

# BRAYARCHITECTS

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## project manual

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ELEMENTARY SCHOOL SECURE ENTRY IMPROVEMENTS TO  
GRIMES ELEMENTARY SCHOOL, NORTH HILL ELEMENTARY SCHOOL, AND  
SUNNYSIDE ELEMENTARY SCHOOL  
BURLINGTON COMMUNITY SCHOOL DISTRICT  
BURLINGTON, IOWA

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### CONTRACT DOCUMENTS

Manual 1 of 1

Architect's Project Number: 3700

Contract Drawings Dated: August 5, 2024

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**ELEMENTARY SCHOOL SECURE ENTRY IMPROVEMENTS  
TO  
GRIMES ELEMENTARY SCHOOL  
NORTH HILL ELEMENTARY SCHOOL  
SUNNYSIDE ELEMENTARY SCHOOL  
FOR  
BURLINGTON COMMUNITY SCHOOL DISTRICT  
BURLINGTON, IOWA**

ARCHITECT

**BRAY ASSOCIATES-ARCHITECTS, INC.  
829 South 1<sup>st</sup> Street  
Milwaukee, Wisconsin 53204  
Telephone: (414) 226-0200**

**Architects Project No. 3700**

**Plans Dated: August 5, 2024**

CONSULTANTS

**ELECTRICAL**

**MSA Professional Services, Inc.  
Kiel, Wisconsin**

**(920) 894-7800**



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DOCUMENT 00 11 13 - ADVERTISEMENT FOR BIDS

1.1 PROJECT INFORMATION

- A. Notice to Bidders: Bidders may submit bids for project as described in this Document. Submit bids according to the Instructions to Bidders.
- B. Project Identification: Burlington CSD - Elementary School Secure Entry Improvements.
  - 1. Project Locations:
    - a. Grimes Elementary School  
800 South St,  
Burlington, IA 52601
    - b. North Hill Elementary School  
825 N. 9th St  
Burlington, IA 52601
    - c. Sunnyside Elementary School  
2040 Sunnyside Ave  
Burlington, IA 52601
- C. Owner: Burlington Community School District.
- D. Architect: Bray Associates-Architects, Inc. 829 South 1st Street, Milwaukee, Wisconsin 53204. Phone: 414-226-0200.
- E. Project Description: The project consists of renovations to three elementary schools to create secure vestibules. The work consists of selective demolition, unit masonry, hollow metal, wood doors, drywall, acoustical panel ceilings and grid, resilient work, carpet, painting, and electrical work.
- F. Construction Contract: Bids will be received for the following Work:
  - 1. General Contract (all trades).

1.2 BID SUBMITTAL AND OPENING

- A. Owner will receive sealed lump sum bids until the bid time and date at the location given below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:
  - 1. Bid Date: Thursday, August 22, 2024.
  - 2. Bid Time: 11:00 a.m., local time.
  - 3. Location: Burlington CSD District Office, 1429 West Ave., Burlington, IA 52601
- B. Bids will be thereafter privately opened.

1.3 BID SECURITY

- A. Bid security shall be submitted with each bid in the amount of five (5) percent of the bid amount. No bids may be withdrawn for a period of sixty (60) days after opening of bids. Owner reserves the right to reject any and all bids and to waive informalities and irregularities.

1.4 DOCUMENTS

- A. Electronic Document Distribution: Contract documents may be obtained in electronic format (pdf's) from the Architect's Davenport office. It is solely the contractor's responsibility to verify that he has all drawings, all specifications, and all addenda for this project. No additional cost will be allowed by the Owner for the contractor's failure to obtain all material. Contractors to request documents by calling the Architect's Davenport office or by emailing at [jwojak@brayarch.com](mailto:jwojak@brayarch.com).
- B. Contract documents are made available only for the purposes of this Project. Their use does not grant a license for other purposes.
- C. Printed hard copies of the documents are available for purchase by the Contractor from:
  - 1. Rapids Reproductions, Inc., 3875 Elmore Avenue, Suite C, Davenport, Iowa 52807; 563/445-3081, ATTN: Mark Hoover. [markh@rapidsrepro.com](mailto:markh@rapidsrepro.com)
  - 2. Contractor must call ahead to order sets of documents as this is a print-to-order project.
- D. Discrepancies, omissions and conflicts of any part of the contract documents shall be brought to the attention of the Architect, Nathan Stark at [nstark@brayarch.com](mailto:nstark@brayarch.com) within seven (7) working days prior to bid date.
- E. Plan Rooms:
  - 1. isqft  
[mbiplanroom-dsm@mbionline.com](mailto:mbiplanroom-dsm@mbionline.com)
  - 2. McGraw-Hill Construction-Dodge  
[dodge.bidding@construction.com](mailto:dodge.bidding@construction.com)
  - 3. ConstructConnect  
[content@constructconnect.com](mailto:content@constructconnect.com)
  - 4. Greater Peoria Contractors & Suppliers  
[info@gpcsa.org](mailto:info@gpcsa.org)

1.5 TIME OF COMPLETION

- A. Successful bidder shall begin the Work on receipt of the Notice to Proceed and shall complete the Work within the Contract Time.

1.6 NOTIFICATION

- A. This Advertisement for Bids document is issued by:

Greg Reynolds  
Director of Business Services/Board Secretary  
Burlington Community School District.  
1429 West Avenue  
Burlington, Iowa 52601

END OF DOCUMENT 00 11 13

DOCUMENT 00 21 13 - INSTRUCTIONS TO BIDDERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. General Information
  - 2. Distribution to Prospective Bidders
  - 3. Bids
  - 4. Acceptable Bidders/Materials
  - 5. Substitutions
  - 6. Bid Guarantee
  - 7. Contract and Contract Documents
  - 8. Withdrawal of Bids
  - 9. Reservation
  - 10. Inadequacies And Omissions
  - 11. Employee And Screening Identification
  - 12. Power of Attorney
  - 13. Sexual Harassment
  - 14. Substance Abuse/Drug Free Workplace Act
  - 15. Domestic Preference
  - 16. Audit And Inspection of Records
  - 17. Permits and Agency Notification
  - 18. Employee and Screening Identification
  - 19. Lead Free
  - 20. Crystalline Silica Rule

1.3 GENERAL INFORMATION

- A. When required by the state or municipality, contractors must be licensed in the State of Iowa, and if required, licensed in the municipality in which the project is located.
- B. Complete sets of Contract Documents must be used in preparing bids, neither Architect nor Engineers assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Contract Documents.
- C. Each Bidder shall refer to Table of Contents and read and examine all sections listed therein, all of which are part of the project manual and contain provisions applicable to successful Bidder. He shall also examine all drawings as successful Bidder will be required to do all work belonging to his contract which is either shown on drawings, mentioned in the specifications or reasonably implied as necessary to complete his contract.

