLIC Materials; Mitsubishi Chemical Composites.
 - b. Alcotex Inc.
 - c. Alfrex, LLC.
 - d. Alucoil North America.
 - e. Arconic.
 - f. Fairview Architectural North America.
 - g. VM Building Solutions USA; Umicore Building Products USA, Inc.
 2. Core: FR.
 3. Panel Thickness: 0.157 inch.

4. Bond Strength: 22.5 in-lb/in. when tested for bond integrity in accordance with ASTM D1781.
5. Fire Performance: Flame-spread index less than 25 and smoke-developed index less than 450, in accordance with ASTM E84 or UL 723.

B. MCM Panel Materials:

1. Aluminum-Faced Panels: ASTM B209/B209M alloy as standard with manufacturer, temper as required to suit finish and forming operations 3003, H14 with 0.020-inch-thick, aluminum sheet facings.
 - a. Exterior Finish: FEVE fluoropolymer.
 - 1) Color: As selected by Architect from manufacturer's full range.

2.3 ACCESSORIES

- A. Metal Subframing and Furring: ASTM C955 cold-formed, metallic-coated steel sheet ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of MCM system.
- B. System Accessories: Provide components required for a complete, weathertight wall system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of MCM panels unless otherwise indicated.
- C. Flashing and Trim: Provide flashing and trim formed from same material as MCM panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent MCM panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Use gasketed or approved coated fasteners between dissimilar metals.
 1. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
 2. Provide exposed fasteners with heads matching color of MCM panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in MCM panels and remain weathertight; and as recommended in writing by MCM system manufacturer.

2.4 FABRICATION

- A. Fabricate and finish MCM panels at the factory, by panel manufacturer's standard procedures and processes, as necessary to fulfill indicated panel performance requirements demonstrated by laboratory testing.

- B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams.
 4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal manufacturer for application, but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Coil-Coated Metal Finish:
1. FEVE Fluoropolymer: AAMA 2605, two-coat fluoropolymer finish containing 100 percent FEVE resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, MCM system supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by MCM system manufacturer.
 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by MCM system manufacturer.
- B. Examine roughing-in for components and assemblies penetrating MCM system to verify actual locations of penetrations relative to seam locations of MCM panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION TOLERANCES

- A. Shim and align MCM panels within installed tolerance of 1/4 inch in 20 ft. non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.3 CLEANING

- A. Remove temporary protective coverings and strippable films as MCM panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, clean finished surfaces as recommended by MCM panel manufacturer. Maintain in a clean condition during construction.
- B. After installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

3.4 PROTECTION

- A. Replace MCM panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 42 93

SOFFIT PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal soffit panels.

B. Related Sections:

1. Section 07 42 13.13 "Formed Metal Wall Panels" for lap-seam metal wall panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof eave and soffit as shown on Drawings; including attachments and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.

1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.8 COORDINATION

- A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
 1. Wind Loads: As indicated on Drawings.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METAL SOFFIT PANELS

- A. Provide metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. MSP, Flush-Profile Metal Soffit Panels: Solid panels formed with vertical panel edges and a flat pan between panel edges; with flush joint between panels.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AEP Span; A BlueScope Steel Company.
 - b. Architectural Building Components.
 - c. ATAS International, Inc.
 - d. Berridge Manufacturing Company.
 - e. CENTRIA Architectural Systems.
 - f. Dimensional Metals, Inc.
 - g. Drexel Metals.
 - h. Englert, Inc.

- i. Fabral.
- j. Firestone Building Products.
- k. Innovative Metals Company, Inc.
- l. MBCI.
- m. McElroy Metal, Inc.
- n. Merchant and Evans.
- o. Metal Sales Manufacturing Corporation.
- p. PAC-CLAD; Petersen Aluminum Corporation.
- q. Ultra Seam Incorporated.

2. Material: Same material, finish, and color as metal wall panels.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 - 1. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
 - 2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

- A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal soffit panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. 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.

C. Aluminum Panels and Accessories:

1. FEVE Fluoropolymer: AAMA 2605. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether (FEVE) resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal panel manufacturer.
 2. Examine sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal panel manufacturer.
 - a. Verify that air- or water-resistive barriers been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.
 1. Soffit Framing: Wire tie[or clip] furring channels to supports[, as required to comply with requirements for assemblies indicated].

3.3 INSTALLATION

- A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 1. Shim or otherwise plumb substrates receiving metal panels.

2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 3. Install screw fasteners in predrilled holes.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Install flashing and trim as metal panel work proceeds.
 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
1. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
1. Apply panels and associated items true to line for neat and weathertight enclosure.
 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
- E. Watertight Installation:
1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.
 2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 3. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and

similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
1. Install exposed flashing and trim that is without buckling, and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 54 23

THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanically fastened thermoplastic polyolefin (TPO) roofing system.
2. Accessory roofing materials.
3. Substrate board.
4. Roof insulation.
5. Insulation accessories and cover board.
6. Asphalt materials.
7. Walkways.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
2. Section 07 62 00 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
3. Section 07 71 00 "Roof Specialties" for manufactured copings and roof edge flashings.
4. Section 07 71 29 "Manufactured Roof Expansion Joints" for manufactured roof expansion-joint assemblies.
5. Section 07 92 00 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
6. Section 22 14 23 "Storm Drainage Piping Specialties" for roof drains.
7. Section includes installation of sound-absorbing insulation strips in ribs of roof deck. Sound-absorbing insulation strips are furnished under Section 05 31 00 "Steel Decking."

1.2 DEFINITIONS

- ###### A. Roofing Terminology: Definitions in ASTM D1079 and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

1.3 PREINSTALLATION MEETINGS

- ###### A. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
 1. Layout and thickness of insulation.
 2. Base flashings and membrane termination details.
 3. Flashing details at penetrations.
 4. Tapered insulation layout, thickness, and slopes.
 5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings.
 6. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 1. Roof membrane and flashings, of color required.
 2. Walkway pads or rolls, of color required.
- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Manufacturer Certificates:
 - 1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of compliance with performance requirements.
 - 2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.
- C. Product Test Reports: For roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.
- D. Evaluation Reports: For components of roofing system, from ICC-ES.
- E. Field quality-control reports.
- F. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturers: A qualified manufacturer that is UL listed for roofing system identical to that used for this Project.
 - 2. Installers: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with

insulation manufacturer's written instructions for handling, storing, and protecting during installation.

- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, cover boards, substrate board, and other components of roofing system.
 - 2. Warranty Period: 20 years from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section, including all components of roofing system such as roof membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, and walkway products, for the following warranty period:
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings to remain watertight.
 - 1. Accelerated Weathering: Roof to withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 - 2. Impact Resistance: Roof membrane to resist impact damage when tested according to ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to local building code requirements using ASCE 7-10.
 - 1. Wind Design Speed: 115 mph.

2. Risk Category: II
 3. Exposure Rating: C 4.
 4. Building Category: Enclosed
- D. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A ; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

- A. TPO Sheet: ASTM D6878/D6878M, internally fabric- or scrim-reinforced, fabric-backed TPO sheet.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle Syntec Systems.
 - b. Firestone Building Products.
 - c. GAF.
 - d. Johns Manville; a Berkshire Hathaway company.
 2. Source Limitations: Obtain components for roofing system from roof membrane manufacturer or manufacturers approved by roof membrane manufacturer.
 3. Thickness: 60 mils, nominal.
 4. Exposed Face Color: White.

2.3 ACCESSORY ROOFING MATERIALS

- A. General: Accessory materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
- B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 60 mils thick, minimum, of same color as TPO sheet.
- C. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- D. Bonding Adhesive: Manufacturer's standard, water based.
- E. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate, and acceptable to roofing system manufacturer.
- G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.4 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by TPO roof membrane manufacturer.

- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle SynTec Incorporated.
 - b. Firestone Building Products.
 - c. GAF.
 - d. Johns Manville; a Berkshire Hathaway company.
 - 2. Compressive Strength: 20 psi.
 - 3. Size: 48 by 96 inches.
 - 4. Thickness:
 - a. Base Layer: 4 inches minimum at roof drains.
- C. Tapered Insulation: Provide factory-tapered insulation boards.
 - 1. Material: Match roof insulation.
 - 2. Minimum Thickness: 1/4 inch.
 - 3. Slope:
 - a. Roof Field: 1/4 inch per foot unless otherwise indicated on Drawings.
 - b. Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.

2.5 INSULATION ACCESSORIES AND COVER BOARD

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.
- B. Fasteners: Factory-coated steel fasteners with metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 - 1. Full-spread, spray-applied, low-rise, two-component urethane adhesive.
- D. Glass-Mat Gypsum Cover Board: ASTM C1177/C1177M, water-resistant gypsum board.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Georgia-Pacific Gypsum LLC.
 - b. National Gypsum Company.
 - c. USG Corporation.
 - 2. Thickness: 1/2 inch .
 - 3. Surface Finish: Factory primed.
- E. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric; water permeable and resistant to UV degradation; type and weight as recommended by roofing system manufacturer for application.

2.6 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch thick and acceptable to roofing system manufacturer.
 - 1. Size: Approximately 36 by 60 inches.
 - 2. Color: Contrasting with roof membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 05 31 00 "Steel Decking."
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION OF ROOFING, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions and approved submittals. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning Work on adjoining roofing.
- B. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition.
- C. Coordinate installation and transition of roofing system component serving as an air barrier with air barrier specified under Section 07 27 26 "Fluid-Applied Membrane Air Barriers."

3.4 INSTALLATION OF INSULATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and roof insulation manufacturer's written instructions for installing roof insulation.
- C. Installation Over Metal Decking:
 - 1. Install base layer of insulation with end joints staggered not less than 12 inches in adjacent rows.
 - a. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
 - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
 - 1) Trim insulation so that water flow is unrestricted.
 - e. Fill gaps exceeding 1/4 inch with insulation.
 - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - g. Mechanically attach base layer of insulation and substrate board using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.
 - 1) Fasten insulation according to requirements in approved submittals.
 - 2) Fasten insulation to resist specified uplift pressure at corners, perimeter, and field of roof.
 - 2. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
 - a. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
 - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
 - 1) Trim insulation so that water flow is unrestricted.
 - e. Fill gaps exceeding 1/4 inch with insulation.
 - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - g. Adhere each layer of insulation to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:

- 1) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 2. At internal roof drains, conform to slope of drain sump.
 - a. Trim cover board so that water flow is unrestricted.
 3. Cut and fit cover board tight to nailers, projections, and penetrations.
 4. Loosely lay cover board over substrate.
 5. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - a. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.6 INSTALLATION OF MECHANICALLY FASTENED ROOF MEMBRANE

- A. Mechanically fasten roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roof membrane and allow to relax before installing.
- C. For in-splice attachment, install roof membrane with long dimension perpendicular to steel roof deck flutes.
- D. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- E. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- F. Mechanically fasten or adhere roof membrane securely at terminations, penetrations, and perimeter of roofing.
- G. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- H. In-Seam Attachment: Secure one edge of TPO sheet using fastening plates or metal battens centered within seam, and mechanically fasten TPO sheet to roof deck.
- I. Seams: Clean seam areas, overlap roof membrane, and hot-air weld side and end laps of roof membrane and sheet flashings to ensure a watertight seam installation.
 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof membrane and flashing sheet.

2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- J. Spread sealant bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.7 INSTALLATION OF BASE FLASHING

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 INSTALLATION OF WALKWAYS

- A. Flexible Walkways:
 1. Install flexible walkways at the following locations:
 - a. Retain one or more subparagraphs below. Revise to suit Project.
 - b. Perimeter of each rooftop unit.
 - c. Between each rooftop unit location, creating a continuous path connecting rooftop unit locations.
 - d. Between each roof hatch and each rooftop unit location or path connecting rooftop unit locations.
 - e. Top and bottom of each roof access ladder.
 - f. Between each roof access ladder and each rooftop unit location or path connecting rooftop unit locations.
 - g. Locations indicated on Drawings.
 - h. As required by roof membrane manufacturer's warranty requirements.
 2. Provide 6-inch clearance between adjoining pads.
 3. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.

- B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.10 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous sheet metal fabrications.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 07 71 00 "Roof Specialties" for manufactured copings, roof-edge specialties, roof-edge drainage systems, reglets, and counterflashings.
3. Section 07 72 00 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.
4. Section 07 95 13.13 "Interior Expansion Joint Cover Assemblies" for manufactured expansion-joint cover assemblies for interior floors, walls, and ceilings.
5. Section 07 95 13.16 "Exterior Expansion Joint Cover Assemblies" for manufactured expansion-joint cover assemblies for exterior building walls, soffits, and parapets.

1.2 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following

1. Underlayment materials.
2. Elastomeric sealant.
3. Butyl sealant.
4. Epoxy seam sealer.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.

2. Include identification of material, thickness, weight, and finish for each item and location in Project.
 3. Include details for forming, including profiles, shapes, seams, and dimensions.
 4. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 5. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.
- C. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.
- D. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- 1.4 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.
 - B. Special warranty.
- 1.5 QUALITY ASSURANCE
- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 2. Protect stored sheet metal flashing and trim from contact with water.
 - B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.
- 1.7 WARRANTY
- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.

- b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim are not to rattle, leak, or loosen, and are to remain watertight.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Copper Sheet: ASTM B370, cold-rolled copper sheet, H00 or H01 temper.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hussey Copper Ltd.
 - b. Revere Copper Products, Inc.
 2. Source Limitations: Obtain sheet from single source from single manufacturer.
 3. Nonpatinated, Exposed Finish: Mill.
 4. Prepatinated Copper-Sheet Finish: Dark brown, prepatinated in accordance with ASTM B882.
- C. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
 1. As-Milled Finish: Mill.
 2. Alclad Finish: Metallurgically bonded surfacing alloy on both sides, forming aluminum sheet with reflective luster.
 3. Factory Prime Coating: Where painting after installation is required, pretreat metal with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil.

4. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
5. Exposed Coil-Coated Finish:
 - a. FEVE Fluoropolymer: AAMA 2605. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether (FEVE) resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
6. Color: As selected by Architect from manufacturer's full range.
7. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.
- B. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F; and complying with physical requirements of ASTM D226/D226M for Type I and Type II felts.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Atlas Molded Products, a division of Atlas Roofing Corporation.
 - b. Intertape Polymer Group.
 - c. Kirsch Building Products.
 - d. SDP Advanced Polymer Products Inc.
 2. Source Limitations: Obtain underlayment from single source from single manufacturer.
- C. Self-Adhering, High-Temperature Sheet Underlayment: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer in accordance with underlayment manufacturer's written instructions.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ATAS International, Inc.
 - b. Carlisle WIP Products; a brand of Carlisle Construction Materials.
 - c. GCP Applied Technologies Inc.
 - d. Henry Company.
 - e. Owens Corning.
 - f. Polyglass U.S.A., Inc.
 - g. Protecto Wrap Company.
 - h. SDP Advanced Polymer Products Inc.
 2. Source Limitations: Obtain underlayment from single source from single manufacturer.

3. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F or lower.

- D. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

2.4 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 2. Fasteners for Copper, Zinc-Tin Alloy-Coated Copper, or Copper-Clad Stainless Steel Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
 3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- D. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.
- H. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.
- I. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with

flashing indicated with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cheney Flashing Company.
 - b. Fry Reglet Corporation.
 - c. Heckmann Building Products, Inc.
 - d. Hohmann & Barnard, Inc.
 - e. Keystone Flashing Company, Inc.
 - f. Metal-Era, Inc.
 - g. OMG Roofing Products; a Division of OMG, Inc., a subsidiary of Steel Partners Holdings L.P.
2. Source Limitations: Obtain reglets from single source from single manufacturer.
3. Material: Aluminum, 0.024 inch thick.
4. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
5. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
6. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
7. Accessories:
 - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
 - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.
8. Finish: Mill.

2.5 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 2. 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.
 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.

5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances:
1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- G. Seams:
1. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 2. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.
 3. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.
- H. Do not use graphite pencils to mark metal surfaces.
- 2.6 MISCELLANEOUS SHEET METAL FABRICATIONS
- A. Equipment Support Flashing: Fabricate from the following materials:
1. Copper: 16 oz./sq. ft.
 2. Stainless Steel: 0.0188 inch thick.
 3. Zinc-Tin Alloy-Coated Copper: 16 oz./sq. ft.
 4. Galvanized Steel: 0.028 inch thick.
 5. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.
 6. Copper-Clad Stainless Steel: 0.018 inch thick.

- B. Overhead-Piping Safety Pans: Fabricate from the following materials:
1. Copper: 24 oz./sq. ft.
 2. Stainless Steel: 0.0250 inch thick.
 3. Zinc-Tin Alloy-Coated Copper: 24 oz./sq. ft.
 4. Galvanized Steel: 0.040 inch thick.
 5. Aluminum-Zinc Alloy-Coated Steel: 0.040 inch thick.
 6. Copper-Clad Stainless Steel: 0.027 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
1. Verify compliance with requirements for installation tolerances of substrates.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim.
1. Install in shingle fashion to shed water.
 2. Lap joints not less than 2 inches.
- B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, in accordance with manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
1. Lap horizontal joints not less than 4 inches.
 2. Lap end joints not less than 12 inches.
- C. Self-Adhering, High-Temperature Sheet Underlayment:
1. Install self-adhering, high-temperature sheet underlayment; wrinkle free.
 2. Prime substrate if recommended by underlayment manufacturer.
 3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures.
 4. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses.

5. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller.
 6. Roll laps and edges with roller.
 7. Cover underlayment within 14 days.
- D. Install slip sheet, wrinkle free, **over underlayment** before installing sheet metal flashing and trim.
1. Install in shingle fashion to shed water.
 2. Lapp joints not less than 4 inches.

3.3 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of sealant.
 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
 6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
 8. Do not field cut sheet metal flashing and trim by torch.
 9. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of uncoated-aluminum sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated.
 - a. Embed hooked flanges of joint members not less than 1 inch into sealant.
 - b. Form joints to completely conceal sealant.
 - c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
 - d. Adjust setting proportionately for installation at higher ambient temperatures.
 - 1) Do not install sealant-type joints at temperatures below 40 deg F.
 2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."
- 3.4 INSTALLATION OF MISCELLANEOUS FLASHING
- A. Equipment Support Flashing:
1. Coordinate installation of equipment support flashing with installation of roofing and equipment.
 2. Weld or seal flashing with elastomeric sealant to equipment support member.
- B. Overhead-Piping Safety Pans:
1. Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings.
 2. Pipe and install drain line to plumbing waste or drainage system.
- 3.5 INSTALLATION TOLERANCES
- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- 3.6 CLEANING
- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.

- C. Clean off excess sealants.

3.7 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION

SECTION 07 71 00

ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copings.
2. Roof-edge specialties.
3. Roof-edge drainage systems.
4. Reglets and counterflashings.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for downspout guards and downspout boots.
2. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking.
3. Section 07 62 00 "Sheet Metal Flashing and Trim" for custom- and site-fabricated sheet metal flashing and trim.
4. Section 07 71 29 "Manufactured Roof Expansion Joints" for manufactured roof expansion-joint cover assemblies.
5. Section 07 72 00 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.
6. Section 07 92 00 "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties.

1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
4. Detail termination points and assemblies, including fixed points.

5. Include details of special conditions.

- C. Samples: For each type of roof specialty and for each color and texture specified.
- D. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Certificates: For each type of roof specialty.
- C. Product Test Reports: For copings and roof-edge flashings, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.5 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof edge as shown on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

- A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 07 54 23 - Thermoplastic-Polyolefin (TPO) Roofing.

- B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. SPRI Wind Design Standard: Manufacture and install copings and roof-edge specialties tested according to SPRIES-1 and capable of resisting the following design pressures:
 - 1. Design Pressure: As indicated on Drawings.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COPINGS

- A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ATAS International, Inc.
 - b. Architectural Products Company.
 - c. Berridge Manufacturing Company.
 - d. Castle Metal Products.
 - e. Cheney Flashing Company.
 - f. Drexel Metals.

- g. EXCEPTIONAL Metals.
 - h. Merchant & Evans Inc.
 - i. Metal-Era, Inc.
 - j. OMG Roofing Products; a Division of OMG, Inc., a subsidiary of Steel Partners Holdings L.P.
 - k. PAC-CLAD; Petersen Aluminum Corporation; a Carlisle company.
 - l. SAF (Southern Aluminum Finishing Company, Inc.).
 - m. SAF Perimeter Systems Division.
2. Formed Aluminum Sheet Coping Caps: Aluminum sheet, 0.050 inch thick.
 - a. Surface: Smooth, flat finish.
 - b. Finish: Three-coat fluoropolymer.
 - c. Color: As selected by Architect from manufacturer's full range.
 3. Corners: Factory mitered and continuously welded.
 4. Coping-Cap Attachment Method: Snap-on or face leg hooked to continuous cleat with back leg fastener exposed, fabricated from coping-cap material.
 - a. Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches wide, with integral cleats.
 - b. Face-Leg Cleats: Concealed, continuous stainless steel.

2.3 ROOF-EDGE SPECIALTIES

- A. Canted Roof-Edge Fascia and Gravel Stop: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous formed galvanized-steel sheet cant, 0.028 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ATAS International, Inc.
 - b. Architectural Products Company.
 - c. Berridge Manufacturing Company.
 - d. Castle Metal Products.
 - e. Cheney Flashing Company.
 - f. Drexel Metals.
 - g. Merchant & Evans Inc.
 - h. Metal-Era, Inc.
 - i. OMG Roofing Products; a Division of OMG, Inc., a subsidiary of Steel Partners Holdings L.P.
 - j. PAC-CLAD; Petersen Aluminum Corporation; a Carlisle company.
 - k. SAF (Southern Aluminum Finishing Company, Inc.).
 2. Formed Aluminum Sheet Fascia Covers: Aluminum sheet, 0.050 inch thick.
 - a. Surface: Smooth, flat finish.
 - b. Finish: Three-coat fluoropolymer.
 - c. Color: As selected by Architect from manufacturer's full range.
 3. Extruded-Aluminum Fascia Covers: Extruded aluminum, 0.080 inch thick.
 - a. Finish: Three-coat fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.
 4. Corners: Factory mitered and **continuously welded**.

5. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
- B. One-Piece Gravel Stops: Manufactured, one-piece, metal gravel stop in section lengths not exceeding 12 feet, with a horizontal flange and vertical leg, fascia terminating in a drip edge, and concealed splice plates of same material, finish, and shape as gravel stop. Provide matching corner units.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Architectural Products Company.
 - b. Berridge Manufacturing Company.
 - c. Castle Metal Products.
 - d. Cheney Flashing Company.
 - e. Drexel Metals.
 - f. OMG Roofing Products; a Division of OMG, Inc., a subsidiary of Steel Partners Holdings L.P.
 - g. PAC-CLAD; Petersen Aluminum Corporation; a Carlisle company.
 - h. SAF (Southern Aluminum Finishing Company, Inc.).
 - i. SAF Perimeter Systems Division.
 2. Formed Aluminum Sheet Gravel Stops: Aluminum sheet,.050 inch thick.
 - a. Surface: Smooth, flat finish.
 - b. Finish: Three-coat fluoropolymer.
 - c. Color: As selected by Architect from manufacturer's full range.
 3. Corners: Factory mitered and continuously welded.

2.4 ROOF-EDGE DRAINAGE SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. ATAS International, Inc.
 2. Architectural Products Company.
 3. Berger; division of OmniMax International, Inc.
 4. Castle Metal Products.
 5. Cheney Flashing Company.
 6. CopperCraft by Euramax.
 7. Drexel Metals.
 8. EXCEPTIONAL Metals.
 9. Merchant & Evans Inc.
 10. Metal-Era, Inc.
 11. OMG Roofing Products; a Division of OMG, Inc., a subsidiary of Steel Partners Holdings L.P.
 12. RDCA; Roof Drainage Components & Accessories.
 13. SAF (Southern Aluminum Finishing Company, Inc.).
 14. SAF Perimeter Systems Division.

- B. Gutters: Manufactured in uniform section lengths not exceeding 12 feet, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.
 - 1. Aluminum Sheet: 0.050 inch thick.
 - 2. Gutter Profile: Style A according to SMACNA's "Architectural Sheet Metal Manual."
 - 3. Corners: Factory mitered and continuously welded.
 - 4. Gutter Supports: Manufacturer's standard supports as selected by Architect with finish matching the gutters.
- C. Downspouts: rectangular complete with mitered elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Formed Aluminum: 0.050 inch thick.
- D. Splash Pans: Fabricate from the following exposed metal:
 - 1. Formed Aluminum: 0.040 inch thick.
- E. Aluminum Finish: Three-coat fluoropolymer.
 - 1. Color: As selected by Architect from manufacturer's full range.

2.5 REGLETS AND COUNTERFLASHINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ATAS International, Inc.
 - 2. Berridge Manufacturing Company.
 - 3. Castle Metal Products.
 - 4. Cheney Flashing Company.
 - 5. Drexel Metals.
 - 6. EXCEPTIONAL Metals.
 - 7. Fry Reglet Corporation.
 - 8. Heckmann Building Products, Inc.
 - 9. Keystone Flashing Company, Inc.
 - 10. Metal-Era, Inc.
 - 11. OMG Roofing Products; a Division of OMG, Inc., a subsidiary of Steel Partners Holdings L.P.
- B. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
 - 1. Formed Aluminum: 0.050 inch thick.
 - 2. Corners: Factory mitered and continuously welded.

3. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
 4. Concrete Type, Embedded: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
 5. Masonry Type, Embedded: Provide reglets with offset top flange for embedment in masonry mortar joint.
- C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets or through-wall-flashing receiver and compress against base flashings with joints lapped, from the following exposed metal:
1. Formed Aluminum: 0.032 inch thick.
- D. Accessories:
1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
 2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
- E. Aluminum Finish: Three-coat fluoropolymer.
1. Color: As selected by Architect from manufacturer's full range.

2.6 MATERIALS

- A. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
- B. Aluminum Extrusions: ASTM B221, alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:

2.7 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ATAS International, Inc.
 - b. Carlisle WIP Products; a brand of Carlisle Construction Materials.
 - c. GCP Applied Technologies Inc.
 - d. Henry Company.
 - e. Owens Corning.
 - f. Polyglass U.S.A., Inc.
 - g. Protecto Wrap Company.

- h. SDP Advanced Polymer Products Inc.
 - 2. Thermal Stability: ASTM D1970/D1970M; stable after testing at 240 deg F.
 - 3. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F.
- B. Felt: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- C. Slip Sheet: Rosin-sized building paper, 3-lb/100 sq. ft. minimum.

2.8 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
 - 1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
 - 2. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
- B. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.
- C. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- E. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.

2.9 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Coil-Coated Aluminum Sheet Finishes:
 - 1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to

exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

- b. Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
 1. Apply continuously under copings, roof-edge specialties, reglets and counterflashings.
 2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.

3.3 INSTALLATION, GENERAL

- A. Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 4. Torch cutting of roof specialties is not permitted.
 5. Do not use graphite pencils to mark metal surfaces.

- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
 - C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
 - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
 - D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
 - E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.
 - F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.
- 3.4 INSTALLATION OF COPINGS
- A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
 - B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.
 - 1. Interlock face-leg drip edge into continuous cleat anchored to substrate at manufacturer's required spacing that meets performance requirements. Anchor back leg of coping with screw fasteners and elastomeric washers at manufacturer's required spacing that meets performance requirements.
- 3.5 INSTALLATION OF ROOF-EDGE SPECIALITIES
- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
 - B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.
- 3.6 INSTALLATION OF ROOF-EDGE DRAINAGE SYSTEMS
- A. Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

- B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 30 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.
 - 1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion-joint caps.
- C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.
- D. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in elastomeric sealant.

3.7 INSTALLATION OF REGLETS AND COUNTERFLASHINGS

- A. Coordinate installation of reglets and counterflashings with installation of base flashings.
- B. Embedded Reglets: See Section 03 30 00 "Cast-in-Place Concrete" and [Section 04 20 00 "Unit Masonry" for installation of reglets.
- C. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.
- D. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.

3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 71 29

MANUFACTURED ROOF EXPANSION JOINTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum roof expansion joints.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wooden curbs or cants for mounting roof expansion joints.
2. Section 07 62 00 "Sheet Metal Flashing and Trim" for shop- and field-fabricated sheet metal expansion-joint systems, flashing, and other sheet metal items.
3. Section 07 72 00 "Roof Accessories" for manufactured and prefabricated metal roof curbs.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For roof expansion joints.

1. Include plans, elevations, sections, and attachment details.
2. Include details of splices, intersections, transitions, fittings, method of field assembly, and location and size of each field splice.
3. Provide isometric drawings of intersections, terminations, changes in joint direction or planes, and transition to other expansion joint systems depicting how components interconnect with each other and adjacent construction to allow movement and achieve waterproof continuity.

C. Samples: For each exposed product and for each color specified, 6 inches in size.

1.3 INFORMATIONAL SUBMITTALS

1. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

B. Qualification Data: For Installer.

C. Product Test Reports: For each fire-barrier provided as part of a roof-expansion-joint assembly, for tests performed by a qualified testing agency.

D. Sample Warranties: For special warranties.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Installer of roofing membrane.

1.5 WARRANTY

- A. Special Warranty: Manufacturer and Installer agree to repair or replace roof expansion joints and components that leak, deteriorate beyond normal weathering, or otherwise fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint seals, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 ALUMINUM ROOF EXPANSION JOINTS

- A. Aluminum Roof Expansion Joint: Factory-fabricated, continuous, waterproof, joint cover; consisting of a formed or extruded metal cover secured to extruded aluminum frames, with water-resistant gasketing between cover and frames, and with provision for securing assembly to substrate and sealing assembly to roofing membrane or flashing.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; RXH-2-1 or comparable product by one of the following:
 - a. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company.
 - c. BASF Corp. - Watson Bowman Acme Corp.
 - d. C/S Group.
 - e. Inpro Corporation.
 - f. Nystrom.
 - 2. Location: Roof to Roof.
 - 3. Cover: Formed or extruded aluminum; thickness as recommended by manufacturer.
 - 4. Corner, Intersection, and Transition Units: Provide factory-fabricated units for corner and joint intersections and horizontal and vertical transitions including those to other building expansion joints.
 - 5. Accessories: Provide splicing units, adhesives, and other components as recommended by roof-expansion-joint manufacturer for complete installation.

6. Secondary Seal: Continuous, waterproof membrane within joint and attached to substrate on sides of joint below the cover.
- B. Aluminum Roof Expansion Joint: Factory-fabricated, continuous, waterproof, joint cover; consisting of a formed or extruded metal cover secured to extruded aluminum frames, with water-resistant gasketing between cover and frames, and with provision for securing assembly to substrate and sealing assembly to roofing membrane or flashing.
1. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; RXJ-2-1 or comparable product by one of the following:
 - a. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company.
 - c. BASF Corp. - Watson Bowman Acme Corp.
 - d. C/S Group.
 - e. Inpro Corporation.
 - f. Nystrom.
 2. Location: Roof to Wall.
 3. Cover: Formed or extruded aluminum; thickness as recommended by manufacturer.
 4. Corner, Intersection, and Transition Units: Provide factory-fabricated units for corner and joint intersections and horizontal and vertical transitions including those to other building expansion joints.
 5. Accessories: Provide splicing units, adhesives, and other components as recommended by roof-expansion-joint manufacturer for complete installation.
 6. Secondary Seal: Continuous, waterproof membrane within joint and attached to substrate on sides of joint below the cover.
- C. Materials:
1. Aluminum: ASTM B209 for sheet and plate, ASTM B221 for extrusions; alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
 - a. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious or preservative-treated wood materials.
 - b. Mill Finish: As manufactured.
- 2.3 MISCELLANEOUS MATERIALS
- A. Adhesives: As recommended by roof-expansion-joint manufacturer.
 - B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to withstand design loads.
 1. Exposed Fasteners: Gasketed. Use screws with hex washer heads matching color of material being fastened.
 - C. Mineral-Fiber Blanket: ASTM C665.
 - D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joint openings, substrates, and expansion-control joint systems that interface with roof expansion joints, for suitable conditions where roof expansion joints will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions for handling and installing roof expansion joints.
 - 1. Anchor roof expansion joints securely in place, with provisions for required movement. Use fasteners, protective coatings, sealants, and miscellaneous items as required to complete roof expansion joints.
 - 2. Install roof expansion joints true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
 - 3. Provide for linear thermal expansion of roof-expansion-joint materials.
 - 4. Provide uniform profile of roof expansion joint throughout its length; do not stretch or squeeze membranes.
 - 5. Provide uniform, neat seams.
 - 6. Install roof expansion joints to fit substrates and to result in watertight performance.
- B. Transitions to Other Expansion-Control Joint Assemblies: Coordinate installation of roof expansion joints with other exterior expansion-control joint assemblies specified in Section 07 95 13.16 "Exterior Expansion Joint Cover Assemblies" to result in watertight performance. Install factory-fabricated units at transitions between roof expansion joints and exterior expansion-control joint systems.
- C. Splices: Splice roof expansion joints to provide continuous, uninterrupted, and waterproof joints.
 - 1. Install waterproof splices and prefabricated end dams to prevent leakage of secondary-seal membrane.
- D. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

END OF SECTION

SECTION 07 72 00

ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof hatches.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
2. Section 07 61 00 "Sheet Metal Roofing" for shop- and field-formed roof curbs and snow guards for sheet metal roofing.
3. Section 07 62 00 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.
4. Section 07 71 00 "Roof Specialties" for manufactured fasciae, copings, gravel stops, gutters and downspouts, and counterflashing.
5. Section 07 71 29 "Manufactured Roof Expansion Joints" for manufactured roof expansion-joint covers.
6. Section 23 05 48 "Vibration and Seismic Controls for HVAC" for special curbs designed to accommodate seismic and vibration controls.
7. Section 23 34 23 "HVAC Power Ventilators" for power roof-mounted ventilators.
8. Section 23 74 13 "Packaged, Outdoor, Central-Station Air-Handling Units" for standard curbs specified with rooftop units.

1.2 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. Shop Drawings: For roof accessories.
 - 1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.
- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 - 4. Required clearances.
- B. Sample Warranties: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.6 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

2.2 ROOF HATCHES

- A. Roof Hatches: Metal roof-hatch units with lids and insulated single-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACUDOR Products, Inc.
 - b. AES Industries, Inc.
 - c. Architectural Specialties, Inc.
 - d. BILCO Company (The).
 - e. Babcock-Davis.
 - f. Dur-Red Products.
 - g. J. L. Industries, Inc.; Activar Construction Products Group, Inc.
 - h. KCC Manufacturing.
 - i. Kingspan Light + Air LLC.
 - j. Lexcor; a division of Luxsoco corp.
 - k. Metallic Products Corporation.
 - l. Milcor; Hart & Cooley, Inc.
 - m. Nystrom, Inc.
 - n. O'Keefe's Inc.
- B. Type and Size:
1. Single-leaf lid, 36 by 36 inches.
- C. Loads: Minimum 40-lbf/sq. ft. external live load and 20-lbf/sq. ft. internal uplift load.
- D. Hatch Material, Steel: Aluminum-zinc alloy-coated steel sheet.
1. Thickness: Manufacturer's standard thickness for hatch size indicated.
 2. Finish: Two-coat fluoropolymer.
 3. Color: As selected by Architect from manufacturer's full range.
- E. Construction:
1. Insulation: 2-inch- thick, polyisocyanurate board.
 2. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
 3. Hatch Lid: Insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
 4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
 5. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
 6. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.

- F. Hardware: Spring operators, hold-open arm, galvanized steel spring latch with turn handles, galvanized steel butt- or pintle-type hinge system, and padlock hasps inside and outside.
- G. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.
 - 1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
 - 2. Height: 42 inches above finished roof deck.
 - 3. Material: Steel tube.
 - 4. Post: 1-5/8-inch- diameter pipe.
 - 5. Finish: Manufacturer's standard baked enamel or powder coat.
 - a. Color: As selected by Architect from manufacturer's full range.

2.3 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 coating designation and mill phosphatized for field painting where indicated.
 - 1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
 - 2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
 - 3. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight.
 - 4. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
 - 5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.
- B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, AZ50 coated.
 - 1. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
 - 2. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight.

3. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
 4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.
- C. Aluminum Sheet: ASTM B209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
1. Mill Finish: As manufactured.
 2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
 3. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
 4. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
 5. Exposed Coil-Coated Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 2605. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight.
 6. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 7. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.
- D. Aluminum Extrusions and Tubes: ASTM B221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.
- E. Stainless Steel Sheet and Shapes: ASTM A240/A240M or ASTM A666, Type 304.
- F. Steel Shapes: ASTM A36/A36M, hot-dip galvanized according to ASTM A123/A123M unless otherwise indicated.
- G. Steel Tube: ASTM A500/A500M, round tube.
- H. Galvanized-Steel Tube: ASTM A500/A500M, round tube, hot-dip galvanized according to ASTM A123/A123M.
- I. Steel Pipe: ASTM A53/A53M, galvanized.
- 2.4 MISCELLANEOUS MATERIALS
- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

- B. Polyisocyanurate Board Insulation: ASTM C1289, thickness and thermal resistivity as indicated.
 - C. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
 - D. Underlayment:
 - 1. Felt: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
 - 2. Polyethylene Sheet: 6-mil- thick polyethylene sheet complying with ASTM D4397.
 - 3. Slip Sheet: Building paper, 3 lb/100 sq. ft. minimum, rosin sized.
 - 4. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - E. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
 - 1. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153/A153M or ASTM F2329.
 - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 - 3. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
 - F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
 - G. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
 - H. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.
 - I. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required for application.
- 2.5 GENERAL FINISH REQUIREMENTS
- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of stainless steel roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof-Hatch Installation:
 - 1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
 - 2. Attach safety railing system to roof-hatch curb.
 - 3. Attach ladder-assist post according to manufacturer's written instructions.
- D. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A780/A780M.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 09 96 00 "High Performance"
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 81 00
APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes sprayed fire-resistive materials.
- B. Related Requirements:
 - 1. Section 07 81 23 "Intumescent Fireproofing" for mastic and intumescent fire-resistive coatings.

1.2 DEFINITIONS

- A. SFRM: Sprayed fire-resistive materials.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Framing plans or schedules, or both, indicating the following:
 - 1. Extent of fireproofing for each construction and fire-resistance rating.
 - 2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
 - 3. Minimum fireproofing thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
 - 4. Treatment of fireproofing after application.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and testing agency.
- B. Product Certificates: For each type of fireproofing.
- C. Evaluation Reports: For fireproofing, from ICC-ES.
- D. Preconstruction Test Reports: For fireproofing.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is 44 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Source Limitations: Obtain fireproofing for each fire-resistance design from single source.
- C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- D. Asbestos: Provide products containing no detectable asbestos.

2.2 SPRAYED FIRE-RESISTIVE MATERIALS

- A. SFRM, Sprayed Fire-Resistive Material: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.
 - 1. Basis-of-Design Product: Provide Grace Construction Products; W.R. Grace & Co. -- Conn; Grace Construction Products; Monokote MK-6 Series or comparable product by one of the following manufacturers:
 - a. Isolatek International, Inc.
 - b. Pyrok, Inc.
 - c. Schundler Company (The).
 - d. Southwest Fireproofing Products Co.
 - 2. Carboline Company; RPM International.
 - 3. Application: Designated for interior use by a qualified testing agency acceptable to authorities having jurisdiction.
 - 4. Bond Strength: Minimum 150-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E 736.

5. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E 605.
6. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.375 inch.
7. Combustion Characteristics: ASTM E 136.
8. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 10 or less.
 - b. Smoke-Developed Index: 10 or less.
9. Compressive Strength: Minimum 10 lbf/sq. in. according to ASTM E 761.
10. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
11. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
12. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
13. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E 859.
14. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G 21.
15. Finish: As selected by Architect from manufacturer's standard finishes. Apply separate, colored topcoat after finishing.
 - a. Color: As selected by Architect from manufacturer's full range.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer and complying with one or both of the following requirements:
 1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 2. Primer's bond strength in required fire-resistance design complies with specified bond strength for fireproofing and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E 736.
- C. Bonding Agent: Product approved by fireproofing manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.

- D. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required, according to fire-resistance designs indicated and fireproofing manufacturer's written instructions. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive fireproofing.
- E. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by fireproofing manufacturer.
- F. Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated; approved and provided by fireproofing manufacturer. Include pins and attachment.
- G. Sealer: Transparent-drying, water-dispersible, tinted protective coating recommended in writing by fireproofing manufacturer for each fire-resistance design.
- H. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.
 - 1. Water-Based Permeable Topcoat: Factory-mixed formulation for brush, roller, or spray application over applied SFRM. Provide application at a rate of 60 sq. ft./gal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
 - 1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fireproofing with substrates under conditions of normal use or fire exposure.
 - 2. Verify that objects penetrating fireproofing, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
 - 3. Verify that substrates receiving fireproofing are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fireproofing application.
- B. Verify that roof construction, installation of rooftop HVAC equipment, and other related work are complete before beginning fireproofing work.
- C. Conduct tests according to fireproofing manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- B. Clean substrates of substances that could impair bond of fireproofing.
- C. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.
- D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing.
 - 1. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.
 - 2. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.
- D. Metal Decks:
 - 1. Do not apply fireproofing to underside of metal deck substrates until concrete topping, if any, is completed.
 - 2. Do not apply fireproofing to underside of metal roof deck until roofing is completed; prohibit roof traffic during application and drying of fireproofing.
- E. Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by fireproofing manufacturer.
- F. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- G. Extend fireproofing in full thickness over entire area of each substrate to be protected.

- H. Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.
- I. Where sealers are used, apply products that are tinted to differentiate them from fireproofing over which they are applied.
- J. Provide a uniform finish complying with description indicated for each type of fireproofing material and matching finish approved for required mockups.
- K. Cure fireproofing according to fireproofing manufacturer's written instructions.
- L. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.
- M. Finishes: Where indicated, apply fireproofing to produce the following finishes:
 - 1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.
 - 2. Spray-Textured Finish: Finish left as spray applied with no further treatment.
 - 3. Rolled, Spray-Textured Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness.
 - 4. Skip-Troweled Finish: Even leveled surface produced by troweling spray-applied finish to smooth out the texture and neaten edges.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Test and inspect as required by the IBC, as indicated on Schedule of Special Inspections.
- B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fireproofing for the next area until test results for previously completed applications of fireproofing show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.
- C. Fireproofing will be considered defective if it does not pass tests and inspections.
 - 1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
 - 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- D. Prepare test and inspection reports.

3.5 CLEANING, PROTECTING, AND REPAIRING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

- B. Protect fireproofing, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fireproofing is without damage or deterioration at time of Substantial Completion.
- C. As installation of other construction proceeds, inspect fireproofing and repair damaged areas and fireproofing removed due to work of other trades.
- D. Repair fireproofing damaged by other work before concealing it with other construction.
- E. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION

SECTION 07 81 23
INTUMESCENT FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mastic and intumescent fire-resistive coatings.