- D. Each Bidder shall visit site to become acquainted with adjacent areas; means of approach to the site; conditions of actual job site; and facilities for delivering, storing, placing and handling of materials and equipment. Bidders shall compare specifications and drawings with any work in place and inform themselves of all conditions affecting execution of work, including other work, if any, being performed.
- E. Unless otherwise specifically mentioned in various sections of specifications, base bids upon assumption that work will be performed during regular working hours. Owner requests firm lump sum base bid for work contemplated and as covered by these specifications and accompanying drawings. Separate lump sum base bids are required for each separate contract as indicated on the bid form.
- F. Electronic digital data files of the Contract Drawings will be provided by Architect/Engineers for Contractor's use in preparing submittals in PDF format only. CAD files WILL NOT be provided.
- G. Building Materials Sales Tax and Use Tax. Contractors are to follow State Law regarding sales and use tax exemption for the purchase of building materials.

#### 1.4 DISTRIBUTION TO PROSPECTIVE BIDDERS

- A. Instrument of Service (bidding documents) may be obtained in accordance with the Section 00 11 13 "Advertisement for Bids."

#### 1.5 BIDS

- A. Lump sum base bids will be received as indicated in Section 00 11 13 "Advertisement for Bids."
- B. Any amendments to bid form or appended thereto or any inclusion of any correspondence, written or printed matter, or details of any nature other than that specifically called for may disqualify bid. No telegraphic alterations to the bid will be accepted. No phone or faxed bids will be accepted.
- C. Building Materials Sales Tax and Use Tax:
  - 1. Contractors are to follow State Law regarding sales and use tax exemption for the purchase of building materials.
  - 2. The Burlington Community School District is an exempt entity for sales tax purposes pursuant to <https://www.tax.iowa.gov> and materials purchased by contractors for incorporation into any Burlington Community School District facility (other than roads, highways or streets) under a contract with the Burlington Community School District are similarly exempt from the imposition of sales taxes. Bids should NOT include sales tax on exempt materials or other tangible personal property which will become components of the facility. A copy of the Burlington Community School District Certificate of Tax Exempt Status (CES) will be provided to the successful bidder at the time of contracting for use in documenting tax-exempt purchases. The Contractors shall include any other (non-exempted) taxes, if applicable with the bid.
- D. Contracts will be awarded on the basis of base bid.
- E. Completing Bid Form: Bid Form shall be filled out by typing or writing in ink and signing in ink. Erasures or other changes in bid must be explained or noted over signature of Bidder. Bid Form containing any conditions, omissions, unexplained erasures or alterations, or items not called for in proposal or irregularities of any kind may disqualify bid. Bid amount shall be entered in both written words and printed figures in space provided on Bid Form and, in case of conflict, amount given in written words will control.

- F. Bidders shall not add any conditions or qualifying statements to the proposal or otherwise the proposal may be declared irregular as being not responsible to the Advertisement for Bids.
- G. All Contractors bidding as Prime Contractors shall obtain bid documents and Bid Form per Section 00 11 13 "Advertisement for Bids."
- H. Requirements of Signing: Each bid must include full business address of Bidder. Bids by corporation should be executed in full legal name of the corporation, giving state of incorporation, and be signed by an authorized officer or officers who shall, in each case, type or print his name and corporation title beneath his signature. Corporate bids should be sealed with the corporate seal and attested by the corporate secretary. Partnership bids should state the full names of all partners, e.g., "Smith and Jones, a partnership of John S. Smith and William R. Jones". Such bids must also be signed by an authorized partner or other representative, typing or printing the name of the signer and his title beneath the signature. Individual bids shall be submitted over the usual signature of the Bidder, with his name typed or printed beneath the signature followed by the words "Sole Proprietor". When requested by Owner, satisfactory evidence of agency or authority of any person signing on behalf of another must be furnished.
- I. Submission: Submit bid in sealed envelope. Contractor shall write on envelope the following information: Project name and number, indicate work covered by bid, and Bidder's name and address. Bids will be received and opened in accordance with Section 00 11 13 "Advertisement for Bids."
- J. The failure or omission of any Bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect to his bid.

#### 1.6 ACCEPTABLE BIDDERS/MATERIALS

- A. Materials are specified in the following ways:
  - 1. Where material is listed by manufacturer and trade name, with no qualifying statement, such material shall be furnished without substitution.
  - 2. Where more than one material or manufacturer is named, Bidder has option of selecting any one of the manufacturers or materials named.
  - 3. Where material is listed by description or by ASTM, any product meeting or exceeding requirements of such specification will be acceptable.

#### 1.7 SUBSTITUTIONS

- A. The materials, products and equipment described in the Bidding Documents establish a standard of function, dimension, appearance and quality to be met by any proposed substitution.
- B. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten (10) days prior to the bid date. Requests shall include the name of the material and/or equipment which it is to be substituted for and a complete description of the proposed material and/or equipment including drawings, performance and test data, and other information necessary for an evaluation. Include a statement stating changes in other materials, equipment or portions of the work, including changes in the work of other contracts that incorporation of the proposed substitution would require. The burden of proof of the proposed substitution is upon the requester. The Architect's decision of approval or disapproval of a proposed substitution shall be final.
  - 1. See Specification Section 00 26 00 "Procurement Substitution Procedures."
  - 2. See Specification Section 00 26 00 "Attachment - Substitution Request form."
  - 3. See Specification Section 01 25 00 "Substitution Procedures for additional information."