B. Related Requirements:

1. Section 07 81 00 "Applied Fireproofing" for sprayed fire-resistive materials (SFRM).

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review products, design ratings, restrained and unrestrained conditions, thicknesses, and other performance requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Framing plans or schedules, or both, indicating the following:

1. Extent of fireproofing for each construction and fire-resistance rating.
2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
3. Minimum fireproofing thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
4. Treatment of fireproofing after application.

C. Samples: For each exposed product and for each color and texture specified, 4 inches square in size.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and testing agency.

B. Product Certificates: For each type of fireproofing.

C. Evaluation Reports: For fireproofing, from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Build mockup of each type of fireproofing and different substrate and each required finish as shown on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is 50 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Source Limitations: Obtain fireproofing for each fire-resistance design from single source.
- C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
 - 2. Flat Paints and Coatings: 50 g/L.
 - 3. Nonflat Paints and Coatings: 50 g/L.
 - 4. Primers, Sealers, and Undercoaters: 100 g/L.

- D. Asbestos: Provide products containing no detectable asbestos.

2.2 MASTIC AND INTUMESCENT FIRE-RESISTIVE COATINGS

- A. IFRC, Mastic and Intumescent Fire-Resistive Coating: Manufacturer's standard, factory-mixed formulation or factory-mixed, multicomponent system consisting of intumescent base coat and topcoat, and complying with indicated fire-resistance design.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Carboline Company; a subsidiary of RPM International.; AD Firefilm III .
 - b. Hilti, Inc.; CFP-S WB Fire Protection Steel Spray.
 - c. International Protective Coatings; Interchar 1120.
 - d. Isolatek International; Cafco SprayFilm-WB 3 and Cafco SprayFilm-WB4.
 2. Application: Designated for "exterior," "interior general purpose," and "conditioned interior space purpose" use by a qualified testing agency acceptable to authorities having jurisdiction.
 3. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design.
 4. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 5. Hardness: Not less than 65, Type D durometer, according to ASTM D2240.
 6. Finish: As selected by Architect from manufacturer's standard finishes.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer and complying with required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by fireproofing manufacturer.
- D. Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated; approved and provided by fireproofing manufacturer. Include pins and attachment.
- E. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
 - 1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fireproofing with substrates under conditions of normal use or fire exposure.
 - 2. Verify that objects penetrating fireproofing, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
 - 3. Verify that substrates receiving fireproofing are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fireproofing application.
- B. Conduct tests according to fireproofing manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- B. Clean substrates of substances that could impair bond of fireproofing.
- C. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.
- D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, topcoats, finishing, and other materials and procedures affecting fireproofing work.

- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
 - C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing.
 - 1. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.
 - 2. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.
 - D. Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by fireproofing manufacturer.
 - E. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
 - F. Extend fireproofing in full thickness over entire area of each substrate to be protected.
 - G. Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.
 - H. Provide a uniform finish complying with description indicated for each type of fireproofing material and matching finish approved for required mockups.
 - I. Cure fireproofing according to fireproofing manufacturer's written instructions.
 - J. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.
 - K. Finishes: Where indicated, apply fireproofing to produce the following finishes:
 - 1. Rolled, Spray-Textured Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness.
- 3.4 FIELD QUALITY CONTROL
- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Test and inspect as indicated on Schedule of Special Inspections. Insert requirement.
 - B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fireproofing for the next area until test results for previously completed applications of fireproofing show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.
 - C. Fireproofing will be considered defective if it does not pass tests and inspections.

1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- D. Prepare test and inspection reports.

3.5 CLEANING, PROTECTING, AND REPAIRING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Protect fireproofing, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fireproofing is without damage or deterioration at time of Substantial Completion.
- C. As installation of other construction proceeds, inspect fireproofing and repair damaged areas and fireproofing removed due to work of other trades.
- D. Repair fireproofing damaged by other work before concealing it with other construction.
- E. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION

SECTION 07 82 00

BOARD FIRE PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mineral-fiber board fire protection.

B. Related Requirements:

1. Section 23 07 13 "Duct Insulation" for fire-rated duct insulation.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Mineral-fiber board.
2. Joint treatment and finishing materials.

B. Shop Drawings:

1. Locations and types of surface preparations required before applying board fire protection.
2. Structural framing plan showing extent of board fire protection for each location and fire-resistance rating, including the following:
 - a. Applicable fire-resistance design designations of qualified testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1) For steel joist assemblies, include applicable fire-resistance design designations, with each steel joist tested with same maximum tensile stress as each steel joist indicated on Drawings. Design designations with steel joists tested at lower maximum tensile stress than those indicated are not permitted.
 - b. Minimum thicknesses needed to achieve required fire-resistance ratings of structural components and assemblies.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain board fire protection for each fire-resistance design from single source.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" from listings of another testing and inspecting agency acceptable to

authorities having jurisdiction, for board fire protection serving as direct-applied protection tested in accordance with ASTM E119.

2.3 BOARD FIRE PROTECTION

- A. Mineral-Fiber Board: Unfaced rigid board produced by combining slag-wool-/rock-wool fibers with thermosetting resin binders passing ASTM E136 for combustion characteristics; of thickness required to produce fire-resistance rating indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Albi Manufacturing; a division of StanChem, Inc.
 - b. Isolatek International.
 - c. Rockwool International.
 - 2. Maximum Density: 10 lb/cu. ft.
 - 3. Surface-Burning Characteristics: Flame-spread and smoke-developed indexes of zero and zero, respectively, in accordance with ASTM E84.

2.4 ACCESSORIES

- A. Anchorage Accessories: Provide manufacturer's standard board-anchorage components complying with related design of UL or of another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Joint Treatment and Finishing Materials: For calcium-silicate board applications exposed to view, provide joint treatment tape and joint compounds recommended in writing by board manufacturer for finishing surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions of construction to receive fire protection, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of the Work.
- B. Reject fire-protection materials that are wet, moisture damaged, or mold damaged.
- C. Examine walls, floors, and other construction for suitable conditions where fire-protection materials will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install board fire protection on structural members after piping and other construction behind fire-resistive materials have been completed.

3.3 INSTALLATION

- A. Install board fire protection in accordance with manufacturer's written instructions.

- B. Install board fire protection to comply with requirements for layer thicknesses and number, construction of joints and corners, and anchorage methods applicable to fire-resistance-rated assemblies indicated.
- C. Install enclosing or concealing construction only after board fire protection has been applied and inspected by authorities having jurisdiction.

3.4 PROTECTION

- A. Replace or repair board fire protection that has been cut away to facilitate other construction. Maintain complete coverage of full thickness on members and substrates protected by board fire protection.
 - 1. Provide final protection and maintain conditions in a manner acceptable to Installer, manufacturer, and authorities having jurisdiction to ensure that board fire protection is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 07 84 13

PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.

B. Related Requirements:

1. Section 07 84 43 "Joint Firestopping" for joints in or between fire-resistance-rated construction, at exterior curtain-wall/floor intersections, and in smoke barriers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly developed in accordance with current International Firestop Council (IFC) guidelines. Obtain approval of authorities having jurisdiction prior to submittal.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Listed System Designs: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval Standard for Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint firestop systems for each type of joint opening indicated from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with listed system designs published by a qualified testing agency.
 - 1) UL in its online directory "Product iQ."
 - 2) Intertek Group in its "Directory of Building Products."
 - 3) FM Approvals in its "Approval Guide."

2.3 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems are to be compatible with one another, with the substrates forming openings, and with penetrating items if any.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. A/D Fire Protection Systems Inc.
 - c. Balco; a CSW Industrials Company.
 - d. Everkem Diversified Products, Inc.
 - e. Grabber Construction Products, Inc.
 - f. Hilti, Inc.
 - g. Holdrite; a division of Reliance Worldwide Corporation.
 - h. International Fireproof Technology Inc.
 - i. NUCO Inc.
 - j. Passive Fire Protection Partners.
 - k. Roxtec Inc.
 - l. STC Sound Control.
 - m. Specified Technologies, Inc.
 - n. Tremco Incorporated.
 - o. Unique Fire Stop Products.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479.
1. F-Rating: Not less than the fire-resistance rating of the wall penetrated.
 2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479.
1. F-Rating: At least one hour, but not less than the fire-resistance rating of the floor penetrated.
 2. T-Rating: At least one hour, but not less than the fire-resistance rating of the floor. The following floor penetrations do not require a T-rating:
 - a. Those within the cavity of a wall.
 - b. Floor, tub, or shower drains within a concealed space.
 - c. 4-inch or smaller metal conduit penetrating directly into metal-enclosed electrical switchgear.
 3. W-Rating: Provide penetration firestopping systems with a Class 1 W-rating in accordance with UL 1479.
- D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479.
1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening and no more than 50-cfm cumulative total for any 100 sq. ft. at both ambient and elevated temperatures.

- E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
 - 1. Permanent forming/damming/backing materials.
 - 2. Substrate primers.
 - 3. Collars.
 - 4. Steel sleeves.

2.4 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric strips for use around combustible penetrants.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Compressible, removable, and reusable intumescent pillows encased in fire-retardant polyester or glass-fiber cloth. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.
- K. Fire-Rated Cable Sleeve Kits: Complete kits designed for new or existing cable penetrations through walls to accept standard accessories.
- L. Thermal Wrap: Flexible protective wrap tested and listed for up to 2-hour fire ratings in accordance with ASTM E814/UL 1479 for membrane penetrations or ASTM E1725/UL 1724 for thermal barrier and circuit integrity protection.

- M. Fire-Rated Cable Pathways: Single or gangable device modules composed of a steel raceway with integral intumescent material and requiring no additional action in the form of plugs, twisting closure, putty, pillows, sealant, or otherwise to achieve fire and air-leakage ratings.
- N. Retrofit Device for Cable Bundles: Factory-made, intumescent, collar-like device for firestopping existing over-filled cable sleeves and capable of being installed around projecting sleeves and cable bundles.
- O. Wall-Opening Protective Materials: Intumescent, non-curing putty pads or self-adhesive inserts for protection of electrical switch and receptacle boxes.
- P. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestop gasket for use around rectangular steel HVAC ducts without fire dampers.
- Q. Firestop Plugs: Flexible, re-enterable, intumescent, foam-rubber plug for use in blank round openings and cable sleeves.
- R. Fire-Rated Cable Grommet: Molded two-piece grommet made of plenum-grade polymer and foam inner core for sealing small cable penetrations in gypsum walls up to 1/2 inch diameter.
- S. Closet Flange Gasket: Molded, single-component, flexible, intumescent gasket for use beneath a water closet (toilet) flange in floor applications.
- T. Endothermic Wrap: Flexible, insulating, fire-resistant, endothermic wrap for protecting membrane penetrations of utility boxes, critical electrical circuits, communications lines, and fuel lines.

2.5 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION OF PENETRATION FIRESTOPPING SYSTEMS

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.
- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."

2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.
- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION

SECTION 07 84 43
JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Joints in or between fire-resistance-rated constructions.
2. Joints at exterior curtain-wall/floor intersections.
3. Joints in smoke barriers.

B. Related Requirements:

1. Section 07 84 13 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers and for wall identification.
2. Section 07 95 13.13 "Interior Expansion Joint Cover Assemblies" for fire-resistive manufactured expansion-joint cover assemblies for interior floors, walls, and ceilings.
3. Section 07 95 13.16 "Exterior Expansion Joint Cover Assemblies" for fire-resistive manufactured expansion-joint cover assemblies for exterior building walls, soffits, and parapets.
4. Section 09 22 16 "Non-Structural Metal Framing" for firestop tracks for metal-framed partition heads.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

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

- B. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.

1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly developed in accordance with current International Firestop Council (IFC) guidelines.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

- B. Listed System Designs: For each joint firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint firestop systems for each type of joint opening indicated from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:

- a. Joint firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with Listed System Designs published by a qualified testing agency.
 - 1) UL in its online directory "Product iQ."
 - 2) Intertek Group in its "Directory of Building Products."
- B. Rain/Water Resistance: For perimeter fire-barrier system applications, where inclement weather or greater-than-transient water exposure is expected, use products that dry rapidly and cure in the presence of atmospheric moisture sufficient to pass ASTM D6904 early rain-resistance test (24-hour exposure).

2.3 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems must accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
 - 1. Joint firestopping systems that are compatible with one another, with the substrates forming openings, and with penetrating items, if any.
 - 2. Provide products that, upon curing, do not re-emulsify, dissolve, leach, breakdown, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture.
 - 3. Provide firestop products that do not contain ethylene glycol.
- B. Intumescent Gypsum Wall Framing Gaskets (Applied to Steel Tracks, Runners and Studs prior to Framing Installation): Provide products with fire, smoke, and acoustical ratings that allow movement up to 100 percent compression and/or extension in accordance with UL 2079 or ASTM E1966; have an L Rating less than 1 cfm/ft.in accordance with UL 2079; and a minimum Sound Transmission Class (STC) rating of 56 in accordance with ASTM E90 or ASTM C919.
- C. For aluminum curtain-wall assemblies with one- or two-piece rectangular mullions at least 2-1/2 by 5 inches, provide perimeter fire-barrier system that does not require direct screw attachment to mullions and transoms to support and fasten curtain-wall insulation. System to be tested in accordance with ASTM E2307 for up to 2-hour fire resistance and with ASTM E1233 for wind cycling equivalent to 108 mph wind for 500 cycles.
- D. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. A/D Fire Protection Systems Inc.
 - c. CEMCO; California Expanded Metal Products Co.
 - d. ClarkDietrich.
 - e. Everkem Diversified Products, Inc.
 - f. Grabber Construction Products.
 - g. Hilti, Inc.

- h. International Fireproof Technology Inc.
 - i. MarinoWARE.
 - j. Nelson; Emerson Electric Co., Automation Solutions.
 - k. NUCO Inc.
 - l. Owens Corning.
 - m. Passive Fire Protection Partners.
 - n. RectorSeal Firestop; a CSW Industrials Company.
 - o. ROCKWOOL.
 - p. Specified Technologies, Inc.
 - q. Tremco, Inc.
 - r. Willseal LLC.
2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
- E. Joints at Exterior Curtain-Wall/Floor Intersections: Provide joint firestopping systems with rating determined per ASTM E2307.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. Hilti, Inc.
 - c. Johns Manville; a Berkshire Hathaway company.
 - d. Nelson; Emerson Electric Co., Automation Solutions.
 - e. NUCO Inc.
 - f. Owens Corning.
 - g. RectorSeal Firestop; a CSW Industrials Company.
 - h. ROCKWOOL.
 - i. Specified Technologies, Inc.
 - j. Tremco, Inc.
 - 2. F-Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
- F. Joints in Smoke Barriers: Provide joint firestopping systems with ratings determined per UL 2079 based on testing at a positive pressure differential of 0.30-inch wg.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. A/D Fire Protection Systems Inc.
 - c. Everkem Diversified Products, Inc.
 - d. Hilti, Inc.
 - e. International Fireproof Technology Inc.
 - f. MarinoWARE.
 - g. Nelson; Emerson Electric Co., Automation Solutions.
 - h. NUCO Inc.
 - i. Owens Corning.
 - j. Passive Fire Protection Partners.
 - k. Polyset.
 - l. RectorSeal Firestop; a CSW Industrials Company.
 - m. ROCKWOOL.

- n. Specified Technologies, Inc.
 - o. Tremco, Inc.
 - p. Willseal LLC.
2. L-Rating: Not exceeding 5.0 cfm/ft.of joint at both ambient and elevated temperatures.
- G. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.

2.4 ACCESSORIES

- A. Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing joint firestopping systems, clean joints immediately to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
- 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Apply a suitable bond-breaker to prevent three-sided adhesion in applications where this condition occurs, such as the intersection of a gypsum wall to floor or roof assembly where the joint is backed by a steel ceiling runner or track.

3.3 INSTALLATION

- A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
 - 1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
 - 3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
 - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 ft. from end of wall and at intervals not exceeding 30 ft.
- B. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning - Joint Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2393.
- B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.
- C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

3.7 JOINT FIRESTOPPING SYSTEM SCHEDULE

- A. Floor-to-Floor, Joint Firestopping Systems:
 - 1. Assembly Rating: 2 hours.
 - 2. Nominal Joint Width: As indicated.
- B. Wall-to-Wall, Joint Firestopping Systems:
 - 1. Assembly Rating: 1 hour or 2 hours. Refer to drawings.
 - 2. Nominal Joint Width: As indicated.
- C. Floor-to-Wall, Joint Firestopping System: UL No. 2079.
 - 1. Basis-of-Design: Hilti System No. FW-D-0067.
 - 2. Assembly Rating: 2 Hours.
 - 3. Nominal Joint width: 1 inch.
- D. Bottom & Head-of-Wall, Fire-Resistive Joint Firestopping Systems:
 - 1. Assembly Rating: 1 hour or 2 hours. Refer to drawings.
 - 2. Nominal Joint Width: As indicated.

- E. Curtainwall Perimeter Fire Barrier System
 - 1. F-Rating: 2 Hours.
 - 2. Joint Width: as indicated on drawings.
 - 3. Basis-of-Design System: Hilti; HI/BPF 120-31/Edge of Slab Quikseal CFS-EOS QS.
 - a. UL No. 2079 (Air Leakage).

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Nonstaining silicone joint sealants.
 - 2. Mildew-resistant joint sealants.
 - 3. Butyl joint sealants.
 - 4. Latex joint sealants.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Joint-sealants.
 - 2. Joint sealant backing materials.
- B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

- A. Test and Evaluation Reports:
 - 1. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:
 - a. Joint-sealant location and designation.
 - b. Manufacturer and product name.
 - c. Type of substrate material.
 - d. Proposed test.
 - e. Number of samples required.

1.4 CLOSEOUT SUBMITTALS

- A. Warranty Documentation:
 - 1. Manufacturers' special warranties.

2. Installer's special warranties.

1.5 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint sealants from single manufacturer.

2.2 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested in accordance with ASTM C1248.
- B. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Pecora Corporation.
 - b. Sika Corporation; Joint Sealants.
 - c. Tremco Incorporated.

2.4 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Adfast.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. Pecora Corporation.
 - d. Soudal USA.
 - e. The Dow Chemical Company.
 - f. Tremco Incorporated.

2.5 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Everkem Diversified Products, Inc.
 - b. Franklin International.
 - c. Pecora Corporation.
 - d. Sherwin-Williams Company (The).
 - e. Tremco Incorporated.

2.6 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Adfast.
 - b. Alcot Plastics Ltd.
 - c. Construction Foam Products; a division of Nomaco, Inc.
 - d. Master Builders Solutions.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove

- loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
- a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide flush joint profile in accordance with Figure 8B in ASTM C1193.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A. Exterior joints in vertical surfaces and horizontal nontraffic surfaces:
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Joints between plant-precast architectural concrete units.
 - c. Control and expansion joints in unit masonry.
 - d. Joints in exterior insulation and finish systems.
 - e. Joints between metal panels.
 - f. Joints between different materials listed above.
 - g. Perimeter joints between materials listed above and frames of doors windows.
 - h. Control and expansion joints in ceilings and other overhead surfaces.
 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement:
1. Joint Locations:

- a. Control joints on exposed interior surfaces.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 2. Joint Sealant: Acrylic latex.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces:
1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION

SECTION 07 95 13.13

INTERIOR EXPANSION JOINT COVER ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes interior expansion joint cover assemblies.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for expansion joint cover assemblies.
- B. Shop Drawings: For each expansion joint cover assembly.
 - 1. Include plans, elevations, sections, details, splices, block-out requirement, attachments to other work, and line diagrams showing entire route of each expansion joint.
 - 2. Where expansion joint cover assemblies change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
- C. Samples: For each expansion joint cover assembly and for each color and texture specified, full width by 6 inches long in size.
- D. Samples for Initial Selection: For each type of exposed finish.
 - 1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric-seal material.
- E. Expansion Joint Cover Assembly Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
 - 1. Manufacturer and model number for each expansion joint cover assembly.
 - 2. Expansion joint cover assembly location cross-referenced to Drawings.
 - 3. Nominal, minimum, and maximum joint width.
 - 4. Movement direction.
 - 5. Materials, colors, and finishes.
 - 6. Product options.
 - 7. Fire-resistance ratings.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

- A. Furnish units in longest practicable lengths to minimize field splicing.
- B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Expansion joint cover assemblies to withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Fire-Resistance Ratings: Provide expansion joint cover assemblies with fire barriers identical to those of systems tested for fire resistance according to UL 2079 or ASTM E1966 by a qualified testing agency.
 - 1. Seismic Movement:
 - a. Joint Movement: As indicated on Drawings.

2.3 FLOOR EXPANSION JOINT COVERS

- A. EJ, Metal-Plate Floor Joint Cover: Metal cover plate fixed on one side of joint gap and free to slide on other.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; SPE-2-1 or comparable product by one of the following:
 - a. Architectural Art Manufacturing; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company.
 - c. Construction Specialties, Inc.
 - d. Nystrom, Inc.
 - e. Watson Bowman Acme Corp.
 - f. inpro Corporation.
 - 2. Application: Floor to wall.
 - 3. Installation: Surface mounted.
 - 4. Fire-Resistance Rating: Not less than that indicated on Drawings.
 - 5. Cover-Plate Design: Plain.
 - 6. Exposed Metal:
 - a. Aluminum: Manufacturer's standard.
- B. EJ, Metal-Plate Floor Joint Cover: Metal cover plate fixed on one side of joint gap and free to slide on other.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; SP-2-2 or comparable product by one of the following:

- a. Architectural Art Manufacturing; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company.
 - c. Construction Specialties, Inc.
 - d. Nystrom, Inc.
 - e. Watson Bowman Acme Corp.
 - f. inpro Corporation.
2. Application: Floor to Floor.
 3. Installation: Surface mounted.
 4. Fire-Resistance Rating: Not less than that indicated on Drawings.
 5. Cover-Plate Design: Plain.
 6. Exposed Metal:
 - a. Aluminum: Manufacturer's standard.

2.4 WALL EXPANSION JOINT COVERS

- A. EJ, Elastomeric-Seal Wall Joint Cover: Assembly consisting of elastomeric seal anchored to frames fixed to sides of joint gap.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; ESS or comparable product by one of the following:
 - a. Architectural Art Manufacturing; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company.
 - c. Construction Specialties, Inc.
 - d. Nystrom, Inc.
 - e. Watson Bowman Acme Corp.
 - f. inpro Corporation.
 2. Application: Wall to wall and Wall to corner.
 3. Seal: Preformed elastomeric membranes or extrusions.
 - a. Color: As selected by Architect from manufacturer's full range.

2.5 CEILING EXPANSION JOINT COVERS

- A. EJ, Ceiling Joint Cover: Metal frames and elastomeric joint filler.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 2. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; VSG-200 or comparable product by one of the following:
 - a. Architectural Art Manufacturing; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company.
 - c. Construction Specialties, Inc.
 - d. Nystrom, Inc.
 - e. inpro Corporation.
 3. Application: Ceiling to ceiling.

4. Exposed Metal:
 - a. Aluminum: Manufacturer's standard.
 - B. EJ, Ceiling Joint Cover: Metal frames and elastomeric joint filler.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 2. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; VSGL-200 or comparable product by one of the following:
 - a. Architectural Art Manufacturing; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company.
 - c. Construction Specialties, Inc.
 - d. Nystrom, Inc.
 - e. inpro Corporation.
 3. Application: Ceiling to Wall.
 4. Exposed Metal:
 - a. Aluminum: Manufacturer's standard.
- 2.6 MATERIALS
- A. Aluminum: ASTM B221, Alloy 6063-T5 for extrusions; ASTM B209, Alloy 6061-T6 for sheet and plate.
 1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
 - B. Elastomeric Seals: Manufacturer's standard preformed elastomeric membranes or extrusions to be installed in metal frames.
- 2.7 ALUMINUM FINISHES
- A. Mill finish.
 - B. Clear Anodic Finish: AAMA 611, [AA-M12C22A41, Class I, 0.018 mm] [AA-M12C22A31, Class II, 0.010 mm] or thicker.
 - C. Color Anodic Finish: AAMA 611, [AA-M12C22A42/A44, Class I, 0.018 mm] [AA-M12C22A32/A34, Class II, 0.010 mm] or thicker.
- 2.8 STAINLESS STEEL FINISHES
- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
 - B. Bright, Cold-Rolled, Unpolished Finish: No. 2B.
- 2.9 ACCESSORIES
- A. Manufacturer's standard attachment devices. Include anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces where expansion joint cover assemblies will be installed for installation tolerances and other conditions affecting performance of the Work.
- B. Notify Architect where discrepancies occur that will affect proper expansion joint cover assembly installation and performance.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to expansion joint cover assembly manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

3.3 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.
- B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion joint cover assemblies.
 - 1. Repair or grout block out as required for continuous frame support using nonmetallic, shrinkage-resistant grout.
 - 2. Install frames in continuous contact with adjacent surfaces.
 - a. Shimming is not permitted.
 - 3. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
 - 4. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation.
 - 5. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
 - 6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.
- C. Seals: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
 - 1. Provide in continuous lengths for straight sections.
 - 2. Seal transitions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.

3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- D. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.
- E. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.

3.4 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion joint cover assemblies. Reinstall cover plates or seals prior to Substantial Completion.

END OF SECTION

SECTION 07 95 13.16

EXTERIOR EXPANSION JOINT COVER ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior expansion joint covers.

B. Related Requirements:

1. Section 07 71 29 "Manufactured Roof Expansion Joints" for factory-fabricated roof expansion joint cover assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for expansion joint cover assemblies.

B. Shop Drawings: For each expansion joint cover assembly.

1. Include plans, elevations, sections, details, splices, block-out requirement, attachments to other work, and line diagrams showing entire route of each expansion joint.
2. Where expansion joint cover assemblies change planes, provide isometric or clearly detailed drawing depicting how components interconnect.

C. Samples: For each exposed expansion joint cover assembly and for each color and texture specified, full width by 6 inches long in size.

D. Samples for Initial Selection: For each type of exposed finish.

1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric seal material.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

A. Furnish units in longest practicable lengths to minimize field splicing.

B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

2.2 EXTERIOR EXPANSION JOINT COVERS

- A. EEJ-1, Exterior Metal-Plate Joint Cover: Assembly consisting of sliding metal cover plate in continuous contact with gaskets mounted on metal frames fixed to sides of joint gap.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 2. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; VSS 200 or comparable product by one of the following:
 - a. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company.
 - c. BASF Corp. - Watson Bowman Acme Corp.
 - d. Construction Specialties, Inc.
 - e. Inpro Corporation.
 - f. MM Systems Corporation.
 - g. Nystrom.
 3. Application: Wall to wall.
 4. Installation: Surface mounted.
 5. Exposed Metal:
 - a. Aluminum: Manufacturer's standard.
 - 1) Color: As selected by Architect from full range of industry colors and color densities.
- B. EEJ-2, Preformed Foam Joint Seals: Manufacturer's standard joint seal manufactured from silicone fused to a cellular polyurethane-polyester binary backer block creating a monolithic seal. A field applied silicone edge reveal bonds the seal to the structure.
1. Basis-of-Design Product: Subject to compliance with requirements, provide MM Systems; ESS-200 or comparable product by one of the following:
 - a. Balco; a CSW Industrials Company.
 - b. BASF Corp. - Watson Bowman Acme Corp.
 - c. EMSEAL Joint Systems, Ltd.
 - d. LymTal International Inc.
 - e. Nystrom.
 - f. Pecora Corporation.
 - g. Schul International Company, Inc.
 - h. Willseal LLC.
 2. Design Criteria:
 - a. Nominal Joint Width: 2 inches.
 3. Joint Seal Color: As selected by Architect from full range of industry colors.

2.3 MATERIALS

- A. Aluminum: ASTM B221, Alloy 6063-T5 for extrusions; ASTM B209, Alloy 6061-T6 for sheet and plate.
1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.

- B. Elastomeric Seals: Manufacturer's standard preformed elastomeric membranes or extrusions to be installed in metal frames.
- C. Moisture Barrier: Manufacturer's standard, flexible elastomeric material.

2.4 ALUMINUM FINISHES

- A. Mill finish.
- B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- C. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

2.5 ACCESSORIES

- A. Moisture Barriers: Manufacturer's standard continuous, waterproof membrane within joint and attached to substrate on sides of joint.
 - 1. Provide where indicated on Drawings.
- B. Manufacturer's standard attachment devices. Include anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces where expansion joint cover assemblies will be installed for installation tolerances and other conditions affecting performance of the Work.
- B. Notify Architect where discrepancies occur that will affect proper expansion joint cover assembly installation and performance.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to expansion joint cover assembly manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

3.3 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.

- B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion joint cover assemblies.
 - 1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
 - 2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation.
 - 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
 - 4. Install frames in continuous contact with adjacent surfaces.
 - a. Shimming is not permitted.
 - 5. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.
- C. Elastomeric Seals: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
 - 1. Provide in continuous lengths for straight sections.
 - 2. Seal transitions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
 - 3. Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- D. Preformed Foam Joint Seals: Install in compliance with manufacturer's written instructions. Install with minimum number of end joints.
 - 1. Install each length of seal immediately after removing protective wrapping.
 - 2. Firmly secure compressed joint seals to joint gap side to obtain full bond using exposed pressure-sensitive adhesive or field-applied adhesive as recommended by manufacturer.
 - 3. Do not pull or stretch material. Produce seal continuity at splices, ends, turns, and intersections of joints.
 - 4. For applications at low ambient temperatures, heat foam joint seal material in compliance with manufacturer's written instructions.
- E. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.
- F. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.
- G. Moisture Barrier Drainage: If indicated, provide drainage fitting and connect to drains.

3.4 CONNECTIONS

- A. Transition to Roof Expansion Joint Covers: Coordinate installation of exterior wall and soffit expansion joint covers with roof expansion joint covers specified in Section 07 71 29 "Manufactured Roof Expansion Joints." Install factory-fabricated units at transition between exterior walls and soffits and roof expansion joint cover assemblies.

3.5 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B. Protect the installation from damage by work of other Sections.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Interior standard steel doors and frames.
- B. Related Requirements:
 - 1. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.3 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.

7. Details of anchorages, joints, field splices, and connections.
 8. Details of accessories.
 9. Details of moldings, removable stops, and glazing.
- C. Samples for Initial Selection: For hollow-metal doors and frames with factory-applied color finishes.
 - D. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For door inspector.
 1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.
 2. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.
 3. Submit copy of DHI Fire and Egress Door Assembly Inspector (FDAI) certificate.
 - B. Product Test Reports: For each type of fire-rated hollow-metal door and frame assembly and fire-rated borrowed-lite assembly for tests performed by a qualified testing agency indicating compliance with performance requirements.
 - C. Field quality control reports.
- 1.6 CLOSEOUT SUBMITTALS
- A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.
- 1.7 QUALITY ASSURANCE
- A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies is to meet the qualifications set forth in NFPA 80, section 5.2.3.1 and the following:
 1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.
 - B. Egress Door Inspector Qualifications: Inspector for field quality control inspections of egress door assemblies is to meet the qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
 1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings on Drawings, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
 1. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing in accordance with UL 1784 and installed in compliance with NFPA 105.
- B. Fire-Rated, Borrowed-Lite Assemblies: Assemblies complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing in accordance with NFPA 257 or UL 9.

2.2 INTERIOR STANDARD STEEL DOORS AND FRAMES

- A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Doors and Frames: ANSI/SDIA250.8, Level 2; ANSI/SDIA250.4, Level B.
 1. Doors: Basis-of-Design Product: Steelcraft GrainTech Doors.
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: Door faces shall be embossed with vertical wood grain pattern extending the full height and width of the door. Applied grain patterns are not acceptable.
 - d. Door Skin Thickness: Minimum thickness of 0.0598 inch.
 - e. Edge Construction: Provide manufacturer's standard beveled or square edges.
 - f. Door Preparation for Integral Exit Device: Factory prepared, including a rolled edge cutout to eliminate sharp edge corners. Reinforcements on lock side of door to be 24-gauge steel channels, welded to the inside face of the door panel sheets.
 - g. Finish: Doors shall be cleaned, phosphatized, and prime painted
 - h. with a stain absorbing primer, and stained to simulate the
 - i. wood door finish for the project, custom matched as required.

- j. Core: Manufacturer's standard.
 - k. Fire-Rated Core: Manufacturer's standard mineral board core for fire-rated.
 - 2. Frames:
 - a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
 - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Full profile welded.
 - 3. Exposed Finish: Prime.
- 2.3 BORROWED LITES
 - A. Fabricate of uncoated steel sheet, minimum thickness of 0.053 inch.
 - B. Construction: Full profile welded.
 - C. Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as metal as frames.
 - D. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
- 2.4 HOLLOW-METAL PANELS
 - A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.
- 2.5 FRAME ANCHORS
 - A. Jamb Anchors:
 - 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 - 2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
 - 3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
 - B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
 - C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.
 - D. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.6 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.
- C. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- D. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.
- E. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

2.7 FABRICATION

- A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
- B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
 - 1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding, or by rigid mechanical anchors.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDIA250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

- D. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with mitered hairline joints.
1. Provide stops and moldings flush with face of door, and with square stops unless otherwise indicated.
 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
 5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

2.8 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDIA250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

- A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.
- B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

- a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
 - b. Install frames with removable stops located on secure side of opening.
 2. Fire-Rated Openings: Install frames in accordance with NFPA 80.
 3. Floor Anchors: Secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 4. Solidly pack mineral-fiber insulation inside frames.
 5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
 6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
 - C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
 1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
 2. Fire-Rated Doors: Install doors with clearances in accordance with NFPA 80.
 3. Smoke-Control Doors: Install doors in accordance with NFPA 105.
 - D. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.
- 3.3 FIELD QUALITY CONTROL
- A. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
 - B. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
 - C. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.4 REPAIR

- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- B. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.
- C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Five-ply flush wood veneer-faced doors for transparent finish.
2. Fire-rated wood door frames.
3. Factory finishing flush wood doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including the following:

1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Door trim for openings.
5. Door frame construction.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

1. Door schedule indicating door location, type, size, fire protection rating, and swing.
2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
3. Details of frame for each frame type, including dimensions and profile.
4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
5. Dimensions and locations of blocking for hardware attachment.
6. Dimensions and locations of mortises and holes for hardware.
7. Clearances and undercuts.
8. Requirements for veneer matching.
9. Doors to be factory finished and application requirements.

C. Samples for Initial Selection: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons, and wrap bundles of doors in plastic sheeting.
- C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.5 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Delamination of veneer.
 - b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 2. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain flush wood doors indicated to be blueprint matched with paneling from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Wood Door and Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated on Drawings, based on testing at positive pressure in accordance with UL 10C or NFPA 252.

2.3 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI/AWMAC/WI's "Architectural Woodwork Standards."

2.4 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Doors, Solid-Core Five-Ply Veneer-Faced:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Lambton Doors.
 - b. Masonite Architectural.
 - c. Oshkosh Door Company.
 - d. VT Industries Inc.
 - 2. Architectural Woodwork Standards Grade: Premium.
 - 3. Faces: Single-ply wood veneer not less than 1/50 inch thick.
 - a. Species: White oak. Veneer to match existing doors.
 - 1) Provide veneers selected for similar color and grain. Figuring not acceptable.
 - b. Cut: Rift cut/rift sawn.
 - c. Match between Veneer Leaves: Book match.
 - d. Assembly of Veneer Leaves on Door Faces: Center-balance.
 - e. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
 - 4. Exposed Vertical and Top Edges: Same species as faces or a compatible species - Architectural Woodwork Standards edge Type A.
 - a. Fire-Rated Single Doors: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed vertical edges.
 - b. Fire-Rated Pairs of Doors:
 - 1) Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
 - c. Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
 - 5. Core for Non-Fire-Rated Doors:
 - a. ANSI A208.1, Grade LD-1 particleboard.
 - 1) Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
 - 2) Provide doors with glued-wood-stave cores instead of particleboard cores for doors scheduled to receive exit devices in Section 08 71 00 "Door Hardware."
 - b. Glued wood stave.

6. Core for Fire-Rated Doors: As required to achieve fire-protection rating indicated on Drawings.
 - a. Blocking for Mineral-Core Doors: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated on Drawings as needed to eliminate through-bolting hardware.
7. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

2.5 LIGHT FRAMES

- A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
 1. Wood Species: Same species as door faces.
 2. Profile: Flush rectangular beads.
 3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.
- B. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; with baked-enamel- or powder-coated finish; and approved for use in doors of fire-protection rating indicated on Drawings.

2.6 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated.
 1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 2. Comply with NFPA 80 requirements for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.
 1. Locate hardware to comply with DHI-WDHS-3.
 2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
 3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
 4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
 5. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- C. Openings: Factory cut and trim openings through doors.
 1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 08 80 00 "Glazing."

3. Louvers: Factory install louvers in prepared openings.

2.7 FACTORY FINISHING

- A. Comply with referenced quality standard for factory finishing.
 1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 2. Finish faces, all four edges, edges of cutouts, and mortises.
 3. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors.
- C. Transparent Finish:
 1. Architectural Woodwork Standards Grade: Premium.
 2. Staining: As selected by Architect from manufacturer's full range.
 3. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 08 71 00 "Door Hardware."
- B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Install frames level, plumb, true, and straight.
 1. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
 2. Anchor frames to anchors or blocking built in or directly attached to substrates.
 - a. Secure with countersunk, concealed fasteners and blind nailing.
 - b. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - 1) For factory-finished items, use filler matching finish of items being installed.

3. Install fire-rated doors and frames in accordance with NFPA 80.
 4. Install smoke- and draft-control doors in accordance with NFPA 105.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
 - E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 08 22 20

FIBERGLASS REINFORCED POLYESTER DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes FRP Face (interior) flush doors.
- B. Related work described in other sections includes:
 - 1. Division 8 Section "Door Hardware".
 - 2. Division 8 Section "Glazing".

1.2 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's product data, specifications and instructions for each type of door and frame required in accordance with Division 1 and the following:
 - 1. Include details of core, stile and rail construction, trim for lites and all other components.
 - 2. Include details of finish hardware mounting.
 - 3. Include one sample of typical fabricated section, showing joints, fastenings, quality of workmanship, hardware and accessory items before fabrication of the work proceeds.
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.
- C. Submit shop drawings for the fabrication and installation of the doors and frames, and associated components. Details to be shown full scale. Include glazing details.

1.3 QUALITY ASSURANCE

- A. Standards: Comply with the requirements and recommendations in applicable specification and standards by AAMA, except to the extent more stringent requirements are indicated.
- B. Performance: A minimum ten year record of production of frames, doors and panels and completion of similar projects in type and size.
- C. Instruction: The manufacturer or his representative will be available for consultation to all parties engaged in the project including instruction to installation personnel.
- D. Field Measurement: Field verify all information prior to fabrication and furnishing of materials. Furnish and install materials omitted due to lack of verification at no additional cost to Owner.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to jobsite in their original, unopened packages with labels intact. Inspect materials for damage and advise manufacturer immediately of any unsatisfactory materials.
- B. Package door assemblies in individual corrugated cartons so no portion of the door has contact with the outer shell of the container.

1.5 PROJECT WARRANTY

- A. Provide a written warranty signed by manufacturer, installer and contractor, agreeing to replace, at no cost to the Owner, any doors which fail in materials or workmanship, within the warranty period. Failure of materials or workmanship includes: excessive deflection, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering and defects in hardware installation. The minimum time period of warranty is ten (10) years from acceptance.

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. Provide door assemblies that have been designed and fabricated to comply with requirements for system performance characteristics listed below, as demonstrated by testing manufacturer's corresponding standard systems according to test methods designated.
- B. Flame Spread/Smoke Developed: Provide FRP doors and panels with the following ratings in accordance with ASTM 84:
 - 1. Flame Spread: Not greater than 25 (Class A)
 - 2. Smoke Developed: Not greater than 450 (Class A)

2.2 DESCRIPTION OF WORK

- A. The extent of each type of door is shown on the drawings and schedules.
- B. The following types of doors are required:
 - 1. FRP flush doors.
 - 2. Rated FRP/Aluminum Hybrid flush doors.

2.3 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
 - 1. Special-Lite, Inc.
 - 2. FRP Architectural Doors Inc.
 - 3. Kawneer.

2.4 MATERIALS AND ACCESSORIES

- A. Aluminum Members: Alloy and temper as recommended by manufacturer for strength, corrosion resistance and application of required finish and control of color; ASTM B 221 for extrusions, ASTM B 209 for sheet/plate with aluminum wall thickness of 0.125 inches.
- B. Fasteners: Aluminum, non-magnetic stainless steel or other non-corrosive metal fasteners, guaranteed by the manufacturer to be compatible with the doors, frames, stops, panels, hardware, anchors and other items being fastened. For exposed fasteners (if any) provide Phillips head screws with finish matching the item to be fastened.
- C. Glazing gaskets: For glazing factory-installed glass, and for gaskets which are factory-installed, manufacturer's standard stripping of molded neoprene, complying with ASTM D 2000, or molded PVC complying with ASTM C 509 Grade 4.

2.5 FABRICATION

- A. Sizes and Profiles: The required sizes for door units, and profile requirements are shown on the drawings.
- B. Complete the cutting, fitting, forming, drilling and grinding of all metal work prior to assembly. Remove burrs from cut edges, and ease edges and corners to a radius of approximately 1/64".
- C. No welding of doors or frames is acceptable.
- D. Maintain continuity of line and accurate relation of planes and angles. Secure attachments and support at mechanical joints, with hairline fit at contacting members.

2.6 FIBERGLASS REINFORCED POLYESTER (FRP) FLUSH DOORS

- A. Materials and Construction
 - 1. Construct 1-3/4" thickness doors of 6063-T5 aluminum alloy rails and stiles minimum 2-5/16" depth. Construct with mitered corners.
 - a. Provide .125" tubular shaped stiles and rails reinforced to accept hardware as specified. Furnish integral reglets to accept face sheet to permit a flush appearance. Rail caps or other face sheet capture methods are not acceptable.
 - 2. Extrude top and bottom rail legs for interlocking continuous rail rigidity weather bar. Lock face sheet material in place with extruded interlocking edges to be flush with aluminum rails and stiles.
 - 3. Door face sheeting .120" thickness fiberglass reinforced polyester.
 - a. Color to be selected from manufacturer's full range of options.
 - 4. Core of Door Assembly: Minimum 3.5 pounds per cubic foot density poured-in-place polyurethane free of CFC. Meeting stiles on pairs of doors and bottom weather bars with nylon brush weatherstripping.