- C. If the Architect approves a proposed substitution prior to receipt of Bids, approval will be set forth in writing through an Addendum. Bidders shall not rely upon approvals made in any other manner.
- D. No substitutions will be considered after the Bid Date.

#### 1.8 BID GUARANTEE

- A. A certified check, a cashier's check or a bid bond payable to the Owner in an amount not less than five (5) percent of maximum bid shall accompany each bid as guarantee that if bid is accepted, the Bidder will file proposed contract and bond within ten (10) days after being notified of acceptance of bid. Company executing bid bond must be licensed to do business in the State of Iowa. Certified check or cashier's check shall be made payable to the Owner.
- B. If successful Bidder so files contract and bond, check will be returned to him. The successful Bidder, upon his failure or refusal to execute and deliver the contract and bonds required within ten days after he has received notice of the acceptance of his bid shall either, at Owner's option, forfeit to the Owner as liquidated damages for such failure or refusal the security deposited with his bid, it being agreed that the actual damages would be difficult to ascertain, or be liable for any loss or damage done to the Owner arising out of delay and the necessity of reletting or of reconstructing the work, including the excess of price obtained by such reletting over the Contractor's accepted bid.
- C. All check deposits, except those of the three lowest Bidders, will be returned to their makers within ten days after bid opening.
- D. Certified check deposits of three lowest Bidders will be returned immediately upon signing of contract and bond by successful Bidder.

#### 1.9 CONTRACT AND CONTRACT DOCUMENTS

- A. The successful Bidder will be required to enter into the AIA Document A101– 2017 Standard Form of Agreement Between Owner and Contractor. Bidders are requested to familiarize themselves with conditions therein and in AIA Document A201, General Conditions.
- B. See General Conditions of the Contract for Construction, subparagraph 1.1.1, for definition of contract documents.
- C. Contract will be awarded on basis of base bid only.
- D. In the bidding process, the Contractor shall assume the same quality and level of detail and finish in areas of the building not specifically shown or detailed.
- E. The Contractor shall provide a complete and functional building and building system whether or not fully specified or detailed. When questions arise during construction relating to the items not detailed on the architectural or engineering drawings, the Contractor shall submit a drawing or statement illustration of what the Contractor had anticipated in their bid for this particular detail. The illustration shall be submitted to the Architect for review.
- F. Overhead and Profit Allowance: The maximum allowable markup on a Change Order proposal for overhead and profit shall not exceed ten (10) percent on the combined work of the prime and sub-contractors. On that portion of the Work done under subcontract, the markup by the Prime Contractor shall not exceed five (5) percent.

1.10 WITHDRAWAL OF BIDS

- A. Bids may be withdrawn on written request received from Bidders prior to time fixed for opening. Negligence on part of Bidder in preparing bid confers no right for withdrawal of bid after it has been opened. Withdrawn bids will be returned unopened.
- B. All bids shall be effective and open for acceptance for period of sixty (60) days after date set for opening of bids.

1.11 RESERVATION

- A. The Owner reserves the right to reject any or all bids or to waive any irregularities in any bid or to accept any bid which will be to the best interests of Owner. Owner also reserves unrestricted privilege to reject any unit prices for additions to or deductions from scheduled amount of work as attached to the bid if they are considered excessive or unreasonable; or to accept, by including same in contract, any or all of such unit prices which may be considered fair and reasonable. The application of unit prices to add to or deduct from scheduled amount of work shall apply without limit.

1.12 INADEQUACIES AND OMISSIONS

- A. No oral explanation in regard to meaning of drawings and specifications will be made and no oral instructions will be given before award of contract. Bidders shall bring discrepancies, omissions, conflicts or doubt as to true meaning of any part of contract documents to attention of Architect by email only at least seven (7) working days before due date for bids. Prompt clarification will immediately be supplied to Bidders by addendum and receipt of each addendum shall be acknowledged on the Bid Form by each Bidder. All addenda so issued shall become part of contract documents.
- B. Neither Owner nor Architect will be responsible for oral instructions.

1.13 EMPLOYEE AND SCREENING IDENTIFICATION

- A. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- B. 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.

1.14 POWER OF ATTORNEY

- A. There must be submitted with each bid or contract bond executed by an attorney-in-fact, a certified and effectively dated copy of his power of attorney. Where the certification is by facsimile or otherwise does not bear an original signature, the Bidder's bonding company must be qualified for recognition under facsimile execution.

1.15 SEXUAL HARASSMENT

- A. The Contractor will have written sexual harassment policies that shall include, at a minimum, the following information: (i) the illegality of sexual harassment; (ii) the definition of sexual harassment, utilizing examples; (iii) an internal complaint process including penalties; (iv) the legal recourse,

investigative, and complaint process available through the Department of Human Rights and the Human Rights Commission; (v) directions on how to contact the Department and Commission; and (vi) protection against retaliation as provided by the Iowa Human Rights Act. A copy of the policies shall be provided to the Buyer upon request.

1.16 SUBSTANCE ABUSE/DRUG FREE WORKPLACE ACT

- A. The Bidders are required to comply with U.S. DOT Drug Free Workplace Acts, and U.S. DOT regulations, "Drug Free Workplace Requirements (Grants), "49 C.F.R. Part 29, Subpart F, and other U.S. DOT and FTA regulations and guidance pertaining to substance abuse (drugs and alcohol) that may be promulgated, and has signed a Drug Free Workplace Certification attesting to that compliance.
- B. The Drug Free Workplace Act requires that no contractor shall be considered for the purposes of being awarded a contract or agreement for the procurement of property or services, unless that contractor has certified that it will provide a drug free workplace. False certification or violation of the certification may result in sanctions including, but not limited to, suspension of contract payments, termination of contract, and debarment of contracting opportunities with the State for at least one (1) year, but not more than five (5) years. The Contractor by submittal of a Bid/Proposal, certifies that it is in compliance with the regulations and policy implementation of the Drug Free Workplace Act. A certification form is normally included with the Exhibits section of the IFB/RFP/RFQ solicitation.