5. Manufacture doors with cutouts for vision lites as scheduled. Factory furnish and install glass prior to shipment where possible. Large vision lites may be installed in the field.
6. Pre-machine doors in accordance with templates from the specified hardware manufacturers and approved hardware schedule.

2.7 RATED (FRP/ALUMINUM) HYBRID FLUSH DOORS

A. Materials and Construction

1. Construct 1-7/8" thickness doors (at door edge).
2. Edge Channels to be 0.062" thick, 3/4" leg, stainless steel edge channel applied to entire perimeter. Sealed by fire barrier caulk.
3. Top and bottom rails to be constructed out of tectonite with minimum 6" top and 4 1/2" bottom rails. Stiles to be minimum 2" on hinge side and 3" for the meeting edge on door pairs.
4. Door face sheeting .120" thickness fiberglass reinforced polyester.
 - a. Color to be selected from manufacturer's full range of options.
5. Core of Door Assembly: Minimum 1 1/2" nominal thickness and 18 pcf minimum density.
6. Manufacture doors with cutouts for vision lites as scheduled. Factory furnish and install glass prior to shipment where possible. Large vision lites may be installed in the field.
7. Pre-machine doors in accordance with templates from the specified hardware manufacturers and approved hardware schedule.

2.8 GLAZING

A. Design system for replacement of glass

1. Manufacturer's standard flush glazing system of recessed channels and captive glazing gaskets or applied stops as shown.
2. Allow for thermal expansion on exterior units.

2.9 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 607.1.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's recommendations and specifications for the installation of the doors.
- B. Set units plumb, level and true to line, without warp or rack of doors or frames. Anchor securely in place. Separate aluminum and other metal surfaces with bituminous coatings or other means as approved by architect.
- C. Clean surfaces promptly after installation of doors, exercising care to avoid damage to the protective coatings.
- D. Ensure that the doors will be without damage or deterioration (other than normal weathering) at the time of acceptance.
- E. Provide Owner with all adjustment tools and instruction sheets. Arrange an in-service session to Owner at Owner's convenience. Provide a minimum one-year written warranty on all labor related to this section. Any workmanship which is defective or deficient shall be corrected to the Owner's satisfaction and at no additional cost to the Owner.

END OF SECTION

SECTION 08 31 13

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Access doors and frames.

B. Related Requirements:

1. Section 07 72 00 "Roof Accessories" for roof hatches.
2. Section 23 33 00 "Air Duct Accessories" for heating and air-conditioning duct access doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Product Schedule: For access doors and frames.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES

A. Flush Access Doors with Exposed Flanges:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Activar Construction Products Group, Inc. - JL Industries.
 - b. ACUDOR Products, Inc.
 - c. Babcock-Davis.
 - d. Cendrex Inc.
 - e. Elmdor/Stoneman Manufacturing Company; a division of Acorn Engineering Company.
 - f. Karp Associates, Inc.
 - g. Lane-Aire Manufacturing Corp.
 - h. Larsens Manufacturing Company.
 - i. Maxam Metal Products Limited.
 - j. Metropolitan Door Industries Corp.
 - k. MIFAB, Inc.
 - l. Milcor; a division of Hart & Cooley, Inc.
 - m. Nystrom.
 - n. Williams Bros. Corporation of America (The).

2. Description: Face of door flush with frame, with exposed flange and concealed hinge.
3. Locations: Wall and ceiling.
4. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch, 16 gage, factory finished.
5. Frame Material: Same material, thickness, and finish as door.
6. Latch and Lock: Cam latch, screwdriver operated.

2.2 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.
- C. Frame Anchors: Same material as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 1. Factory Finished: Apply manufacturer's standard baked-enamel or powder-coat finish immediately after cleaning and pretreating, with minimum dry-film thickness of 1 mil for topcoat.
 - a. Color: As selected by Architect from full range of industry colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

SECTION 08 33 23
OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Insulated service doors.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for miscellaneous steel supports, door-opening framing, corner guards, and bollards.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
3. Include description of automatic-closing device and testing and resetting instructions.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. For exterior components, include details of provisions for assembly expansion and contraction and for excluding and draining moisture to the exterior.
5. Show locations of controls, locking devices and other accessories.
6. Include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Oversize Construction Certification: For door assemblies required to be fire-rated and that exceed size limitations of labeled assemblies.
- C. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Special warranty.
- B. Maintenance Data: For overhead coiling doors to include in maintenance manuals.
- C. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
 - 1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of doors that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.
 - 1. Obtain operators and controls from overhead coiling-door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.
- B. Structural Performance, Exterior Doors: Capable of withstanding the following design wind loads:
 - 1. Design Wind Load: As indicated on Drawings.
 - 2. Testing: According to ASTM E330/E330M.

3. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.
4. Operability under Wind Load: Design overhead coiling doors to remain operable under **design** wind load, acting inward and outward.

2.3 DOOR ASSEMBLY

- A. OCD, Insulated Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Overhead Door Corporation; Stormtite AP Model 627 or comparable product by one of the following:
 - a. ACME Rolling Doors.
 - b. Advanced Door Technologies.
 - c. Alpine Overhead Doors, Inc.
 - d. Alumatec Pacific Products.
 - e. ASTA Door Corporation.
 - f. C.H.I. Overhead Doors, Inc.
 - g. City-Gates.
 - h. Clopay Building Products.
 - i. Cookson; a CornellCookson company.
 - j. Cornell; a CornellCookson company.
 - k. Dynamic Closures Corporation.
 - l. ENTREMATIIC.
 - m. Hormann High Performance Doors.
 - n. Lawrence Roll-Up Doors, Inc.
 - o. McKeon Rolling Steel Door Company, Inc.
 - p. Metro Door LLC.
 - q. Raynor Garage Doors.
 - r. Southwestern Rolling Steel Door Co.
 - s. Wayne-Dalton Corp.
 - t. Windsor Door.
- B. Operation Cycles: Door components and operators capable of operating for not less than 20,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
 1. Include tamperproof cycle counter.
- C. Air Infiltration: Maximum rate of 1.0 cfm/sq. ft. at 15 and 25 mph when tested according to ASTM E283 or DASMA 105.
- D. STC Rating: 26.
- E. Insulated Door Curtain R-Value: 4.5 deg F x h x sq. ft./Btu.
- F. Insulated Door Assembly U-Factor: 0.90 Btu/deg F x h x sq. ft.
- G. Door Curtain Material: Aluminum.
- H. Door Curtain Slats: Flat profile slats of 2-5/8-inch center-to-center height.

1. Vision Panels: Approximately 10- by 1-5/8-inch openings spaced approximately 2 inches apart and beginning 12 inches from end guides; in two rows of slats at height indicated on Drawings; installed with insulated vision-panel glazing.
2. Insulated-Slat Interior Facing: Metal.
3. Gasket Seal. Manufacturer's standard continuous gaskets between slats.
- I. Bottom Bar: Two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch thick; fabricated from stainless steel or aluminum extrusions] and finished to match door.
- J. Curtain Jamb Guides: Aluminum with exposed finish matching curtain slats.
- K. Hood: Match curtain material and finish.
 1. Shape: Square.
 2. Mounting: Face of wall.
- L. Locking Devices: Equip door with locking device assembly and chain lock keeper.
 1. Locking Device Assembly: Cremone-type, both jamb sides locking bars, operable from inside with thumbturn and outside with cylinder.
- M. Electric Door Operator:
 1. Usage Classification: Medium duty, up to 12 cycles per hour and up to 50 cycles per day.
 2. Operator Location: Wall.
 3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 ft. or lower.
 4. Motor Exposure: Interior.
 5. Motor Electrical Characteristics:
 - a. Horsepower: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - b. Voltage: 115 V ac, single phase, 60 Hz.
 6. Emergency Manual Operation: Chain type.
 7. Obstruction-Detection Device: Automatic electric sensor edge on bottom bar.
 - a. Sensor Edge Bulb Color: Black.
 8. Control Station(s): Interior mounted.
- N. Curtain Accessories: Equip door with weatherseals, push/pull handles, and pull-down strap.
- O. Door Finish:
 1. Baked-Enamel or Powder-Coated Finish: Color as selected by Architect from manufacturer's full range.
 2. Interior Curtain-Slat Facing: Finish as selected by Architect from manufacturer's full range.

2.4 MATERIALS, GENERAL

- A. 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.

2.5 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Aluminum Door Curtain Slats: ASTM B209 sheet or ASTM B221 extrusions, alloy and temper standard with manufacturer for type of use and finish indicated; thickness of 0.050 inch; and as required.
 - 2. Vision-Panel Glazing: Manufacturer's standard clear glazing, fabricated from transparent acrylic sheet or fire-protection-rated glass as required for type of door; set in glazing channel secured to curtain slats.
 - 3. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E84 or UL 723. Enclose insulation completely within slat faces.
 - 4. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum aluminum thickness of 0.032 inch.
- B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.6 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Aluminum: 0.040-inch-thick aluminum sheet complying with ASTM B209, of alloy and temper recommended by manufacturer and finisher for type of use and finish indicated.

2.7 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

- B. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
 - 1. Lock Cylinders: As specified in Section 08 71 00 "Door Hardware" and keyed to building keying system.
 - 2. Keys: Three for each cylinder.
- C. Chain Lock Keeper: Suitable for padlock.
- D. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.8 CURTAIN ACCESSORIES

- A. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.
 - 1. At door head, use 1/8-inch-thick, replaceable, continuous-sheet baffle secured to inside of hood or field-installed on the header.
 - 2. At door jambs, use replaceable, adjustable, continuous, flexible, 1/8-inch-thick seals of flexible vinyl, rubber, or neoprene.
- B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.
- C. Pull-Down Strap: Provide pull-down straps for doors more than 84 inches high.
- D. Pole Hooks: Provide pole hooks and poles for doors more than 84 inches high.

2.9 COUNTERBALANCE MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

2.10 ELECTRIC DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
 - 1. Comply with NFPA 70.
 - 2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.
- C. Door Operator Location(s): Operator location indicated for each door.

1. Wall Mounted: Operator is mounted to the inside front wall on the left or right side of door and connected to door drive shaft with drive chain and sprockets. Side room is required for this type of mounting. Wall-mounted operator can also be mounted above or below shaft; if above shaft, headroom is required.
- D. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated for each door assembly.
 1. Electrical Characteristics: Minimum as indicated for each door assembly. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
 2. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
 3. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
- E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- F. Obstruction-Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. For non-fire-rated doors, activation of device immediately stops and reverses downward door travel.
 1. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
 - a. Self-Monitoring Type: Four-wire-configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.
- G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."
 1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf.
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

2.11 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.12 ALUMINUM FINISHES

- A. Baked-Enamel or Powder-Coat Finish: AAMA 2603. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, controls, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with the accessibility standard.
- D. Power-Operated Doors: Install according to UL 325.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Test door release, closing, and alarm operations when activated by smoke detector or building's fire-alarm system. Test manual operation of closed door. Reset door-closing mechanism after successful test.

- B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- C. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. After electrical circuitry has been energized, operate doors to confirm proper motor rotation and door performance.
 - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.5 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
 - 1. Adjust exterior doors and components to be weather resistant.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide tight fit around entire perimeter.

3.6 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service includes 12 months' full maintenance by skilled employees of coiling-door Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door operation. Parts and supplies are to be manufacturer's authorized replacement parts and supplies.
 - 1. Perform maintenance, including emergency callback service, during normal working hours.
 - 2. Include 24-hour-per-day, seven-day-per-week, emergency callback service.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION

SECTION 08 33 44

OVERHEAD COILING FIRE CURTAINS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire and Smoke-protective curtain assemblies for fixed openings.

1.2 COORDINATION

- A. Coordinate fire- and smoke-protective curtain assemblies with power, signal, fire-alarm, and smoke-detection systems specified in Division 26 and Division 28.
- B. Coordinate fire- and smoke-protective curtain assemblies with ceilings for operational clearances and maintenance access requirements.
- C. Coordinate fire- and smoke-protective curtain assemblies with walls for support requirements, rating continuity above ceilings, and recessed wall switches.
- D. Coordinate requirements for metal supports required for fire- and smoke-protective curtain assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of fire- and smoke-protective curtain assembly and fire door.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protective curtain assemblies.
2. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
3. Include ratings, operating components, electrical characteristics, control systems, and furnished specialties and accessories.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Include details of fire-protective curtain assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location of each field connection.
3. Detail fabrication and assembly of fire-protective curtain assemblies.
4. Show locations of controls, detectors or replaceable fusible links, and other accessories.
5. Include diagrams for power, signal, and control wiring.

- C. Product Schedule: For fire-protective curtain assemblies. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer, testing agency, and factory-authorized service representative.
- B. Evaluation Reports: For curtain assemblies, from ICC-ES.
- C. Field quality-control reports.
- D. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-protective curtain assemblies to include in emergency, operation, and maintenance manuals.
- B. Field quality-control reports for required testing.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: An entity experienced in manufacturing smoke-and-draft-control curtain assemblies that have been successfully installed in compliance with requirements of authorities having jurisdiction.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
- C. Fire-Protective Curtain Assembly Inspector Qualifications: Inspector for field quality control inspections of fire- and smoke-protective curtain assemblies complying with NFPA 80.

1.7 FIELD CONDITIONS

- A. Field Measurements: Field-verify and coordinate dimensions and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of curtain assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

- A. Source Limitations: Obtain fire-protective curtains from single source from single manufacturer.

1. Obtain operators and controls from fire-protective curtain manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Protective Curtain Assemblies: Complying with NFPA 80; listed and labeled by qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible in accordance with UL 10D.
- B. Curtain Fabric Fire-Test-Response Characteristics: Provide products that pass NFPA 701, as determined by testing of fabrics that were treated using treatment-application method intended for use for this Project by a testing and inspecting agency acceptable to authorities having jurisdiction.
- C. 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.

2.3 FIRE- AND SMOKE- PROTECTIVE CURTAIN ASSEMBLIES FOR FIXED OPENINGS

- A. Alarm-activated fire- and smoke-protective curtain assemblies restrained by curtain guides at each jamb of an opening.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Smoke Guard, a CSW Industries Company, M2500 fire-rated curtain or approved equal.
- C. Fire-Resistance Ratings: 2-hour.
- D. Smoke Containment: Assemblies complying with UL 1784 for air leakage.
- E. Operation: Motorized automatic operation with controlled descent.
- F. Hood/Head Box: Manufactured from galvanized steel conforming to ASTM A653/A653M; rated at the same temperature as the curtain fabric.
 1. Bottom pan shall have 14" bottom tray finished connected to pan in manufacturer's standard color.
- G. Curtain: Manufacturer's standard glass filament fabrics of glass fiber material coated on one side.
- H. Roller: Cold-formed steel tube conforming to ASTM A500/A500M.
- I. Side Guides: Manufacturer's standard.
- J. Motor Operator: Provide factory-assembled electric operation system of size and capacity recommended by curtain manufacturer for assembly specified, with electric motors and factory-prewired motor controls, control devices, and accessories required for proper operation.
 1. Include wiring from control stations to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
 2. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by a qualified testing agency, and marked for intended location and application.
 3. Battery Backup: Manufacturer's standard battery backup sized for motor power requirements.

- K. Leading Edge: Manufacturer standard wireless edge.
 - 1. Curtain shall have continuous wireless object safety edge. Wireless safety edge shall not have any visible parts while curtain is in stored/up position.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install fire-protective curtain assemblies in accordance with manufacturer's written installation instructions and in conformance with NFPA 80.
- B. Power-Operated Curtains: Install in accordance with UL 325.
- C. Install anchorage devices to securely fasten assembly to substrate and building framing without distortion or stress.
- D. Securely brace components suspended from structure.
- E. Fit and align assembly, including vertical guides, level and plumb, to provide smooth operation.
- F. Adjust fire-protective curtain assemblies to function smoothly, as recommended by manufacturer.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified opening protective assembly inspector to perform tests and inspections and to furnish reports to Architect.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Test release mechanism, closing, and alarm operations when activated by smoke detector or building's fire-alarm system. Test manual operation of closed curtain. Reset closing mechanism after successful test.
 - 2. Inspections: Inspect each fire-protective curtain in accordance with NFPA 80.
- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- E. Prepare and submit separate inspection report for each fire-protective curtain assembly indicating compliance with each item listed in NFPA 80.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling smoke curtains.

END OF SECTION

SECTION 08 41 23

FIRE RATED ALUMINUM FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Fire rated framing systems for installation as windows in exterior openings.

B. Related Sections:

1. Section 05 50 00 "Metal Fabrications:" Steel attachment members inserts and anchors
2. Section 07 84 00 "Firestopping:" Firestops between work of this section and other fire resistive assemblies.
3. Section 07 92 00 "Joint Sealants" for installation of joint sealants installed with steel fire-rated glazed curtain-wall systems and for sealants to the extent not specified in this Section.
4. Section 08 71 00 "Door Hardware:" Door hardware other than that provided by the work of this section
5. Section 08 22 20 "Fiberglass Polyester Reinforced Doors" for fire-rated doors.
6. Section 08 88 13 "Fire-Rated Glazing" for glazing in rated storefront.

1.2 REFERENCES

A. American Architectural Manufacturers Association (AAMA)

1. AAMA 2603-2002 Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
2. AAMA 2604 -2005 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
3. AAMA 2605 -2005 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

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

1. Fire safety related:
 - a. ASTM E119: Methods for Fire Tests of Building Construction and Materials.
2. Material related:

- a. ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2007.
 - b. ASTM A 1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2006b.
3. Exterior-related:
- a. ASTM E 283-04: Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen
 - b. ASTM E 330-02: Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference Procedure A
 - c. ASTM E 331-04: Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
 - d. ASTM E 783-02: Test Method for Field Measurement of Air Leakage through Installed Exterior Windows and Doors
 - e. ASTM E 1105-00: Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference
- C. American Welding Society (AWS)
1. AWS D1.3 - Structural Welding Code - Sheet Steel; 2007
- D. Builders Hardware Manufacturers Association, Inc.
1. BHMA A156 - American National Standards for door hardware; 2006 (ANSI/BHMA A156).
- E. Canadian Standards
1. CAN-S101 Fire Endurance Tests of Building Construction and Materials
 2. CAN4-S104-M, "Fire Tests of Door Assemblies"
 3. CAN4-S106-M, "Standard Method for Fire Tests of Window and Glass Block Assemblies"
- F. National Fire Protection Association (NFPA):
1. NFPA 80: Fire Doors and Windows.
 2. NFPA 251: Fire Tests of Building Construction & Materials
 3. NFPA 252: Fire Tests of Door Assemblies
 4. NFPA 257: Fire Test of Window Assemblies
- G. Underwriters Laboratories, Inc. (UL):
1. UL 9: Fire Tests of Window Assemblies.
 2. UL 10 B: Fire Tests of Door Assemblies

3. UL 10 C: Positive Pressure Fire Tests of Window & Door Assemblies
 4. UL 263: Fire tests of Building Construction and Materials
 5. UL-752 Ratings of Bullet-Resistant Materials
 - H. American National Standards Institute (ANSI):
 1. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings
 - I. Consumer Product Safety Commission (CPSC):
 1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials
 - J. American Society of Civil Engineers (ASCE)
 1. ASCE 7 – Minimum Design Loads for Buildings and Other Structures; 2005
- 1.3 DEFINITIONS
- A. Manufacturer: A firm that produces primary glass, fabricated glass or framing as defined in referenced glazing publications.
- 1.4 ACTION SUBMITTALS
- A. Product Data:
 1. Technical Information: Submit latest edition of manufacturer’s product data providing product descriptions, technical data, Underwriters Laboratories, Inc. listings and installation instructions.
 - B. Shop Drawings:
 1. Include plans, elevations and details of product showing component dimensions; framing opening requirements, dimensions, tolerances, and attachment to structure
 - C. Structural Calculations (optional):
 1. Provide structural calculations sealed by a licensed professional engineer in the State in which the project is located; prepared in compliance with referenced documents and these specifications.
 - D. Samples. For following products:
 1. Sample of frame.
 2. Verification of sample of selected finish.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Warranties: Submit manufacturer’s warranty.
 - B. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements.
 1. Separate certification will not be required for glazing materials bearing manufacturer’s permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized

certification agency or independent testing laboratory acceptable to authority having jurisdiction

1.6 QUALITY ASSURANCE

- A. Fire-Rated Wall Assemblies: Assemblies complying with ASTM E119 that are classified and labeled by UL, for fire ratings indicated, based on testing in accordance with UL 263, ASTM E119.
- B. Listings and Labels - Fire Rated Assemblies: Under current follow-up service by Underwriters Laboratories maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle under provisions specified by manufacturer.

1.8 PROJECT CONDITIONS

- A. Obtain field measurements prior to fabrication of frame units. If field measurements will not be available in a timely manner coordinate planned measurements with the work of other sections.
 - 1. Note whether field or planned dimensions were used in the creation of the shop drawings.
- B. Coordinate the work of this section with others effected including but not limited to: other interior and/or exterior envelope components and door hardware beyond that provided by this section.

1.9 WARRANTY

- A. Provide manufacturer's standard five-year manufacturer warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Alumfram North America.
 - 2. GPX Architectural Series manufactured by SaftiFirst.
 - 3. Fireframe Aluminum Series supplied by Technical Glass Products (TGP).
- B. Basis of Design Product:
 - 1. Framing System: Fireframe Aluminum Series as manufactured by Technical Glass Products, 60-minute rated.

2.2 PERFORMANCE REQUIREMENTS

A. System Description:

1. Steel fire-rated glazed wall and/or window system, dual aluminum cover cap format
2. Face widths available: 2"
3. Custom extruded aluminum cover caps
4. Custom stainless steel cover caps
5. Duration – Windows Capable of providing a fire rating for 60 minutes.
6. Duration – Walls: Capable of providing a fire rating for 60 minutes.

B. Structural Performance:

1. Design and size the system to withstand structural forces placed upon it without damage or permanent set when tested in accordance with ASTM E330 using load 1.5 times the design wind loads and of 10 seconds in duration.

C. Air Infiltration: ASTM E 283; Air infiltration rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.24 psf.

D. Water Resistance, (static): ASTM E 331; No leakage at a static air pressure differential of 15 psf as defined in AAMA 501.

2.3 MATERIALS –ALUMINUM FRAMES

A. Aluminum Framing System: 60 min.

1. Steel Frame — The steel framing members are made of two halves, nom. 1.9 in. wide with a nom. minimum depth of 1.38 in. with lengths cut according to glazing size.
2. Aluminum Trim — Supplied with the steel framing members. Nom. 2 in. with a nom. depth of 1.54 in. with lengths cut according to glazing size.
3. Stainless Steel Standoffs — Supplied with the steel framing members. Nom 5/16 in. diameter with a nom. minimum depth of 1 1/8 in. with depth adjusted to match glazing thickness.
4. Stainless Steel Moment and Connecting Braces: — Supplied with the steel framing members. Nom 3/8 in. thick with a nom. minimum depth of 1 1/8 in. with depth adjusted to match glazing thickness.
5. Framing Member Fasteners — Supplied with the steel framing members. Screws are M6 x16mm Button Head Socket Cap Screws for frame assembly and #6 x 1" Pan Head Sheet Metal Screws for door installation.

B. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221.

C. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to

recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 2. Cold-Rolled Sheet and Strip: ASTM A 611.
 3. Hot-Rolled Sheet and Strip: ASTM A 570/A 570M.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 2. Reinforce members as required to receive fastener threads.

2.4 ACCESSORIES

- A. Fasteners: Use fasteners fabricated from Type 304 or Type 316 stainless steel.
- B. Intumescent Tape: As supplied by frame manufacturer.
- C. Setting Blocks: 1/4" Calcium silicate.
- D. Perimeter Anchors: Steel.
- E. Flashings: As recommended by manufacturer; same material and finish as cover caps.
- F. Silicone Sealant: One-Part Low Modulus, neutral cure High Movement-Capable Sealant: Type S; Grade NS; Class 25 with additional movement capability of 100 percent in extension and 50 percent in compression (total 150 percent); Use (Exposure) NT; Uses (Substrates) M, G, A, and O as applicable. (Use-O joint substrates include: Metal factory-coated with a high-performance coating; galvanized steel; ceramic tile.)
 1. Products:
 - a. Dow Corning 790, 795 - Dow Corning Corp.
 - b. Momentive.
 - c. Tremco.
- G. Intumescent Caulk: Single component, latex-based, intumescent caulk designed to stop passage of fire, smoke, and fumes through fire-rated separations; permanently flexible after cure; will not support mold growth; flame spread/smoke developed 10/10.
 1. Available Products:
 - a. 3M CP-25 WP+

2.5 FABRICATION

- A. Obtain reviewed shop drawings prior to fabrication.
- B. Fabrication Dimensions: Fabricate fire-rated assembly to field dimensions.
- C. Field glaze door and frame assemblies.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish frames after assembly.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.7 POWDERCOAT FINISHES

- A. Finish after fabrication.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.
- C. Steel or Aluminum Finishes
- D. Powder-Coat Finish: Polyester Super Durable powder coating which meets AAMA 2604 for chalking and fading. Apply manufacturer's standard powder coating finish system applied to factory-assembled frames before shipping, complying with manufacturer's recommended instructions for surface preparation including pretreatment, application, and minimum dry film thickness.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.
 - 2. Acceptable Manufacturers:
 - a. Tiger Drylac
 - a. Additional manufacturers as approved by TGP
- E. Aluminum Finishes:
 - 1. High-Performance Organic Finish (2-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2604 and with coating and resin manufacturers' written instructions.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive curtain wall system and sill plate is level in accordance with manufacturer's acceptable tolerances.
- B. Notify Architect of any conditions which jeopardize the integrity of the proposed fire wall / door system.

- C. Do not proceed until such conditions are corrected.

3.2 INSTALLATION

- A. Comply with Manufacturer's written installation manual.

3.3 REPAIR AND TOUCH UP

- A. Powder Coated Finishes:
 - B. Limited to minor repair of small scratches. Use only manufacturer's recommended products.
 - C. Such repairs shall match original finish for quality or material and view.
 - D. Repairs and touch-up not visible from a distance of 5 feet Owner and Architect to approve.
 - E. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged.

3.4 PROTECTION AND CLEANING

- A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
 - 1. Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.
 - 2. Do not use any of the following:
 - a. Steam jets
 - b. Abrasives
 - c. Strong acidic or alkaline detergents, or surface-reactive agents
 - d. Detergents not recommended in writing by the manufacturer
 - e. Do not use any detergent above 77 degrees F
 - f. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
 - g. Metal or hard parts of cleaning equipment must not touch the glass surface
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION

SECTION 08 44 13

GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glazed aluminum curtain wall systems:
 - a. Conventionally glazed.

B. Related Requirements:

1. Section 07 84 43 "Joint Firestopping" perimeter fire-containment systems field installed with glazed aluminum curtain walls.
2. Section 07 92 00 "Joint Sealants" for installation of joint sealants installed with glazed aluminum curtain walls and for sealants to the extent not specified in this Section.
3. Section 08 80 00 "Glazing" for curtain wall glazing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
2. Include full-size isometric details of each type of vertical-to-horizontal intersection of glazed aluminum curtain walls, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Delegated-Design Submittal: For glazed aluminum curtain walls, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data:
 - 1. For Installer.
 - 2. For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the state in which Project is located.
- B. Energy Performance Certificates: For glazed aluminum curtain walls, accessories, and components from manufacturer.
 - 1. Basis for Certification: NFRC-certified energy performance values for each glazed aluminum curtain wall.
- C. Product Test Reports: For glazed aluminum curtain walls, for tests performed by manufacturer and witnessed by a qualified testing agency.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and that employs a qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AGM) contractors and that employs glazing technicians certified under the Architectural Glass and Metal Technician (AGMT) certification program.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.5 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical wall area as shown on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 WARRANTY

- A. Special Assembly Warranty: Installer agrees to repair or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: Five years from date of Substantial Completion.
- B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design glazed aluminum curtain walls.
- B. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Glazed aluminum curtain walls shall withstand movements of supporting structure, including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.

- d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- C. Structural Loads:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Other Design Loads: As indicated on Drawings.
- D. Deflection of Framing Members Supporting Glass: At design wind load, as follows:
 - 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans of greater than 13 feet 6 inches.
 - 2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
- E. Structural: Test in accordance with ASTM E330/E330M as follows:
 - 1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- F. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:
 - 1. No evidence of water penetration through fixed glazing and framing areas when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 15 lbf/sq. ft..
- G. Water Penetration under Dynamic Pressure: Test in accordance with AAMA 501.1 as follows:
 - 1. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 15 lbf/sq. ft. .
 - 2. Maximum Water Leakage: In accordance with AAMA 501.1. Water leakage does not include water controlled by flashing and gutters or water that is drained to exterior.
- H. Energy Performance: Certified and labelled by manufacturer for energy performance as follows:
 - 1. Thermal Transmittance (U-factor):
 - a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.38 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.

2. Solar Heat Gain Coefficient (SHGC):
 - a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.25 as determined in accordance with NFRC 200.
 3. Air Leakage:
 - a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested in accordance with ASTM E283.
 4. Condensation Resistance Factor (CRF):
 - a. Fixed Glazing and Framing Areas: CRF for the system of not less than 74as determined in accordance with AAMA 1503.
- I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
 2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested in accordance with AAMA 501.5.
 - a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
 - b. Low Exterior Ambient-Air Temperature: 0 deg F.

2.2 SOURCE LIMITATIONS

- A. Obtain all components of curtain-wall system and storefront system, including framing spandrel panels, entrances, and accessories, from single manufacturer.

2.3 GLAZED ALUMINUM CURTAIN WALL SYSTEMS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide YKK AP America Inc.; YCW 750 OG or comparable product by one of the following:
1. Arcadia, Inc.
 2. EFCO Corporation.
 3. Kawneer North America, an Arconic company.
 4. Oldcastle BuildingEnvelope (OBE); CRH Americas.
 5. TRACO, a division of Kawneer.
 6. Trulite Glass & Aluminum Solutions, LLC.
 7. Tubelite Inc.
- B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Construction: Thermally broken.
 2. Glazing System: Retained mechanically with gaskets on four sides.
 3. Glazing Plane: Front
 4. Finish: Superior-performance organic finish.

5. System: Either stick or unitized system.
 6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 7. Steel Reinforcement: As required by manufacturer for clear spans indicated on drawings.
- C. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.
1. Include snap-on aluminum trim that conceals fasteners.
- D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- E. Entrance Door Systems: Comply with Section 08 22 20 "Fiberglass Reinforced Polyester Doors".

2.4 GLAZING

- A. Glazing: Comply with Section 08 80 00 "Glazing."
- B. Glazing Gaskets: ASTM C509 or ASTM C864. Extruded silicone.
 1. Color: Black.
- C. Glazing Sealants: As recommended by manufacturer.

2.5 MATERIALS

- A. Sheet and Plate: ASTM B209.
- B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
- C. Structural Profiles: ASTM B308/B308M.
- D. Steel Reinforcement:
 1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
 2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
 3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.
- E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

2.6 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.

2. Reinforce members as required to receive fastener threads.
 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.
- C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
1. Profiles that are sharp, straight, and free of defects or deformations.
 2. Accurately fitted joints with ends coped or mitered.
 3. Physical and thermal isolation of glazing from framing members.
 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 5. Provisions for field replacement of glazing from exterior.
 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Fabricate components to resist water penetration as follows:
1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
- E. Curtain-Wall Framing: Fabricate components for assembly using shear-block system.
- F. Factory-Assembled Frame Units:
1. Rigidly secure nonmovement joints.
 2. Prepare surfaces that are in contact with structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
 3. Seal joints watertight unless otherwise indicated.

4. Install glazing to comply with requirements in Section 08 80 00 "Glazing."
- G. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Superior-Performance Organic Finish, Three-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.
 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 2. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions.
- B. Do not install damaged components.
- C. Fit joints to produce hairline joints free of burrs and distortion.
- D. Rigidly secure nonmovement joints.
- E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- F. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- G. Seal joints watertight unless otherwise indicated.
- H. Metal Protection:
 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- I. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

- J. Install components plumb and true in alignment with established lines and grades.

3.3 INSTALLATION OF GLAZING

- A. Install glazing as specified in Section 08 80 00 "Glazing."

3.4 ERECTION TOLERANCES

- A. Install glazed aluminum curtain walls to comply with the following maximum tolerances:
 - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
 - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
 - 3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
 - 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Test Area: Perform tests on one bay at least 30 feet, by one story.
- C. Field Quality-Control Testing: Perform the following test on representative areas of glazed aluminum curtain walls
 - 1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested in accordance with AAMA 501.2 and shall not evidence water penetration.
 - a. Perform a minimum of three tests in areas as directed by Architect.
 - 2. Air Leakage: ASTM E783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
 - a. Perform a minimum of three tests in areas as directed by Architect.
- D. Glazed aluminum curtain walls will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION

08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes items known commercially as door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. Refer to the characteristics section for each product. The criteria listed in the specifications is based on one manufacturer. No substitution of product will be accepted unless that product meets all the characteristics listed under its respective section.
- C. This Section includes the following:
 - 1. Hinges
 - 2. Key control system
 - 3. Lock cylinders and keys
 - 4. Lock and latch sets
 - 5. Bolts
 - 6. Exit devices
 - 7. Electronic exit devices
 - 8. Push/pull units
 - 9. Closers
 - 10. Protection plates
 - 11. Weatherstripping for exterior doors
 - 12. Sound stripping for interior doors
 - 13. Thresholds
- D. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 08110: Steel Doors and Frames
 - 2. Section 08210: Wood Doors
 - 3. Division 16: Electrical

1.2 REFERENCES

- A. Standards of the following as referenced:
 - 1. American National Standards Institute (ANSI)
 - 2. Door and Hardware Institute (DHI)
 - 3. Factory Mutual (FM)
 - 4. National Fire Protection Association (NFPA)
 - 5. Underwriters' Laboratories, Inc. (UL)
 - 6. Warnock Hersey

- B. Regulatory standards of the following as referenced:
 - 1. Department of Justice, Office of the Attorney General, Americans with Disabilities Act, Public Law 101-336 (ADA).
 - 2. CABO/ANSI A117.1: Providing Accessibility and Usability for Physically Handicap People, 1992 edition.

1.3 SYSTEM DESCRIPTION

- A. Refer to applicable Headings for system description for electric hardware products.

1.4 SUBMITTALS

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

- B. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into vertical format "hardware sets" indicating complete designations of every item required for each door or opening. Use specification Heading numbers with any variations suffixed a, b, etc. Include the following information:
 - a. Type, style, function, size, and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.

- e. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - h. Keying information.
 - i. Cross reference numbers used within schedule deviating from those specified.
 - 1) Column 1: State specified item and manufacturer.
 - 2) Column 2: State prior approved substituted item and its manufacturer.
2. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
3. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- D. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- E. Contract closeout submittals:
- 1. Operation and maintenance data: Complete information for installed door hardware.
 - 2. Warranty: Completed and executed warranty forms.

1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, exit devices, closers, etc.) from a single manufacturer.
- 1. Refer to the characteristics section for each product. Manufacturers will be considered provided they meeting all the performance criteria listed therein.

- B. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

1.6 QUALITY CRITERIA

A. Supplier Qualifications:

1. The finish hardware supplier shall be a factory authorized distributor with office and warehouse facilities within a 50-mile radius of Cherokee County, Georgia.
2. The finish hardware supplier shall have a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project.
3. The finish hardware supplier shall employ an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the work, for consultation.
4. Estimating Responsibility: It is the responsibility of any potential supplier to thoroughly review all project documents to insure complicity with the hardware specifications. Report any and all discrepancies to the architect no later than 7 days prior to bid.
5. Supply Responsibility: It is the responsibility of the successful supplier to supply hardware to 100% completion of project, should a door or item of hardware be omitted from this specification or should hardware other than what is specified be required to meet code, project type requirements, or functionality, it is the distributor's sole responsibility to supply that material in the same brands and quality levels without additional cost to the architect, contractor or owner.

- B. The General Contractor to schedule and attend a pre-construction meeting with the Architect, Cherokee County Schools Program Manager, Cherokee County Construction Manager, a representative of the Cherokee County Schools Maintenance Department, electrical sub-contractor, masonry sub-contractor, frame, door and hardware installers (aluminum, hollow metal, wood, FRP), frame, door and hardware suppliers (aluminum, hollow metal, wood, FRP), finish hardware manufacturers' representative(s), and the access control system integrator under contract to the Owner to review and coordinate construction responsibilities, schedules, and timelines.

- C. The General Contractor to schedule and attend a pre-installation conference with the Cherokee County Schools Construction Manager, a representative of the Cherokee County Schools Maintenance Department, frame, door and hardware installers (aluminum, hollow metal, wood, FRP), frame, door and hardware suppliers (aluminum, hollow metal, wood, FRP), and finish hardware manufacturers' representative(s) to review and coordinate product installation and adjustment in accordance with manufacturers' recommendations and Owner's requirements. If there are electrified hardware products included in the scope of work, then the electrical sub-contractor, masonry contractor and the Architect's electrical engineer to also attend this conference.

- D. The General Contractor to schedule and attend an electrified hardware coordination meeting with the Cherokee County Schools Construction Manager, a representative of the Cherokee County Schools Maintenance Department, frame, door and hardware installers (aluminum, hollow metal, wood, FRP), frame, door and hardware suppliers (aluminum, hollow metal, wood, FRP), electrical sub-contractor to coordinate the installation and termination of connections of the electrified hardware products. Hardware supplier to provide riser diagrams, elevation drawings, wiring diagrams, and operational descriptions as required by the General and sub- contractors.

- E. The General Contractor to use a finish hardware installer trained by the manufacturer(s) to install and adjust the specified door hardware products, including locksets, exit devices, door closers, and overhead stops and holders, some of which may be electrical, in accordance with the respective manufacturer's instructions. The door hardware installer to provide a copy of Certificate of Training to the General Contractor.
- F. The door hardware installer is responsible for the installation of all hardware in this section, including all low voltage hardware. This is to include final wire termination and testing of all electrical door hardware. The only exception to this is the electro-magnetic door hold-opens that are controlled by the smoke/fire alarm system. The door hardware installer will complete the product installation and the alarm vendor will complete the final wire terminations.
- G. All electrical components, other than what is specified in this section, wire and wire pulls are by the electrical sub-contractor.
- H. All items requiring 120VAC power, and conduit where required, are to be installed and powered by the electrical sub-contractor.
- I. All schools shall have all exterior doors, that are not receiving electrified hardware for access control via this specification, be prepared for future access control, including door and frame preparations for EPT power transfers, wire chases thru doors, mortar guards and conduit to an accessible location above the drop ceiling. In the absence of a drop ceiling contact the architect for further direction.

1.7 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).

- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.8 WARRANTY

A. Special warranties:

1. Door Closers: Thirty-year period
2. Exit Devices: Five-year period
3. Locks and Cylinders: Five-year period
4. Electrified Locks and Exit Devices: One-year period
(Manufacturer's whose standard warranty does not equal, or exceed the requirements listed above must provide a letter for each project stating that they will extend their warranty to comply with the requirements of the specification.)

1.9 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Hinges:

1. Products by Ives*, Stanley, and Hager meeting all the performance characteristics listed below.
2. Characteristics:
 - a. Templates: Provide only template-produced units.
 - b. Screws: Provide Phillips flat-head screws complying with the following requirements:
 - 1) For metal doors and frames install machine screws into drilled and tapped holes.
 - 2) For wood doors and frames install threaded-to-the-head wood screws.

- 3) For fire-rated wood doors install #12 x 1-1/4 inch, threaded-to-the-head steel wood screws.
- 4) Finish screw heads to match surface of hinges or pivots.
- c. Hinge pins: Except as otherwise indicated, provide hinge pins as follows:
 - 1) Out-Swing Exterior Doors: Non-removable pins.
 - 2) Interior Doors: Non-rising pins.
 - 3) Tips: Flat button and matching plug. Finished to match leafs.
- d. Size: Where hinges are specified, unless otherwise noted, they shall be of the types and sizes as follows:
 - 1) EXTERIOR DOORS:
 - a) 1-3/4" thick - up to 3'0 wide, 5BB1-32D 4-1/2", NRP
 - b) 1-3/4" thick - over 3'0 wide, 5BB1HW-32D 5", NRP
 - 2) INTERIOR DOORS:
 - a) 1-3/4" thick - up to 3'0", 5BB1-26D, 4-1/2"
 - b) 1-3/4" thick - over 3'0" wide, 5BB1HW-26D, 5"
 - 3) The width of hinges shall be sufficient to clear all trim.
- e. Quantity: Furnish one pair of hinges for all doors up to 5'0" high. Furnish one additional hinge for each additional 2-1/2 feet or fraction thereof.

B. Continuous Hinges:

1. Acceptable manufacturers:
 - a. Ives*
 - b. Select Products
 - c. Stanley
2. Characteristics:
 - a. Continuous gear hinges to be manufactured of extruded 6063-T6 aluminum alloy with anodized finish, or factory painted finish as scheduled.
 - b. All hinges are to be manufactured to template. Uncut hinges shall be non-handed and shall be a pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising.
 - c. Vertical door loads shall be carried on chemically lubricated polyacetal thrust bearings. The door and frame leaves shall be continually geared together for the entire hinge length and secured with a full cover channel. Hinge to operate to a full 180°.
 - d. Hinges to be milled, anodized, and assembled in matching pairs. Fasteners supplied shall be 410 stainless steel, plated and hardened.
 - e. Continuous hinges at fire doors to be UL listed.

- f. Hinge type, 112/224, to be determined by door manufacturer requirements.
- g. Use continuous hinges on all exterior doors and all interior doors over 36" wide and corridor, gymnasium, cafeteria, media center and any other high traffic high-capacity room door.
- h. All exterior door continuous hinges to be prepared for EPT, any opening not receiving electrified door hardware via this specification to receive Don-Jo EPT1 blank plates to cover the door and frame EPT preparation.

C. ELECTRIC POWER TRANSFER

- 1. Manufacturers:
 - a. Scheduled Manufacturer and Product:
 - 1) Von Duprin EPT-10, meeting all the performance characteristics listed below.
- 2. Characteristics:
 - a. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
 - b. Molex connector to be compatible with and match wire color combination scheme of all power transfers, electrified locksets, electrified panic hardware, all specified wire harnesses and any other electrified hardware with Molex connector.
 - c. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.
 - d. All exterior doors, and any other door being prepared for future access control to be fully prepared for and EPT and to receive Don-Jo EPT1 cover plates.

D. WIRE HARNESSSES AND CONNECTORS

- 1. Manufacturers:
 - a. Scheduled Manufacturer and Product:
 - 1) Von Duprin -CON, meeting all the performance characteristics listed below.
- 2. Characteristics:
 - a. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
 - b. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.