1.17 DOMESTIC PREFERENCE

- A. 2 CFR § 200.322 Domestic preferences for procurements.
  - 1. (a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.
  - 2. (b) For purposes of this section:
    - B. (1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
    - C. (2) "Manufactured products" means items and construction materials composed in whole or in part of nonferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

1.18 AUDIT AND INSPECTION OF RECORDS

- A. The Contractor shall permit the authorized representatives of the Buyer(s) to inspect and audit all data and records of the Contractor relating to the Contractor's performance under any subsequent contract or agreement. This applies to all third party contract records (at any tier), as required.
- B. The Contractor shall maintain verifiable records which include all Project eligible costs incurred while completing those tasks contained in any contracted Scope of Work. The Contractor shall retain all books, records, documents, and other material relevant to any subsequent contract or agreement for a period of five (5) calendar years following the Buyer's final payment and all other pending matters are closed. The Contractor agrees that the Buyer or its designee shall have full access and the right to examine any of said records at all reasonable times during said period.



- C. If any litigation, claim, negotiation, audit, or other action involving any contract or agreement for a Project's records has been initiated prior to the expiration of the five-year period, the Contractor shall retain the appropriate records of the Project for the five-year period immediately following completion of the action and resolution of all issues arising from it.

1.19 LEAD FREE

- A. All contractors shall refer to the Federal EPA guidelines as noted in 40CFR Part 745. Contractors shall be lead certified firms. There shall be a Certified Renovator at the job site as required. Contractor shall take all necessary tests, samples, etc. and follow all lead safe policies and practices.

1.20 CRYSTALLINE SILICA RULE

- A. All contractors shall comply with OSHA Crystalline Silica Rule. Provide engineering controls and protection of workers and other individuals at the site. Collect all run-off water and properly dispose of. Protect existing and new materials from damage by water. Repair all damage.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 21 13

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DOCUMENT 00 26 00 - PROCUREMENT SUBSTITUTION PROCEDURES

1.1 DEFINITIONS

- A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Procurement and Contracting Documents, submitted prior to receipt of bids.
- B. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award. See Section 01 25 00 "Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

1.2 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.

1.3 PROCUREMENT SUBSTITUTIONS

- A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.
- B. Procurement Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:
  - 1. Extensive revisions to the Contract Documents are not required.
  - 2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
  - 3. The request is fully documented and properly submitted.

1.4 SUBMITTALS

- A. Procurement Substitution Request: Submit to Architect. Procurement Substitution Request must be made in writing by prime contract Bidder only in compliance with the following requirements:
  - 1. Requests for substitution of materials and equipment will be considered if received no later than ten (10) days prior to date of bid opening.
    - a. Submit Substitution Request Form to Nathan Stark at [nstark@brayarch.com](mailto:nstark@brayarch.com) at Bray Associates-Architects, Inc., 829 South 1st Street, Milwaukee, WI 53204.
  - 2. Submittal Format: Submit one (1) copy of each written Procurement Substitution Request, using CSI Substitution Request Form 1.5C.
    - a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and drawing numbers.

- b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
  - 1) List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
  - 2) Product data, including drawings and descriptions of products and fabrication and installation procedures.
  - 3) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
  - 4) Copies of current, independent third-party test data of salient product or system characteristics.
  - 5) Samples where applicable or when requested by Architect.
  - 6) Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. 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.
  - 7) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - 8) Research reports, where applicable, evidencing compliance with building code in effect for Project, from ICC-ES.
  - 9) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.
- c. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
- d. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.

B. Architect's Action:

1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Procurement and Contracting Documents.

- C. Architect's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

END OF DOCUMENT 00 26 00

# SUBSTITUTION REQUEST

(During the Bidding/Negotiating Phase)



<b>PROJECT:</b> _____ _____ <b>TO:</b> _____ _____ <b>RE:</b> _____	<b>SUBSTITUTION REQUEST NUMBER:</b> _____ <b>FROM:</b> _____ <b>DATE:</b> _____ <b>A/E PROJECT NUMBER:</b> _____ <b>CONTRACT FOR:</b> _____
---	---

<b>SPECIFICATION TITLE:</b> _____	<b>DESCRIPTION:</b> _____
<b>SECTION:</b> _____	<b>PAGE:</b> _____
<b>ARTICLE/PARAGRAPH:</b> _____	

**PROPOSED SUBSTITUTION:** \_\_\_\_\_

**MANUFACTURER:** \_\_\_\_\_ **ADDRESS:** \_\_\_\_\_ **PHONE:** \_\_\_\_\_

**TRADE NAME:** \_\_\_\_\_ **MODEL NO.:** \_\_\_\_\_

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.  
 Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

- The Undersigned certifies:
- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
  - Same warranty will be furnished for proposed substitution as for specified product.
  - Same maintenance service and source of replacement parts, as applicable, is available.
  - Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
  - Proposed substitution does not affect dimensions and functional clearances.
  - Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

**SUBMITTED BY:** \_\_\_\_\_

**SIGNED BY:** \_\_\_\_\_

**FIRM:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**TELEPHONE:** \_\_\_\_\_

**A/E's REVIEW AND RECOMMENDATION:**

- Approve Substitution—Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures.
- Approve Substitution as noted—Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures.
- Reject Substitution—Use specified materials.
- Substitution Request received too late—Use specified materials.

**SIGNED BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**SUPPORTING DATA ATTACHED:**     Drawings     Product Data     Samples     Tests     Reports     \_\_\_\_\_



DOCUMENT 00 31 13 - PRELIMINARY SCHEDULES

1.1 PROJECT SCHEDULE

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but do not affect Contract Time requirements. This Document and its attachments are not part of the Contract Documents.
- B. Available Project information includes the following:
1. Project Schedule.
- C. Project schedule including design and construction milestones are as follows:

**Documents, Bidding and Contract:**

Bid Documents Issued	Monday, August 5, 2024
Addendum No. 1	Friday, August 16, 2024
Bid Due	Thursday, August 22, 2024, 11:00 AM
Contract Award and Signing (Tentative)	Monday, August 26, 2024

**Proposed Construction Milestones:**

Proposed Start of Construction	Tuesday, September 3, 2024
Proposed Substantial Completion	Friday, October 18, 2024
First Day of School with Staff	Tuesday, August 20, 2024

END OF DOCUMENT 00 31 13

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DOCUMENT 00 41 13 - BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

1.1 BID INFORMATION

- A. Bidder: \_\_\_\_\_.
- B. Project Name: Burlington CSD - Elementary School Secure Entry Improvements.
- C. Project Locations:
  - 1. Grimes Elementary School  
800 South St,  
Burlington, IA 52601
  - 2. North Hill Elementary School  
825 N. 9th St  
Burlington, IA 52601
  - 3. Sunnyside Elementary School  
2040 Sunnyside Ave  
Burlington, IA 52601
- D. Owner: Burlington Community School District.
- E. Architect: Bray Associates-Architects, Inc.
- F. Architect Project Number: 3700.

1.2 CERTIFICATIONS AND BASE BID

- A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by Bray Associates Architects, Inc. and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. \_\_\_\_\_ Dollars (\$ \_\_\_\_\_).

All trades not included below ..... \$ \_\_\_\_\_

Electrical..... \$ \_\_\_\_\_

- B. The Owner reserves the right to accept or reject any or all of the above proposals.

1.3 SALES AND USE TAX

- A. Contractors are to follow State Law regarding sales and use tax exemption for the purchase of building materials.

- B. The Burlington Community School District is an exempt entity for sales tax purposes pursuant to <https://www.tax.iowa.gov> and materials purchased by contractors for incorporation into any Burlington Community School District facility (other than roads, highways or streets) under a contract with the Burlington Community School District are similarly exempt from the imposition of sales taxes. Bids should NOT include sales tax on exempt materials or other tangible personal property which will become components of the facility. A copy of the Burlington Community School District Certificate of Tax Exempt Status (CES) will be provided to the successful bidder at the time of contracting for use in documenting tax-exempt purchases. The Contractors shall include any other (non-exempted) taxes, if applicable with the bid.

#### 1.4 BID SECURITY

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within ten (10) days after a written Notice of Award, if offered within sixty (60) days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five (5) percent of the Base Bid amount above:

1. \_\_\_\_\_ Dollars (\$\_\_\_\_\_).

- B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

#### 1.5 SUBCONTRACTORS AND SUPPLIERS

- A. Submit proposed subcontractors as required by Section 00 43 36 "List of Proposed Subcontractors."

#### 1.6 TIME OF COMPLETION

- A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and shall fully complete the Work within the duration as indicated in the Owner Contractor Agreement.

#### 1.7 ACKNOWLEDGEMENT OF ADDENDA

- A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

1. Addendum No. 1, dated \_\_\_\_\_.
2. Addendum No. 2, dated \_\_\_\_\_.

#### 1.8 BID SUPPLEMENTS

- A. The following supplements are a part of this Bid Form and are attached hereto.

1. Bid Form Supplement: Allowances.
2. Bid Form Supplement: Bid Bond Form (AIA Document A310-2010).
3. Bid Form Supplement: List of Proposed Subcontractors

1.9 CONTRACTOR'S LICENSE

- A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in the State of Iowa and City of Burlington, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.10 REJECTION OF BIDS

- A. The Owner reserves the right to accept or reject any or all of the above proposals.

1.11 SUBMISSION OF BID

- A. Respectfully submitted this \_\_\_\_ day of \_\_\_\_\_, 2024.
- B. Submitted By: \_\_\_\_\_ (Name of bidding firm or corporation).
- C. Authorized Signature: \_\_\_\_\_ (Handwritten signature).
- D. Signed By: \_\_\_\_\_ (Type or print name).
- E. Title: \_\_\_\_\_ (Owner/Partner/President/Vice President).
- F. Witnessed By: \_\_\_\_\_ (Handwritten signature).
- G. Attest: \_\_\_\_\_ (Handwritten signature).
- H. By: \_\_\_\_\_ (Type or print name).
- I. Title: \_\_\_\_\_ (Corporate Secretary or Assistant Secretary).
- J. Street Address: \_\_\_\_\_.
- K. City, State, Zip: \_\_\_\_\_.
- L. Phone: \_\_\_\_\_.
- M. License No.: \_\_\_\_\_.
- N. Federal ID No.: \_\_\_\_\_ (Affix Corporate Seal Here).

END OF DOCUMENT 00 41 13

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# Bidder Status Form

## To be completed by all bidders

## Part A

Please answer "Yes" or "No" for each of the following:

- Yes  No My company is authorized to transact business in Iowa.  
*(To help you determine if your company is authorized, please review the worksheet on the next page).*
- Yes  No My company has an office to transact business in Iowa.
- Yes  No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.
- Yes  No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.
- Yes  No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

If you answered "No" to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

## To be completed by resident bidders

## Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ to \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Dates: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ to \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Dates: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ to \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Address: \_\_\_\_\_

*You may attach additional sheet(s) if needed.* City, State, Zip: \_\_\_\_\_

## To be completed by non-resident bidders

## Part C

1. Name of home state or foreign country reported to the Iowa Secretary of State:

\_\_\_\_\_

2. Does your company's home state or foreign country offer preferences to bidders who are residents?  Yes  No

3. If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

\_\_\_\_\_

\_\_\_\_\_

*You may attach additional sheet(s) if needed.*

## To be completed by all bidders

## Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Firm Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**You must submit the completed form to the governmental body requesting bids  
per 875 Iowa Administrative Code Chapter 156.**

**This form has been approved by the Iowa Labor Commissioner.**

## Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

- Yes  No My business is currently registered as a contractor with the Iowa Division of Labor.
- Yes  No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.
- Yes  No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
- Yes  No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
- Yes  No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.
- Yes  No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
- Yes  No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.
- Yes  No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.
- Yes  No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.
- Yes  No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
- Yes  No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

DOCUMENT 00 43 13 - BID SECURITY FORM

1.1 BID FORM SUPPLEMENT

- A. A completed bid bond form is required to be attached to the Bid Form.