- c. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

E. Keying and Key Control:

1. Manufacturer: Schlage
2. Characteristics:
 - a. Keyed to Owner's existing Schlage Primus Interchangeable Core, and standard Interchangeable Core system
 - b. Cylinder and key identification to be 50-216 (CKC) for concealed stamping on cores and 50-217 (VKC) for stamping on keys.
 - c. Hardware Distributor to install ALL permanent cores.
 - d. All locks and exit devices that require cylinders are to be equipped with cylinder housings to receive Owner's permanent cores.
 - e. Furnish only temporary construction cores that are keyed alike for use during the construction period. All cylinders must receive a construction core. The Hardware Distributor will install the permanent cores and retrieve the construction cores.
 - f. Teacher's cabinets DO NOT need to be keyed to match respective classrooms. Cabinet locks with cylinders shall be provided by millwork supplier.

F. Mortise Locksets and Latchsets:

1. Manufacturer: Schlage
2. Products by Schlage L9000 x 03A series, meeting all the performance characteristics listed below.
3. Characteristics:
 - a. All locksets and latchsets shall have barrier free lever handles.
 - b. Locksets and latchsets shall have a 626 finish for interior use and a 630 finish for exterior use.
 - c. Owner requires that locksets and cylinders be of the same manufacturer.
4. Mortise Locksets and Latchsets: as scheduled.
 - a. Chassis: cold-rolled steel, handing field-changeable without disassembly.
 - b. Latchbolts: 3/4-inch throw stainless steel two-piece mechanical anti-friction type. Nylon inserts are not acceptable.
 - c. Lever Trim: through-bolted, accessible design, cast or solid rod lever as scheduled. Spindles: independent break-away.

- d. Thumbturns: accessible design not requiring pinching or twisting motions to operate.
- e. Deadbolts: stainless steel 1-inch throw.
- f. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches. Provide motor based electrified locksets that comply with the following requirements:
 - 1) Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
 - 2) Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case
 - 3) Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
 - 4) Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
 - 5) Connections – provide quick-connect Molex system standard.
- g. Strikes: 16 gage curved stainless steel, bronze, or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
- h. Certifications:
 - 1) ANSI A156.13, 1994, Grade 1 Operational.
 - 2) ANSI/ASTM F476-84 Grade 30 UL Listed.
- i. Standard functions will be as indicated below:
 - 1) Restrooms within secure areas, nurses/clinic areas, classrooms and private offices to receive privacy lockset with a deadbolt, L9440.
 - 2) Faculty restrooms in corridors or areas generally accessible by students to receive storeroom lockset with a deadbolt, L9480 with L283-722 vacant/occupied indicator on the outside of the door.
 - 3) Offices and workrooms within a secure area to receive classroom lockset, L9070
 - 4) Offices and workrooms in areas generally accessible by students, and all classrooms, to receive classroom security lockset L9071 with L283-711 locked/unlocked indicator on the inside of the door.
 - 5) Any area used for storage to receive storeroom function, L9080.

- 6) These are the “standard” functions used, occasionally different functions will be applied to room types above, functions in hardware sets will always take precedent.
- 7) The owner reserves the right to change functions for like priced functions until the keying meeting has been concluded. Once the keying meeting has concluded the lock function are set.

G. CYLINDRICAL LOCKS – GRADE 1

1. Manufacturers and Products:
2. Scheduled Manufacturer and Product:
 - a. Schlage ND series Tubular
3. Characteristics:
 - a. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
 - b. Cylinders: Refer to “KEYING” article, herein.
 - c. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
 - d. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
 - e. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
 - f. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
 - g. Provide electrified options as scheduled in the hardware sets.
 - h. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
 - i. Lever Design: Tubular.
 - j. Standard functions will be as indicated below:
 - 1) Multi-Stall restroom stall doors to receive ND40 Tubular.
 - k. The owner reserves the right to change functions for like priced functions until the keying meeting has been concluded. Once the keying meeting has concluded the lock function are set

H. Exit Devices:

1. Products by Von Duprin, 98 Series meeting all the performance characteristics listed below.
2. Electronic access points shall be Von Duprin QEL98 Electric panic hardware.

- a. QEL devices shall use a 1-amp motor to activate a mechanical linkage to retract the latch.
- b. Power supplies shall be Von Duprin PS900 Series with 900-2RS or 900-4RL accessory boards as required.
3. Conduit and necessary wiring shall be provided under Section 01600. See Owner's standard detail in Electrical 01600.
4. Characteristics:
 - a. All exit devices shall be of one manufacturer.
 - b. All exit devices shall have 630 touchpads. All finished parts that are not 630 shall be 626. No painted finish shall be allowed.
 - c. All exit devices shall be flush mounted. Provide manufacturer's standard shim kit to accommodate moulding for glass and vision lites. Exit devices that are not flush mounted must provide a filler bar on those doors where conflict with moulding for glass vision lites is not an issue.
 - d. Exit devices shall be attached with sex nuts and bolts on all doors. Finish on all exposed fasteners shall match devices.
 - e. At specific locations on exterior pairs of doors, provide keyed removable mullions controlled by a key cylinder under the master key system. Refer to the drawings and door schedule for locations of keyed movable mullions. Non-key removable mullions will be used at all other opening requiring a mullion.
 - f. Exterior door trim to be Von Duprin 990-NL. Any exterior door that not access control will be exit only and will receive no exterior trim and be less mechanical dogging (LD).
 - g. Lever handle operating trim for exit devices shall be of heavy-duty construction, incorporating cast or heavy solid forged escutcheons and levers. Where listed in the hardware sets, provide "breakaway" lever incorporating an internal clutch mechanism allowing the lever to break away and drop into a "down" position when more than 35 pounds of torque are applied. Lever shall be easily reset to its operating position by a simple uplift motion. Lever design to be Schlage 03.
 - h. Exit devices shall be "UL" listed for life safety. All exit devices for fire rated openings shall have "UL" labels for "Fire Exit Hardware."
 - i. All exit devices mounted on labeled wood doors shall be mounted on the door per the door manufacturer's requirements. (Owner prefers exit devices to be thru-bolted even on non-rated doors.)
 - j. All trim shall be thru-bolted to the lock stile case.
 - k. All exit devices shall be made of brass, bronze, stainless steel, or aluminum material, plated or powder coated to the standard architectural finishes to match the balance of the door hardware. Painted finishes are not accepted.

- l. Provide glass bead conversion kits to shim exit devices on doors with raised glass heads.
- m. Dogging mechanism shall be “hook and eye” type. No plastic dogging cams or friction type dogging mechanism shall be allowed.
- n. Equip rim exit devices with a roller strike.
- o. All exit devices shall be non-handed.
- p. Touchpad shall extend a minimum of 1/2 of the door width. Touchpad height shall exceed height of mechanism case or rail assembly to eliminate pinch points. If touchpad height does not exceed height of mechanism case/rail assembly provide factory installed insert/filler on top and bottom of touchpad along mechanism case/rail assembly to prevent pinch point. Plastic touchpads are not acceptable.
- q. All latchbolts to be the deadlocking type. Latchbolts shall have a self-lubricating coating to reduce wear. Plated or plastic coated latchbolts are not acceptable.
- r. At specific locations, such as the Media Center, Auditorium, Administrative areas, etc. equip exit devices with the quiet mechanical (QM) option to reduce noise associated with the operation of the exit device.
- s. Exit devices at classrooms, media centers, libraries and any other area normally occupied by students to be less dogging (LD) and include -2SI lock status indicators.
- t. Exit devices shall include impact resistant, flush mounted end cap design to avoid damage due to carts and other heavy objects passing through an opening. End cap shall be of heavy-duty metal alloy construction and provide horizontal adjustment to provide alignment with device cover plate. When exit device end cap is installed, no raised edges will protrude.

I. RECESSED EXIT DEVICES

1. Manufacturers and Products:
 - a. Scheduled Manufacturer and Product:
 - 1) Von Duprin 94/95 series, meeting all the performance characteristics listed below.
2. Characteristics:
 - a. Recessed exit devices shall be of the pushpad design with straight or horizontal motion to eliminate pinch points. The pushpad shall project a maximum of 1-3/4" from the face of the door in the closed position. The pushpad shall project a maximum of 1-1/4" from the face of the door in the open position.
 - b. Latchbolts shall have a self-lubricating coating to reduce friction and wear.
 - c. Endcaps shall be die-cast aluminum and be of a sloping design to deflect impact from carts.
 - d. Exit devices shall have compression springs, and all internal parts shall be zinc dichromate coated to prevent corrosion.
 - e. Outside trim shall be heavy-duty type and fasten by means of concealed studs and through-bolt from the inside. Lever trim shall be cast brass with a minimum average thickness of .130".
 - f. Exit devices shall be tested in accordance to ANSI/BHMA A156.3 Grade 1 by a BHMA certified testing laboratory.
 - g. A written certification showing successful completion of a minimum of one million cycles must be also provided.
 - h. Recessed exit devices shall be as manufactured by Von Duprin. Exit device series shall be 94 series as noted in hardware sets.
 - i. Trim: 94/95 Series 940L x Levers to match lockset design.
 - j. Use Steelcraft hollow metal doors or appropriate equal for interior cross corridor pairs of doors. Exit device preps must have radius corners and rolled-back edges. See specification Section 08 11 130 Hollow Metal Work.

J. Closers and Door Control Devices:

1. Products by LCN 4040XP with metal covers (MC) series meeting all the performance characteristics listed below.
2. Characteristics:
 - a. Door closers shall be overhead type and have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder.
 - b. Mechanical hold-open closers SHALL NOT be used unless approved by the owner.
 - c. All closers shall be attached using sex nuts and bolts only.
 - d. All closers shall have metal covers.
 - e. Provide special templates, drop plates, mounting brackets, or

adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

- f. All fire rated doors shall have closers. Closers shall not be installed on classroom doors unless required by Fire Marshal's office.
- g. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F (49 degrees C) to -30 degrees F (-35 degrees C).
- h. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed and back check. Closers shall be sized in accordance with manufacturer's recommendation.
- i. Closers incorporating pressure relief valves are not acceptable.
- j. All closers shall have solid forged steel main arms (and forearms for parallel arm closers) and where specified shall have a cast-in solid stop on the closer shoe ("cush"). Where door travel on out-swing doors must be limited, use "Cush" type closers. Auxiliary stops are not required when cushion type closers are used.
- k. All closers shall be certified to exceed ten million (10,000,000) full load cycles by a recognized independent testing laboratory. All closers (overhead, surface, and concealed) shall be of one manufacturer and carry manufacturer's thirty-year warranty (electric closers to have two-year warranty).
- l. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ADA and ANSI A-117.1 provisions for door opening force.
- m. Closers to be installed to allow door swing as shown on plans. Doors swinging into exit corridors shall provide for corridor clear width as required by code. Where possible, mount closers inside rooms.
- n. Provide powder coated finish, certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification. Lacquer or painted finish on metal components is not acceptable.

K. Floor Stops and Wall Stops:

- 1. Manufacturer: Ives, Trimco, Rockwood
- 2. Characteristics:
 - a. Wall stops for mortise locks, exit devices and push/pull (wall stops are not acceptable on sheetrock walls)

- 1) WS406/WS407 CVX
- b. Wall Stops for cylindrical locks (wall stops are not acceptable on sheetrock walls)
 - 1) WS406/WS407 CCV
- c. Floor Stops in public areas
 - 1) Ives FS441
- d. Floor stops in non public areas and for exterior doors
 - 1) Ives FS18
- e. Floor stops with automatic holder
 - 1) Ives FS41
- f. Wall stops with automatic holder
 - 1) WS40

L. Push Plates:

- 1. Manufacturer: Ives, Trimco, Rockwood
- 2. Characteristics:
 - a. Exposed Fasteners: Provide manufacturers standard exposed fasteners.
 - b. Material to be stainless steel, per the hardware headings.
 - c. Provide plate size as shown in hardware headings.

M. Door Pulls & Pull Plates:

- 1. Manufacturer: Ives, Trimco, Rockwood
- 2. Characteristics:
 - a. Provide concealed thru-bolted trim on back-to-back mounted pulls, but not for single units.
 - b. Material to be forged stainless steel.
 - c. Provide units sized as shown in hardware headings.

N. Protective Plates:

- 1. Manufacturer: Ives, Trimco, Rockwood
- 2. Characteristics:
 - a. Provide manufacturers standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
 - b. Materials:
 - 1) Metal Plates: Stainless Steel, .050 inch (U.S. 18 gage).
 - c. Fabricate protection plates not more than 1-1/2 inches less than door width on hinge side and not more than 1/2 inch less than door width on pull side. Bevel all edges.
 - d. Heights:

- 1) Kick plates to be 8 inches in height.
- 2) Mop plates to be 8 inches in height.
- 3) Armor plates to be 34 inches in height.

O. Security Astragals:

1. Manufacturer: Zero
2. Acceptable manufacturers:
 - a. Zero 43STST

P. Thresholds:

1. Acceptable manufacturers:
 - a. National Guard Products, Inc.*
 - b. Pemko Manufacturing Company
 - c. Zero Weatherstripping Co., Inc.
2. Types: Indicated in hardware headings, and shown in sill details.

Q. Weatherstripping:

1. Acceptable manufacturers:
 - a. National Guard Products, Inc.
 - b. Pemko Manufacturing Company
 - c. Zero Weatherstripping Co., Inc.*
2. Types: Silicone rubber seals as indicated in hardware headings.

R. Silencers:

1. Acceptable manufacturers:
 - a. Hager
 - b. Ives*
 - c. Rockwood Manufacturing
2. Three for each single doors; two for pairs of doors.

2.2 MATERIALS AND FABRICATION

A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.

1. Manufacturer's identification will be permitted on rim of lock cylinders only.

- B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 - 1. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
 - 2. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
 - 3. All exit devices and door closers shall be attached with thru-bolts. Contact the owner's construction coordinator for clarification about use of thru-bolts on FRP doors.

2.3 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).
- B. Provide finishes that match those established by ANSI or, if none established, match the Architect's sample.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- D. The designations used to indicate hardware finishes are those listed in ANSI/BHMA A156.18, "Materials and Finishes," including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.
 - 1. Hinges (Exterior): 630 (US32D) Satin Stainless Steel
 - 2. Hinges (Interior wood doors): 652 (US26D) Satin Chrome Plated Steel

3. Continuous Hinges: (US28) Aluminum
4. Locks: 630 Satin Stainless Steel exterior and 626 satin chrome interior
5. Exit Devices: 626 (US26D) US32D touchpads.
6. Door Closers: 689 (Powder Coated)
7. Push Plates: 630 (US32D) Satin Stainless Steel
8. Pull Plates: 630 (US32D) Satin Stainless Steel
9. Protective Plates: 630 (US32D) Satin Stainless Steel
10. Door Stops: 630 (US32D) Satin Stainless Steel or 626 Satin Chrome Plated Brass/Bronze
11. Thresholds: 627 (US27) Mill Finish Aluminum
12. Weatherstrip: 628 (US28) Clear Anodized Aluminum

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. It is the responsibility of the hardware installer for each type of door, Aluminum, FRP, Hollow Metal, Wood and any other door material receiving door hardware via this specification, to install and connect all Molex® plug-n-play wire harnesses, from locksets and panic hardware thru the door to the EPT and on the wall side of the hinge jamb.
- D. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

- F. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section "Joint Sealers."
- G. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.



3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
 - 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Door Hardware Supplier's Field Service
 - 1. Inspect door hardware items for correct installation and adjustment after complete installation of door hardware.
 - 2. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
 - 3. File written report of this inspection to Architect.

3.3 HARDWARE SCHEDULE

76119 OPT0286053 Version 3 - Creekland Middle School – Additions & Renovations

Legend:








-  Link to catalog cut sheet
-  Electrified Opening

Hardware Group No. CR1KWS

For use on Door #(s):

302B

Provide each SGL door(s) with the following:








| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|----------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 |  | 652 | IVE |
| 1 | EA | CLASSROOM LOCK | L9070T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

Hardware Group No. CRSI1KWS OFFICE

For use on Door #(s):

306 308 318 320 906 908
 918 920

Provide each SGL door(s) with the following:









| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|--------------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 |  | 652 | IVE |
| 1 | EA | CLASSROOM SECURITY | L9071T 03A L283-711 |  | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

Hardware Group No. CRSI3KWS

For use on Door #(s):

301 303 321 903 921A

Provide each SGL door(s) with the following:






| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|--------------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 NRP |  | 652 | IVE |
| 1 | EA | CLASSROOM SECURITY | L9071T 03A L283-711 |  | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP EDA MC TBWMS |  | 689 | LCN |
| 1 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

Hardware Group No. CRSIFS N

For use on Door #(s):

323A 901 923

Provide each SGL door(s) with the following:






| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|--------------------|----------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 NRP |  | 652 | IVE |
| 1 | EA | CLASSROOM SECURITY | L9071T 03A L283-711 |  | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | FLOOR STOP | FS441 |  | 626 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

Hardware Group No. CRSIWM

For use on Door #(s):

305 307 309 315 317 319
 324B 902B 905 907 909 915
 917 919 924A

Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|--------------------|----------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 |  | 652 | IVE |
| 1 | EA | CLASSROOM SECURITY | L9071T 03A L283-711 |  | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 3 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. EXT PR FB DP1 MNL EP 2

For use on Door #(s):
 MECH-1B

Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|---|--|--|--------|-----|
| 2 | EA | CONT. HINGE | 224XY | | 628 | IVE |
| 6 | EA | HINGE PREP FILLER FRAME, AS REQUIRED | FF-45 AS REQUIRED (VOJ) | | 600 | DON |
| 1 | EA | DOOR CORD | 798-12 LESS WIRES | | ⚡ 626 | SCE |
| 2 | EA | MANUAL FLUSH BOLT | FB458 | | 626 | IVE |
| 1 | EA | DUST PROOF STRIKE | DP1 | | 626 | IVE |
| 1 | EA | ELEC PANIC HARDWARE | LD-RX-9875-NL-CON-SNB | | ⚡ 626 | VON |
| 1 | EA | MORTISE CYLINDER | 20-061 ICX | | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ | | 626 | SCH |
| 2 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS | | 689 | LCN |
| 2 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ | | 689 | LCN |
| 1 | EA | PERIMETER SEAL | 8303AA-S | | AA | ZER |
| 1 | EA | ASTRAGAL | 43STST | | STST | ZER |
| 2 | EA | DOOR SWEEP | 8198AA | | AA | ZER |
| 1 | EA | THRESHOLD | 655A-223 OR AS REQ | | A | ZER |
| 1 | EA | WIRE HARNESS | CON-6W (EPT TO AC SYS) PANIC TO AC SYSTEM | | | VON |
| 2 | EA | DOOR CONTACT | 679-05HM | | ⚡ BLK | SCE |

OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR. PROVIDE BOX WITH CONDUIT BEHIND EPT AND DOOR POSITION SWITCH PREPS IN FRAME AND CONDUIT ABOVE DROP CEILING FOR LX-RX, RX-QEL AND LX-RX-QEL PANIC HARDWARE AND L909X ELECTRIFIED LOCKS. ELECTRICAL CONTRACTOR TO PROVIDE BOX ABOVE CEILING FOR POWER CONNECTIONS. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG BOX ON EXTERIOR OF BUILDING FOR CARD READER. CONDUIT MUST BE PROVIDED BETWEEN SINGLE GANG BOX AND CONTROLLER. ALL CONDUIT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.

OPERATION:
 SECURITY SYSTEM MONITORS DOOR POSITION.

Hardware Group No. EXT PR FB DP1 MNL EP AC 2

For use on Door #(s):
 MECH-2B

Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|---------------------------|----------------------------------|--|--------|-----|
| 1 | EA | CONT. HINGE | 224XY | | 628 | IVE |
| 1 | EA | CONT. HINGE | 224XY EPT | | 628 | IVE |
| 1 | EA | POWER TRANSFER | EPT10 CON | | ⚡ 689 | VON |
| 2 | EA | MANUAL FLUSH BOLT | FB458 | | 626 | IVE |
| 1 | EA | DUST PROOF STRIKE | DP1 | | 626 | IVE |
| 1 | EA | ELEC PANIC HARDWARE | RX-QEL-9875-NL-CON-SNB 24 VDC | | ⚡ 626 | VON |
| 1 | EA | MORTISE CYLINDER | 20-061 ICX | | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ | | 626 | SCH |
| 2 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS | | 689 | LCN |
| 2 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ | | 689 | LCN |
| 1 | EA | PERIMETER SEAL | 8303AA-S | | AA | ZER |
| 1 | EA | ASTRAGAL | 43STST | | STST | ZER |
| 2 | EA | DOOR SWEEP | 8198AA | | AA | ZER |
| 1 | EA | THRESHOLD | 655A-223 OR AS REQ | | A | ZER |
| 1 | EA | WIRE HARNESS | CON-XX (PANIC TO EPT) | | | VON |
| 1 | EA | WIRE HARNESS | CON-6W (EPT TO AC SYS) | | | VON |
| 1 | EA | MULTITECH READER | MT15 - OWNER SUPPLIED | | ⚡ BLK | SCE |
| 1 | EA | ACCESS CONTROL PACKAGE | OWNER SUPPLIED | | ⚡ | |
| 2 | EA | DOOR CONTACT | 679-05HM | | ⚡ BLK | SCE |
| 1 | EA | POWER SUPPLY | BY ACCESS CONTROL | | ⚡ | VON |

OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR. PROVIDE BOX WITH CONDUIT BEHIND EPT AND DOOR POSITION SWITCH PREPS IN FRAME AND CONDUIT ABOVE DROP CEILING FOR LX-RX, RX-QEL AND LX-RX-QEL PANIC HARDWARE AND L909X ELECTRIFIED LOCKS. ELECTRICAL CONTRACTOR TO PROVIDE BOX ABOVE CEILING FOR POWER CONNECTIONS. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG BOX ON EXTERIOR OF BUILDING FOR CARD READER. CONDUIT MUST BE PROVIDED BETWEEN SINGLE GANG BOX AND CONTROLLER. ALL CONDUIT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.

OPERATION:

SECURITY SYSTEM MONITORS DOOR POSITION. PRESENTATION OF VALID CREDENTIAL AT READER TEMPORARILY SHUNTS DOOR POSITION SWITCH AND RETRACTS LATCHBOLT ON RHR LEAF ONLY FOR AUTHORIZED ENTRY. RX SWITCHES IN TOUCHPADS TEMPORARILY SHUNT DOOR POSITION SWITCHES ON EXIT. FREE EGRESS AT ALL TIMES. FAIL SECURE.

Hardware Group No. EXT PR FRPD ALF ED EO NL 4K 5 EP 12 AC

For use on Door #(s):

300A STW-6D

Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|-----|---------------------------|-----------------------------------|--|--------|-----|
| 2 | EA | CONT. HINGE | 112XY EPT/224XY EPT AS REQ | | 628 | IVE |
| 2 | EA | POWER TRANSFER | EPT10 CON | | ⚡ 689 | VON |
| 1 | EA | REMOVABLE MULLION | KR4954 STAB | | 689 | VON |
| 1 | EA | ELEC PANIC HARDWARE | LD-LX-RX-98-EO-CON-SNB | | ⚡ 626 | VON |
| 1 | EA | ELEC PANIC HARDWARE | LX-RX-QEL-98-NL-CON-SNB 24 VDC | | ⚡ 626 | VON |
| 1 | EA | MULLION STORAGE KIT | MT54 | | 689 | VON |
| 1 | EA | RIM CYLINDER | 20-057 ICX | | 626 | SCH |
| 1 | EA | MORTISE CYLINDER | 20-061 ICX | | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 CKC EV AS REQ | | 626 | SCH |
| 2 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS | | 689 | LCN |
| 2 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ | | 689 | LCN |
| 2 | EA | BLADE STOP SPACER | 4040XP-61 AS REQ | | 689 | LCN |
| 1 | EA | RAIN DRIP | 142AA | | AA | ZER |
| 1 | EA | MULLION SEAL | 8780NBK PSA | | BK | ZER |
| 1 | SET | MTG STILE SEALs | DOOR MFG STD | | | |
| 1 | SET | PERIMETER SEALS | FRAME MFG STD | | | |
| 2 | EA | DOOR SWEEP | 8198AA | | AA | ZER |
| 1 | EA | THRESHOLD | 655A-223 OR AS REQ | | A | ZER |
| 2 | EA | WIRE HARNESS | CON-XX (PANIC TO EPT) | | | VON |
| 2 | EA | WIRE HARNESS | CON-6W (EPT TO AC SYS) | | | VON |
| 1 | EA | MULTITECH READER | MT15 - OWNER SUPPLIED | | ⚡ BLK | SCE |
| 1 | EA | ACCESS CONTROL PACKAGE | OWNER SUPPLIED | | ⚡ | |
| 2 | EA | DOOR CONTACT | 679-05HM | | ⚡ BLK | SCE |
| 1 | EA | POWER SUPPLY | BY ACCESS CONTROL | | ⚡ | VON |

OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR. PROVIDE BOX WITH CONDUIT BEHIND EPT AND DOOR POSITION SWITCH PREPS IN FRAME AND CONDUIT ABOVE DROP CEILING FOR LX-RX AND LX-RX-QEL PANIC HARDWARE AND L909X ELECTRIFIED LOCKS. ELECTRICAL CONTRACTOR TO PROVIDE BOX ABOVE CEILING FOR POWER CONNECTIONS. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG BOX ON EXTERIOR OF BUILDING FOR CARD READER. CONDUIT MUST BE PROVIDED BETWEEN SINGLE GANG BOX AND CONTROLLER. ALL CONDUIT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.

OPERATION:

SECURITY SYSTEM MONITORS DOOR POSITION. PRESENTATION OF VALID CREDENTIAL AT READER TEMPORARILY SHUNTS DOOR POSITION SWITCH AND RETRACTS LATCHBOLT ON RHR LEAF ONLY FOR AUTHORIZED ENTRY. RX SWITCHES IN TOUCHPADS TEMPORARILY SHUNT DOOR POSITION SWITCHES ON EXIT. LX SWITCHES MONITOR LATCH POSITION. FREE EGRESS AT ALL TIMES. FAIL SECURE.

Hardware Group No. EXT PR FRPD ED EO NL 4M 5 EP 12 AC

For use on Door #(s):
 STW-6C

Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|-----|---------------------------|-----------------------------------|--|--------|-----|
| 2 | EA | CONT. HINGE | 112XY EPT/224XY EPT AS REQ | | 628 | IVE |
| 2 | EA | POWER TRANSFER | EPT10 CON | | ⚡ 689 | VON |
| 1 | EA | REMOVABLE MULLION | 4954 STAB | | 689 | VON |
| 1 | EA | ELEC PANIC HARDWARE | LD-LX-RX-98-EO-CON-SNB | | ⚡ 626 | VON |
| 1 | EA | ELEC PANIC HARDWARE | LX-RX-QEL-98-NL-CON-SNB 24 VDC | | ⚡ 626 | VON |
| 1 | EA | RIM CYLINDER | 20-057 ICX | | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ | | 626 | SCH |
| 2 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS | | 689 | LCN |
| 2 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ | | 689 | LCN |
| 2 | EA | BLADE STOP SPACER | 4040XP-61 AS REQ | | 689 | LCN |
| 1 | EA | RAIN DRIP | 142AA | | AA | ZER |
| 1 | EA | MULLION SEAL | 8780NBK PSA | | BK | ZER |
| 1 | SET | MTG STILE SEALs | DOOR MFG STD | | | |
| 1 | SET | PERIMETER SEALS | FRAME MFG STD | | | |
| 2 | EA | DOOR SWEEP | 8198AA | | AA | ZER |
| 1 | EA | THRESHOLD | 655A-223 OR AS REQ | | A | ZER |
| 2 | EA | WIRE HARNESS | CON-XX (PANIC TO EPT) | | | VON |
| 2 | EA | WIRE HARNESS | CON-6W (EPT TO AC SYS) | | | VON |
| 1 | EA | MULTITECH READER | MT15 - OWNER SUPPLIED | | ⚡ BLK | SCE |
| 1 | EA | ACCESS CONTROL PACKAGE | OWNER SUPPLIED | | ⚡ | |
| 2 | EA | DOOR CONTACT | 679-05HM | | ⚡ BLK | SCE |
| 1 | EA | POWER SUPPLY | BY ACCESS CONTROL | | ⚡ | VON |

OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR. PROVIDE BOX WITH CONDUIT BEHIND EPT AND DOOR POSITION SWITCH PREPS IN FRAME AND CONDUIT ABOVE DROP CEILING FOR LX-RX AND LX-RX-QEL PANIC HARDWARE AND L909X ELECTRIFIED LOCKS. ELECTRICAL CONTRACTOR TO PROVIDE BOX ABOVE CEILING FOR POWER CONNECTIONS. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG BOX ON EXTERIOR OF BUILDING FOR CARD READER. CONDUIT MUST BE PROVIDED BETWEEN SINGLE GANG BOX AND CONTROLLER. ALL CONDUIT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.

OPERATION:

SECURITY SYSTEM MONITORS DOOR POSITION. PRESENTATION OF VALID CREDENTIAL AT READER TEMPORARILY SHUNTS DOOR POSITION SWITCH AND RETRACTS LATCHBOLT ON RHR LEAF ONLY FOR AUTHORIZED ENTRY. RX SWITCHES IN TOUCHPADS TEMPORARILY SHUNT DOOR POSITION SWITCHES ON EXIT. LX SWITCHES MONITOR LATCH POSITION. FREE EGRESS AT ALL TIMES. FAIL SECURE.

Hardware Group No. EXT PR FRPD HMF ED EO NL 4K 5 EP 12 AC

For use on Door #(s):

805H STW-2 STW-3

Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|-----|---------------------------|-----------------------------------|--|--------|-----|
| 2 | EA | CONT. HINGE | 112XY EPT/224XY EPT AS REQ | | 628 | IVE |
| 2 | EA | POWER TRANSFER | EPT10 CON | | ⚡ 689 | VON |
| 1 | EA | REMOVABLE MULLION | KR4954 STAB | | 689 | VON |
| 1 | EA | ELEC PANIC HARDWARE | LD-LX-RX-98-EO-CON-SNB | | ⚡ 626 | VON |
| 1 | EA | ELEC PANIC HARDWARE | LX-RX-QEL-98-NL-CON-SNB 24 VDC | | ⚡ 626 | VON |
| 1 | EA | MULLION STORAGE KIT | MT54 | | 689 | VON |
| 1 | EA | RIM CYLINDER | 20-057 ICX | | 626 | SCH |
| 1 | EA | MORTISE CYLINDER | 20-061 ICX | | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 CKC EV AS REQ | | 626 | SCH |
| 2 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS | | 689 | LCN |
| 2 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ | | 689 | LCN |
| 2 | EA | BLADE STOP SPACER | 4040XP-61 AS REQ | | 689 | LCN |
| 1 | EA | RAIN DRIP | 142AA | | AA | ZER |
| 1 | EA | GASKETING | 488SBK PSA | | BK | ZER |
| 1 | EA | MULLION SEAL | 8780NBK PSA | | BK | ZER |
| 1 | SET | MTG STILE SEALs | DOOR MFG STD | | | |
| 2 | EA | DOOR SWEEP | 8198AA | | AA | ZER |
| 1 | EA | THRESHOLD | 655A-223 OR AS REQ | | A | ZER |
| 2 | EA | WIRE HARNESS | CON-XX (PANIC TO EPT) | | | VON |
| 2 | EA | WIRE HARNESS | CON-6W (EPT TO AC SYS) | | | VON |
| 1 | EA | MULTITECH READER | MT15 - OWNER SUPPLIED | | ⚡ BLK | SCE |
| 1 | EA | ACCESS CONTROL PACKAGE | OWNER SUPPLIED | | ⚡ | |
| 2 | EA | DOOR CONTACT | 679-05HM | | ⚡ BLK | SCE |
| 1 | EA | POWER SUPPLY | BY ACCESS CONTROL | | ⚡ | VON |

OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR. PROVIDE BOX WITH CONDUIT BEHIND EPT AND DOOR POSITION SWITCH PREPS IN FRAME AND CONDUIT ABOVE DROP CEILING FOR LX-RX AND LX-RX-QEL PANIC HARDWARE AND L909X ELECTRIFIED LOCKS. ELECTRICAL CONTRACTOR TO PROVIDE BOX ABOVE CEILING FOR POWER CONNECTIONS. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG BOX ON EXTERIOR OF BUILDING FOR CARD READER. CONDUIT MUST BE PROVIDED BETWEEN SINGLE GANG BOX AND CONTROLLER. ALL CONDUIT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.

OPERATION:

SECURITY SYSTEM MONITORS DOOR POSITION. PRESENTATION OF VALID CREDENTIAL AT READER TEMPORARILY SHUNTS DOOR POSITION SWITCH AND RETRACTS LATCHBOLT ON RHR LEAF ONLY FOR AUTHORIZED ENTRY. RX SWITCHES IN TOUCHPADS TEMPORARILY SHUNT DOOR POSITION SWITCHES ON EXIT. LX SWITCHES MONITOR LATCH POSITION. FREE EGRESS AT ALL TIMES. FAIL SECURE.

Hardware Group No. EXT SGL FRPD ED EO 5 EP 12 MON

For use on Door #(s):

C-8

Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|-----|---------------------|----------------------------|--|--------|-----|
| 1 | EA | CONT. HINGE | 112XY EPT/224XY EPT AS REQ | | 628 | IVE |
| 1 | EA | POWER TRANSFER | EPT10 CON | | ⚡ 689 | VON |
| 1 | EA | ELEC PANIC HARDWARE | LD-LX-RX-98-EO-CON-SNB | | ⚡ 626 | VON |
| 1 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS | | 689 | LCN |
| 1 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ | | 689 | LCN |
| 1 | EA | BLADE STOP SPACER | 4040XP-61 AS REQ | | 689 | LCN |
| 1 | EA | RAIN DRIP | 142AA | | AA | ZER |
| 1 | SET | PERIMETER SEALS | FRAME MFG STD | | | |
| 1 | EA | DOOR SWEEP | 8198AA | | AA | ZER |
| 1 | EA | THRESHOLD | 655A-223 OR AS REQ | | A | ZER |
| 1 | EA | WIRE HARNESS | CON-XX (PANIC TO EPT) | | | VON |
| 1 | EA | WIRE HARNESS | CON-6W (EPT TO AC SYS) | | | VON |
| 1 | EA | DOOR CONTACT | 679-05HM | | ⚡ BLK | SCE |

OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR. PROVIDE BOX WITH CONDUIT BEHIND EPT AND DOOR POSITION SWITCH PREPS IN FRAME AND CONDUIT ABOVE DROP CEILING FOR LX-RX AND LX-RX-QEL PANIC HARDWARE AND L909X ELECTRIFIED LOCKS. ELECTRICAL CONTRACTOR TO PROVIDE BOX ABOVE CEILING FOR POWER CONNECTIONS. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG BOX ON EXTERIOR OF BUILDING FOR CARD READER. CONDUIT MUST BE PROVIDED BETWEEN SINGLE GANG BOX AND CONTROLLER. ALL CONDUIT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.

OPERATION: SECURITY SYSTEM MONITORS DOOR POSITION. RX SWITCHES IN TOUCHPAD TEMPORARILY SHUNT DOOR POSITION SWITCH ON EXIT. LX SWITCH MONITOR LATCH POSITION. FREE EGRESS AT ALL TIMES. FAIL SECURE.

Hardware Group No. EXT SGL FRPD ED NL 5 EP 12 AC

For use on Door #(s):
 C-9

Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|-----|---------------------------|-----------------------------------|--|--------|-----|
| 1 | EA | CONT. HINGE | 112XY EPT/224XY EPT AS REQ | | 628 | IVE |
| 1 | EA | POWER TRANSFER | EPT10 CON | | ⚡ 689 | VON |
| 1 | EA | ELEC PANIC HARDWARE | LX-RX-QEL-98-NL-CON-SNB 24 VDC | | ⚡ 626 | VON |
| 1 | EA | RIM CYLINDER | 20-057 ICX | | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ | | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS | | 689 | LCN |
| 1 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ | | 689 | LCN |
| 1 | EA | BLADE STOP SPACER | 4040XP-61 AS REQ | | 689 | LCN |
| 1 | EA | RAIN DRIP | 142AA | | AA | ZER |
| 1 | SET | PERIMETER SEALS | FRAME MFG STD | | | |
| 1 | EA | DOOR SWEEP | 8198AA | | AA | ZER |
| 1 | EA | THRESHOLD | 655A-223 OR AS REQ | | A | ZER |
| 1 | EA | WIRE HARNESS | CON-XX (PANIC TO EPT) | | | VON |
| 1 | EA | WIRE HARNESS | CON-6W (EPT TO AC SYS) | | | VON |
| 1 | EA | MULTITECH READER | MT15 - OWNER SUPPLIED | | ⚡ BLK | SCE |
| 1 | EA | ACCESS CONTROL PACKAGE | OWNER SUPPLIED | | ⚡ | |
| 1 | EA | DOOR CONTACT | 679-05HM | | ⚡ BLK | SCE |
| 1 | EA | POWER SUPPLY | BY ACCESS CONTROL | | ⚡ | VON |

OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR. PROVIDE BOX WITH CONDUIT BEHIND EPT AND DOOR POSITION SWITCH PREPS IN FRAME AND CONDUIT ABOVE DROP CEILING FOR LX-RX AND LX-RX-QEL PANIC HARDWARE AND L909X ELECTRIFIED LOCKS. ELECTRICAL CONTRACTOR TO PROVIDE BOX ABOVE CEILING FOR POWER CONNECTIONS. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG BOX ON EXTERIOR OF BUILDING FOR CARD READER. CONDUIT MUST BE PROVIDED BETWEEN SINGLE GANG BOX AND CONTROLLER. ALL CONDUIT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.












OPERATION: SECURITY SYSTEM MONITORS DOOR POSITION. PRESENTATION OF VALID CREDENTIAL AT READER TEMPORARILY SHUNTS DOOR POSITION SWITCH AND RETRACTS LATCHBOLT FOR AUTHORIZED ENTRY. RX SWITCHES IN TOUCHPAD TEMPORARILY SHUNT DOOR POSITION SWITCH ON EXIT. LX SWITCH MONITOR LATCH POSITION. FREE EGRESS AT ALL TIMES. FAIL SECURE.

Hardware Group No. INT PR HM INPACT CROSS CORRIDOR/STAIRWELL DOORS

For use on Door #(s):

STW-6A STW-6B STW-6E STW-6F

Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|--------------------|--|---|--------|-----|
| 2 | EA | CONT. HINGE | 224XY |  | 628 | IVE |
| 2 | EA | FIRE EXIT HARDWARE | 9447-L-F-LBR-03 |  | 626 | VON |
| 2 | EA | MORTISE CYLINDER | 20-061 ICX |  | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 2 | EA | SURFACE CLOSER | 4040XP EDA MC TBWMS |  | 689 | LCN |
| 2 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ |  | 689 | LCN |
| 2 | EA | KICK PLATE | 8400 8" X 1" LDW B-CS |  | 630 | IVE |
| 2 | EA | FIRE/LIFE WALL MAG | SEM7850 AND ACCESSORIES AND VOLTAGE AS EQ |  | ⚡ 689 | LCN |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |
| 1 | EA | MTG STILE SEALS | 8042SBK PSA |  | BK | ZER |
| 2 | EA | DOOR CONTACT | 679-05HM |  | ⚡ BLK | SCE |

GRAINTECH HM DOORS.

OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR.

TEMPLATE DOOR CLOSERS SO THAT DOORS THAT CAN SWING 180 DEGREES TO WALL WILL.














OPERATION:

DOOR POSITION MAY BE MONITORED. DOORS NORMALLY HELD OPEN AND CLOSE AUTOMATICALLY WHEN SIGNALLED BY FIRE ALARM SYSTEM.

Hardware Group No. INT PR WD QMEO QML2SI 4K 6

For use on Door #(s):
 C-1F









Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|---------------------|---------------------------|---|--------|-----|
| 2 | EA | CONT. HINGE | 224XY |  | 628 | IVE |
| 1 | EA | REMOVABLE MULLION | KR4954 STAB |  | 689 | VON |
| 1 | EA | PANIC HARDWARE | LD-QM-98-EO-SNB |  | 626 | VON |
| 1 | EA | PANIC HARDWARE | LD-QM-98-L-2SI-03-SNB |  | 626 | VON |
| 1 | EA | MULLION STORAGE KIT | MT54 | | 689 | VON |
| 2 | EA | RIM CYLINDER | 20-057 ICX |  | 626 | SCH |
| 1 | EA | MORTISE CYLINDER | 20-061 ICX |  | 626 | SCH |
| 3 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 2 | EA | SURFACE CLOSER | 4040XP SHCUSH MC TBWMS |  | 689 | LCN |
| 2 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ |  | 689 | LCN |
| 2 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | MTG STILE SEALS | 8042SBK PSA |  | BK | ZER |
| 1 | EA | MULLION SEAL | 8780NBK PSA |  | BK | ZER |
| 2 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. INT SGL WD ED LNFL F S

For use on Door #(s):
 MECH-2A




Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|--------------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 NRP |  | 652 | IVE |
| 1 | EA | FIRE EXIT HARDWARE | 98-L-NL-F-07-SNB |  | 626 | VON |
| 1 | EA | RIM CYLINDER | 20-057 ICX |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS |  | 689 | LCN |
| 1 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

Hardware Group No. RR STALL

For use on Door #(s):
 RR STALL
 DOORS



Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|-----------------------|----------------|---|--------|-----|
| 1 | EA | CONT. HINGE | 224XY |  | 628 | IVE |
| 1 | EA | PRIVACY LOCK | ND40S TLR |  | 626 | SCH |
| 1 | EA | WARDROBE HOOK/STOP | B-212 | | 626 | BOB |
| 2 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. RR STALL ADA

For use on Door #(s):
 RR STALLS
 ADA








Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|-----------------------|----------------|---|--------|-----|
| 1 | EA | CONTINUOUS HINGE | FS402 | | 628 | MAR |
| 1 | EA | PRIVACY LOCK | ND40S TLR |  | 626 | SCH |
| 1 | EA | WARDROBE HOOK/STOP | B-212 | | 626 | BOB |
| 2 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. SR1KFS STOR

For use on Door #(s):
 304B 322B 904B








Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|----------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 |  | 652 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | FLOOR STOP | FS441 |  | 626 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

Hardware Group No. SR1KWM 48 MECH

For use on Door #(s):
 304A 322A 904A 922A

Provide each SGL door(s) with the following:








| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|----------------|---------------------------|---|--------|-----|
| 1 | EA | CONT. HINGE | 112XY/224XY AS REQ |  | 628 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 3 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. SR1KWM JAN

For use on Door #(s):

314 914

Provide each SGL door(s) with the following:








| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|----------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 |  | 652 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 3 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. SR1KWM STOR

For use on Door #(s):

302A 324A 805G 902A 924B

Provide each SGL door(s) with the following:








| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|----------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 |  | 652 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 3 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. SR1KWS

For use on Door #(s):

310 910









Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|----------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 |  | 652 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

Hardware Group No. SR5KFS STOR

For use on Door #(s):
 921B









Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|-------------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 NRP |  | 652 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP SCUSH MC TBWMS |  | 689 | LCN |
| 1 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | FLOOR STOP | FS441 |  | 626 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

Hardware Group No. SRDI1KMWM TEACH RR

For use on Door #(s):
 312 913

Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|-------------------------|------------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 |  | 652 | IVE |
| 1 | EA | STOREROOM W/DEADBOLT | L9480T 03A L583-363 L283-722 |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | MOP PLATE | 8400 8" X 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 3 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. SREU1KWS AC DATA

For use on Door #(s):
 316 916

Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|---------------------------|-------------------------------------|--|--------|-----|
| 3 | EA | HINGE | 5BB1 | | 652 | IVE |
| 1 | EA | POWER TRANSFER | EPT10 CON | | ⚡ 689 | VON |
| 1 | EA | EU MORTISE LOCK | L9092TEU 03A RX LX CON 12/24 VDC | | ⚡ 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ | | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG MC TBWMS | | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS | | 630 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX | | 630 | IVE |
| 1 | EA | GASKETING | 488SBK PSA | | BK | ZER |
| 1 | EA | WIRE HARNESS | CON-XX (LOCK TO EPT) | | | VON |
| 1 | EA | WIRE HARNESS | CON-6W (EPT TO AC SYS) | | | VON |
| 1 | EA | MULTITECH READER | MT15 - OWNER SUPPLIED | | ⚡ BLK | SCE |
| 1 | EA | ACCESS CONTROL PACKAGE | OWNER SUPPLIED | | ⚡ | |
| 1 | EA | DOOR CONTACT | 679-05HM | | ⚡ BLK | SCE |
| 1 | EA | POWER SUPPLY | BY ACCESS CONTROL | | ⚡ | VON |










OPENING MAY REQUIRE COORDINATION WITH ELECTRICAL, ACCESS CONTROL SUPPLIER/INSTALLER, INTRUSION ALARM SUPPLIER/INSTALLER AND POSSIBLY SMOKE/FIRE ALARM SUPPLIER/INSTALLER. ALL ELECTRICAL COMPONENTS, OTHER THAN WHAT IS SPECIFIED ABOVE, WIRE AND WIRING BY ELECTRICAL CONTRACTOR. PROVIDE BOX WITH CONDUIT BEHIND EPT AND DOOR POSITION SWITCH PREPS IN FRAME AND CONDUIT ABOVE DROP CEILING FOR LX-RX AND LX-RX-QEL PANIC HARDWARE AND L909X ELECTRIFIED LOCKS. ELECTRICAL CONTRACTOR TO PROVIDE BOX ABOVE CEILING FOR POWER CONNECTIONS. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG BOX ON EXTERIOR OF BUILDING FOR CARD READER. CONDUIT MUST BE PROVIDED BETWEEN SINGLE GANG BOX AND CONTROLLER. ALL CONDUIT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.

OPERATION: SECURITY SYSTEM MONITORS DOOR POSITION. PRESENTATION OF VALID CREDENTIAL AT READER MOMENTARILY UNLOCKS LOCK AND LEVER OPERATION LX SWITCH SHUNTS DOOR POSITION SWITCH AND ALLOWS FOR AUTHORIZED ENTRY. RX SWITCH IN LOCKSET TEMPORARILY SHUNT DOOR POSITION SWITCHES ON EXIT. LX SWITCHES MONITOR LATCH POSITION. FREE EGRESS AT ALL TIMES. FAIL SECURE.

Hardware Group No. SRFBDP1WFKM N

For use on Door #(s):
 C-7

Provide each PR door(s) with the following:









| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|-------------------|-----------------------|---|--------|-----|
| 6 | EA | HINGE | 5BB1 NRP |  | 652 | IVE |
| 2 | EA | MANUAL FLUSH BOLT | FB458 |  | 626 | IVE |
| 1 | EA | DUST PROOF STRIKE | DP1 |  | 626 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 2 | EA | KICK PLATE | 8400 8" X 1" LDW B-CS |  | 630 | IVE |
| 1 | EA | FLOOR STOP | FS441 |  | 626 | IVE |
| 1 | EA | WALL STOP | WS406/407CVX |  | 630 | IVE |
| 2 | EA | SILENCER | SR64 |  | GRY | IVE |

RHR LEAF TO SWING 180 DEGREES TO WALL STOP.

Hardware Group No. SRFBDP19K N

For use on Door #(s):
 C-5









Provide each PR door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|-------------------|-----------------------|---|--------|-----|
| 6 | EA | HINGE | 5BB1 NRP |  | 652 | IVE |
| 2 | EA | MANUAL FLUSH BOLT | FB458 |  | 626 | IVE |
| 1 | EA | DUST PROOF STRIKE | DP1 |  | 626 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 03A |  | 626 | SCH |
| 1 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 2 | EA | OH STOP | 900S SNB |  | 630 | GLY |
| 2 | EA | KICK PLATE | 8400 8" X 1" LDW B-CS |  | 630 | IVE |
| 2 | EA | SILENCER | SR64 |  | GRY | IVE |

Hardware Group No. U3KFS N

For use on Door #(s):
 301B 323B 903A 921C

Provide each SGL door(s) with the following:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|-----|----|--------------------|---------------------------|---|--------|-----|
| 3 | EA | HINGE | 5BB1 NRP |  | 652 | IVE |
| 1 | EA | DBL CYL STORE W/DB | L9466T 03A |  | 626 | SCH |
| 2 | EA | FSIC CORE | 23-030 CKC EV AS REQ |  | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP EDA MC TBWMS |  | 689 | LCN |
| 1 | EA | CUSH SHOE SUPPORT | 4040XP-30 AS REQ |  | 689 | LCN |
| 1 | EA | KICK PLATE | 8400 8" X 1 1/2" LDW B-CS |  | 630 | IVE |
| 1 | EA | FLOOR STOP | FS441 |  | 626 | IVE |
| 1 | EA | GASKETING | 488SBK PSA |  | BK | ZER |

END OF SECTION 08 71 00

SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass products.
 - 2. Laminated glass.
 - 3. Insulating glass.
 - 4. Glazing sealants.
 - 5. Glazing tapes.
 - 6. Miscellaneous glazing materials.
- B. Related Requirements:
 - 1. Section 08 88 13 "Fire-Rated Glazing."

1.2 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
 - 1. Laminated glass.
 - 2. Insulating glass.

3. Spandrel glass.

- C. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch lengths Install sealant Samples between two strips of material representative in color of adjoining framing system.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- E. Delegated Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For glass.
- C. Product Test Reports: For fabricated glass and glazing sealants, for tests performed by a qualified testing agency.
 - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved by primary glass manufacturer.
- B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.
1. Warranty Period: 10 years from date of Substantial Completion.
- D. Manufacturer's Special Warranty for Heat-Soaked Tempered Glass: Manufacturer agrees to replace heat-soaked tempered glass units that spontaneously break due to nickel sulfide (NiS) inclusions at a rate exceeding 0.3 percent (3/1000) within specified warranty period. Coverage for any other cause is excluded.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain coated glass from single source from single manufacturer.

- B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:
 - 1. Design Wind Pressures: As indicated on Drawings.
 - a. Wind Design Data: As indicated on Drawings.
 - b. Importance Factor: 1.0.
 - c. Exposure Category: B.
 - 2. Probability of Breakage for Sloped Glazing: For glass sloped more than 15 degrees from vertical, design glass for a probability of breakage not greater than 0.001.
 - 3. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
 - 4. Thermal Loads: Design glazing to resist thermal stress breakage induced by differential temperature conditions and limited air circulation within individual glass lites and insulated glazing units.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 - 1. For monolithic-glass lites, properties are based on units with lites of thickness indicated.
 - 2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 - 3. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on most current non-beta version of LBL's WINDOW computer program, expressed as Btu/sq. ft. x h x deg F.
 - 4. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on most current non-beta version of LBL's WINDOW computer program.
 - 5. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.
 - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.
 - 2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- B. Reflective- and Low-E-Coated Vision Glass: ASTM C1376.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cardinal Glass Industries.
 - b. Guardian Glass; SunGuard.
 - c. Pilkington North America.
 - d. Viracon, Inc.
 - e. Vitro Architectural Glass.

- C. Ceramic-Coated Vision Glass: ASTM C1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in NGA's "Engineering Standards Manual."
- D. Ceramic-Coated Spandrel Glass: ASTM C1048, Type I, Condition B, Quality-Q3.
- E. Reflective- and Low-E-Coated Spandrel Glass: ASTM C1376, Kind CS.

2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Eastman Chemical Company.
 - b. Kuraray America, Inc.
 - 2. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
 - 3. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 - 4. Interlayer Color: Clear unless otherwise indicated.

2.6 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.
 - 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 - 2. Perimeter Spacer: Manufacturer's standard.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Technoform.
 - 2) Thermix; a brand of Ensinger USA.
 - 3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.7 GLAZING SEALANTS

- A. General:
 - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

- B. Neutral-Curing Silicone Glazing Sealant, Class 100/50: Complying with ASTM C920, Type S, Grade NS, Use NT.
- C. Neutral-Curing Silicone Glazing Sealant, Class 50: Complying with ASTM C920, Type S, Grade NS, Use NT.
- D. Neutral-Curing Silicone Glazing Sealant, Class 25: Complying with ASTM C920, Type S, Grade NS, Use NT.
- E. Acid-Curing Silicone Glazing Sealant, Class 25: Complying with ASTM C920, Type S, Grade NS, Use NT.

2.8 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks:
 - 1. Silicone with Shore A durometer hardness of 85, plus or minus 5.
 - 2. Type recommended in writing by sealant or glass manufacturer.
- D. Spacers:

1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
 2. Type recommended in writing by sealant or glass manufacturer.
- E. Edge Blocks:
1. Silicone with Shore A durometer hardness per manufacturer's written instructions.
 2. Type recommended in writing by sealant or glass manufacturer.
- F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.10 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep systems.
 3. Minimum required face and edge clearances.
 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 MONOLITHIC GLASS SCHEDULE

- A. Clear Glass Type, GL-1: Fully tempered float glass.
 - 1. Minimum Thickness: 6 mm.
 - 2. Safety glazing required.

3.9 LAMINATED GLASS SCHEDULE

- A. Clear Laminated Glass Type, GL-6: Two plies of low-iron fully tempered float glass.
 - 1. Basis-of-Design Product: Provide Vitro; Heavy Starphire Ultra-Clear or comparable product acceptable to the Architect which meets the design criteria and color indicated.
 - 2. Minimum Thickness of Each Glass Ply: 3 mm.
 - 3. Interlayer Thickness: 0.030 inch.
 - 4. Safety glazing required.

3.10 INSULATING GLASS SCHEDULE

A. Low-e-coated, Clear Insulating Glass Type, GL-3:

1. Basis-of-Design Product: Provide Vitro; Solarban 90 (2) Acuity + Acuity or comparable product acceptable to the Architect which meets the design criteria and color indicated.
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: ¼".
4. Outdoor Lite: Fully tempered float glass.
5. Interspace Content: Air.
6. Indoor Lite: Fully tempered float glass.
7. Winter Nighttime U-Factor: 0.29 maximum.
8. Summer Daytime U-Factor: 0.26 maximum.
9. Safety glazing required.

B. Ceramic-Coated, Low-E, Insulating Spandrel Glass Type, GL-4:

1. Basis-of-Design Product: Provide Vitro; Solarban 90 (2) Acuity + Acuity or comparable product acceptable to the Architect which meets the design criteria and color indicated.
2. Coating Color: OPACI-COAT-300 – CHARCOAL.
3. Overall Unit Thickness: 1 inch.
4. Minimum Thickness of Each Glass Lite: ¼".
5. Outdoor Lite: Low-iron fully tempered float glass.
6. Interspace Content: Air.
7. Indoor Lite: Low-iron fully tempered float glass.
8. Low-E Coating: Sputtered on second surface.
9. Opaque Coating Location: Fourth surface.
10. Winter Nighttime U-Factor: 0.29 maximum.
11. Summer Daytime U-Factor: 0.26 maximum.

C. Acid-etched, Low-e-coated, Clear Insulating Glass Type, GL-7:

1. Basis-of-Design Product: Provide Vitro; Solarban 90 (2) Acuity + Acuity with Walker; Velour Acid-etched glass or comparable product acceptable to the Architect which meets the design criteria and color indicated.
2. Coating Color: Opaque.
3. Overall Unit Thickness: 1 inch.
4. Minimum Thickness of Each Glass Lite: ¼".
5. Outdoor Lite: Low-iron fully tempered float glass.

6. Interspace Content: Air.
7. Indoor Lite: Low-iron fully tempered float glass.
8. Low-E Coating: Sputtered on second surface.
9. Acid-etched Location: Third surface.
10. Winter Nighttime U-Factor: 0.29 maximum.
11. Summer Daytime U-Factor: 0.26 maximum.

END OF SECTION

SECTION 08 88 13
FIRE-RATED GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire-protection-rated glazing.
 - 2. Fire-resistance-rated glazing.

1.2 DEFINITIONS

- A. Fire-Protection-Rated Glazing: Glazing that prevents spread of fire and smoke and complies with requirements for rated openings; incapable of blocking radiant heat
- B. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- C. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product; 12 inches square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and glass testing agency.
- B. Product Certificates: For each type of glass and glazing product.
- C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the NGA's Certified Glass Installer Program.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install fire-resistant glazing until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature conditions at occupancy levels during remainder of construction period.

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

- B. Manufacturer's Special Warranty for Tempered Glazing Units with Clear Intumescent Interlayer: Manufacturer agrees to replace units that deteriorate within specified warranty period. Deterioration of tempered glazing units with clear intumescent interlayer is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning glass contrary to manufacturer's written instructions. Evidence of failure is air bubbles within units, or obstruction of vision by contamination or deterioration of intumescent interlayer.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Glass: For each glass type, obtain from single source from single manufacturer.
- B. Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; deterioration of glazing materials; or other defects in construction.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organization below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. NGA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or manufacturer. Label shall indicate manufacturer's name, type of glass, glass thickness, and safety glazing standard with which glass complies.

2.4 GLASS PRODUCTS

- A. Float Glass: ASTM C1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Low-Iron Float Glass: ASTM C1036, Type I, Quality-Q3, Class I (clear), with visible light transmission not less than 91 percent.
- C. Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class I (clear) unless otherwise indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- D. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Construction: Laminate glass with polyvinyl butyral interlayer unless fire-protection or fire-resistance rating is based on another product.
 - 2. Interlayer Thickness: Provide thickness as needed to comply with requirements.
 - 3. Interlayer Color: Clear unless otherwise indicated.

2.5 FIRE-PROTECTION-RATED GLAZING

- A. General: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on positive-pressure testing in accordance with NFPA 257 or UL 9, including hose-stream test, and shall comply with NFPA 80.
 - 1. Fire-protection-rated glazing required to have a fire-protection rating of 20 minutes shall be exempt from hose-stream test.

- B. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether glazing has passed hose-stream test; whether glazing meets 450 deg F temperature-rise limitation; and fire-resistance rating in minutes.
- C. Fire-Protection-Rated Laminated Ceramic Glazing: Laminated glass made from two plies of clear, ceramic glass; 8-mm total thickness; complying with 16 CFR 1201, Category II.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. McGrory Glass, Inc.
 - b. Schott North America, Inc.
 - c. Technical Glass Products; an Allegion brand.
 - d. Vetrotech Saint-Gobain North America Inc.

2.6 FIRE-RESISTANCE-RATED GLAZING

- A. General: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-resistance ratings indicated, based on testing in accordance with ASTM E119 or UL 263.
- B. Fire-Resistance-Rated Glazing Labeling: Permanently mark fire-resistance-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, that glazing is approved for use in walls, and fire-resistance rating in minutes.
- C. Fire-Resistance-Rated Framing and Doors: Fire-resistance-rated glazing with 60-, 90-, and 120-minute ratings requires framing and doors from glass supplier, tested as an assembly complying with ASTM E119 or UL 263.
- D. Fire-Resistance-Rated Laminated Glass with Intumescent Interlayers: Laminated glass made from multiple plies of uncoated, clear float glass; with intumescent interlayers; complying with 16 CFR 1201, Category II.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. McGrory Glass, Inc.
 - b. Pilkington North America; NSG Group.
 - c. SAFTI FIRST Fire Rated Glazing Solutions.
 - d. Technical Glass Products; an Allegion brand.
 - e. Vetrotech Saint-Gobain North America Inc.

2.7 GLAZING ACCESSORIES

- A. Provide glazing gaskets, glazing sealants, glazing tapes, setting blocks, spacers, edge blocks, and other glazing accessories that are compatible with glazing products and each other and are approved by testing agencies that listed and labeled fire-resistant glazing products with which products are used for applications and fire-protection ratings indicated.

- B. Glazing Sealants for Fire-Rated Glazing Products: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 50, Use NT. Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. GE Construction Sealants; Momentive Performance Materials Inc.
 - b. The Dow Chemical Company.
 - c. Tremco Incorporated.
 - 2. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.
- C. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- D. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- C. Perimeter Insulation for Fire-Resistance-Rated Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.9 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with manufacturing and installation tolerances, including those for size, squareness, and offsets at corners, and for compliance with minimum required face and edge clearances.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate fire side and protected side. Label or mark units as needed so that fire side and protected side are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Use methods approved by testing agencies that listed and labeled fire-resistant glazing products.
- B. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches.
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances

unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
- I. Set glass lites with proper orientation so that coatings face fire side or protected side as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

- B. Insert soft compression gasket between glass and frame or fixed stop, so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- D. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 FIRE-PROTECTION-RATED GLAZING SCHEDULE

- A. Glass Type FPGL: 60-minute fire-protection-rated glazing with 450 deg F temperature-rise limitation in rated doors only, with a maximum vision area of 100 sq. in.; fire-protection-rated laminated ceramic glazing.

3.9 FIRE-RESISTANCE-RATED GLAZING SCHEDULE

- A. Glass Type FRGL/GL-5: 60-minute fire-resistance-rated glazing complying with ASTM E119 or UL 263 in a tested assembly of glass and framing with 450 deg F temperature-rise limitation; fire-resistance-rated laminated glass with intumescent interlayers.

END OF SECTION

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.
2. Suspension systems for interior ceilings and soffits.
3. Grid suspension systems for gypsum board ceilings.

B. Related Requirements:

1. Section 05 40 00 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; and roof rafters and ceiling joists.

1.2 ACTION SUBMITTALS

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

1.3 INFORMATIONAL SUBMITTALS

- ###### A. Product Certificates: For each type of code-compliance certification for studs and tracks.

1.4 QUALITY ASSURANCE

- ###### A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association or the Supreme Steel Framing System Association.

1.5 DELIVERY, STORAGE, AND HANDLING

- ###### A. Notify manufacturer of damaged materials received prior to installation.
- ###### B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- ###### C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.
- C. Horizontal Deflection: For composite wall assemblies, limited to 1/360 of the wall height based on horizontal loading of 10 lbf/sq. ft..
- D. Design framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing - Nonstructural Members," unless otherwise indicated.
- E. Design Loads: As indicated on architectural Drawings or 5 lbf/sq. ft. minimum as required by the IBC.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C645 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C645 requirements for metal unless otherwise indicated
 - 2. Protective Coating: Comply with ASTM C645; ASTM A653/A653M, G40; or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.
 - a. Coating demonstrates equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.
- B. Studs and Track: ASTM C645.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CEMCO; California Expanded Metal Products Co.
 - b. ClarkDietrich.
 - c. Custom Stud.
 - d. Jaimes Industries.
 - e. MarinoWARE.
 - f. MBA Building Supplies.
 - g. MRI Steel Framing, LLC.
 - h. Phillips Manufacturing Co.
 - i. SCAFCO Steel Stud Company.
 - j. Steel Construction Systems.
 - k. Telling Industries.
 - l. The Steel Network, Inc.

2. Minimum Base-Steel Thickness: As required by performance requirements for horizontal deflection.
 3. Depth: As indicated on Drawings.
- C. Embossed, High Strength Steel Studs and Tracks: Roll-formed and embossed with surface deformations to stiffen the framing members so that they are structurally comparable to conventional ASTM C645 steel studs and tracks.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CEMCO; California Expanded Metal Products Co.
 - b. ClarkDietrich.
 - c. MarinoWARE.
 - d. MBA Building Supplies.
 - e. Phillips Manufacturing Co.
 - f. SCAFCO Steel Stud Company.
 - g. Steel Construction Systems.
 - h. Telling Industries.
 - i. The Steel Network, Inc.
 2. Minimum Base-Steel Thickness: As required by horizontal deflection performance requirements.
 3. Depth: As indicated on Drawings.
- D. Slip-Type Head Joints: Where indicated, provide one of the following:
1. Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to tracks while allowing 1-1/2-inch minimum vertical movement.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) CEMCO; California Expanded Metal Products Co.
 - 2) ClarkDietrich.
 - 3) Fire Trak Corp.
 - 4) MarinoWARE.
 - 5) SCAFCO Steel Stud Company.
 - 6) Steel Construction Systems.
 - 7) Super Stud Building Products Inc.
 - 8) The Steel Network, Inc.
 2. Single Long-Leg Track System: ASTM C645 top track with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
 3. Double-Track System: ASTM C645 top outer tracks, inside track with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
 4. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) CEMCO; California Expanded Metal Products Co.
 - 2) ClarkDietrich.
 - 3) MarinoWARE.
 - 4) MBA Building Supplies.
 - 5) Metal-Lite.
 - 6) SCAFCO Steel Stud Company.
 - 7) Steel Construction Systems.
 - 8) Telling Industries.
 - 9) The Steel Network, Inc.
- E. Firestop Tracks: Top track manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CEMCO; California Expanded Metal Products Co.
 - b. ClarkDietrich.
 - c. Fire Trak Corp.
 - d. MarinoWARE.
 - e. Metal-Lite.
 - f. SCAFCO Steel Stud Company.
 - g. Steel Construction Systems.
 - h. The Steel Network, Inc.
- F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Steel Thickness: 0.0598 inch.
- G. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-steel thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: 1-1/2 inches.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.
- H. Hat-Shaped, Rigid Furring Channels: ASTM C645.
 - 1. Minimum Base-Steel Thickness: 0.0179 inch.
 - 2. Depth: 1-1/2 inches.
- I. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.
 - 1. Configuration: Asymmetrical or hat shaped.
- J. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: 3/4 inch.

2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch.
 3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch- diameter wire.
- K. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-steel thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- B. Hanger Attachments to Concrete:
1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or AC308 as appropriate for the substrate.
 - a. Uses: Securing hangers to structure.
 - b. Type: Torque-controlled, expansion anchor.
 - c. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
 - d. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.
 2. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.
- E. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-steel thickness of 0.0538 inch and minimum 1/2-inch- wide flanges.
1. Depth: 2-1/2 inches.
- F. Furring Channels (Furring Members):
1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges, 3/4 inch deep.
 2. Steel Studs and Tracks: ASTM C645.
 - a. Minimum Base-Steel Thickness: 0.0179 inch.
 - b. Depth: As indicated on Drawings.
 3. Resilient Furring Channels: 1/2-inch- deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.
- G. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armstrong Ceiling & Wall Solutions.
 - b. Certainteed; SAINT-GOBAIN.
 - c. Rockfon (Rockwool International).
 - d. USG Corporation.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 1. Asphalt-Saturated Organic Felt: ASTM D226/D226M, Type I (No. 15 asphalt felt), nonperforated.
 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials:
 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce

thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
 - 2. Multilayer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
 - 3. Tile Backing Panels: As required by horizontal deflection performance requirements unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.

- c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 - E. Direct Furring:
 1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
 - F. Z-Shaped Furring Members:
 1. Erect insulation, specified in Section 07 21 00 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.
 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
 - G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING CEILING SUSPENSION SYSTEMS

 - A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 1. Hangers: 48 inches o.c.
 2. Carrying Channels (Main Runners): 48 inches o.c.
 3. Furring Channels (Furring Members): 24 inches o.c.
 - B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
 - C. Suspend hangers from building structure as follows:
 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

- a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
5. Do not attach hangers to steel roof deck.
6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.

B. Related Requirements:

1. Section 06 16 00 "Sheathing" for gypsum sheathing for exterior walls.
2. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.
3. Section 09 30 13 "Ceramic Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

C. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.

D. Samples for Initial Selection: For each type of trim accessory indicated.

1.3 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.3 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.4 INTERIOR GYPSUM BOARD

- A. Gypsum Board, Type X: ASTM C1396/C1396M.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum.
 - b. Certainteed; SAINT-GOBAIN.
 - c. Continental Building Products Inc.
 - d. Georgia-Pacific Gypsum LLC.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. PABCO Gypsum.
 - h. Panel Rey.
 - i. USG Corporation.
 2. Thickness: 5/8 inch.
 3. Long Edges: Tapered.
- B. Abuse-Resistant Gypsum Board: ASTM C1396/C1396M gypsum board, tested according to ASTM C1629/C1629M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum.
 - b. Certainteed; SAINT-GOBAIN.
 - c. Continental Building Products Inc.
 - d. Georgia-Pacific Gypsum LLC.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. USG Corporation.
 2. Core: 5/8 inch, Type X.
 3. Surface Abrasion: ASTM C1629/C1629M, meets or exceeds Level 3 requirements.
 4. Indentation: ASTM C1629/C1629M, meets or exceeds Level 1 requirements.
 5. Soft-Body Impact: ASTM C1629/C1629M, meets or exceeds Level 1 requirements.
 6. Long Edges: Tapered.
 7. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
- C. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum.
 - b. Certainteed; SAINT-GOBAIN.
 - c. Continental Building Products Inc.
 - d. Georgia-Pacific Gypsum LLC.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. USG Corporation.
 2. Core: 5/8 inch, Type X.
 3. Long Edges: Tapered.
 4. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
- 2.5 TRIM ACCESSORIES
- A. Interior Trim: ASTM C1047.
1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 2. Shapes:
 - a. Bullnose bead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - e. Expansion (control) joint.
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fry Reglet Corporation.
 - b. Gordon Inc.
 - c. Pittcon Industries.
 - d. Tamlyn.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221, Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
 2. Exterior Gypsum Soffit Board: Paper.
 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 4. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

2.7 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- E. Thermal Insulation: As specified in Section 07 21 00 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. Comply with ASTM C840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
 - H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
 - I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
 - J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.
- ### 3.3 INSTALLATION OF INTERIOR GYPSUM BOARD
- A. Install interior gypsum board in the following locations:
 1. Type X: Surfaces above ceilings.
 2. Mold-Resistant Gypsum Board: Ceiling surfaces.
 3. Abuse-Resistant Type: Vertical surfaces unless otherwise indicated.
 - B. Single-Layer Application:
 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
 3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
 - C. Multilayer Application:
 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
 4. Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.
- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLATION OF TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 1. Bullnose Bead: Use at outside corners.
 2. LC-Bead: Use at exposed panel edges.
- D. Aluminum Trim: Install in locations indicated on Drawings.

3.5 FINISHING OF GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed.
 - 2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Class A according to ASTM E 1264.
 - 2. Smoke-Developed Index: 50 or less.

2.3 APC-1, ACOUSTICAL PANELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc.; SCHOOL ZONE Fine Fissured or comparable product by one of the following:
 - 1. CertainTeed Corp.
 - 1. Chicago Metallic Corporation.
 - 2. Tectum Inc.
 - 3. USG Interiors, Inc.; Subsidiary of USG Corporation.
- B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- C. Classification: Provide panels as follows:
 - 1. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
 - 2. Pattern: CE (perforated, small holes and lightly textured).
- D. Color: White.
- E. Light Reflectance (LR): Not less than 0.85.
- F. Ceiling Attenuation Class (CAC): Not less than 40.
- G. Noise Reduction Coefficient (NRC): Not less than 0.70.
- H. Edge/Joint Detail: Square.
- I. Thickness: 3/4 inch.
- J. Modular Size: 24 by 24 inches.
- K. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative

bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.

2.4 APC-4, ACOUSTICAL PANELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc.; Clean Room VL No. 868 or comparable product by one of the following:
 - 1. CertainTeed Corp.
 - 2. Chicago Metallic Corporation.
 - 3. Tectum Inc.
 - 4. USG Interiors, Inc.; Subsidiary of USG Corporation.
- B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- C. Classification: Provide panels as follows:
 - 1. Type and Form: Type IV, mineral base with vinyl-faced membrane overlay; Form 2, water felted.
 - 2. Pattern: E (lightly textured).
- D. Color: White.
- E. Light Reflectance (LR): Not less than 0.80.
- F. Ceiling Attenuation Class (CAC): Not less than 40.
- G. Edge/Joint Detail: Square.
- H. Thickness: 5/8 inch.
- I. Modular Size: 24 by 24 inches.
- J. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.

2.5 APC-5, SHEETROCK PANELS & ACOUSTICAL PANELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc.; Sheetrock Lay-In Ceiling Panel and Painted Nubby 3102 or comparable product by one of the following:
 - 1. CertainTeed Corp.
 - 2. Chicago Metallic Corporation.
 - 3. Tectum Inc.
 - 4. USG Interiors, Inc.; Subsidiary of USG Corporation.

- B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- C. Layout: Provide 50 percent sheetrock panels and 50 percent acoustical panels in pattern indicated on drawings.

2.6 METAL SUSPENSION SYSTEM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 1. CertainTeed Corp.
 - 2. Chicago Metallic Corporation.
- B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.
- C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30coating designation; with prefinished 15/16-inch-metal caps on flanges.
 - 1. Structural Classification: Intermediate-duty system.
 - 2. End Condition of Cross Runners: Override (stepped) type.
 - 3. Face Design: Flat, flush.
 - 4. Cap Material: Cold-rolled steel or aluminum.
 - 5. Cap Finish: Painted white.

2.7 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Corrosion Protection: Carbon-steel components zinc plated according to ASTM B 633, Class SC 1 (mild) service condition.
- B. Wire Hangers, Braces, and Ties: Provide wires as follows:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch-diameter wire.
- C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

2.8 METAL EDGE MOLDINGS AND TRIM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. CertainTeed Corp.
 - 3. Chicago Metallic Corporation.
 - 4. Fry Reglet Corporation.
 - 5. Gordon, Inc.
 - 6. USG Interiors, Inc.; Subsidiary of USG Corporation.
- B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
 - 1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
 - 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- C. Extruded Aluminum Perimeter Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for floating ceilings
 - 1. Profile height: 3 7/8"
 - 2. Color: to match ceiling and suspension systems.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at

borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

- B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 3. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 - 4. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - 5. Do not attach hangers to steel deck tabs.
 - 6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 7. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 - 8. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
 - 1. Arrange directionally patterned acoustical panels as follows:
 - a. Install panels in a basket-weave pattern.
 - 2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 54 26

SUSPENDED WOOD CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid-wood, linear-plank ceilings.

1.2 DEFINITIONS

- A. NRC: Noise Reduction Coefficient.

1.3 COORDINATION

- A. Coordinate layout and installation of wood ceilings and suspension systems with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For suspended wood ceilings.
 - 1. Include reflected ceiling plans, sections, and details, drawn to scale, showing the following:
 - a. Wood ceiling patterns and joints.
 - b. Ceiling suspension members.
 - c. Method of attaching hangers to building structure and locations of cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - d. Ceiling-mounted items including, but not limited to, light fixtures, diffusers, grilles, speakers, sprinklers, and access panels.
 - e. Ceiling perimeter and penetrations through ceiling; trim and moldings.
- C. Samples: For each exposed product and for each type, color, and finish specified, 12 inches long by 12 inches wide or full width in size.
- D. Samples for Initial Selection: For units with factory-applied colors and finishes.
 - 1. Include Samples of accessories involving color and finish selections.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each suspended wood ceiling, for tests performed by a qualified testing agency.
- B. Evaluation Reports: For suspended-wood-ceiling framing systems.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Suspended-Wood-Ceiling Components: Quantity of each wood-ceiling unit, suspension-system component, accessory, and exposed molding and trim equal to **2** percent of quantity installed.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ceiling components and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they are protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
 - 1. Store materials flat and level, raised from the floor.
- B. Handle ceiling components and accessories in a manner that prevents damage.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install interior ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
 - 1. Store and acclimatize wood products in the spaces where they will be installed for a minimum of 72 hours immediately before ceiling installation.

PART 2 - PRODUCTS

2.1 SWC, SOLID-WOOD, LINEAR-PLANK CEILING

- A. Linear Ceiling Planks: Manufacturer's standard kiln-dried, solid-wood planks free of knots; without finger joints, cracks, checks, or warp, and with square-cut ends.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong Ceilings; Woodworks Linear, Solid Wood Panels or comparable product by one of the following:
 - a. ASI Architectural.
 - b. Norton Industries Inc.
 - c. Hunter Douglas Architectural
 - 2. Wood Species: Maple.
 - 3. Wood Cut: Manufacturer's standard.

4. Nominal Plank Width: 5 inches.
 5. Plank Depth: 3/4 inch.
 6. Plank Length: 96 inches.
 7. Plank Long Edge: Tongue-and-groove, V-groove joint.
 - a. Reveal: 1/2 inch between long edges of planks.
 - b. Reveal Filler Strip: Black felt with flame-spread index of 25 or less and smoke-developed index of 450 or less as determined by testing in accordance with ASTM E84.
 8. Plank End Joints: Butt.
 9. Factory Finish: Manufacturer's standard interior finish; applied on every wood surface.
 - a. Surface-Burning Characteristics: Provide manufacturer's standard intumescent finish system with the following characteristics when tested in accordance with ASTM E84:
 - 1) Flame-Spread Index: 25 or less.
 - 2) Smoke-Developed Index: 450 or less.
 - b. Type: Tinted finish in color selected by Architect from manufacturer's standard.
 - c. Stain: As selected by Architect from manufacturer's standard range.
 - d. Gloss: Manufacturer's standard.
- B. Linear-Ceiling-Plank Accessories: Linear-ceiling-plank manufacturer's accessories required to provide a complete installation of ceiling in accordance with manufacturer's written installation instructions.
1. Attachment Clips: Manufacturer's standard metal clips for attaching planks to grid suspension system.
 2. Solid-Wood Trim: In wood species and finished to match panels; with trim connectors recommended in writing by ceiling and suspension-system manufacturers.
- C. Grid Suspension System: ASTM C635/C635M; recommended in writing by ceiling and suspension-system manufacturers for applications indicated; main- and cross-runner system complete with suspension-system components required to support ceiling units and other ceiling-supported construction.
1. Material: ASTM A653/A653M, hot-dip galvanized, cold-rolled sheet steel, G60 coating designation.
 2. Structural Classification: Heavy-duty system.
 3. Face Width: 15/16 inch.
 4. Finish: Flat black.
- 2.2 SUSPENSION-SYSTEM HANGERS, BRACES, AND TIES
- A. Attachment Devices: Size for 5 times the design load indicated in ASTM C635/C635M, Table 1, Direct Hung, unless otherwise indicated.
1. Cast-in-Place and Postinstalled Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type

indicated and with capability to sustain, without failure, a load equal to **5** times that imposed by ceiling construction as determined by testing in accordance with ASTM E488/E488M or ASTM E1512, as applicable, conducted by a qualified testing and inspecting agency.

- a. Type: Postinstalled expansion anchors.
 - b. Corrosion Protection:
 - 1) Carbon-steel components zinc plated to comply with ASTM B633, Class Fe/Zn 5 (0.005 mm) for Class SC service condition (mild).
 - 2) Stainless steel components complying with ASTM F593 and ASTM F594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchors.
2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction as determined by testing in accordance with ASTM E1190 conducted by a qualified testing and inspecting agency.
- B. Wire Hangers, Braces, and Ties: Provide wire complying with the following requirements:
1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
 2. Stainless Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
 3. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C635/C635M, Table 1, Direct Hung is less than yield stress of wire, but provide not less than 0.135-inch - diameter wire.
- C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed from 0.04-inch-thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing and substrates to which suspended wood ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and with requirements for installation tolerances and other conditions affecting performance of suspended wood ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of suspended wood ceilings.

1. Balance border widths at opposite edges of each ceiling.
2. Avoid using less-than-half-width units.

3.3 INSTALLATION

- A. Comply with ASTM C636/C636M and seismic requirement indicated, in accordance with manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns in 3 inches. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate to which hangers are attached and for type of hanger involved.
 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that does not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
 6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, power-actuated fasteners, or postinstalled mechanical or adhesive anchors that extend through forms into concrete.
 7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 8. Do not attach hangers to steel deck tabs.
 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns in 1-1/2 inches. Suspend bracing from building's structural

members as required for hangers and without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

- D. Install edge moldings and trim at perimeter of ceiling area and where necessary to conceal edges and ends of wood units.
 - 1. Screw-attach metal moldings to substrate at intervals of not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 - 2. Do not use exposed fasteners on moldings and trim.
- E. Grid Suspension Systems: Space main beams at 48 inches o.c.
 - 1. Install cross tees to form modules sized in accordance with manufacturer's written installation instructions.
 - 2. Remove and replace dented, bent, or kinked members.
- F. Linear-Carrier Suspension Systems: Install carriers at no more than 24 inches o.c. aligned and securely interlocked with one another.
 - 1. Install stabilizer channels, tees, and bars at regular intervals to stabilize carriers and at light fixtures, air-distribution equipment, access doors, and other equipment; spaced as standard with manufacturer for use indicated.
 - 2. Remove and replace dented, bent, or kinked members.
- G. Install wood components and accessories in accordance with manufacturer's written instructions and to accommodate natural expansion and contraction of wood products resulting from fluctuations in humidity.
- H. Cut wood components for accurate fit at borders and at interruptions and penetrations by other work through ceilings.
 - 1. Stiffen edges of cut wood components as required to eliminate variations in flatness.
- I. Treat field-cut edges of wood components in accordance with manufacturer's written recommendations; finish exposed field cuts to match factory finish.
 - 1. Solid-Wood Planks: Use solid-wood end caps to conceal exposed field-cut edges.
- J. Install wood components in coordination with suspension system and moldings and trim.
- K. Install field-constructed access panels in locations indicated on Drawings.

3.4 CLEANING

- A. Clean exposed surfaces of ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented units.

END OF SECTION

SECTION 09 64 66
WOOD ATHLETIC FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes wood athletic flooring.

1.2 COORDINATION

- A. Coordinate layout and installation of slab depressions to accommodate layout and height of wood athletic flooring assembly.
- B. Coordinate layout and installation of flooring with floor inserts for gymnasium equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for wood athletic flooring.
- B. Shop Drawings: For each type of floor assembly, include the following:
 - 1. Plans, sections, and attachment details.
 - 2. Details of concrete-slab depressions.
 - 3. Expansion provisions and trim details.
 - 4. Layout, colors, widths, and dimensions of game lines and markers.
 - 5. Locations of floor inserts for athletic equipment installed through flooring assembly.
- C. Samples: For each exposed product and for each color and texture specified, approximately 12 inches in size.
 - 1. Include Sample sets showing the full range of normal color and texture variations expected in wood flooring.
 - 2. Include Sample sets showing finishes and game-line and marker paints applied to wood flooring.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each wood athletic flooring system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For wood athletic flooring and finish systems to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual that has been approved by MFMA as an accredited Installer according to the MFMA Accreditation Program.
 - 1. Installer responsibilities include installation and field finishing of wood athletic flooring components and accessories, and application of game lines and markers.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver floor assembly materials in unopened cartons or bundles.
- B. Protect wood from exposure to moisture. Do not deliver wood components until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.
- C. Store wood components in a dry, warm, well-ventilated, weathertight location and in a horizontal position.

1.8 FIELD CONDITIONS

- A. Conditioning period begins not less than seven days before wood athletic flooring installation, is continuous through installation, and continues not less than seven days after installation.
 - 1. Environmental Conditioning: Maintain ambient temperature between 65 and 75 deg F and relative humidity planned for building occupants, but not less than 35 percent or more than 50 percent, in spaces to receive wood athletic flooring during the conditioning period.
 - 2. Wood Conditioning: Move wood components into spaces where they will be installed, no later than beginning of the conditioning period.
 - a. Do not install wood athletic flooring until wood components adjust to relative humidity of, and are at same temperature as, spaces where they are to be installed.
 - b. Open sealed packages to allow wood components to acclimatize immediately on moving wood components into spaces in which they will be installed.
- B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.
- C. Install wood athletic flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Connor Sports Floor; Rezill Channel-01 or comparable product by one of the following:
 - 1. Acer Flooring, LLC.
 - 2. Action Floor Systems, LLC.
 - 3. Robbins Sports Surfaces.
 - 4. Tarkett Sports; a division of the Tarkett Group.

2.2 SYSTEM DESCRIPTION

- A. System Type: Anchored resilient.
- B. Overall System Height: 2 inches.

2.3 FLOORING MATERIALS

- A. Maple Flooring: Comply with MFMA grading rules for species, grade, and cut.
 - 1. Certification: Provide flooring that carries MFMA mark on each bundle or piece.
- B. Random-Length Strip Flooring: Northern hard maple (*Acer saccharum*), kiln dried, random length, tongue and groove, and end matched.
 - 1. Grade: MFMA-RL Second and Better.
 - a. Exception: For areas under stacked portion of telescoping bleachers that are normally concealed from view, provide Third and Better Grade.
 - 2. Thickness: 25/32 inch.
 - 3. Face Width: 2-1/4 inches.

2.4 SUBFLOOR MATERIALS

- A. Board Underlayment: Nominal 1-by-6-inch graded boards; of SPIB No. 2 Southern pine, WCLIB Construction grade (any species), or WWPA No. 3 (any species), dried to 15 percent moisture content.
- B. Channels: Manufacturer's standard as indicated by product designation above.
 - 1. Channel Anchors: Manufacturer's standard, but not less than modified steel drive pins recommended by anchor manufacturer to achieve minimum 900-lbf pullout strength.
 - 2. Clips: Manufacturer's standard as indicated by product designation above.
- C. Resilient Pads: With air voids for resiliency and installed at manufacturer's standard spacing for product designation indicated above.
- D. Resilient Underlayment: Flexible, multicellular, closed-cell, expanded polyethylene-foam sheet; nominal 2-lb/cu. ft. density.

2.5 FINISHES

- A. Floor-Finish System: System of compatible components recommended in writing by flooring manufacturer, and MFMA approved.
 - 1. Floor-Sealer Formulation: Pliable, penetrating type. MFMA Group 1, Sealers.
 - 2. Finish-Coat Formulation: Formulated for gloss finish indicated and multicoat application.
 - a. Type: MFMA Group 3, Gymnasium-Type Surface Finishes.
 - 3. Game-Line and Marker Paint: Industrial enamel compatible with finish coats and recommended in writing by manufacturers of finish coats, and paint for this use.