1.2 BID BOND FORM

- A. AIA Document A310-2010 "Bid Bond" is the recommended form for a bid bond. A bid bond acceptable to Owner, or other bid security as described in the Instructions to Bidders, is required to be attached to the Bid Form as a supplement.
- B. Copies of AIA standard forms may be obtained from The American Institute of Architects; <https://www.aiacontracts.org/>; email: [docspurchases@aia.org](mailto:docspurchases@aia.org); (800) 942-7732.

END OF DOCUMENT 00 43 13

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DOCUMENT 00 43 21 - ALLOWANCE FORM

1.1 BID INFORMATION

- A. Bidder: \_\_\_\_\_.
- B. Project Name: Burlington CSD - Elementary School Secure Entry Improvements.
- C. Project Locations:
  - 1. Grimes Elementary School  
800 South St,  
Burlington, IA 52601
  - 2. North Hill Elementary School  
825 N. 9th St  
Burlington, IA 52601
  - 3. Sunnyside Elementary School  
2040 Sunnyside Ave  
Burlington, IA 52601
- D. Owner: Burlington Community School District.
- E. Architect: Bray Associates-Architects, Inc.
- F. Architect Project Number: 3700.

1.2 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.
- B. The undersigned Bidder certifies that Base Bid submission to which this Bid Supplement is attached includes those allowances described in the Contract Documents and scheduled in Section 01 21 00 "Allowances."

1.3 SUBMISSION OF BID SUPPLEMENT

- A. Respectfully submitted this \_\_\_\_ day of \_\_\_\_\_, 2024.
- B. Submitted By: \_\_\_\_\_ (Insert name of bidding firm or corporation).
- C. Authorized Signature: \_\_\_\_\_ (Handwritten signature).
- D. Signed By: \_\_\_\_\_ (Type or print name).
- E. Title: \_\_\_\_\_ (Owner/Partner/President/Vice President).

END OF DOCUMENT 00 43 21

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SECTION 00 52 00 – AGREEMENT FORM

1.1 FORM OF AGREEMENT

A. The following form of Owner/Contractor Agreement shall be used for the Project:

1. AIA Document A101-2017 "Standard Form of Agreement between Owner and Contractor Where the Basis of Payment is a Stipulated Sum", as provided by the Owner.

END OF SECTION 00 52 00

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SECTION 00 61 13 – PERFORMANCE AND PAYMENT BOND

1.1 ADMINISTRATIVE FORMS

- A. Administrative Forms: Additional administrative forms are specified in Division 01 General Requirements.
- B. Copies of AIA standard forms may be obtained from the American Institute of Architects; [www.aiacontractdocsaiacontracts.org](http://www.aiacontractdocsaiacontracts.org); (800) 942-7732.
- C. Preconstruction Forms:
  - 1. Form of Performance Bond and Labor and Material Bond: AIA Document A312-2010 "Performance Bond" and "Payment Bond."

END OF SECTION 00 61 13

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SECTION 00 72 00 – GENERAL CONDITIONS OF THE CONTRACT

1.1 GENERAL CONDITIONS

A. The following form of the General Conditions shall be used for the Project:

1. The General Conditions for Project are AIA Document A201-2017 "General Conditions of the Contract for Construction."

END OF SECTION 00 72 00

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SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Project information.
  - 2. Work covered by Contract Documents.
  - 3. Contractor's use of site and premises.
  - 4. Coordination with occupants.
  - 5. Work restrictions.
  - 6. Specification and Drawing conventions.
  - 7. Miscellaneous provisions.

1.3 DEFINITIONS

- A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.4 PROJECT INFORMATION

- A. Project Identification: Burlington CSD - Elementary School Secure Entry Improvements.
  - 1. Project Locations:
    - a. Grimes Elementary School  
800 South St,  
Burlington, IA 52601
    - b. North Hill Elementary School  
825 N. 9th St  
Burlington, IA 52601
    - c. Sunnyside Elementary School  
2040 Sunnyside Ave  
Burlington, IA 52601
- B. Owner: Burlington Community School District.
- C. Architect: Bray Associates-Architects, Inc. 829 South 1st Street, Milwaukee, Wisconsin 53204. Phone: 414-226-0200.

1. Architect's Representative: Nathan Stark, Email: [nstark@brayarch.com](mailto:nstark@brayarch.com).
- D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:
  1. Electrical: MSA Professional Services, Inc., Kiel, Wisconsin (920) 894-7800
- E. Web-Based Project Software: Project software will be used for purposes of managing communication and documents during the construction stage.
  1. See Section 01 31 00 "Project Management and Coordination." for requirements for using web-based Project software.

#### 1.5 BUILDING MATERIALS SALES TAX AND USE TAX

Contractors are to follow State Law regarding sales and use tax exemption for the purchase of building materials.

The Burlington Community School District is an exempt entity for sales tax purposes pursuant to <https://www.tax.iowa.gov> and materials purchased by contractors for incorporation into any Burlington Community School District facility (other than roads, highways or streets) under a contract with the Burlington Community School District are similarly exempt from the imposition of sales taxes. Bids should NOT include sales tax on exempt materials or other tangible personal property which will become components of the facility. A copy of the Burlington Community School District Certificate of Tax Exempt Status (CES) will be provided to the successful bidder at the time of contracting for use in documenting tax-exempt purchases. The Contractors shall include any other (non-exempted) taxes, if applicable with the bid.

#### 1.6 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
  1. Renovations to three elementary schools to create secure vestibules.
- B. Type of Contract:
  1. Project will be constructed under a single prime contract.