2.6 ACCESSORIES

- A. Resilient Wall Base: Molded, vented, rubber or vinyl cove base; 4 by 3 by 48 inches; with premolded outside corners.
 - 1. Color: Black.
- B. Thresholds: As specified in Section 08 71 00 "Door Hardware."
- C. Fasteners: Type and size recommended by manufacturer, but not less than those recommended by MFMA for application indicated.
- D. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood athletic flooring manufacturer.
- E. Adhesives: Manufacturer's standard for application indicated.
 - 1. Adhesive shall have a VOC content of 100 g/L or less.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Concrete Slabs: Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
 - 1. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft.in 24 hours.

- b. Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 80 percent relative humidity level measurement.
- c. Perform additional moisture tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

3.2 PREPARATION

A. Concrete Slabs:

- 1. Grind high spots and fill low spots on concrete substrates to produce a maximum 1/8-inch deviation in any direction when checked with a 10-foot edge.
- 2. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- 3. Remove coatings including curing compounds and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone; use mechanical methods recommended by manufacturer. Do not use solvents.

- B. Broom and vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Comply with wood athletic flooring manufacturer's written instructions, but not less than written recommendations of MFMA applicable to flooring type indicated.
- B. Pattern: Lay flooring parallel with long dimension of space to be floored unless otherwise indicated.
- C. Expansion Spaces: Provide as indicated, but not less than that required by manufacturer's written instructions and MFMA's written recommendations at walls and other obstructions, and at interruptions and terminations of flooring.
 - 1. Cover expansion spaces with base molding, trim, and saddles, as indicated on Drawings.
- D. Vapor Retarder: Cover entire slab area beneath wood flooring. Install with joints lapped a minimum of 6 inches and sealed.
- E. Underlayment: Install perpendicular to direction of flooring, staggering end joints in adjacent rows.
- F. Strip Flooring: Mechanically fasten perpendicular to supports.
- G. Installation Tolerances: 1/8 inch in 10 feet of variance from level.

3.4 SANDING AND FINISHING

- A. Allow installed flooring to acclimate to ambient conditions before sanding.

- B. Machine sand with coarse, medium, and fine grades of sandpaper to achieve a level, smooth, uniform surface without ridges or cups. Remove sanding dust by tack or vacuum.
- C. Finish: Apply seal and finish coats of finish system according to finish manufacturer's written instructions. Provide no fewer than four coats total and no fewer than two finish coats.
 - 1. Water-Based Finishes: Use finishing methods recommended by finish manufacturer to reduce grain raise and side bonding effect.
 - 2. Game-Line and Marker Paint: Apply game-line and marker paint between final seal coat and first finish coat according to paint manufacturer's written instructions.
 - a. Mask flooring at game lines and markers, and apply paint to produce lines and markers with sharp edges.
 - b. Where game lines cross, break minor game line at intersection; do not overlap lines.
 - c. Apply game lines and markers in widths and colors according to requirements indicated on Drawings.
 - d. Apply finish coats after game-line and marker paint is fully cured.

3.5 PROTECTION

- A. Protect wood athletic flooring during remainder of construction period to allow finish to cure and to ensure that flooring and finish are without damage or deterioration at time of Substantial Completion.
 - 1. Do not cover flooring after finishing until finish reaches full cure and not before seven days after applying last finish coat.
 - 2. Do not move heavy and sharp objects directly over flooring. Protect fully cured floor finishes and surfaces with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION

SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Thermoset-rubber base.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.
- C. Samples for Initial Selection: For each type of product indicated.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 50 linear feet of each type, color, pattern, and size of resilient product installed.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F for more than 90 deg F.

1.5 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F for more than 95 deg F, in spaces to receive resilient products during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F for more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RB, THERMOSET-RUBBER BASE

- A. Basis-of-Design Product: Refer to Interior Finish Schedule for product or provide products by one of the following:
 - 1. Burke Mercer Flooring Products, Division of Burke Industries Inc.
 - 1. Flexco.
 - 2. Johnsonite; a Tarkett company.
- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location:
 - a. Style A, Straight: Provide in areas with carpet.
 - b. Style B, Cove: Provide in areas with resilient floor coverings.
- C. Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Colors: As indicated by manufacturer's designations.

2.2 RMA, RUBBER MOLDING ACCESSORY

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Roppe Corporation, USA.
 - 2. VPI Corporation.
- B. Description: Rubber transition strips.
- C. Profile and Dimensions: As indicated.
- D. Locations: Provide rubber molding accessories in areas indicated.
- E. Colors and Patterns: As indicated by manufacturer's designations.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from marks, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 09 65 19
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Luxury Vinyl floor tile.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of resilient floor tile.
 - 1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 2. Show details of special patterns.
- C. Samples: Full-size units of each color, texture, and pattern of floor tile required.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish 100 sq.ft., of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg For more than 90 deg F. Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg For more than 95 deg F, in spaces to receive floor tile during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg For more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 LVT, LUXURY VINYL FLOOR TILE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Mannington Commercial; Structure and Access or comparable product by one of the following:
 - 1. Altro Group
 - 2. American Biltrite
 - 3. Ecomoso, Centiva Vinyl Flooring
 - 4. Gerflor
 - 5. Johnsonite; A Tarkett Company
 - 6. Armstrong World Industries, Inc;

7. Patcraft; a division of Shaw Industries, Inc
 8. Philadelphia Commercial; a division of Shaw Industries, Inc
 9. Shaw Contract Group; a Berkshire Hathaway company
- B. Tile Standard: ASTM F1700 Class III, Type B.
 - C. Wear Layer Thickness: 20 mil.
 - D. Thickness: 0.098 inch.
 - E. Size: 12 by 24 inches.
 - F. Colors and Patterns: As indicated on drawings.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: One component, 100% solids, cross-linking modified silane polymer-based adhesive.
 1. Basis of Design: Mannington Commercial; MoistureLoc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 1. Lay tiles in pattern indicated.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 1. Lay tiles in pattern of colors and sizes indicated.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover floor tile until Substantial Completion.

END OF SECTION

SECTION 09 67 23
RESINOUS FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resinous flooring.
 - 2. Integral cove base accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's technical data, installation instructions, and recommendations for each resinous flooring component required.
- B. Samples: For each resinous floor system required and for each color and texture specified, 6 inches square in size, applied to a rigid backing by Installer for this Project.
- C. Samples for Initial Selection: For each type of exposed finish required.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
 - 1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring installation.

- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring installation.
- C. Close spaces to traffic during resinous flooring installation and for 24 hours after installation unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Flammability: Self-extinguishing in accordance with ASTM D635.

2.2 RES, RESINOUS FLOORING

- A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Basis-of-Design Product: Refer to Interior Finish Schedule for product or provide comparable products by one of the following:
 - a. BASF Corporation.
 - b. Crossfield Products Corp.
 - c. Duraflex, Inc.
 - d. FLEXMAR Coatings, Inc.
 - e. Florock Polymer Flooring.
 - f. Garland Company, Inc. (The).
 - g. Key Resin Company.
 - h. Neogard; a division of Jones-Blair, Inc.
 - i. Nox-Crete Products Group.
 - j. Pacific Polymers®; ITW Polymers Sealants North America.
 - k. Polymerica, Incorporated.
 - l. POLYSPEC THIOKOL®; ITW Polymers Sealants North America.
 - m. ROCK-TRED Corporation.
 - n. Sherwin-Williams Company, General Polymers.
 - o. Stonhard.
 - p. Sika Corporation; Flooring.
 - q. Tamms; a brand of Euclid Chemical Company; an RPM Company.
 - r. Tnemec Inc.
 - B. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.
 - C. System Characteristics:
 - 1. Color and Pattern: As selected by Architect from manufacturer's full range.
 - 2. Wearing Surface: Manufacturer's standard wearing surface.
 - 3. Overall System Thickness: 1/8 inch.

- D. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested in accordance with test methods indicated:
1. Tensile Strength: 1,600 psi minimum in accordance with ASTM C307.
 2. Flexural Modulus of Elasticity: 1.1×10^6 psi minimum in accordance with ASTM C580.
 3. Abrasion Resistance: 0.06 gm maximum weight loss in accordance with ASTM D4060.
 4. Hardness: 85 to 90, Shore D in accordance with ASTM D2240.
 5. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended in writing by manufacturer for installation indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resinous flooring systems.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare and clean substrates in accordance with resinous flooring manufacturer's written instructions for substrate indicated to ensure adhesion.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
1. Roughen concrete substrates as follows:
 - a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
 - b. Comply with requirements in SSPC-SP 13/NACE No. 6, with a Concrete Surface Profile of 3 or greater in accordance with ICRI Technical Guideline No. 310.2R, unless manufacturer's written instructions are more stringent.
 2. Repair damaged and deteriorated concrete in accordance with resinous flooring manufacturer's written instructions.
 3. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates in accordance with manufacturer's written instructions.

4. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring in accordance with manufacturer's written instructions.
- C. Resinous Materials: Mix components and prepare materials in accordance with resinous flooring manufacturer's written instructions.

3.3 INSTALLATION

- A. Apply components of resinous flooring system in accordance with manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness specified.
 1. Coordinate installation of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 2. Cure resinous flooring components in accordance with manufacturer's written instructions. Prevent contamination during installation and curing processes.
 3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
- B. Primer: Apply primer over prepared substrate at spreading rate recommended in writing by manufacturer.
- C. Field-Formed Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring coats. Apply in accordance with manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and top coating of cove base. Round internal and external corners.
 1. Integral Cove Base: 4 inches high.
- D. Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness specified for flooring system.
 1. Aggregates: Broadcast aggregates at rate recommended in writing by manufacturer. After resin is cured, remove excess aggregates to provide surface texture indicated.
- E. Troweled or Screeded Body Coats: Apply troweled or screeded body coats in thickness specified for flooring system. Hand or power trowel and grout to fill voids. When body coats are cured, remove trowel marks and roughness using method recommended in writing by manufacturer.
- F. Grout Coat: Apply grout coat to fill voids in surface of final body coat.
- G. Topcoats: Apply topcoats in number indicated for flooring system specified, at spreading rates recommended in writing by manufacturer, and to produce wearing surface specified.

3.4 FIELD QUALITY CONTROL

- A. Material Sampling: Owner may, at any time and any number of times during resinous flooring installation, require material samples for testing for compliance with requirements.

1. Core Sampling: At Owner's direction and at locations designated by Owner, take one core sample per 1000 sq. ft. of resinous flooring, or portion of, to verify thickness. For each sample that fails to comply with requirements, take two additional samples. Repair damage caused by coring. Correct deficiencies in installed flooring as indicated by testing.

3.5 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION

SECTION 09 68 13

TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modular carpet tile.

B. Related Requirements:

1. Section 02 41 19 "Selective Demolition" for removing existing floor coverings.
2. Section 09 65 13 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
2. Include manufacturer's written installation recommendations for each type of substrate.

B. Shop Drawings: For carpet tile installation, plans showing the following:

1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
2. Carpet tile type, color, and dye lot.
3. Type of subfloor.
4. Type of installation.
5. Pattern of installation.
6. Pattern type, location, and direction.
7. Pile direction.
8. Type, color, and location of insets and borders.
9. Type, color, and location of edge, transition, and other accessory strips.
10. Transition details to other flooring materials.

C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet Tile: Full-size Sample.

2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- long Samples.
 - D. Samples for Initial Selection: For each type of carpet tile.
 1. Include Samples of exposed edge, transition, and other accessory stripping involving color or finish selection.
- 1.3 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
 - B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.
 - C. Sample Warranty: For special warranty.
- 1.4 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.
- 1.5 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Carpet Tile: Full-size units equal to **5**percent of amount installed for each type indicated, but not less than 10 sq. yd.
- 1.6 QUALITY ASSURANCE
- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Comply with the Carpet and Rug Institute's CRI 104.
- 1.8 FIELD CONDITIONS
- A. Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.

- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.9 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, the following:
 - a. More than 10 percent edge raveling, snags, and runs.
 - b. Dimensional instability.
 - c. Excess static discharge.
 - d. Loss of tuft-bind strength.
 - e. Loss of face fiber.
 - f. Delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CPT, CARPET TILE

- A. Basis-of-Design Product: Refer to Interior Finish Schedule for products or provide products by one of the following:
 - 1. Atlas Carpet Mills, Inc.
 - 2. J&J Invision; J&J Industries, Inc.
 - 3. Julie Industries.
 - 4. Mannington Mills, Inc.
 - 5. Milliken & Company.
 - 6. Mohawk Group (The); Mohawk Carpet, LLC.
 - 7. Patcraft; a division of Shaw Industries, Inc.
 - 8. Philadelphia Commercial; a division of Shaw Industries, Inc.
 - 9. Schönox; HPS North America, Inc.
 - 10. Shaw Contract Group; a Berkshire Hathaway company.

11. Tandus; a Tarkett company.
 - B. Color: As indicated on drawings.
 - C. Product Construction: Tufted Textured Loop.
 - D. Yarn System: 100% Recycled Content Nylon.
 - E. Dye Method: 100% Solution Dyed.
 - F. Backing System: GlasBac.
 - G. Size: 50 cm x 50 cm.
 - H. Applied Treatments:
 1. Soil-Resistance Treatment: Manufacturer's standard treatment.
 2. Antimicrobial Treatment: Manufacturer's standard treatment protects carpet tiles as follows:
 - a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.
- B. Examine carpet tile for type, color, pattern, and potential defects.
- C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 03 30 00 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
 1. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

- b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
 - c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
- C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer.
- C. Maintain dye-lot integrity. Do not mix dye lots in same area.
- D. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.
- E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- H. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:

1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 2. Remove yarns that protrude from carpet tile surface.
 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION

SECTION 09 84 33

SOUND-ABSORBING WALL UNITS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes shop-fabricated, acoustical panel units tested for acoustical performance, including the following:
 - 1. Sound-absorbing wall panels.

1.2 DEFINITIONS

- A. NRC: Noise Reduction Coefficient.
- B. SAA: Sound Absorption Average.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include panel edge, core material, and mounting indicated.
- B. Shop Drawings: For unit assembly and installation.
 - 1. Include plans, elevations, sections, and mounting devices and details.
 - 2. Include details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge profile and core materials.
 - 3. Include details at cutouts and penetrations for other work.
- C. Samples for Initial Selection: For each type of fabric facing.
 - 1. Include Samples of hardware and accessories involving color or finish selection.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Electrical outlets, switches, and thermostats.
 - 2. Items penetrating or covered by units including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Alarms.
 - e. Sprinklers.
- B. Product Certificates: For each type of unit.

- C. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of unit to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with fabric and unit manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
- B. Deliver materials and units in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install units until a permanent level of lighting is provided on surfaces to receive the units.
- C. Air-Quality Limitations: Protect units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.
- D. Field Measurements: Verify unit locations and actual dimensions of openings and penetrations by field measurements before fabrication, and indicate them on Shop Drawings.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace units and components that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to the following:
 - a. Acoustical performance.
 - b. Fabric sagging, distorting, or releasing from panel edge.
 - c. Warping of core.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Units shall comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 Method B Protocol or NFPA 286.

2.2 SOUND-ABSORBING WALL UNITS

- A. AWP-1, Sound-Absorbing Wall Panel: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Tectum Finale; or comparable product by one of the following:
 - a. Acoustical Panel Systems (APS, Inc.).
 - b. Acoustical Solutions, Inc.
 - c. AVL Systems, Inc.
 - d. Conwed Designscape; an Owens Corning company.
 - e. Decoustics Limited; a Saint Gobain company.
 - f. Essi Acoustical Products.
 - g. MBI Products Company, Inc.
 - h. Panel Solutions, Inc.
 - i. Perdue Acoustics, Inc.
 - j. Sound Management Group LLC.
 - k. Wall Technology, Inc.; an Owens Corning company.
 - l. Wenger Corporation.
 - m. Working Walls, Inc.
 2. Panel Shape: Flat.
 3. Mounting Method: D-20.
 4. Core: Manufacturer's standard.
 5. Edge Construction: Manufacturer's standard.
 6. Edge Profile: Long edges Chamfered (beveled).
 7. Acoustical Performance: Sound absorption NRC 0.90 according to ASTM C 423 for Type D-20 mounting according to ASTM E 795.
 8. Nominal Core Thickness: 1 inch with integral Minwool inserts & 1" furring.

9. Panel Width: As indicated on Drawings.
 10. Panel Height: As indicated on Drawings.
- B. AWP-2, Sound-Absorbing Wall Panel: Manufacturer's standard construction consisting of facing material laminated to foil.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Insul-Quilts; IQF-F Studio Blanket Foil Backing or comparable product approved by architect.
 2. Color: Black.
 3. Mounting Method: Stick Clips with blanket overlaps.
 4. Core: Manufacturer's standard.
 5. Acoustical Performance: Sound absorption NRC 1.00 / STC 16.
 6. Nominal Core Thickness: 2 inches.
 7. Panel Width: 48 inches.
 8. Panel Height: As indicated on Drawings.

2.3 MATERIALS

- A. Core Materials: Manufacturer's standard.
- B. Mounting Devices: Direct Attach Panels to furring strips 24" O.C. or equal.

2.4 FABRICATION

- A. Standard Construction: Use manufacturer's standard construction unless otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.
- B. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch for the following:
 1. Thickness.
 2. Edge straightness.
 3. Overall length and width.
 4. Squareness from corner to corner.
 5. Chords, radii, and diameters.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fabric, fabricated units, substrates, areas, and conditions for compliance with requirements, installation tolerances, and other conditions affecting unit performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install units in locations indicated. Unless otherwise indicated, install units with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.

3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb and Level: Plus or minus 1/16 inch in 48 inches, noncumulative.
- B. Variation of Joint Width: Not more than 1/16-inch variation from hairline in 48 inches, noncumulative.

3.4 CLEANING

- A. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION

SECTION 09 91 23
INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Primers.
2. Water-based finish coatings.
3. Floor sealers and paints.
4. Dry fall coatings.

B. Related Requirements:

1. Section 05 12 00 "Structural Steel Framing" for shop priming structural steel.
2. Section 05 50 00 "Metal Fabrications" for shop priming metal fabrications.
3. Section 05 51 13 "Metal Pan Stairs" for shop priming metal pan stairs.
4. Section 05 52 13 "Pipe and Tube Railings" for shop priming pipe and tube railings.
5. Section 09 96 00 "High-Performance Coatings" for tile-like coatings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include preparation requirements and application instructions.
2. Indicate VOC content.

B. Samples: For each type of topcoat product.

C. Samples for Initial Selection: For each type of topcoat product.

D. Product Schedule: Use same designations indicated on Drawings and in the Interior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint Products: 5 percent, but not less than 1 gal. of each material and color applied.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Behr Paint Company; Behr Process Corporation.
 - 2. Benjamin Moore & Co.
 - 3. California Paints.
 - 4. Conco Paints.
 - 5. Coronado Paint; Benjamin Moore & Co.
 - 6. Diamond Vogel Paints.
 - 7. Dunn-Edwards Corporation (a Nippon Paint Holdings Co. Ltd. company).
 - 8. H&C® Decorative Concrete Products; a brand of Sherwin-Williams Co.
 - 9. HEMPEL A/S.
 - 10. Kelly-Moore Paint Company Inc.
 - 11. McCormick Paints.
 - 12. PPG Paints.
 - 13. Pratt & Lambert.
 - 14. Rodda Paint Co.
 - 15. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
 - 16. Sherwin-Williams Company (The).
 - 17. United Gilsonite Laboratories (UGL).
 - 18. Valspar Corporation (The).

19. Vista Paint Corporation.

- B. Source Limitations: Obtain each paint product from single source from single manufacturer.

2.2 PAINT PRODUCTS, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

- B. VOC Content: For field applications that are inside the weatherproofing system, verify paints and coatings comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Undercoaters: 100 g/L.
5. Rust-Preventive Coatings: 100 g/L.
6. Pretreatment Wash Primers: 420 g/L.

- C. Colors: As indicated on drawings.

2.3 PRIMERS

- A. Interior/Exterior Latex Block Filler: Water-based, high-solids, emulsion coating formulated to bridge and fill porous surfaces of exterior concrete masonry units in preparation for specified subsequent coatings.
- B. Alkali-Resistant, Water-Based Primer: Water-based primer formulated for use on alkaline surfaces, such as plaster, vertical concrete, and masonry.
- C. Interior Latex Primer Sealer: Water-based latex sealer used on new interior plaster, concrete, and gypsum wallboard surfaces.
- D. Interior, Institutional Low-Odor/VOC Primer Sealer: Water-based primer sealer with low-odor characteristics and a VOC of less than 10 grams per liter for use on new interior plaster, concrete, and gypsum wallboard surfaces that are subsequently to be painted with latex finish coats.
- E. Interior Alkyd Primer Sealer: Solvent-based, alkyd-type, primer/sealer for new interior wood, plaster, and porous surfaces,
- F. Water-Based Rust-Inhibitive Primer: Corrosion-resistant, water-based-emulsion primer formulated for resistance to flash rusting when applied to cleaned, interior ferrous metals subject to mildly corrosive environments.

- G. Water-Based Galvanized-Metal Primer: Corrosion-resistant, acrylic primer; formulated for use on cleaned/etched, exterior, galvanized metal to prepare it for subsequent water-based coatings.
- H. Quick-Drying Aluminum Primer: Corrosion-resistant, solvent-based, alkyd or modified-alkyd primer formulated for quick-drying capabilities and for use on prepared exterior aluminum.
- I. Water-Based Bonding Primer: Water-based-emulsion primer formulated to promote adhesion of subsequent specified coatings.

2.4 WATER-BASED FINISH COATS

- A. Interior, Latex, Institutional Low Odor/VOC, Flat: White or colored latex paint with low-odor characteristics and a VOC of less than 10 grams per liter.
 - 1. Gloss and Sheen Level: Manufacturer's standard flat finish.
- B. Interior, Latex, Institutional Low Odor/VOC, Eggshell: White or colored latex paint with low-odor characteristics and a VOC of less than 10 grams per liter, for use in areas, such as hospitals and other occupied buildings, where the odor and VOC levels of conventional latex products would preclude their use.
 - 1. Gloss and Sheen Level: Manufacturer's standard eggshell finish.
- C. Interior, Latex, Institutional Low Odor/VOC, Semigloss: White or colored latex paint with low-odor characteristics and a VOC of less than 10 grams per liter, for use in areas, such as hospitals and other occupied buildings, where the odor and VOC levels of conventional latex products would preclude their use.
 - 1. Gloss Level: Manufacturer's standard semigloss finish.
- D. Interior, Latex, High-Performance Architectural Coating, Satin: High-performance architectural latex coating providing a significantly higher level of performance than conventional latex paints in the areas of scrub resistance, burnish resistance, and ease of stain removal.
 - 1. Gloss and Sheen Level: Manufacturer's standard low-sheen finish.

2.5 FLOOR SEALERS AND PAINTS

- A. Water-Based Concrete Floor Sealer: Clear, water-based, acrylic-copolymer-emulsion sealer formulated for oil, gasoline, alkali, and water resistance and for use on concrete traffic surfaces.

2.6 DRY FALL COATINGS

- A. Dry Fall, Latex, Flat: Pigmented, water-based, emulsion-type, fast-drying coating for use on interior plaster, concrete, gypsum board, primed wood, and metal ceilings.
 - 1. Gloss and Sheen Level: Manufacturer's standard flat finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMUs): 12 percent.
 - 3. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer, but not less than the following:
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7/NACE No. 4.
 - 4. SSPC-SP 11.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.

3.3 INSTALLATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms:
 - a. Equipment, including panelboards and switch gear.
 - b. Uninsulated metal piping.

- c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
2. Paint the following work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry-Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry-film thickness.
 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry-film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry-film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 3. Allow empty paint cans to dry before disposal.
 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Traffic Surfaces:
 - 1. Water-Based Concrete Floor Sealer System:
 - a. First Coat: Matching topcoat.
 - b. Topcoat: Water-based concrete floor sealer.
- B. CMU Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Block Filler: Interior/exterior latex block filler.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, institutional low odor/VOC, semigloss.
- C. Steel Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Water-based rust-inhibitive primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, institutional low odor/VOC, semigloss.
 - 2. Water-Based Dry Fall over Shop-Applied Quick-Drying Shop Primer System:
 - a. Prime Coat: Quick-dry primer for shop application.
 - b. Topcoat: Dry fall, latex, flat.
- D. Fiberglass Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Water-based bonding primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, institutional low odor/VOC, flat.
- E. Plastic Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Solvent-based bonding primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, institutional low odor/VOC, semigloss.
- F. Gypsum Board Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Interior, institutional low-odor/VOC primer sealer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, institutional low odor/VOC, semigloss.
- G. Acoustic Panels and Tiles:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Matching topcoat.

- b. Intermediate Coat: Matching topcoat.
- c. Topcoat: Interior, latex, institutional low odor/VOC, flat.

END OF SECTION

SECTION 09 96 00

HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of high-performance coating systems on the following substrates:
 - 1. Exterior Substrates:
 - a. Steel.
 - b. Galvanized metal.
 - 2. Interior Substrates:
 - a. Steel.
- B. Related Requirements:
 - 1. Section 05 12 00 "Structural Steel Framing" for shop priming of structural steel with primers specified in this Section.
 - 2. Section 05 52 13 "Pipe and Tube Railings" for shop priming pipe and tube railings with coatings specified in this Section.
 - 3. Section 09 91 23 "Interior Painting" for general field painting.

1.2 DEFINITIONS

- A. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- B. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- C. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product indicated.
- C. Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Coatings: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each coating system indicated to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each coating system.
 - a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior coatings in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Behr Process Corporation.
2. Benjamin Moore & Co.
3. Devoe Paint Company; Akzo Nobel.
4. Dulux (formerly ICI Paints); a brand of AkzoNobel.
5. PPG Architectural Finishes, Inc.
6. Pratt & Lambert.
7. Sherwin-Williams Company (The).
8. Tnemec Company, Inc.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
 3. Products shall be of same manufacturer for each coat in a coating system.
- C. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
 1. Nonflat Paints and Coatings: 150 g/L.
 2. Primers, Sealers, and Undercoaters: 200 g/L.
 3. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
 4. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
 5. Pretreatment Wash Primers: 420 g/L.
 6. Floor Coatings: 100 g/L.
 7. Shellacs, Clear: 730 g/L.
 8. Shellacs, Pigmented: 550 g/L.
- D. Colors: As selected by Architect from manufacturer's full range.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Coating Materials: Owner reserves the right to invoke the following procedure:
 1. Owner will engage the services of a qualified testing agency to sample coating materials. Contractor will be notified in advance and may be present when samples are taken. If coating materials have already been delivered to Project

site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 7/NACE No. 4.
 - 2. SSPC-SP 11.
 - 3. SSPC-SP 6/NACE No. 3.
 - 4. SSPC-SP 10/NACE No. 2.
 - 5. SSPC-SP 5/NACE No. 1.
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied coatings.

3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for coating and substrate indicated.
 - 2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
 - 1. Contractor shall touch up and restore coated surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 EXTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Steel Substrates:

- 1. Epoxy System MPI EXT 5.1F:
 - a. Prime Coat: Primer, epoxy, anti-corrosive, for metal, MPI #101.
 - b. Intermediate Coat: Epoxy, high build, low gloss, MPI #108.
 - c. Topcoat: Epoxy, gloss, MPI #77.

B. Galvanized-Metal Substrates:

- 1. Epoxy System MPI EXT 5.3C:
 - a. Prime Coat: Primer, epoxy, anti-corrosive, for metal, MPI #101.
 - b. Intermediate Coat: Epoxy, matching topcoat.
 - c. Topcoat: Epoxy, gloss, MPI #77.

3.7 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Steel Substrates:

- 1. Epoxy System MPI INT 5.1L:
 - a. Prime Coat: Primer, epoxy, anti-corrosive, for metal, MPI #101.
 - b. Intermediate Coat: Epoxy, matching topcoat.
 - c. Topcoat: Epoxy, gloss, MPI #77.

END OF SECTION

SECTION 10 11 00
VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Visual display board assemblies.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and accessories for visual display units.
 - 2. Include electrical characteristics for motorized units.
- B. Shop Drawings: For visual display units.
 - 1. Include plans, elevations, sections, details, and attachment to other work.
 - 2. Show locations of panel joints.
 - 3. Include sections of typical trim members.
- C. Samples for Initial Selection: For each type of visual display unit indicated, for units with factory-applied color finishes, and as follows:
 - 1. Samples of facings for each visual display panel type, indicating color and texture.
 - 2. Actual factory-finish color samples, applied to aluminum substrate.
 - 3. Include accessory Samples to verify color selected.
- D. Product Schedule: For visual display units. Use same designations indicated on Drawings.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For visual display units to include in maintenance manuals.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.6 WARRANTY

- A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Surfaces lose original writing and erasing qualities.
 - b. Surfaces exhibit crazing, cracking, or flaking.
 - 2. Warranty Period: 50 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 50 or less.

2.2 VISUAL DISPLAY BOARD ASSEMBLY

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. A-1 Visual Systems.
 - 2. AARCO Products, Inc.
 - 3. ADP Lemco.
 - 4. AJW Architectural Products.
 - 5. Architectural School Products Ltd.
 - 6. Aywon.
 - 7. Bangor Cork Company, Inc.
 - 8. CIG-JAN Products, Ltd.
 - 9. Claridge Products and Equipment, Inc.
 - 10. Delta Products, Ltd.
 - 11. Egan Visual Inc.

12. Everase, Inc.
 13. EverWhite.
 14. Ghent Manufacturing, Inc.
 15. K-Pro Specialty Products.
 16. Marsh Industries, Inc.
 17. MooreCo, Inc.
 18. Nudo Products, Inc.
 19. Panel Processing, Inc.
 20. Peter Pepper Products, Inc.
 21. Platinum Visual Systems.
 22. PolyVision Corporation, a Steelcase company.
 23. Shanahan's Manufacturing Limited.
- B. Visual Display Board Assembly: factory fabricated.
1. Assembly: markerboard and tackboard.
 2. Corners: Square.
 3. Width: As indicated on Drawings.
 4. Height: As indicated on Drawings.
 5. Mounting Method: Direct to wall.
- C. Markerboard Panel: Porcelain-enamel-faced markerboard panel on core indicated.
1. Color: White.
- D. Tackboard Panel: Plastic-impregnated-cork tackboard panel on core indicated.
1. Fabric Wrapped Edge: Wrap edge of tackboard panel with fabric facing.
 2. Color and Pattern: As selected by Architect from full range of industry colors.
- E. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch- thick, extruded aluminum; standard size and shape.
1. Aluminum Finish: Manufacturer's standard baked-enamel or powder-coat finish.
 - a. Color: As selected by Architect from full range of industry colors and color densities.
- F. Chalk tray: Manufacturer's standard; continuous.
1. Solid Type: Extruded aluminum with ribbed section and smoothly curved exposed ends.
- G. Display Rail: Manufacturer's standard, extruded-aluminum display rail with plastic-impregnated-cork insert, end stops, designed to hold accessories.
1. Size: 1 inch high by full length of visual display unit.

2. Map Hooks and Clips: Two map hooks with flexible metal clips for every 48 inches of display rail or fraction thereof.
3. Flag Holder: One for each room.
4. Tackboard Insert Color: As selected by Architect from full range of industry colors.
5. Aluminum Color: Match finish of visual display assembly trim.

2.3 MARKERBOARD PANELS

- A. Porcelain-Enamel Markerboard Panels: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction, consisting of moisture-barrier backing, core material, and porcelain-enamel face sheet with low-gloss finish. Laminate panels under heat and pressure with manufacturer's standard, flexible waterproof adhesive.
 1. Face Sheet Thickness: 0.021 inch uncoated base metal thickness.
 2. Manufacturer's Standard Core: Minimum 1/4 inch thick, with manufacturer's standard moisture-barrier backing.

2.4 TACKBOARD PANELS

- A. Tackboard Panels:
 1. Facing: 1/8-inch- thick, plastic-impregnated cork.
 2. Core: Manufacturer's standard.

2.5 MATERIALS

- A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard two- or three-coat process.
- B. Plastic-Impregnated-Cork Sheet: Seamless, homogeneous, self-sealing sheet consisting of granulated cork, linseed oil, resin binders, and dry pigments that are mixed and calendared onto fabric backing; with washable vinyl finish and integral color throughout; with surface-burning characteristics indicated.
- C. Hardboard: ANSI A135.4, tempered.
- D. Particleboard: ANSI A208.1, Grade M-1.
- E. MDF: ANSI A208.2, Grade 130.
- F. Fiberboard: ASTM C 208 cellulosic fiber insulating board.
- G. Extruded Aluminum: ASTM B 221, Alloy 6063.

2.6 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.
- B. Color Anodic Finish: AAMA 611, AA-M12C22A32/A34, Class II, 0.010 mm or thicker.
- C. Baked-Enamel or Powder-Coat Finish: AAMA 2603, except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine walls and partitions for proper preparation and backing for visual display units.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances, such as dirt, mold, and mildew, that could impair the performance of and affect the smooth, finished surfaces of visual display boards.
- C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display units and wall surfaces.
- D. Prime wall surfaces indicated to receive visual display units and as recommended in writing by primer/sealer manufacturer and visual display unit manufacturer.

3.3 INSTALLATION

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- B. Factory-Fabricated Visual Display Board Assemblies: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches o.c. Secure tops and bottoms of boards to walls.

- C. Visual Display Board Assembly Mounting Heights: Install visual display units at mounting heights indicated on Drawings, or if not indicated, at heights indicated below.
 - 1. Mounting Height: 36 inches above finished floor to top of chalktray.

3.4 CLEANING AND PROTECTION

- A. Clean visual display units in accordance with manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.
- C. Cover and protect visual display units after installation and cleaning.

END OF SECTION

SECTION 10 14 16

PLAQUES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal plaques.

B. Related Requirements:

1. Section 10 14 23.16 "Room-Identification Panel Signage" for plaques or signs similar to metal plaques, with or without frames, except that they are made of materials other than solid metal.

1.2 DEFINITIONS

- ###### A. Accessible: In accordance with the accessibility standard.

1.3 ACTION SUBMITTALS

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

- ###### B. Shop Drawings: For plaques.

1. Include fabrication and installation details and attachments to other work.
2. Show plaque mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, tpestyles, graphic elements and layout for each plaque at least half size.

- ###### C. Samples for Initial Selection: For each type of plaque, exposed component, and exposed finish.

1. Include representative Samples of available tpestyles and graphic symbols.

1.4 CLOSEOUT SUBMITTALS

- ###### A. Maintenance Data: For plaques to include in maintenance manuals.

1.5 WARRANTY

- ###### A. Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 METAL PLAQUES

- A. Cast Plaque: Cast-metal plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A.R.K. Ramos.
 - b. ACE Sign Systems, Inc.
 - c. Erie Landmark Company; a division of Paul W. Zimmerman Foundries.
 - d. Gemini Incorporated.
 - e. Matthews International Corporation; Bronze Division.
 - f. Metal Arts.
 - g. Metallic Arts.
 - h. Signs & Decal Corp.
 - i. Southwell Company (The).
 2. Plaque Material: Cast aluminum.
 3. Plaque Thickness: 0.25 inch.
 4. Plaque Size: 18" x 24".
 5. Finishes:
 - a. Integral Aluminum Finish: Anodized color as selected by Architect from full range of industry colors and color densities.
 6. Background Texture: As selected by Architect from manufacturer's full range.
 7. Integrally Cast Border Style: Square double line, polished.
 8. Mounting: Concealed studs.
 9. Text and Typeface: Typeface as selected by Architect from manufacturer's full range.

2.3 MATERIALS

- A. Aluminum Castings: ASTM B26/B26M, alloy and temper recommended by plaque manufacturer for casting process used and for type of use and finish indicated.
- B. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

- C. Aluminum Extrusions: ASTM B221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

2.4 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:
 - 1. Use concealed fasteners and anchors unless indicated to be exposed.
 - 2. Plaque Mounting Fasteners:
 - a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque unless otherwise indicated.
 - b. Through Fasteners: Exposed metal fasteners matching plaque finish, with type of head indicated, installed in predrilled holes.

2.5 FABRICATION

- A. General: Provide manufacturer's standard plaques according to requirements indicated.
 - 1. Preassemble plaques in the shop to greatest extent possible. Disassemble plaques only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 - 2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 - 3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
 - 4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 - 5. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match plaque finish.
 - 6. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.6 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.
- D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.7 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.
- B. Color Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Verify that plaque-support surfaces are within tolerances to accommodate plaques without gaps or irregularities between backs of plaques and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF METAL PLAQUES

- A. General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.
 - 2. Install plaques so they do not protrude or obstruct according to the accessibility standard.
 - 3. Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.
 - 4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- B. Mounting Methods:
 - 1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.
 - a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to

surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.

- b. Thin or Hollow Surfaces: Place plaque in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed plaques and plaques that do not comply with specified requirements. Replace plaques with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as plaques are installed.
- C. On completion of installation, clean exposed surfaces of plaques according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain plaques in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION

SECTION 10 14 23.16

ROOM-IDENTIFICATION PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes room-identification panel signs that are directly attached to the building.
- B. Related Requirements:
 - 1. Section 10 14 16 "Plaques" for one-piece, solid metal signs, with or without frames, that are used for high-end room-identification.

1.2 DEFINITIONS

- A. Accessible: In accordance with the accessibility standard.

1.3 COORDINATION

- A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.
- B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For room-identification signs.
 - 1. Include fabrication and installation details and attachments to other work.
 - 2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
 - 3. Show message list, timesteps, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
- C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
 - 1. Include representative Samples of available timesteps and graphic symbols.
- D. Product Schedule: For room-identification signs. Use same designations indicated on Drawings or specified.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.

- B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For signs to include in maintenance manuals.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.
 - c. Separation or delamination of sheet materials and components.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 ROOM-IDENTIFICATION SIGNS

- A. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ace Sign Systems, Inc.
 - b. Advance Corporation; Braille-Tac Division.
 - c. Allen Industries, Inc.
 - d. Allen Markings International.
 - e. APCO Graphics, Inc.
 - f. ASE, Inc.
 - g. ASI Sign Systems, Inc.
 - h. Best Sign Systems Inc.
 - i. Bunting Graphics, Inc.
 - j. Clarke Systems.
 - k. Diskey Sign Company.
 - l. Fossil Industries, Inc.

- m. InPro Corporation.
 - n. Mohawk Sign Systems.
 - o. Nelson-Harkins Industries.
 - p. Poblocki Sign Company, LLC.
 - q. Seton Identification Products.
 - r. Stamp-Rite Supersine Company (The); Division of Stamp-Rite, Inc.
 - s. Vista System.
 - t. Vomar Products, Inc.
- 2. Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated to acrylic backing sheet to produce composite sheet.
 - a. Composite-Sheet Thickness: Manufacturer's standard for size of sign.
 - b. Surface-Applied Graphics: Applied vinyl film.
 - c. Color(s): Match existing signage.
 - 3. Sign-Panel Perimeter: Finish edges smooth.
 - a. Edge Condition: Radius corners.
 - 4. Frame: Unframed.
 - 5. Mounting: Manufacturer's standard method for substrates indicated.
 - 6. Text and Typeface: Match existing.
 - 7. Schedule: Refer to drawings and provide:
 - a. (1) room identification sign for all of the new or renovated rooms, stairs, toilets, or mechanical rooms.
 - b. (1) evacuation map frame for all of the new or renovated classroom spaces. Frame to hold a 8.5" x 11" insert provided by owner.
 - c. (1) Occupancy sign for each assembly area: Auxiliary Gym.
- 2.3 SIGN MATERIALS
- A. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).
 - B. Vinyl Film: UV-resistant vinyl film with pressure-sensitive, permanent adhesive; die cut to form characters or images as indicated on Drawings.
 - C. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.
- 2.4 ACCESSORIES
- A. Adhesive: As recommended by sign manufacturer.
 - B. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.
- 2.5 FABRICATION
- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 4. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
- B. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:
1. For snap-in changeable inserts beneath removable face sheet, furnish one suction or other device to assist in removing face sheet. Furnish initial changeable insert. Subsequent changeable inserts are by Owner.
 2. For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Subsequent changeable inserts are by Owner.
 3. For frame to hold changeable sign panel, fabricate frame without burrs or constrictions that inhibit function. Furnish initial sign panel. Subsequent changeable sign panels are by Owner.

2.6 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
- B. Accessibility: Install signs in locations on walls according to the accessibility standard.

C. Mounting Methods:

1. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.
2. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

3.2 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION

SECTION 10 21 13.19

SOLID PLASTIC URINAL SCREENS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid-plastic urinal screens.

1.2 COORDINATION

- A. Coordinate requirements for blocking, reinforcing, and other supports concealed within wall to ensure that urinal screens can be supported and installed as indicated.

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Solid-plastic urinal screens:
 - a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, details, and attachment details.
 - 2. Show locations of centerlines of plumbing fixtures.
- C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors.
 - 1. Include Samples of hardware and accessories involving material and color selection.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For urinal screens.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with urinal screens by field measurements, and coordinate before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire Performance: Tested in accordance with, and pass the acceptance criteria of, NFPA 286.
- B. Regulatory Requirements: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 SOLID-PLASTIC URINAL SCREENS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AJW Architectural Products.
 - 2. ASI Accurate Partitions.
 - 3. ASI Global Partitions.
 - 4. All American Metal Corp.
 - 5. American Sanitary Partition Corporation.
 - 6. General Partitions Mfg. Corp.
 - 7. Hadrian Inc.; Zurn Industries, LLC.
 - 8. Knickerbocker Partition Corporation.
 - 9. Metpar Corp.
 - 10. Partition Systems International of South Carolina (PSISC); Columbia Systems International of South Carolina LLC.
 - 11. Scranton Products.
 - 12. Weis/Robart Partitions, Inc.
- B. Urinal-Screen Style: Pilaster floor mounted.
- C. Panel and Pilaster Construction: Solid, high-density polyethylene (HDPE) material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color throughout thickness of material.
 - 1. Color: One color as selected by Architect from manufacturer's full range.
- D. Pilaster Shoes: Manufacturer's standard design; stainless steel.
 - 1. Plastic Color: Matching pilaster.
- E. Pilaster Sleeves (Caps): Manufacturer's standard design; stainless steel.
- F. Brackets (Fittings):
 - 1. Full-Height (Continuous) Type: Manufacturer's standard design; extruded aluminum or stainless steel.

2.3 HARDWARE AND ACCESSORIES

- A. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 MATERIALS

- A. Aluminum Castings: ASTM B26/B26M.
- B. Aluminum Extrusions: ASTM B221.
- C. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.
- D. Stainless Steel Castings: ASTM A743/A743M.
- E. Zamac: ASTM B86, commercial zinc-alloy die castings.

2.5 FABRICATION

- A. Urinal-Screen Posts: Manufacturer's standard corrosion-resistant anchoring assemblies at posts and walls, with leveling adjustment nuts at tops and bottoms of posts. Provide shoes and sleeves (caps) at posts to conceal anchorage.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
 - 1. Confirm location and adequacy of blocking and supports required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
 - 1. Maximum Clearances:
 - a. Pilasters and Panels or Screens: 1/2 inch.
 - b. Panels or Screens and Walls: 1 inch.
 - 2. Full-Height (Continuous) Brackets: Secure panels or screens to walls and to pilasters with full-height brackets.

- a. Locate bracket fasteners, so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
- B. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

END OF SECTION

SECTION 10 28 00

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Public-use washroom accessories.
 - 2. Public-use shower room accessories.
 - 3. Underlavatory guards.
 - 4. Custodial accessories.

1.2 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
- B. Samples: For each exposed product and for each finish specified, full size.
 - 1. Approved full-size Samples will be returned and may be used in the Work.
- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
- D. Delegated-Design Submittal: For grab bars and shower seats.
 - 1. Include structural design calculations indicating compliance with specified structural-performance requirements.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For accessories to include in maintenance manuals.

1.6 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, visible silver spoilage defects.
 - 2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS

- A. Owner-Furnished Materials for the Contractor to install:
 - 1. Toilet Paper Dispensers
 - 2. Soap Dispensers
 - 3. Paper Towel Dispensers

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design accessories and fasteners to comply with the following requirements:
 - 1. Grab Bars: Installed units are able to resist 250 lbf concentrated load applied in any direction and at any point.
 - 2. Shower Seats: Installed units are able to resist 250 lbf applied in any direction and at any point.

2.3 PUBLIC-USE WASHROOM ACCESSORIES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
 - 1. AJW Architectural Products.
 - 2. American Specialties, Inc.
 - 3. Bobrick Washroom Equipment, Inc.
 - 4. Bradley Corporation.
 - 5. Brey-Krause Manufacturing Co.
 - 6. GAMCO Specialty Accessories; a division of Bobrick.
 - 7. Tubular Specialties Manufacturing, Inc.
- B. Source Limitations: Obtain each type of public-use washroom accessory from single source from single manufacturer.
- C. GB, Grab Bar:
 - 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-6806.

2. Mounting: Flanges with concealed fasteners.
 3. Material: Stainless steel, 0.05 inch thick.
 - a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin) on ends and slip-resistant texture in grip area.
 4. Outside Diameter: 1-1/2 inches.
 5. Configuration and Length: As indicated on Drawings.
- D. SND, Sanitary-Napkin Disposal Unit:
1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-270.
 2. Mounting: Surface mounted.
 3. Door or Cover: Self-closing, disposal-opening cover.
 4. Receptacle: Removable.
 5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
- E. MIR, Mirror Unit (M-01):
1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-290 1836.
 2. Frame: Stainless steel angle, 0.05 inch thick.
 - a. Corners: Manufacturer's standard.
 3. Hangers: Manufacturer's standard rigid, tamper and theft resistant.
- 2.4 PUBLIC-USE SHOWER ROOM ACCESSORIES
- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
1. AJW Architectural Products.
 2. American Specialties, Inc.
 3. Bobrick Washroom Equipment, Inc.
 4. Bradley Corporation.
 5. Brey-Krause Manufacturing Co.
 6. GAMCO Specialty Accessories; a division of Bobrick.
 7. Tubular Specialties Manufacturing, Inc.
- B. SCR, Shower Curtain Rod:
1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-207x60.
 1. Description: 1-inch outside diameter, straight rod.
 2. Configuration: As indicated on Drawings.
 3. Mounting Flanges: Concealed fasteners; in manufacturer's standard material and finish.
 4. Rod Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
 5. Locations: Provide (1) for every shower stall.

C. SC, Shower Curtain:

1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-204-3.
2. Size: Minimum 6 inches wider than opening by 72 inches high.
3. Material: Vinyl, minimum 0.006 inch thick, opaque, matte.
4. Color: White.
5. Grommets: Corrosion resistant at minimum 6 inches o.c. through top hem.
6. Shower Curtain Hooks: Chrome-plated or stainless steel, spring wire curtain hooks with snap fasteners, sized to accommodate specified curtain rod. Provide one hook per curtain grommet.
7. Locations: Provide (1) for every shower stall.

D. FSS, Folding Shower Seat:

1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-5181.
2. Configuration: L-shaped seat, designed for wheelchair access.
3. Seat: Phenolic or polymeric composite of slat-type or one-piece construction in color as selected by Architect.
4. Mounting Mechanism: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
5. Dimensions: 33"w x 20 15/16"d.
6. Locations: Provide (1) seat for every shower stall.

E. SD, Soap Dish:

1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-6807.
2. Description: Surface mounted, with the following features:
3. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
4. Locations: Provide (1) for every shower stall.

F. RH, Robe Hook:

1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-6777.
2. Description: Single-prong unit.
3. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
4. Locations: Provide (1) Hook for every shower stall.

2.5 UNDERLAVATORY GUARDS

A. Underlavatory Guard:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Buckaroos, Inc.
 - b. Plumberex Specialty Products, Inc.
 - c. Truebro by IPS Corporation.

2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded plastic, white.

2.6 CUSTODIAL ACCESSORIES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
 1. AJW Architectural Products.
 2. American Specialties, Inc.
 3. Bobrick Washroom Equipment, Inc.
 4. Bradley Corporation.
 5. Brey-Krause Manufacturing Co.
 6. GAMCO Specialty Accessories; a division of Bobrick.
 7. Tubular Specialties Manufacturing, Inc.
- B. BMH-1, Custodial Mop and Broom Holder:
 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-239x34.
 2. Description: Unit with shelf, hooks, holders.
 3. Length: 34 inches.
 4. Hooks: Four.
 5. Mop/Broom Holders: Three, spring-loaded, rubber hat, cam type.
 6. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
 - a. Shelf: Not less than nominal 0.05-inch- thick stainless steel.
 7. Locations: Provide (1) for every Janitor's Room.

2.7 MATERIALS

- A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.031-inch- minimum nominal thickness unless otherwise indicated.
- B. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), 0.036-inch- minimum nominal thickness.
- C. Galvanized-Steel Sheet: ASTM A653/A653M, with G60 hot-dip zinc coating.
- D. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.
- E. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.
- F. Chrome Plating: ASTM B456, Service Condition Number SC 2 (moderate service).

- G. Mirrors: ASTM C1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.8 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
 - 1. Remove temporary labels and protective coatings.
- B. Grab Bars: Install to comply with specified structural-performance requirements.
- C. Shower Seats: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION

SECTION 10 44 13
FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-protection cabinets for the following:
 - a. Portable fire extinguisher.

B. Related Requirements:

1. Section 10 44 16 "Fire Extinguishers" for portable, hand-carried fire extinguishers accommodated by fire-protection cabinets

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.

B. Shop Drawings: For fire-protection cabinets.

1. Include plans, elevations, sections, details, and attachments to other work.

C. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semirecessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

2.3 FIRE-PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher, FEC.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Activar Construction Products Group, Inc. - JL Industries.
 - b. Babcock-Davis.
 - c. Fire-End & Croker Corporation.
 - d. Guardian Fire Equipment, Inc.
 - e. Larsens Manufacturing Company.
 - f. Modern Metal Products, Division of Technico Inc.
 - g. MOON American.
 - h. Nystrom.
 - i. Potter Roemer LLC; a Division of Morris Group International.
 - j. Strike First Corporation of America (The).
- B. Cabinet Construction: Nonrated and One-hour fire rated.
 - 1. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch-thick cold-rolled steel sheet lined with minimum 5/8-inch-thick fire-barrier material. Provide factory-drilled mounting holes.
- C. Cabinet Material: Cold-rolled steel sheet.
- D. Recessed Cabinet:
 - 1. Exposed Flat Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).
- E. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).
 - 1. Rolled-Edge Trim: 2-1/2-inch backbend depth.
- F. Cabinet Trim Material: material and finish as door.
- G. Door Material: Steel sheet.
- H. Door Style: Vertical duo panel with frame.
- I. Door Glazing: Tempered float glass (clear).
- J. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - 1. Provide recessed door pull and friction latch.
 - 2. Provide manufacturer's standard hinge, permitting door to open 180 degrees.
- K. Accessories:

1. Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.
2. Door Lock: Cylinder lock, keyed alike to other cabinets.
3. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.
 - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
 - 2) Application Process: Pressure-sensitive vinyl letters.
 - 3) Lettering Color: Red.
 - 4) Orientation: Vertical.

L. Materials:

1. Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.
 - a. Finish: Baked enamel, TGIC polyester powder coat, HAA polyester powder coat, epoxy powder coat, or polyester/epoxy hybrid powder coat, complying with AAMA 2603.
 - b. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - c. Color: As selected by Architect from manufacturer's full range.
2. Tempered Float Glass: ASTM C1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.4 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
 1. Weld joints and grind smooth.
 2. Miter corners and grind smooth.
 3. Provide factory-drilled mounting holes.
 4. Install door locks at factory.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.
 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
 2. Miter and weld perimeter door frames and grind smooth.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire-protection cabinets after assembly.
- D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where recessed and semirecessed cabinets will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for recessed and semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire-protection cabinets in locations and at mounting heights indicated.
 - 1. Fire-Protection Cabinet Mounting Height: 42 inches above finished floor to top of fire extinguisher.
- B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semirecessed fire-protection cabinets.
 - 2. Provide inside latch and lock for break-glass panels.
 - 3. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
- C. Identification:
 - 1. Apply vinyl lettering at locations indicated.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 10 44 16
FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable fire extinguishers.
- B. Related Requirements:
 - 1. Section 10 44 13 "Fire Protection Cabinets."

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher.
- B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.5 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
 - b. Faulty operation of valves or release levers.
 - 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Activar Construction Products Group, Inc. - JL Industries.
 - b. Amerex Corporation.
 - c. Ansul; brand of Johnson Controls International plc, Building Solutions North America.
 - d. Babcock-Davis.
 - e. Badger Fire Protection.
 - f. Buckeye Fire Equipment Company.
 - g. Fire End & Croker Corporation.
 - h. Guardian Fire Equipment, Inc.
 - i. Kidde; Carrier Global Corporation.
 - j. Larsens Manufacturing Company.
 - k. MOON American.
 - l. Nystrom.
 - m. Potter Roemer LLC; a Division of Morris Group International.
 - n. Pyro-Chem; brand of Johnson Controls International plc, Building Solutions North America.
 - o. Strike First Corporation of America (The).
 - 2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
 - 3. Valves: Manufacturer's standard.
 - 4. Handles and Levers: Manufacturer's standard.
 - 5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
- B. FE-1, Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:60-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

END OF SECTION

SECTION 10 51 13

METAL LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Welded athletic lockers.
 - 2. Locker benches.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker and bench.
- B. Shop Drawings: For metal lockers.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Show locker trim and accessories.
 - 3. Include locker identification system and numbering sequence.
- C. Samples: For each color specified, in manufacturer's standard size.
- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. The following metal locker hardware items equal to 10 percent of amount installed for each type and finish installed, but no fewer than five units:
 - a. Locks.
 - b. Blank identification plates.
 - c. Hooks.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.8 COORDINATION

- A. Coordinate sizes and locations of concrete bases for metal lockers.
- B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Faulty operation of latches and other door hardware.
 - 2. Damage from deliberate destruction and vandalism is excluded.
 - 3. Warranty Period for Welded Metal Lockers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain Triple-Tier metal lockers, locker benches, and accessories from single source from single locker manufacturer.

2.2 LKR, WELDED ATHLETIC LOCKERS

- A. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Art Metal Products; Champ Athletic Elite.
 - 2. DeBourgh Mfg. Co.; Core Athletic Sports Team Lockers.
 - 3. List Industries Inc.; Marquis Champion.
 - 4. Lyon Workspace Products, LLC; Heavy-Duty Ventilated Lockers.
 - 5. Penco Products, Inc.; All-Welded.
 - 6. Republic Storage Systems, LLC; All-Welded Ventilated.

- B. Size: Triple-Tier - 15" W x 15" D x 24" H
- C. Perforated Doors: One piece; fabricated from 0.075-inch nominal-thickness steel sheet with manufacturer's standard diamond perforations; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges and latch point (bottom) and right-angle single bend at remaining edges for box lockers.
 - 1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches wide; welded to inner face of doors.
- D. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
 - 1. Tops and Bottoms: 0.060-inch nominal thickness, with single bend at edges.
 - 2. Backs: 0.048-inch nominal thickness.
 - 3. Shelves: 0.060-inch nominal thickness, with double bend at front and single bend at sides and back.
- E. Unperforated Sides: Fabricated from 0.048-inch nominal-thickness steel sheet.
- F. Frames: Channel formed; fabricated from 0.060-inch nominal-thickness steel sheet or 0.097-inch nominal-thickness steel angles; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.
 - 1. Cross Frames for Triple-Tier Lockers: Channel formed and fabricated from same material as main frames; welded to vertical main frames.
- G. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees; self-closing.
 - 1. Knuckle Hinges: Steel, full loop, five or seven knuckles, tight pin; minimum 2 inches high. Provide no fewer than three hinges for each door more than 42 inches high.
 - 2. Continuous Hinges: Manufacturer's standard, steel; side or top mounted as required by locker configuration.
 - 3. Hinges: Manufacturer's standard, steel, continuous or knuckle type.
- H. Recessed Door Handle and Latch: Stainless steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.
 - 1. Multipoint Latching: Finger-lift latch control designed for use with padlocks.
 - a. Latch Hooks: Equip doors 48 inches and higher with three latch hooks and doors less than 48 inches high with two latch hooks; fabricated from 0.120-inch nominal-thickness steel sheet; welded to full-height door strikes; with resilient silencer on each latch hook.
 - b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact, and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.
- I. Locks: Combination padlocks.

- J. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch high.
- K. Hooks: Manufacturer's standard ball-pointed, aluminum or steel; zinc plated.
- L. Continuous Sloping Tops: Fabricated from 0.048-inch nominal-thickness steel sheet, with a pitch of approximately 20 degrees.
 - 1. Closures: Vertical-end type.
- M. Filler Panels: Fabricated from 0.048-inch nominal-thickness steel sheet.
- N. Materials:
 - 1. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
 - 2. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B; with A60 zinc-iron, alloy (galvannealed) coating designation.
 - 3. Expanded Metal: ASTM F1267, Type II (flattened), Class I (uncoated), 3/4-inch steel mesh, with at least 70 percent open area.
- O. Finish: Baked enamel or powder coat.
 - 1. Color: Two colors, with door one color and frame and body another color; as selected by Architect from manufacturer's full range.

2.3 LOCKER BENCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AJW Architectural Products.
 - 2. ASI Storage Solutions.
 - 3. Art Metal Products.
 - 4. Hadrian Inc.; Zurn Industries, LLC.
 - 5. List Industries Inc.
 - 6. Lyon LLC.
 - 7. Penco Products, Inc.
 - 8. Shanahan's Manufacturing Limited.
 - 9. Top Tier Storage Products.
- B. Provide bench units with overall assembly height of 17-1/2 inches.
- C. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.
 - 1. Size: Minimum 9-1/2 inches wide by 1-1/4 inches thick.
 - 2. Laminated clear hardwood with one coat of clear sealer on all surfaces and one coat of clear lacquer on top and sides.
- D. Movable-Bench Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top, complete with fasteners, and as follows:

1. Aluminum: 1/8-inch-thick by 3-inch-wide channel or 1/4-inch-thick by 3-inch-wide bar stock, shaped into inverted-T form; with nonskid pads at bottom.
 - a. Finish: Clear anodic finish.

E. Materials:

1. Extruded Aluminum: ASTM B221, alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated.

2.4 FABRICATION

A. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.

1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments.

C. Equipment: Provide each locker with an identification plate and the following equipment:

1. Triple-Tier Units: One double-prong ceiling hook.

D. Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds smooth and flush.

E. Accessible Lockers: Fabricate as follows:

1. Locate bottom shelf no lower than 15 inches above the floor.

F. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.

1. Sloping-top corner fillers, mitered.

G. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.

1. Provide one-piece panels for double-row (back-to-back) locker ends.

2.5 ACCESSORIES

A. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.

B. Anchors: Material, type, and size required for secure anchorage to each substrate.

1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls, and elsewhere as indicated, for corrosion resistance.
2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and floors or support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install lockers level, plumb, and true; shim as required, using concealed shims.
 - 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
- B. Welded Lockers: Connect groups together with manufacturer's standard fasteners, with no exposed fasteners on face frames.
- C. Equipment:
 - 1. Attach hooks with at least two fasteners.
 - 2. Attach door locks on doors using security-type fasteners.
 - 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
 - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
 - b. Attach plates to upper shelf of each open-front metal locker, centered, with a least two aluminum rivets.
- D. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
 - 1. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
 - 2. Attach sloping-top units to metal lockers, with closures at exposed ends.
- E. Movable Benches: Place benches in locations indicated on Drawings.

3.3 ADJUSTING

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

3.4 PROTECTION

- A. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.

- B. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION

SECTION 10 56 13
METAL STORAGE SHELVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Four-post metal storage shelving.

1.2 COORDINATION

- A. Coordinate sizes and locations of blocking and backing required for installation of metal storage shelving attached to wall and ceiling assemblies.
- B. Coordinate locations and installation of metal storage shelving that may interfere with ceiling systems including lighting, HVAC, speakers, sprinklers, access panels, electrical switches or outlets, and floor drains.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated capacities, construction details, material descriptions, dimensions of individual components and profiles, and finishes for metal storage shelving.
- B. Shop Drawings: For metal storage shelving.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include installation details of connectors, lateral bracing, and special bracing.
- C. Samples: For each type of metal storage shelving and for each color specified, in the following sizes:
 - 1. Vertical Supports: 12 inches tall.
 - 2. Shelves: Full size, but not more than 24 inches wide by 12 inches deep.
 - 3. Connectors: Full size.
 - 4. Shelf-Label Holders: Full size.
- D. Product Schedule: For metal storage shelving. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of metal storage shelving.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal storage shelving to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Shelves: Full-size units equal to 5 percent of amount installed for each type indicated, but no fewer than 5 shelves.
 - 2. Shelf-to-Post Connectors: Full-size units equal to 5 percent of amount installed for each type indicated, but no fewer than 10 connectors.
 - 3. Shelf-Label Holders: Full-size units equal to 5 percent of amount installed for each type indicated, but no fewer than 10 holders.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install metal storage shelving until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for building occupants during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 FOUR-POST METAL STORAGE SHELVING

- A. Open Four-Post Metal Storage Shelving: Complying with MH 28.1 and field assembled from factory-formed components. Shelves span between supporting corner posts that allow shelf-height adjustment over full height of shelving unit. Provide fixed top and bottom shelves, adjustable intermediate shelves, and accessories indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Adjustable Shelving Products; a division of Karp Associates, Inc.
 - b. Borroughs Corporation.
 - c. Durham Manufacturing Company (The).
 - d. Edsal.
 - e. Equipto.
 - f. Excalibur Shelving Systems.
 - g. Hallowell; Division of List Industries, Inc.
 - h. Hodge; a division of Durham Mfg. Co., Inc.
 - i. Jeter Systems Corporation.
 - j. Lyon Workspace Products, LLC.

- k. Mecalux.
 - l. Montel Aetnastak Inc.
 - m. Penco Products, Inc.
 - n. Republic Storage Systems, LLC.
 - o. Richards-Wilcox, Inc.
 - p. Rousseau Metal Inc.
 - q. Safco Products; a division of LDI.
 - r. Schaefer Systems International, Inc.
 - s. Spacesaver Corporation.
 - t. Tensco.
 - u. Unicor; Federal Prison Industries, Inc.
 - v. Western Pacific Storage Systems.
2. Load-Carrying Capacity per Shelf: 350 lb.
 3. Posts: Fabricated from hot-rolled steel; in manufacturer's standard shape; with perforations at 1-1/2 inches o.c. to receive shelf-to-post connectors.
 - a. Unit Configuration: Configure shelving units as individual, freestanding assemblies.
 - 1) Add-On Shelf Posts: Fabricated from hot-rolled steel, manufacturer's standard shape; perforated to match main posts.
 - b. Post Base: Bolt leveler.
 4. Solid-Type Shelves:
 - a. Steel Sheet: Nominal thickness as required for load-carrying capacity per shelf.
 - b. Metallic-Coated Steel Sheet: Nominal thickness as required for load-carrying capacity per shelf.
 - c. Fabricate fronts and backs of shelves with box-formed edges, with corners lapped and welded.
 5. Shelf Quantity: Three shelves per shelving unit in addition to top and bottom shelf.
 6. Shelf-to-Post Connectors: Manufacturer's standard connectors.
 7. Base: Open, with exposed post legs.
 8. Overall Unit Width: 48 inches, inclusive of two end posts.
 9. Overall Unit Depth: 24 inches.
 10. Overall Unit Height: 96 inches.
 11. Accessories:
 - a. Shelf-Label Holders: Clear plastic, designed to clip onto front edge of shelf.
 12. Steel Finish: powder coat.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

2.2 ANCHORS

- A. Wall Anchors: Manufacturer's standard, galvanized-steel anchors designed to secure metal storage shelving to adjacent wall. Provide one per shelving unit for each shelving unit adjacent to a wall unless additional anchors are indicated in calculations.

2.3 FABRICATION

- A. Fabricate metal storage shelving components to provide field-assembled units that are square and rigid, with posts plumb and true and shelves flat and free of dents or distortion. Fabricate connections to form a rigid structure, free of buckling and warping.
 - 1. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.
 - 2. Build in straps, plates, brackets, and other reinforcements as needed to support shelf loading.
 - 3. Cut, reinforce, drill, and tap metal fabrications to receive hardware, fasteners, and similar items.
- B. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- C. Form edges and corners free of sharp edges or rough areas. Fold back and crimp exposed edges of unsupported sheet metal to form a hem on the concealed side; ease edges of metal plate to radius of approximately 1/32 inch. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Weld corners and seams continuously to develop strength, minimize distortion, and maintain the corrosion resistance of base metals. At exposed locations, finish welds and surfaces smooth and blended so surface is smooth after finishing and contour of welded surface matches that of adjacent surface. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces before finishing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine floors for suitable conditions where metal storage shelving will be installed.
- C. Examine walls to which metal storage shelving will be attached for properly located blocking, grounds, or other solid backing for attachment of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Vacuum and clean finished floor over which metal storage shelving is to be installed.

3.3 INSTALLATION

- A. Install metal storage shelving level, plumb, square, rigid, true, and with shelves flat and free of dents or distortion. Make connections to form a rigid structure, free of buckling and warping.

1. Install exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
2. Install braces, straps, plates, brackets, and other reinforcements as needed to support shelf loading and as required for stability.
3. Adjust post-base bolt leveler to achieve level and plumb installation.
4. Anchor shelving units to floor with floor anchors through floor plate. Shim floor plate to achieve level and plumb installation.
5. Connect side-to-side and back-to-back shelving units together.
6. Install shelves in each shelving unit at spacing indicated on Drawings.
 - a. Case-Type Metal Storage Shelving: Install adjustable shelf clips at front and back of each shelf.
 - b. Four-Post Metal Storage Shelving: Install four clips, one at each post, for support of each shelf; with clips fully engaged in post perforations.
 - c. Post-and-Beam Metal Storage Shelving: Install beams with beam-to-post connectors fully engaged in post perforations.

3.4 ERECTION TOLERANCES

- A. Erect four-post metal storage shelving to a maximum tolerance from vertical of 1/2 inch in up to 10 feet of height, not exceeding 1 inch for heights taller than 10 feet.

3.5 ADJUSTING

- A. Adjust metal storage shelving so that connectors and other components engage accurately and securely.
- B. Adjust and lubricate operable components to operate smoothly and easily, without binding or warping. Check and readjust operating hardware.
- C. Touch up marred finishes or replace metal storage shelving that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal storage shelving manufacturer.
- D. Replace metal storage shelving components that have been damaged beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 11 30 13
RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cooking appliances.
 - 2. Refrigeration appliances.
 - 3. Cleaning appliances.
 - 4. Classroom Equipment.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.
- C. Product Schedule: For appliances Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Certificates: For each type of appliance.
- C. Field quality-control reports.
- D. Sample Warranties: For manufacturers' special warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.5 WARRANTY

- A. Special Warranties: Manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: **Five** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain residential appliances from single source and each type of residential appliance from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design and ICC A117.1.

2.3 RANGES

- A. RNG-1, Electric Range: Free-Standing range with one oven(s).
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide General Electric Company (GE Appliances); Model #JBS460DMWW or comparable product by one of the following:
 - a. BSH Home Appliances Corporation (Bosch).
 - b. Electrolux Home Products (Frigidaire).
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. LG Appliances.
 - e. Maytag; a division of Whirlpool Corporation.
 - f. Samsung.
 - g. Sears Brands LLC (Kenmore).
 - h. Whirlpool Corporation.
 - 2. Width: 30 inches.
 - 3. Electric Burner Elements: Four.
 - 4. Oven Features:
 - a. Capacity: 5.0 cu. ft.
 - b. Operation: conventional.
 - c. Electric Power Rating:
 - 1) Oven(s): Manufacturer's standard.
 - d. Controls: Digital panel controls and timer display, located on front side of rangetop.
 - 5. Anti-Tip Device: Manufacturer's standard.
 - 6. Electric Power Supply: 208 V, 1 phase, 40 A.
 - 7. Material: Porcelain-enameled steel with manufacturer's standard cooktop.
 - a. Color/Finish: White.
- B. RNG-2, Gas Range: Freestanding range with one oven(s).

1. Basis-of-Design Product: Subject to compliance with requirements, provide General Electric Company (GE Appliances); Model #JGBS30DEKWW or comparable product by one of the following:
 - a. BSH Home Appliances Corporation (Bosch).
 - b. Electrolux Home Products (Frigidaire).
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. LG Appliances.
 - e. Maytag; a division of Whirlpool Corporation.
 - f. Samsung.
 - g. Sears Brands LLC (Kenmore).
 - h. Whirlpool Corporation.
 2. Width: 30 inches.
 3. Gas Burners: Four.
 - a. Power Ratings: Manufacturer's standard.
 - b. Controls: Manual-dial controls, located on front side of rangetop.
 - c. Grates: Individual.
 4. Oven Features:
 - a. Capacity: 4.8 cu. ft.
 5. Anti-Tip Device: Manufacturer's standard.
 6. Electric Power Supply: 120 V, 60 Hz, 1 phase, 15 A.
 7. Material: Porcelain-enameled steel with manufacturer's standard cooktop.
 - a. Color/Finish: White.
- C. RNG-3, Electric Range: Free-Standing range with one oven(s).
1. Basis-of-Design Product: Subject to compliance with requirements, provide General Electric Company (GE Appliances); Model #JB735DPWW or comparable product by one of the following:
 - a. BSH Home Appliances Corporation (Bosch).
 - b. Electrolux Home Products (Frigidaire).
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. LG Appliances.
 - e. Maytag; a division of Whirlpool Corporation.
 - f. Samsung.
 - g. Sears Brands LLC (Kenmore).
 - h. Whirlpool Corporation.
 2. Width: 30 inches.
 3. Electric Burner Elements: Five.
 4. Oven Features:
 - a. Capacity: 5.3 cu. ft.
 - b. Operation: convection.
 - c. Electric Power Rating:
 - 1) Oven(s): Manufacturer's standard.
 - d. Controls: Digital panel controls and timer display, located on splash panel at rear of rangetop.
 5. Anti-Tip Device: Manufacturer's standard.

6. Electric Power Supply: 208 V, 1 phase, 40 A.
7. Material: Porcelain-enameled steel with manufacturer's standard ceramic-glass cooktop.
 - a. Color/Finish: White.

2.4 MICROWAVE OVENS

A. MWV, Microwave Oven:

1. Basis-of-Design Product: Subject to compliance with requirements, provide General Electric Company (GE Appliances); Model #PES7227SLSS or comparable product by one of the following:
 - a. BSH Home Appliances Corporation (Bosch).
 - b. Electrolux Home Products (Frigidaire).
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. LG Appliances.
 - e. Maytag; a division of Whirlpool Corporation.
 - f. Samsung.
 - g. Sears Brands LLC (Kenmore).
 - h. Whirlpool Corporation.
2. Mounting: Countertop.
3. Type: Conventional.
4. Dimensions:
 - a. Width: 24 inches.
 - b. Depth: 19-3/4 inches.
 - c. Height: 14 inches.
5. Capacity: 2.2 cu. ft.
6. Oven Door: Door with observation window and pushbutton latch release.
7. Microwave Power Rating: Manufacturer's standard.
8. Material: Stainless steel.

2.5 REFRIGERATOR/FREEZERS

A. REF, Refrigerator/Freezer: Two-door refrigerator/freezer with freezer on top and complying with AHAM HRF-1.

1. Basis-of-Design Product: Subject to compliance with requirements, provide General Electric Company (GE Appliances); Model #GIE21GTHWW or comparable product by one of the following:
 - a. BSH Home Appliances Corporation (Bosch).
 - b. Electrolux Home Products (Frigidaire).
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. LG Appliances.
 - e. Maytag; a division of Whirlpool Corporation.
 - f. Samsung.
 - g. Sears Brands LLC (Kenmore).
 - h. Whirlpool Corporation.

2. Type: Freestanding.
3. Dimensions:
 - a. Width: 33 inches.
 - b. Depth: 34 inches.
 - c. Height: 66-3/4 inches
4. Storage Capacity:
 - a. Refrigeration Compartment Volume: 15.1 cu. ft.
 - b. Freezer Volume: 6.04 cu. ft.
5. Front Panel(s): Manufacturer's standard.
 - a. Panel Color: White.
6. Appliance Color/Finish: White.

2.6 ICEMAKERS

A. IC, Ice maker:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Manitowoc; Indigo NXT Series iT0420 on D-320 Storage Bin, Model IYT0420A or comparable product by one of the following:
 - a. General Electric Company (GE Appliances).
 - b. Jenn-Air; a division of Whirlpool Corporation.
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. Maytag; a division of Whirlpool Corporation.
 - e. Viking Range Corporation.
 - f. Whirlpool Corporation.
2. Type: Free-Standing.
3. Dimensions:
 - a. Width: 22 inches.
 - b. Depth: 34 inches.
 - c. Height: 60 inches.
4. Ice Capacity:
 - a. Production: 375 lbs. per day @ 90-degree air / 70-degree Water.
 - b. Storage: 264 lbs.
5. Electrical Power: 115 V, 60 Hz, 1 phase, 15 A.

2.7 DISHWASHERS

A. DSH, Dishwasher: Complying with AHAM DW-1.

1. Basis-of-Design Product: Subject to compliance with requirements, provide General Electric Company (GE Appliances); Model #GDF510PGRWW or comparable product by one of the following:
 - a. BSH Home Appliances Corporation (Bosch).
 - b. Electrolux Home Products (Frigidaire).
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. LG Appliances.
 - e. Maytag; a division of Whirlpool Corporation.

- f. Samsung.
- g. Sears Brands LLC (Kenmore).
- h. Whirlpool Corporation.
2. Type: Built-in undercounter.
3. Dimensions:
 - a. Width: 24 inches.
 - b. Depth: 24 inches.
 - c. Height: 33-3/8 inches.
4. Capacity:
 - a. International Place Settings of China: 14.
5. Sound Level: Maximum 59 dB.
6. Tub and Door Liner: Manufacturer's standard with sealed detergent and automatic rinsing-aid dispensers.
7. Controls: Touch-pad controls with wash cycles and hot-air and heat-off drying cycle options.
8. Front Panel: Manufacturer's standard.
 - a. Panel Color: White.
9. Appliance Color/Finish: White.

2.8 CLOTHES WASHERS AND DRYERS

- A. WSH, Clothes Washer: Complying with AHAM HLW-1.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Maytag; Model #MVWC565FW or comparable product by one of the following:
 - a. BSH Home Appliances Corporation (Bosch).
 - b. Electrolux Home Products (Frigidaire).
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. LG Appliances.
 - e. Samsung.
 - f. Sears Brands LLC (Kenmore).
 - g. Whirlpool Corporation.
 - h. General Electric Company (GE Appliances).
 - i. General Electric Company (Hotpoint).
 2. Type: Freestanding, top-loading unit.
 3. Dimensions:
 - a. Width: 27 1/2 inches.
 - b. Depth: 27 inches.
 - c. Height: 42-3/4 inches.
 4. Drum: Manufacturer's standard.
 - a. Capacity: 4.2 cu. ft.
 5. Controls: Rotary-dial controls for water-fill levels, wash/rinse water temperatures, and variable-speed and fabric selectors.
 6. Electrical Power: 120 V, 60 Hz, 1 phase, 15 A.

7. Motor: Manufacturer's standard with built-in overload protector.
 8. Appliance Finish: Enamel.
 - a. Color: White.
 9. Front-Panel Finish: Manufacturer's standard.
 - a. Panel Color: White.
- B. DRY, Clothes Dryer: Complying with AHAM HLD-1.
1. Basis-of-Design Product: Subject to compliance with requirements, provide General Electric Company (GE Appliances); Model #MEDC465HW or comparable product by one of the following:
 - a. BSH Home Appliances Corporation (Bosch).
 - b. Electrolux Home Products (Frigidaire).
 - c. KitchenAid; a division of Whirlpool Corporation.
 - d. LG Appliances.
 - e. Maytag; a division of Whirlpool Corporation.
 - f. Samsung.
 - g. Sears Brands LLC (Kenmore).
 - h. Whirlpool Corporation.
 2. Type: Freestanding, frontloading, electric unit.
 3. Dimensions:
 - a. Width: 29 inches.
 - b. Depth: 28 inches.
 - c. Height: 42 inches.
 4. Drum: Manufacturer's standard.
 - a. Capacity: 7.0 cu. ft.
 5. Controls: Rotary-dial controls for drying cycle, temperatures, and fabric selectors.
 6. Electric-Dryer Power: 240 V, 60 Hz, 1 phase, 30 A.
 7. Appliance Finish: Enamel.
 - a. Color: White.
 8. Front-Panel Finish: Manufacturer's standard.
 - a. Panel Color: White.

2.9 CLASSROOM EQUIPMENT

- A. KLN, Kiln.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Olympic; Oval Kilns, Model 3027HE or product by one of the following:
 - a. Skutt
 - b. Jen-Ken
 - c. Seattle Pottery Supply
 - d. L&L Kilns.
 2. Type: Freestanding, top-loading unit.
 3. Inside Dimensions:
 - a. Length: 30 inches.

- b. Width: 42 inches.
 - c. Depth: 29 inches.
 - 4. Controler: V6-CF 12 Key Controller.
 - 5. Electrical Power: 208 V, 1 phase, 92 A.
- B. DT, Demo Table with Mirror.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Advance Tabco; Demo Table with Mirror, Model #109VSSDT366 or comparable product by another manufacturer.
 - 2. Gauge: 14 Gauge.
 - 3. Stainless Steel Type: 304.
 - 4. Dimensions:
 - a. Length: 72 inches.
 - b. Width: 36 inches.
 - c. Height: 97 1/2 inches.
 - 5. Backsplash: without backsplash.
 - 6. Mirror Size: 25 1/2" x 62 1/2".

2.10 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.
- C. Examine walls, ceilings, and roofs for suitable conditions where overhead exhaust hoods will be installed.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install appliances according to manufacturer's written instructions.

- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
 - 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After installation, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

END OF SECTION

SECTION 11 52 13
PROJECTION SCREENS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Electrically operated, front-projection screens.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for metal support framing for front-projection screens.

1.2 DEFINITIONS

- A. ALR: Ambient-light rejection; for specular reflective viewing surfaces, measured as the percentage of ambient light striking the viewing surface that has equal angles of incidence and reflection.

- B. Gain: Ratio of light reflected from viewing-surface material to that reflected perpendicularly from a magnesium carbonate surface as determined in accordance with SMPTE RP 94.

- C. Half-Gain Angle: The angle, measured from the axis of the viewing surface to the most central position on a perpendicular plane through the horizontal centerline of the viewing surface, where the gain is half of the peak gain.

1.3 ACTION SUBMITTALS

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

- B. Shop Drawings: Show layouts and types of front-projection screens. Include the following:

1. Drop heights.
2. Location of seams in viewing surfaces.
3. For end-mounted motors, location of screen centerline relative to ends of screen case.
4. Anchorage details, including connection to supporting structure for suspended units.
5. Details of juncture of screen case or trim with adjacent finishes.
6. For electrically operated units, wiring diagrams and location of wiring connections.
7. Accessories.

- C. Samples: For each type of exposed finish and for each color and finish specified, in manufacturer's standard sizes.
 - D. Samples for Initial Selection: For each type of exposed finish.
- 1.4 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For front-projection screens to include in maintenance manuals.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Environmental Limitations: Do not deliver front-projection screens until spaces are enclosed and weathertight, wet-work in installation spaces is complete and dry, and temporary or permanent HVAC system is operating and maintaining ambient temperature and humidity conditions planned for building occupants during the remainder of the construction period.
 - B. Store front-projection screens in manufacturer's protective packaging and according to manufacturer's written instructions.
- 1.6 COORDINATION
- A. Coordinate layout and installation of front-projection screens with adjacent construction, including ceiling suspension systems, light fixtures, HVAC system components, fire-suppression system, and partitions.

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
- A. Viewing-Surface and Masking Materials:
 - 1. Mildew-Resistance Rating: Zero or 1 when tested in accordance with ASTM G21.
 - 2. Flame Resistance: Passes NFPA 701.
 - 3. Flame-Spread Index: Not greater than 75 when tested in accordance with ASTM E84.
- 2.2 ELECTRICALLY OPERATED, FRONT-PROJECTION SCREENS
- A. General Requirements: Manufacturer's standard units, consisting of case, screen, motor, controls, mounting accessories, and other components necessary for a complete installation. Provide units that are listed and labeled as an assembly by Underwriters Laboratories Inc. (UL) or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. 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.

2. Screen Mounting: Top edge securely anchored to rigid metal roller and bottom edge formed into a pocket holding a metal rod, with ends of rod protected by plastic caps.
- B. Suspended, Electrically Operated Screen: Unit designed and fabricated for suspended mounting.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 2. Basis-of-Design Product: Subject to compliance with requirements, provide Draper Inc; Paragon/Series V or comparable product by one of the following:
 - a. Legrand AV Inc.; Legrand North America, LLC.
 - b. Stewart Filmscreen.
 3. Motor in Roller: Instant-reversing motor of size and capacity recommended in writing by screen manufacturer; with permanently lubricated ball bearings, automatic thermal-overload protection, preset limit switches to automatically stop screen in up and down positions, and positive-stop action to prevent coasting. Mount motor inside roller with vibration isolators to reduce noise transmission.
 4. Wiring Compartment: Metal or metal lined.
 5. Controls: Remote, key-operated, three-position control switch installed in recessed device box with flush cover plate matching other electrical device cover plates in room where switch is installed.
 - a. Provide with one control switch.
 - b. Provide power supply for low-voltage systems if required.
 - c. Provide key-operated, power-supply switch.
 - d. Provide video interface control for connecting to projector.
 6. Screen Case: Extruded Aluminum.
 - a. Finish on Exposed Surfaces: Manufacturer's standard.
 7. Tab-Tensioned, Viewing Surface: On axis gain of 1.0 and 180-degree. Provide viewing surface with black backing and without seams.
 - a. Tab Tensioning: Durable low-stretch cord, such as braided polyester, on each side of screen that is connected to edge of entire height of screen by tabs, to pull viewing surface flat horizontally.
 8. Size of Viewing Surface: 148 by 198 inches.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install front-projection screens at locations indicated on Drawings to comply with screen manufacturer's written instructions.
- B. Install front-projection screens with screen cases in position and in relation to adjoining construction indicated. Securely anchor them to supporting substrate in a manner that produces a smoothly operating screen that, when lowered, has flat viewing surface and plumb vertical edges.

1. Install low-voltage controls in accordance with NFPA 70 and complying with manufacturer's written instructions.
 - a. Wiring Method: Install wiring in raceway, except in accessible ceiling spaces and in gypsum board partitions, where unenclosed wiring method may be used. Use UL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables, except in unfinished spaces.
2. Test electrically operated units to verify that screen controls, limit switches, closures, and other operating components are in optimum functioning condition.

END OF SECTION

SECTION 11 61 43

STAGE CURTAINS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stage curtains, scrims, and drops.
2. Draw-curtain tracks.
3. Curtain rigging.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for steel framing and supports for stage-curtain systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product and the following:

1. Tracks: Capability of each track to support the weight and operation of curtains that it supports.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and attachment details of curtains.
2. Include fabric assembly and hanging details.
3. Dimension operating clearances.
4. Include documentation of capacity of each batten, track, attachment, and rigging component to support loads.
5. Points of attachment for proscenium curtain and the corresponding static and dynamic loads imposed on structure.

C. Samples for Initial Selection: For each type of stage curtain indicated. Include color charts showing full range of colors, textures, and patterns available, together with 12-inch- square Sample (any color) of each fabric type and seam.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Structural members to which tracks, battens, and other stage-curtain equipment will be attached.

2. Locations of lighting fixtures and cabling, ductwork, piping, and sprinklers.
 3. Rigging equipment for stage equipment.
 4. Access panels.
- B. Product Certificates: For the following, from manufacturer:
1. Fabric: Provide name of flame-retardant chemical used, identification of applicator, treatment method, application date, allowable life span for treatment, and details of any restrictions and limitations.
 2. Rigging: Compliance of suspended battens and tracks with requirements.
- C. Sample Warranty: For manufacturer's special warranty.
- 1.4 CLOSEOUT SUBMITTALS
- A. Operation and Maintenance Data: For stage curtains and rigging to include in operation and maintenance manuals.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: Manufacturer of stage curtains.
- 1.6 FIELD CONDITIONS
- A. Environmental Limitations: Do not install stage curtains until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Verify locations of supporting structural elements and construction contiguous with stage curtains and rigging by field measurements before fabrication and indicate measurements on Shop Drawings.
- 1.7 WARRANTY
- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of stage-curtain systems that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, faulty operation of rigging.
 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 STAGE-CURTAIN SYSTEMS

- A. Description: Complete stage-curtain systems, including stage curtains, tracks, draw-curtain machines, and rigging; with necessary accessories for support and operation.