#### 1.7 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Restricted Use of Site: 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.
- B. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  1. Limits on Use of Site: Confine construction operations to areas as noted on drawings.
  2. 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 for 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 on-site.
- C. 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.
- D. 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.

#### 1.8 COORDINATION WITH OCCUPANTS

- A. 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 seventy-two (72) hours' notice to Owner of activities that will affect Owner's operations.
- B. 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.

#### 1.9 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
- 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to between 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
- 1. Weekend Hours: As directed by Owner.

2. Early Morning Hours: As directed by Owner and complying with regulations of authorities having jurisdiction.
  3. Work in Existing Building: As directed by Owner.
  4. Hours for Utility Shutdowns: As directed by Owner and complying with regulations of authorities having jurisdiction.
  5. Hours for Core Drilling or other noisy activity: As directed by Owner and complying with regulations of authorities having jurisdiction.
- 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 arranging for temporary utility services according to requirements indicated:
1. Notify Architect and Owner not less than two (2) days in advance of proposed utility interruptions.
  2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
1. Notify Architect and Owner not less than two (2) days in advance of proposed disruptive operations.
  2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances within the building or on Project site is not permitted.
- F. Firearms Restrictions: No firearms allowed within the building or on Project site.
- 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 requirements of Section 01 14 13 "Background Check Requirements."

#### 1.10 SPECIFICATION AND DRAWING CONVENTIONS

- A. 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. Imperative mood and streamlined language are generally used in the Specifications. 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.
  2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
  3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
  4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. 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 and published as part of the U.S. National CAD Standard.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

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SECTION 01 14 13 – BACKGROUND CHECK REQUIREMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDE

- A. The Contractor shall be responsible for conducting a criminal background check, for Burlington Community School District as to all persons working in buildings or at the site. This includes all employees of the Contractor or any subcontractor, all independent contractors, casual laborers, workers obtained through Union Halls or Hiring Halls, and all other individuals present on the property at any time during the performance of the contract.
- B. No person shall be permitted to work on the Owner's property who has been convicted of a felony or who is on the Sex Offender Registry for any state.
- C. The Contractor must have records submitted to the Owner to inspect. The Owner reserves the right to order the Contractor to remove any person from the Owner's work who the Owner determines to be a threat. All workers must follow Owner's regulations and rules as to building access and security.

1.2 IOWA CRIMINAL BACKGROUND CHECK

- A. Criminal Background Checks are conducted by Iowa Department of Public Safety, Division of Criminal Investigation:

<https://dps.iowa.gov/divisions/criminal-investigation/criminal-history/record-check-forms>

Current cost is \$15.00, to be paid by contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 14 13

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SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
  - 1. Lump-sum allowances.
  - 2. Contingency allowances.

1.3 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

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

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 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. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

#### 1.7 LUMP-SUM 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 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 or selected by Architect 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 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.
- D. At Project closeout, credit unused amounts remaining in the contingency 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, required maintenance materials, 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 markups.
  - 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 due to a change in the 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. Allowance No. 1: Lump-Sum Allowance: Include the sum of One Thousand Dollars (\$1,000) for door signage.
  1. This allowance includes material cost receiving, handling, and installation and Contractor overhead and profit.
- B. Allowance No. 2: Contingency Allowance: Include a contingency allowance of Ten Thousand Dollars (\$10,000.00) for use according to Owner's written instructions.

END OF SECTION 01 21 00

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SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
  - 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 to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit documentation identifying 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 CSI Form 13.1A.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product, fabrication, or installation method cannot be provided, if applicable.
    - b. Coordination of 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 substitutions 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 as well as 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 ICC-ES.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitutions 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.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within five (5) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within five (5) days of receipt of request, or five (5) days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

#### 1.5 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.

#### 1.6 PROCEDURES

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

#### 1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen (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. Substitution request is fully documented and properly submitted.
    - c. Requested substitution will not adversely affect Contractor's construction schedule.
    - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - e. Requested substitution is compatible with other portions of the Work.
    - f. Requested substitution has been coordinated with other portions of the Work.



- g. Requested substitution provides specified warranty.
- h. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

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SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.3 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 Architect's form titled "Project Supplement".

1.4 PROPOSAL REQUESTS

- A. 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 costs of labor 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 acceptable to Architect.

1.5 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.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 PROJECT SUPPLEMENTS

- A. Project Supplements: Architect will issue Project Supplements on the Architect's form. The Project Supplement instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - 1. Project Supplement 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 Project Supplements.
  - 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 01 26 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 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.

1.4 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 (7) days before the date scheduled for submittal of initial Applications for 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. Owner's name.
    - c. Owner's Project number.
    - d. Name of Architect.
    - e. Architect's Project number.
    - f. Contractor's name and address.
    - g. Date of submittal.
  - 2. Arrange schedule of values consistent with format of AIA Document G703.
  - 3. Provide a breakdown of the Contract Sum using the Description of Work Categories listed in the attached schedule (at a minimum) for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five (5) percent of the Contract Sum.
  - 4. 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.
5. 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.
6. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
7. Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
8. Temporary Facilities: 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. 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.

#### 1.5 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 indicated in the Owner/Contractor Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. 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.
- E. 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.
- F. Transmittal: Submit two (2) signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within twenty-four (24) hours. One (1) copy shall include waivers of lien and similar attachments if required.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. 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.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of values.
  - 3. Contractor's construction schedule (preliminary if not final).
  - 4. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
  - 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.
- I. 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.

- a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 01 77 00 "Closeout Procedures."
  2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. 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. Certification of completion of final punch list items.
  3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  4. Updated final statement, accounting for final changes to the Contract Sum.
  5. AIA Document G706.
  6. AIA Document G706A.
  7. AIA Document G707.
  8. Evidence that claims have been settled.
  9. Proof that taxes, fees, and similar obligations are paid.
  10. Waivers and releases.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00



SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
  - 1. General coordination procedures.
  - 2. RFIs.
  - 3. Digital project management procedures.
  - 4. Web-based Project management software package.
  - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

1.3 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 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.
- B. Key Personnel Names: Within five (5) 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, 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, in web-based Project software directory, and in prominent location in each built facility. Keep list current at all times.