1. **Manufacturers:** Subject to compliance with requirements, provide products by **one of** the following:
 - a. Black Sheep Enterprises.
 - b. Georgia Stage, Inc.
 - c. iWeiss Theatrical Solutions.
 - d. Janson Industries.
 - e. LimeLight Productions, Inc.
 - f. LuXout Stage Curtains.
 - g. Mainstage Theatrical Supply, Inc.
 - h. NorthEast Stage.
 - i. Rose Brand.
 - j. Show Works.
 - k. S&K Theatrical Draperies, Inc.
 - l. Stagecraft Industries, Inc.
 - m. Stage Decoration & Supplies, Inc.
 - n. Syracuse Scenery & Stage Lighting Co., Inc.
 - o. Texas Scenic Company, Inc.
 - p. Tru-Roll, Inc.; a division of Advanced Entertainment Technology.

- B. **Source Limitations:** Obtain stage-curtain systems from single manufacturer. Obtain each color, grade, finish, type, and variety of fabric from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

- A. **Delegated Design:** Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design stage-curtain systems, including comprehensive engineering analysis and attachments to building structure, using performance requirements.
- B. **Fire-Test-Response Characteristics:** Provide stage curtains meeting the following requirements as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 1. **Flame-Propagation Resistance:** Passes NFPA 701.
 - a. Permanently attach label to each fabric of curtain assembly indicating whether fabric is inherently and permanently flame resistant or is treated with flame-retardant chemicals and whether it requires retreatment after cleaning or after a designated time period of use.
 - b. Permanently attach 12-inch-square swatch of same fabric and dye lot for each fabric of a curtain assembly to the back of assembly for use as fire-resistance test strip.

2.3 CURTAIN FABRICS

- A. **General:** Provide fabrics inherently and permanently flame resistant or chemically flame resistant by immersion treatment according to performance requirements indicated. Provide fabrics of each type and color from same dye lot.
- B. **Heavyweight Woven Cotton Velour:** Napped fabric of 100 percent cotton weighing not less than 25 oz./linear yd., with pile height not less than 79 mils; 54-inch minimum width.

1. Products: Subject to compliance with requirements, provide **one of** the following:
 - a. Dazian LLC; Symphony.
 - b. Frankel Associates/Fabric One; 950.
 - c. JB Martin Company; #2703 Overture.
 - d. KM Fabrics, Inc.; Memorable.
 - e. Valley Forge Fabrics, Inc.; 2525 Velour.
2. Color/Texture/Pattern: As selected by Architect from manufacturer's full range.

2.4 LINING

- A. Cotton Lining: Yarn-dyed denim cloth of 100 percent cotton; woven in a warp-faced twill; 54-inch minimum width; black.

2.5 CURTAIN-BOTTOM WEIGHTS

- A. Individual Weights: Curtain manufacturer's standard segmented weights to suit each curtain type and location.

2.6 CURTAIN FABRICATION

- A. General: Affix permanent label, stating compliance with requirements of authorities having jurisdiction, in accessible location on fabric not visible to audience. Provide vertical seams unless otherwise indicated. Arrange vertical seams so they do not fall on faces of pleats. Do not use fabric cuts less than one-half width.
- B. Vertical and Top Hems: Machine sew hems as follows unless otherwise indicated:
 1. Vertical Hems: Minimum 2 inches wide, and not less than 4 inches wide at borders, valance, teasers, and tormentors, with not less than a 1-inch tuck and with no selvage material visible from front of curtain. Sew open ends of hems closed.
 2. Turnbacks: Provide leading-edge turnbacks for traveler curtains, formed by folding back not less than 12 inches of face fabric, with not less than a 1-inch tuck, and vertically secured by sewing.
 3. Top Hems: Reinforced by double-stitching 3-1/2-inch- wide, heavy, jute or laminated synthetic webbing to top edge on back side of curtain with not less than 2 inches of face fabric turned under.
- C. Fullness:
 1. Flat: Provide zero percent fullness in curtains.
 2. 50 Percent Fullness: Provide fullness, exclusive of turnbacks and hems, by sewing additional material into 3-inch double-stitched, flat, box pleats spaced at 12 inches o.c. along top hem reinforcement.
- D. Grommets: Brass, No. 3, or No. 4.
 1. Black Curtains: Provide brass or aluminum grommets with black finish.

2. Flat Curtains: Place 12 inches o.c. and 1 inch from corner of curtain; for ties, snap hooks, or S-hooks.
- E. Bottom Hems: Machine sew hems as follows unless otherwise indicated:
1. For Flat Curtains Without Fullness: 4-inch lined hem with pocket for sliding pipe or conduit weight and stiffener into bottom of curtain, and with a concealing flap of same fabric in front of pocket made 2 inches longer than bottom edge of pocket.
 2. For Curtains With Fullness:
 - a. Curtains That Do Not Hang to Floor: Hems not less than 3 inches deep, and with open ends of hems sewn closed.
 - b. Floor-Length Curtains: Hems not less than 6 inches deep, with individual weights in individual closed pockets sewn above finished bottom edge of curtain, and with open ends of hems sewn closed.
 3. Lining: Where indicated, provide lining for curtain in same fullness as face fabric and finished 2 inches shorter than face fabric. Sew or otherwise securely attach lining to top hem of face fabric. Attach lining to face fabric along bottom and side seams with 4-inch- long strips of heavy woven cotton tape. Sew lining to bottom edge of curtain allowing sufficient lining fabric for tucking to prevent shrinkage.

2.7 CURTAIN ACCESSORIES

- A. Snap Hooks: Manufacturer's standard heavy-duty hooks, sewn to top edge of curtain.

2.8 ALUMINUM CURTAIN TRACK

- A. Aluminum Track: Extruded aluminum, ASTM B 221; alloy and temper as recommended by manufacturer for strength and corrosion resistance; black paint finish; complete with necessary accessories for support and operation.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Automatic Devices Company; 130 series, Flex-I-Track.
 - b. H & H Specialties Inc.; 300 series.
 - c. Tru-Roll, Inc., a division of Advanced Entertainment Technology; No. 1200 Medium Duty Straight Track.
 2. Cable Guides for Curved Track: Outside idlers, mule pulleys, spindles, and guides; quantity sufficient for configuration of curve(s) and length of track.
 3. Aluminum Thickness: As recommended by manufacturer for loads and operation.
- B. Curtain Rails: Single or double curtain capacity as indicated. Provide end stops for track rails.
- C. Curtain Carriers: Standard carriers with a pair of neoprene-tired ball-bearing wheels riveted parallel to plated-steel body. Equip carriers with rubber or neoprene bumpers and nylon glide strips to reduce noise, and heavy-duty, plated-steel swivel

eye for attaching curtain snap or S-hook. Provide quantity of curtain carriers sufficient for track length, to suit curtain fabrication.

1. Master Curtain Carriers: One master carrier, for each leading curtain edge, with two pairs of neoprene-tired ball-bearing wheels riveted parallel to plated-steel body.
 - D. Clamp and Bracket Hangers: Steel clamps and brackets of sufficient strength required to support loads for attaching track to overhead support.
 - E. Track-Lap Clamp: Metal to match track channel for attaching two tracks at center overlap.
 - F. Manual Walk-Along Operation: Fabricate curtain track without cord, cable, pulleys, or floor pulley.
 - G. Manual Cord Operation: Fabricate curtain track with cord, pulleys, and floor pulley.
 1. Operating Line: 3/8-inch-diameter, stretch-resistant operating cord consisting of braided synthetic-fiber jacket over solid, synthetic-fiber, linear filaments.
 2. End Pulleys: One single dead-end and one double live-end pulley. Provide sheave(s) with shielded ball bearing(s) housed in plated-steel body finished to match track. Provide with bracket for securing off-stage curtain end.
- 2.9 CURTAIN RIGGING
- A. Supports, Clamps, and Anchors: ASTM A 153/A 153M, Class B, galvanized sheet steel in manufacturer's standard thicknesses, galvanized after fabrication.
 - B. Trim and Support Cable: 1/4-inch- diameter, 7x19 galvanized-steel cable with a breaking strength of 7000 lb. Provide fittings according to cable manufacturer's written instructions for size, number, and method of installation, including a drop-forged galvanized turnbuckle to allow for leveling.
 - C. Inserts, Bolts, Rivets, and Fasteners: Manufacturer's standard corrosion-resistant units.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for supporting members, blocking, installation tolerances, clearances, and other conditions affecting performance of stage-curtain work.
- B. Examine inserts, clips, blocking, or other supports required to be installed by others to support tracks and battens.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install stage-curtain system according to curtain and track manufacturer's written instructions.

3.3 BATTEN INSTALLATION

- A. Install battens by suspending at heights indicated with trim and supports spaced to support load, except do not exceed 10 feet between supports.
 - 1. Cable Trim and Support: Secure cables either directly to structures or to inserts, eye screws, or other devices that are secure and appropriate to substrate and that are not subject to deterioration or failure with age or elevated temperatures. Attach other cable end to pipe clamps with turnbuckles, housed or fixed with nuts after adjustment, to prevent loosening.
 - 2. Chain Trim and Support: Secure chain with load-rated terminations.

3.4 TRACK INSTALLATION

- A. Wall-Mounted Track: Install track by suspending from brackets securely mounted to wall construction at track-support spacing, according to manufacturer's written instructions.
- B. Track-Support Spacing: According to manufacturer's recommendations for applied loads, but not exceeding the following dimensions between supports:
 - 1. Heavy-Duty Track: 72 inches.
- C. Install track for center-parting curtains with not less than 24-inch overlap of track sections at center, supported by track lap clamps.

3.5 CURTAIN INSTALLATION

- A. Track Hung: Secure curtains to track carriers with S-hooks.

3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain stage curtains and tracks.

END OF SECTION

SECTION 12 24 13
ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manually operated, single-roller shades.
2. Motor-operated, single-roller shades.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
2. Section 07 92 00 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified, 10 inches long.

D. Samples for Initial Selection: For each type and color of shadeband material.

1. Include Samples of accessories involving color selection.

E. Product Schedule: For roller shades. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of shadeband material.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than **two** units.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain roller shades from single source from single manufacturer.

2.2 RS-1; MANUALLY OPERATED, SINGLE-ROLLER SHADES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. CACO, Inc.
 - 2. DFB Sales, Inc.
 - 3. Draper, Inc.
 - 4. Hunter Douglas, Inc.
 - 5. Insolroll Window Shading Systems.
 - 6. Levolor Inc.
 - 7. Lutron Electronics Co., Inc.

8. MechoShade Systems, LLC.
 9. QMotion; Legrand Building Control Systems (BCS); Legrand, North America, LLC.
 10. SM Automatic.
- B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
1. Bead Chains: Manufacturer's standard.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Clip, jamb mount.
 2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller shade weight and for lifting heavy roller shades.
 - a. Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criterion is more stringent.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
1. Roller Drive-End Location: As indicated on Drawings.
 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
 3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
- F. Shadebands:
1. Shadeband Material: Light-filtering fabric.
 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material.
 - b. Color and Finish: As selected by Architect from manufacturer's full range.
- G. Installation Accessories:
1. Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 4 inches.
 - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.

2. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.3 RS-2; MANUALLY OPERATED, SINGLE-ROLLER SHADES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. CACO, Inc.
 2. DFB Sales, Inc.
 3. Draper, Inc.
 4. Hunter Douglas, Inc.
 5. Insolroll Window Shading Systems.
 6. Levolor Inc.
 7. Lutron Electronics Co., Inc.
 8. MechoShade Systems, LLC.
 9. QMotion; Legrand Building Control Systems (BCS); Legrand, North America, LLC.
 10. SM Automatic.
- B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 1. Bead Chains: Manufacturer's standard.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Clip, jamb mount.
 2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller shade weight and for lifting heavy roller shades.
 - a. Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criterion is more stringent.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 1. Roller Drive-End Location: As indicated on Drawings.
 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
 3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
 - F. Shadebands:
 - 1. Shadeband Material: Light-blocking fabric.
 - 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material.
 - b. Color and Finish: As selected by Architect from manufacturer's full range.
 - G. Installation Accessories:
 - 1. Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 4 inches.
 - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
 - 2. Side Channels: With light seals and designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.
 - 3. Installation Accessories Color and Finish: As selected from manufacturer's full range.
- 2.4 RS-3; MOTOR-OPERATED, SINGLE-ROLLER SHADES
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CACO, Inc.
 - 2. DFB Sales, Inc.
 - 3. Draper, Inc.
 - 4. Hunter Douglas, Inc.
 - 5. Insolroll Window Shading Systems.
 - 6. Levolor Inc.
 - 7. Lutron Electronics Co., Inc.
 - 8. MechoShade Systems, LLC.
 - 9. QMotion; Legrand Building Control Systems (BCS); Legrand, North America, LLC.
 - 10. SM Automatic.
 - B. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include

wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.

1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Electric Motor: **Manufacturer's standard** tubular, enclosed in roller.
3. Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for **recessed or flush** mounting. Provide the following for remote-control activation of shades:
 - a. Group Control Station: Momentary-contact, three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for single-switch group control.
 - b. Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features; isolated from voltage spikes and surges.
 - c. Color: As selected by Architect from manufacturer's full range.
4. Crank-Operator Override: Crank and gearbox operate shades in event of power outage or motor failure.
5. Limit Switches: Adjustable switches interlocked with motor controls and set to stop shades automatically at fully raised and fully lowered positions.
6. Operating Features:
 - a. Group switching with integrated switch control; single faceplate for multiple switch cutouts.
 - b. Capable of accepting input from building automation control system.
 - c. Override switch.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 1. Roller Drive-End Location: Left side of interior face of shade.
 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
 3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers that are operated by one roller drive-end assembly.
- F. Shadebands:
 1. Shadeband Material: Light-filtering fabric.
 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material.
 - b. Color and Finish: As selected by Architect from manufacturer's full range.
- G. Installation Accessories:

1. Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 4 inches.
 - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
2. Side Channels: With light seals and designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.
 - a. Location: Creekland MS – Band Room only.
3. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.5 RS-4; MOTOR-OPERATED, SINGLE-ROLLER SHADES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. CACO, Inc.
 2. DFB Sales, Inc.
 3. Draper, Inc.
 4. Hunter Douglas, Inc.
 5. Insolroll Window Shading Systems.
 6. Levolor Inc.
 7. Lutron Electronics Co., Inc.
 8. MechoShade Systems, LLC.
 9. QMotion; Legrand Building Control Systems (BCS); Legrand, North America, LLC.
 10. SM Automatic.
- B. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
 1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 2. Electric Motor: Manufacturer's standard tubular, enclosed in roller.
 3. Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for recessed or flush mounting. Provide the following for remote-control activation of shades:

- a. Group Control Station: Momentary-contact, three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for single-switch group control.
 - b. Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features; isolated from voltage spikes and surges.
 - c. Color: As selected by Architect from manufacturer's full range.
4. Crank-Operator Override: Crank and gearbox operate shades in event of power outage or motor failure.
5. Limit Switches: Adjustable switches interlocked with motor controls and set to stop shades automatically at fully raised and fully lowered positions.
6. Operating Features:
 - a. Group switching with integrated switch control; single faceplate for multiple switch cutouts.
 - b. Capable of accepting input from building automation control system.
 - c. Override switch.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 1. Roller Drive-End Location: Left side of interior face of shade.
 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
 3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers that are operated by one roller drive-end assembly.
- F. Shadebands:
 1. Shadeband Material: Light-blocking fabric.
 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material.
 - b. Color and Finish: As selected by Architect from manufacturer's full range.
- G. Installation Accessories:
 1. Side Channels: With light seals and designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.
 2. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped.

- b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 4 inches.
3. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.6 SHADEBAND MATERIALS

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
 1. Source: Roller shade manufacturer.
 2. Type: PVC-coated fiberglass.
 3. Weave: Mesh.
 4. Thickness: 0.020".
 5. Weight: 13.3 oz./sq. yd.
 6. Roll Width: As indicated on Drawings .
 7. Openness Factor: 1 percent.
 8. Color: selected by Architect from manufacturer's full range.
- C. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.
 1. Source: Roller shade manufacturer.
 2. Type: Fiberglass textile with PVC film bonded to both sides.
 3. Thickness: .015".
 4. Weight: 12 oz./sq. yd.
 5. Roll Width: As indicated on Drawings.
 6. Color: As selected by Architect from manufacturer's full range.

2.7 ROLLER SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
 2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

- C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:
 - 1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
 - 2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.
- B. Electrical Connections: Connect motor-operated roller shades to building electrical system.
- C. Roller Shade Locations: As indicated on Drawings.

3.3 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION

SECTION 12 35 53.19

WOOD LABORATORY CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood laboratory casework.
2. Countertops.
3. Sinks and Water service fittings.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood blocking for anchoring laboratory casework.
2. Section 09 22 16 "Non-Structural Metal Framing" for reinforcements in metal-framed partitions for anchoring laboratory casework.
3. Section 09 65 13 "Resilient Base and Accessories" for resilient base applied to laboratory casework.

1.2 DEFINITIONS

A. Concealed Surfaces of Casework: Include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

B. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches above floor, and visible surfaces in open cabinets or behind glass doors.

1. Ends of cabinets are defined as "exposed" except ends are defined as "concealed" where installed directly against and completely concealed by walls or other cabinets.

C. Semiexposed Surfaces of Casework: Surfaces behind opaque doors, such as cabinet interiors, shelves, and dividers; interiors and sides of drawers; and interior faces of doors. Tops of cases 78 inches or more above floor and bottoms of cabinets more than 24 inches but less than 48 inches above floor are defined as "semiexposed."

1.3 COORDINATION

A. Coordinate layout and installation of framing and reinforcements for support of laboratory casework.

B. Coordinate installation of laboratory casework with installation of laboratory equipment.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For laboratory casework.
 - 1. Include plans, elevations, sections, and attachments to other work including blocking and reinforcements required for installation.
 - 2. Indicate types and sizes of casework.
 - 3. Indicate manufacturer's catalog numbers for casework.
 - 4. Show fabrication details, including types and locations of hardware.
 - 5. Indicate locations and types of service fittings.
 - 6. Include details of utility spaces showing supports for conduits and piping.
 - 7. Include details of support framing system.
 - 8. Include details of exposed conduits, if required, for service fittings.
 - 9. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and laboratory equipment.
 - 10. Include coordinated dimensions for laboratory equipment specified in other Sections.
- C. Keying Schedule: Include schematic keying diagram, and index each key set to unique designations that are coordinated with the Contract Documents.
- D. Samples: For casework finishes and materials requiring color selection.
- E. Samples for Initial Selection: For casework finishes and materials requiring color selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Test Reports:
 - 1. Casework: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework with requirements of specified product standard.
 - 2. Countertop Surface Material: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory countertop surface material with requirements specified for chemical and physical resistance.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish complete touchup kit for each type and color of casework finish provided. Include fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.
- B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Cabinet Mounting Clips and Related Hardware: Quantity equal to 5 percent of amount installed, but no fewer than 20 of each type.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that produces casework of types indicated for this Project that has been tested for compliance with SEFA 8 W.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, utility roughing-in and wet-work are complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Established Dimensions: Where laboratory casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
- C. Field Measurements: Where laboratory casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.
- D. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before enclosing them, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.
- B. Obtain countertops, sinks, accessories, and service fittings from casework manufacturer.
- C. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers. Other manufacturers' laboratory casework of similar sizes and similar door and drawer configurations and complying with the Specifications may be considered. See Section 01 60 00 "Product Requirements."

2.2 CASEWORK, GENERAL

- A. Casework Product Standard: Comply with SEFA 8 W, "Laboratory Grade Wood Casework."
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 WOOD LABORATORY CASEWORK

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Bedcolab.
 - 2. CIF Lab Solutions LP.
 - 3. Diversified Woodcrafts, Inc.
 - 4. ICIscientific.
 - 5. Kewaunee Scientific Corporation.
 - 6. Leonard Peterson & Company, Inc.
 - 7. Mott Manufacturing Ltd.
 - 8. Sheldon Laboratory Systems.
 - 9. South Texas Woodmill, Inc.
- B. Design: Lipped overlay with radiused edges.
 - 1. Provide 1/8-inch reveals between doors and drawers that are adjacent.
- C. Wood Species: Red oak.
 - 1. Wood Stain Colors and Finishes: As selected by Architect from casework manufacturer's full range.
- D. Cut: Rift cut/sawn.
- E. Veneer Matching:
 - 1. None required; select and arrange veneers for compatible grain and color.
 - 2. Provide veneers for each cabinet from a single flitch, book and balance matched.
 - a. Provide continuous matching of adjacent drawer fronts within each cabinet.
- F. Grain Direction:
 - 1. Doors: Vertical with continuous vertical matching.
 - 2. Drawer Fronts: Vertical with continuous vertical matching.
 - 3. Face Frame Members: Lengthwise.
 - 4. End Panels: Vertical.

5. Bottoms and Tops of Units: Side to side.
 6. Knee Space Panels: Vertical.
 7. Aprons: Horizontal.
- G. Exposed Materials:
1. General: Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
 2. Plywood: Hardwood plywood, either veneer core or particleboard core with face veneer of species indicated. Grade A exposed faces, at least 1/50 inch thick, and Grade J crossbands. Provide backs of same species as faces.
 3. Solid Wood: Clear hardwood lumber of species indicated.
 4. Edgebanding: Wood veneer of same species as face veneer.
- H. Semiexposed Materials:
1. Wood: Provide solid wood or hardwood plywood for semiexposed surfaces unless otherwise indicated.
 - a. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of same species as exposed solid wood.
 - b. Plywood: Hardwood plywood of same species as exposed plywood. Provide backs of same species as faces.
 - 1) Grade: B faces and Grade J crossbands.
 2. Metal for Steel Drawer Pans: Cold-rolled, carbon-steel sheet complying with ASTM A1008/A1008M; matte finish; suitable for exposed applications.
- I. Concealed Materials:
1. Solid Wood: With no defects affecting strength or utility.
 2. Plywood: Hardwood plywood. Provide backs of same species as faces.
 3. Particleboard.
 4. MDF.
 5. Hardboard.
- 2.4 WOOD CABINET MATERIALS
- A. General:
1. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
- B. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.
- C. MDF: Medium-density fiberboard, ANSI A208.2, Grade 130.
- D. Hardboard: ANSI A135.4, Class 1 tempered.
- E. PVC Edgebanding for Wood: Rigid PVC extrusions, through color with satin finish, 3.0 mm thick at doors and drawer fronts, 1.0 mm thick elsewhere.

2.5 CABINET HARDWARE

- A. General: Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.
- B. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, Type B01602, self-closing. Provide two for doors 48 inches high or less and three for doors more than 48 inches high.
 - 1. Degrees of Opening: 135.
- C. Hinged-Door and Drawer Pulls: Solid-aluminum, stainless steel, or chrome-plated-brass, back-mounted pulls. Provide two pulls for drawers more than 24 inches wide.
 - 1. Design: Wire pulls.
 - 2. Overall Size: 1 by 4-1/2 inches.
- D. Sliding-Door Pulls: Stainless steel or chrome-plated recessed flush pulls.
 - 1. Design and Size: Round, 3/4-inch diameter by 1/8 inch deep.
- E. Recessed Pulls: Aluminum. Provide two pulls for drawers more than 24 inches wide.
- F. Channel Pulls: Full-width, recessed solid-hardwood channels; matching exposed wood of cabinets.
- G. Door Catches: Dual, self-aligning, permanent magnet catches. Provide two catches on doors more than 48 inches high.
- H. Drawer Slides: ANSI/BHMA A156.9.
 - 1. Manufacturer's standard.
 - 2. Heavy Duty (Grade 1HD-100): Side mount.
 - a. Type: Full extension.
 - b. Material: Epoxy-coated polymer slides.
 - c. Motion Feature: Self-closing mechanism.
 - 3. General-purpose drawers; provide 100 lb load capacity.
 - 4. File drawers; provide 150 lb load capacity.
- I. Label Holders: Stainless steel, aluminum, or chrome plated; sized to receive standard label cards approximately 1 by 2 inches, attached with screws or rivets. Provide on drawers.
- J. Locks: Cam type, brass with chrome-plated finish; complying with ANSI/BHMA A156.11, Type E07281 or Type E07261.
 - 1. Tumbler: Disc.
 - 2. Lock Locations: Provide on drawers and doors.
 - 3. Keying: Key locks alike within each room; key each room separately.
 - a. Master key for up to 225 key changes.
 - 4. Key Quantity: Minimum of two keys per lock.
 - 5. Master Key System: Key locks to be operable by master key.
 - a. Master Keys: Provide two.

- K. Sliding-Door Hardware Sets: Laboratory casework manufacturer's standard, to suit type and size of sliding-door units.
- L. Adjustable Shelf Supports: ANSI/BHMA A156.9, powder-coated steel standards, surface type, and epoxy powder-coated steel shelf brackets, Type B04102 and Type B04112.

2.6 COUNTERTOPS

- A. General: Provide laboratory countertops as indicated on Drawings.
- B. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Epoxy Scientific LLC.
 - b. Durcon; a Wilsonart Company.
 - c. Prime Industries, Inc.
 - 2. Physical Properties:
 - a. Flexural Strength: Not less than 10,000 psi.
 - b. Modulus of Elasticity: Not less than 2,000,000 psi.
 - c. Hardness (Rockwell M): Not less than 100.
 - d. Water Absorption (24 Hours): Not more than 0.02 percent.
 - e. Heat Distortion Point: Not less than 260 deg F.
 - 3. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
 - a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
 - b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
 - 4. Color: Black.

2.7 WOOD CABINET FABRICATION

- A. Construction: Provide wood-faced laboratory casework complying with SEFA 8 W.
 - 1. Bottoms of Base Cabinets and Tall Cabinets: 3/4-inch- thick, veneer-core hardwood plywood.
 - 2. Tops and Bottoms of Wall Cabinets and Tops of Tall Cabinets: 1-inch- thick, veneer-core hardwood plywood.
 - 3. Ends of Cabinets: 3/4-inch- thick, hardwood plywood.
 - 4. Shelves: 1-inch- thick, veneer-core hardwood plywood.
 - 5. Base Cabinet Top Frames: 3/4-by-2-inch solid wood with mortise and tenon or doweled connections, glued and pinned or screwed.

6. Base Cabinet Stretchers: 3/4-by-4-1/2-inch panel product strips or solid-wood boards at front and back of cabinet, glued and pinned or screwed. May be provided as an option to base cabinet top frames.
 7. Base Cabinet Subtops: 3/4-inch- thick panel product, glued and pinned or screwed. May be provided as an option to base cabinet top frames.
 8. Exposed Backs of Cabinets: 3/4-inch- thick, MDF-core hardwood plywood.
 9. Unexposed Backs of Cabinets: 1/2-inch- thick, hardwood plywood dadoed into sides, bottoms, and tops unless otherwise indicated.
 10. Drawer Fronts: 3/4-inch- thick, MDF-core hardwood plywood or solid hardwood.
 11. Drawer Sides and Backs: 1/2-inch- thick, solid hardwood or veneer-core hardwood plywood, with glued dovetail or multiple-dowel joints.
 12. Drawer Bottoms: 1/4-inch- thick, veneer-core hardwood plywood glued and dadoed into front, back, and sides of drawers. Use 1/2-inch- thick material for drawers more than 24 inches wide.
 13. Drawer Bodies: Steel drawer pans formed from 0.036-inch- thick metal, metallic phosphate treated, and finished with manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat with a minimum dry film thickness of 1 mil for topcoat and 2 mils for system.
 14. Doors Less Than 48 Inches (1200 mm) High: 3/4 inch thick, with particleboard or MDF cores and hardwood face veneers and crossbands.
 - a. Provide solid-hardwood stiles and rails.
 15. Doors More Than 48 Inches (1200 mm) High: 1-1/16 inches thick, with honeycomb cores, solid-hardwood stiles and rails, and hardwood face veneers and crossbands.
 16. Stiles and Rails of Glazed Doors Less Than 48 Inches (1200 mm) High: 3/4 inch thick.
 - a. Material: Solid hardwood.
 17. Stiles and Rails of Glazed Doors More Than 48 Inches (1200 mm) High: 1-1/16-inch- thick, solid wood with hardwood face veneers and crossbands.
- B. Removable Backs: Provide backs that can be removed from within cabinets at utility spaces.
- C. Filler and Closure Panels: Provide where indicated and as needed to close spaces between casework and walls, ceilings, and equipment. Fabricate from same material and with same finish as adjacent exposed casework surfaces unless otherwise indicated.
1. Provide knee-space panels (modesty panels) at spaces between base cabinets, where cabinets are not installed against a wall or where space is not otherwise closed.
 2. Provide utility-space closure panels at spaces between base cabinets where utility space would otherwise be exposed, including spaces below countertops.
 3. Provide closure panels at ends of utility spaces where utility space would otherwise be exposed.

2.8 WOOD FINISH

- A. Preparation: Sand lumber and plywood before assembling. Sand edges of doors, drawer fronts, and molded shapes with profile-edge sander. Sand after assembling for uniform smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.
- B. Staining: Remove fibers and dust and apply stain to exposed and semiexposed surfaces as necessary to match approved Samples. Apply stain to produce a consistent appearance. Apply wash-coat sealer before applying stain to closed-grain wood species.
- C. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard two-coat, chemical-resistant, transparent finish. Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.
 - 1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8 W. Acceptance level for chemical spot test to be no more than for Level 3 conditions.

2.9 COUNTERTOP FABRICATION

- A. Countertops, General: Provide units with smooth surfaces in uniform plane, free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch.
- B. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
 - 1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2, unless otherwise indicated.
 - 2. Overflows: For each sink except cup sinks, provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches less than sink depth. Provide in same material as strainer.
- C. Epoxy:
 - 1. Countertops: Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and butt joints assembled with epoxy adhesive and concealed metal splines.
 - a. Flat Configuration: 3/4 inch thick with continuous drip groove on underside 1/2 inch from overhang edge.
 - 1) Edges and Corners: Rounded.
 - 2) Backsplash: Integral coved.
 - b. Construction: Uniform throughout full thickness.
 - 2. Sinks: Molded in one piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch minimum thickness.
 - a. Provide with polypropylene strainers and tailpieces.
 - b. Provide integral sinks in epoxy countertops, bonded to countertops with invisible joint line.
 - c. Provide sinks for drop-in installation with 1/4-inch-thick lip around perimeter of sink.

- d. Provide sinks for underside installation with manufacturer's recommended adjustable support system for table- and cabinet-type installations.

2.10 WATER AND LABORATORY GAS SERVICE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Broen A/S.
 2. Chicago Faucets; Geberit Group.
 3. WaterSaver Faucet Co.
- B. Materials: Fabricated from cast or forged red brass unless otherwise indicated.
 1. Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.
- C. Finish: Acid- and solvent-resistant powder coating complying with requirements in SEFA 7 for corrosion-resistant finishes.
 1. Provide chemical-resistant powder coating in laboratory casework manufacturer's standard metallic brown, aluminum, white, or other color as approved by Architect.
- D. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig.
 1. Vacuum Breakers: Provide ASSE 1035 vacuum breakers on water fittings with serrated outlets.
 2. Aerators: Provide aerators on water fittings that do not have serrated outlets.
 3. Self-Closing Valves: Provide self-closing valves where indicated.
- E. Handles: Provide three- or four-arm, forged-brass or three- or four-wing, molded-plastic or powder-coated-metal handles for valves unless otherwise indicated.
 1. Provide lever-type handles for ball valves unless otherwise indicated. Lever handle aligns with outlet when valve is closed and is perpendicular to outlet when valve is fully open.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CASEWORK

- A. Comply with installation requirements in SEFA 2. Install level, plumb, and true in line; shim as required using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:
 - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
 - 2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet.
 - 3. Variation of Faces of Casework from a True Plane: 1/8 inch in 10 feet.
 - 4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
 - 5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.
- B. Base Cabinets: Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions, with fasteners spaced not more than 16 inches o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.
 - 1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than two fasteners per side.
- C. Wall Cabinets: Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 16 inches o.c.
- D. Install hardware uniformly and precisely.
- E. Adjust operating hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF COUNTERTOPS

- A. Comply with installation requirements in SEFA 2. Abut top and edge surfaces true in plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints where indicated on Shop Drawings.
- B. Field Jointing: Where possible, make in same manner as shop-made joints, using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Shop prepare edges for field-made joints.
 - 1. Plastic-Laminate Countertops: Secure field-made joints using concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten in accordance with manufacturer's written instructions to exert a uniform heavy pressure at joints.
- C. Fastening:
 - 1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
 - 2. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.

3. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.

- D. Provide holes and cutouts required for service fittings.
- E. Seal unfinished edges and cutouts in plastic-laminate countertops with heavy coat of polyurethane varnish.
- F. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
- G. Dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF SINKS

- A. Comply with installation requirements in SEFA 2.
- B. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in sink and countertop manufacturers' recommended chemical-resistant sealing compound or adhesive, and firmly secure to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement. Remove excess sealant or adhesive while still wet and finish joint for neat appearance.

3.5 CLEANING AND PROTECTING

- A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- B. Protect countertop surfaces during construction with 6-mil plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches o.c.

END OF SECTION

SECTION 12 36 61.16

SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid surface material countertops.
2. Solid surface material backsplashes.
3. Solid surface material end splashes.

B. Related Requirements:

1. Section 22 41 00 "Residential Plumbing Fixtures" for sinks and plumbing fittings.

1.2 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

1. Show locations and details of joints.
2. Show direction of directional pattern, if any.

C. Samples for Initial Selection: For each type of material exposed to view.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.

B. Installer Qualifications: Fabricator of countertops.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.7 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SSM, SOLID SURFACE COUNTERTOP MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ISFA 2-01.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Affinity Surfaces; a brand of Domain Industries, Inc.
 - b. Avonite Surfaces.
 - c. Durasein Solid Surface; a brand of Relang International, LLC.
 - d. E. I. du Pont de Nemours and Company.
 - e. Formica Corporation.
 - f. LX Hausys.
 - g. Meganite Inc.
 - h. Samsung Chemical USA, Inc.
 - i. Swan Corporation (The).
 - j. Transolid.
 - k. Wilsonart LLC.
 - 2. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.2 FABRICATION

- A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
 - 1. Grade: Premium.
- B. Configuration:
 - 1. Front: Straight, slightly eased at top.
 - 2. Backsplash: Straight, slightly eased at corner.
 - 3. End Splash: Matching backsplash.
- C. Countertops:
 - 1. 1/2-inch- thick, solid surface material with front edge built up with same material.
- D. Backsplashes: 1/2-inch- thick, solid surface material.

- E. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 - 1. Fabricate with loose backsplashes for field assembly.
- F. Joints:
 - 1. Fabricate countertops in sections for joining in field.
 - a. Joint Locations: Not within 18 inches of a sink or cooktop and not where a countertop section less than 36 inches long would result, unless unavoidable.
- G. Cutouts and Holes:
 - 1. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant for Countertops: Comply with applicable requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.
- B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- C. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

1. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- F. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Pre-drill holes for screws as recommended by manufacturer.
- G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- H. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

END O SECTION

SECTION 12 48 13

ENTRANCE FLOOR MATS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient entrance mats.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for floor mats and frames.
- B. Shop Drawings:
 - 1. Custom Graphics: Scale drawing indicating colors.
- C. Samples: For the following products, in manufacturer's standard sizes:
 - 1. Floor Mat: Assembled sections of floor mat.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For floor mats and frames to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 ENTRANCE FLOOR MATS AND FRAMES, GENERAL

- A. Structural Performance: Provide roll-up rail mats and frames capable of withstanding the following loads and stresses within limits and under conditions indicated:
 - 1. Uniform floor load of 300 lbf/sq. ft.
 - 2. Wheel load of 350 lb per wheel.
- B. Accessibility Standard: Comply with applicable provisions in the DOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 RESILIENT ENTRANCE MATS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Amarco Products.
 - 2. American Floor Mats.

3. American Floor Products Company, Inc.
 4. Babcock-Davis.
 5. C/S Group.
 6. Cactus Mat Mfg. Co.
 7. Consolidated Plastics Company, Inc.
 8. Durable Corporation.
 9. Entrance Inc.
 10. Forbo Industries, Inc.
 11. JL Industries, Inc.
 12. K. N. Crowder Manufacturing, Inc.
 13. Kadee Industries, Inc.
 14. Matco International.
 15. Mats Inc.
 16. Musson Rubber Company.
 17. Pawling Corporation; Architectural Products Division.
 18. ProSpec; an Oldcastle company.
 19. Reese Enterprises, Inc.
 20. Sbemco International Inc.; Matting by Design.
 21. U.S. Mat & Rubber Corporation.
- B. Loop Filament Mats: Loop filament vinyl material 3/8 inch thick, with slip-resistant nitrile rubber backing and with built-in chemical agents to reduce fungus and mildew.
1. Color: As selected by Architect from full range of industry colors.
 2. Mat Size: 4 ft x 6 ft.
- C. Graphics: Jet Printed graphic logo, as indicated by owner.

2.3 FABRICATION

- A. Floor Mats: Shop fabricate units to greatest extent possible in sizes indicated. Unless otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and floor conditions for compliance with requirements for location, sizes, and other conditions affecting installation of floor mats and frames.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install surface-type units to comply with manufacturer's written instructions; coordinate with entrance locations and traffic patterns.

END OF SECTION

SECTION 12 66 00
TELESCOPING STANDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manually operated telescoping stands.

1.2 DEFINITIONS

- A. Forward Folding: Wall- or floor-attached bleachers that open in the forward direction by moving the front row away from the stack to the fully extended position.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for telescoping stands.
 - 2. Include load capacities, assembly characteristics, and furnished accessories.
- B. Shop Drawings: For telescoping stands in both stacked and extended positions.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include load capacities.
 - 3. Show seating layout, aisle widths, row-lettering and seat-numbering scheme, and wheelchair accessibility provisions.
- C. Samples for Initial Selection: For each type of exposed product and for each color and texture required.
 - 1. Signage: Full-size units for row letters, seat numbers, each type of accessibility sign, and custom graphics.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For telescoping stands to include in operation and maintenance manuals.

1.6 FIELD CONDITIONS

- A. Finished Spaces: Do not deliver or install telescoping stands until finishes in spaces to receive them are complete, including suspended ceilings, floors, and painting.
- B. Field Measurements: Indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Telescoping stands to withstand the effects of gravity loads, operational loads, and other loads and stresses according to ICC 300.
- B. Accessibility Standard: Comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design and ICC A117.1.

2.2 TELESCOPING STANDS

- A. System Description: Operable system of multiple-tiered seating on interconnected folding platforms that close for storage, without being dismantled, into a nested stack. Telescoping-stand units permit opening and closing of adjacent, individual and multiple rows, and close with vertical faces of platforms in the same vertical plane.
 - 1. Telescoping-Stands Standard: ICC 300.
- B. Wall-Attached Telescoping Stands: Forward-folding system, in which the bleachers open in the forward direction by moving the front row away from the stack to the fully extended position and the rear of bleacher understructure permanently attaches to wall construction.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hussey Seating Company.
 - b. Interkal LLC.
 - c. Irwin Telescopic Seating Company; Irwin Seating Company.
 - 2. Row Spacing: 26 inches.
 - 3. Row Rise: one dimension between 11 and 12 inches.
 - 4. Seat Type: Benches.
 - 5. Operation: Manually operated.

2.3 COMPONENTS

- A. Benches: Seats and skirts.
 - 1. Material: Molded plastic with contour surfaces.
 - a. Color: As selected by Architect from manufacturer's standard.
 - 2. Bench Height: Not less than 16 inches or more than 18 inches.
 - 3. Bench Depth: 12 inches.

- B. Wheelchair-Accessible Seating: Locate retractable truncated benches to provide wheelchair-accessible seating at locations indicated on Drawings.
 - 1. Equip tiers adjacent to wheelchair-accessible seating with front rails as required by ICC 300.
- C. Deck: Aluminum.
 - 1. Finish: Clear anodized.
- D. Risers: Steel sheet with manufacturer's standard, rust-inhibiting coating or hot-dip galvanized finish.
- E. Safety Rails: Steel, finished with manufacturer's standard powder coat system.
 - 1. Self-storing mid-aisle handrails located at centerline of each aisle with seating on both sides.
 - 2. End rails (guards) that are telescoping and self-storing.
 - 3. Removable rails around accessible seating cutouts and truncations.
 - 4. Color: Black.
- F. Understructure: Structural steel.
 - 1. Finish: Manufacturer's standard rust-inhibiting finish.
 - 2. Color: Manufacturer's standard.
- G. Support Column Wheels: Nonmarring, soft, rubber-face wheel assembly under each support column.
 - 1. Include wheels of size, number, and design required to support stands and operate smoothly without damaging the flooring surface, but no fewer than four per column or less than 4 inches in diameter and 1-1/2 inches wide.
- H. Fasteners: Vibration proof, in manufacturer's standard size and material.

2.4 ACCESSORIES

- A. Steps:
 - 1. Slip-resistant, abrasive tread surfaces at aisles.
 - 2. Intermediate aisle steps, fully enclosed, at each aisle.
 - 3. Transitional top step, fully enclosed, at each aisle where last row of telescoping stands is adjacent to a cross aisle.
 - 4. Removable front steps, fully enclosed, at each aisle, that engage with front row to prevent accidental separation or movement and are equipped with a minimum of four skid-resistant feet.
- B. Closure Panels and Void Fillers:
 - 1. Aisle closures at foot level that produce flush vertical face at aisles when system is stored.
 - 2. End panels covering exposed ends of stands in the stored position.
 - 3. Panels at cutouts and truncations for accessible seating.

4. Rear fillers including supports for closing openings between top row and rear wall of adjoining construction.
5. Gap fillers for closing openings between stand units or between stand units and adjoining construction.

C. Signage:

1. Row letters at each row end.
2. Seat numbers at 18 inches o.c. on benches.
3. Accessibility signs at each accessible space and accessible aisle seat.

2.5 MATERIALS

- A. Plywood: PS 1 as standard with manufacturer.
- B. Molded Plastic: High-density polyethylene; blow or injection molded, color-pigmented, textured, impact-resistant, with integral reinforcing ribs for attachment and anchoring points. Provide with UV inhibitors to retard fading.

2.6 FABRICATION

- A. Fabricate telescoping stands to operate easily without special tools or separate fasteners unless otherwise indicated.
- B. Round corners and edges of components and exposed fasteners to reduce snagging and pinching hazards.
- C. Form exposed work with flat, flush surfaces, level and true in line.
- D. Supports: Fabricate supports to withstand, without damage to components, the forces imposed by use of stands without failure or other conditions that might impair their usefulness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install telescoping stands according to ICC 300 and manufacturer's written instructions.

3.3 ADJUSTING

- A. Adjust backrests so that they are at proper angles and aligned with each other in uniform rows.

- B. Adjust hardware and moving parts to function smoothly, and lubricate, test, and adjust each telescoping stand unit to operate according to manufacturer's written instructions.
- C. Clean installed telescoping stands on exposed and semiexposed surfaces. Touch up factory-applied finishes or replace components as required to restore damaged or soiled areas.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to inspect, adjust, operate, and maintain telescoping stands.

END OF SECTION