## 1.5 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.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Preinstallation conferences.
  - 7. Project closeout activities.
  - 8. Startup and adjustment of systems.

## 1.6 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

- A. Ambiguity or conflict in description of quality or quantity shall be resolved in favor of the better quality or greater quantity.
- B. In the case where the materials specified or shown on the Drawings will be provided by more than one subcontractor, each subcontractor shall provide the item. Architect will determine who will ultimately provide work and who shall submit credit for work.
- C. Each subcontractor must provide all work and materials which any section or part of the plans, drawings, specifications and conditions require regardless of whether or not such requirement is faithfully repeated in other parts or sections thereof to which the provision might be appropriate.

## 1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  - 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.

2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Owner name.
  3. Owner's Project number.
  4. Name of Architect.
  5. Architect's Project number.
  6. Date.
  7. Name of Contractor.
  8. RFI number, numbered sequentially.
  9. RFI subject.
  10. Specification Section number and title and related paragraphs, as appropriate.
  11. Drawing number and detail references, as appropriate.
  12. Field dimensions and conditions, as appropriate.
  13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  14. Contractor's signature.
  15. 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.
- C. RFI Forms: AIA Document G716.
1. Attachments shall be electronic files in PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven (7) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.
    - f. Requests for interpretation of Architect's actions on submittals.
    - g. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
  3. 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 five (5) days of receipt of the RFI response.

- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of web-based Project management software. Software log to contain 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 Architect's response was received.
  8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
- F. 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 three (3) days if Contractor disagrees with response.

#### 1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Architect's Data Files Not Available: Architect will not provide Architect's BIM model digital data files for Contractor's use during construction.
- B. Web-Based Project Management Software Package: Use web-based Project management software package as indicated in Section 01 33 00. 13 "Electronic Submittal Procedures" for purposes of hosting and managing Project communication and documentation until Final Completion.
- C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare 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.
  3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

#### 1.9 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 times a minimum of seven days prior to meeting.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than ten (10) days after execution of the Agreement.

1. 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.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Responsibilities and personnel assignments.
    - b. Tentative construction schedule.
    - c. Phasing.
    - d. Critical work sequencing and long lead items.
    - e. Designation of key personnel and their duties.
    - f. Lines of communications.
    - g. Use of web-based Project software.
    - h. Procedures for processing field decisions and Change Orders.
    - i. Procedures for RFIs.
    - j. Procedures for testing and inspecting.
    - k. Procedures for processing Applications for Payment.
    - l. Distribution of the Contract Documents.
    - m. Submittal procedures.
    - n. Preparation of Record Documents.
    - o. Use of the premises and existing building.
    - p. Work restrictions.
    - q. Working hours.
    - r. Owner's occupancy requirements.
    - s. Responsibility for temporary facilities and controls.
    - t. Procedures for moisture and mold control.
    - u. Procedures for disruptions and shutdowns.
    - v. Construction waste management and recycling.
    - w. Parking availability.
    - x. Office, work, and storage areas.
    - y. Equipment deliveries and priorities.
    - z. First aid.
    - aa. Security.
    - bb. Progress cleaning.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise 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. Space and access limitations.
  - r. Regulations of authorities having jurisdiction.
  - s. Testing and inspecting requirements.
  - t. Installation procedures.
  - u. Coordination with other work.
  - v. Required performance results.
  - w. Protection of adjacent work.
  - x. 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.
  - 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.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than twenty (20) 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 the following:
    - a. Preparation of Record Documents.
    - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    - c. Procedures for completing and archiving web-based Project software site data files.
    - d. Submittal of written warranties.
    - e. Requirements for preparing operations and maintenance data.
    - f. Requirements for delivery of material samples, attic stock, and spare parts.
    - g. Requirements for demonstration and training.
    - h. Preparation of Contractor's punch list.
    - i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    - j. Submittal procedures.
    - k. Coordination of separate contracts.
    - l. Owner's partial occupancy requirements.
    - m. Installation of Owner's furniture, fixtures, and equipment.
    - n. Responsibility for removing temporary facilities and controls.
  - 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

- E. 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) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site use.
      - 8) Temporary facilities and controls.
      - 9) Progress cleaning.
      - 10) Quality and work standards.
      - 11) Status of correction of deficient items.
      - 12) Field observations.
      - 13) Status of RFIs.
      - 14) Status of Proposal Requests.
      - 15) Pending changes.
      - 16) Status of Change Orders.
      - 17) Pending claims and disputes.
      - 18) 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.
    - 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 01 31 00

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SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Startup construction schedule.
  - 2. Contractor's Construction Schedule.
  - 3. Construction schedule updating reports.
  - 4. Daily construction reports.
  - 5. Material location reports.
  - 6. Site condition reports.
  - 7. Unusual event reports.

1.3 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. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
- 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. Resource Loading: The allocation of labor and equipment necessary for completing an activity as scheduled.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
  - 1. Working electronic copy of schedule file.
  - 2. PDF file.
- B. Startup construction schedule.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
  - 1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- E. Construction Schedule Updating Reports: Submit with Applications for Payment.
- F. Daily Construction Reports: Submit at weekly intervals.
- G. Material Location Reports: Submit at monthly intervals.
- H. Site Condition Reports: Submit at time of discovery of differing conditions.
- I. Unusual Event Reports: Submit at time of unusual event.
- J. Qualification Data: For scheduling consultant.

#### 1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in scheduling and reporting, with capability of producing reports and diagrams within twenty-four (24) hours of Architect's request.
- B. 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 the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
  - 1. Review software limitations and content and format for reports.
  - 2. Verify availability of qualified personnel needed to develop and update schedule.
  - 3. Discuss constraints, including phasing, work stages, area separations, interim milestones, 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.

#### 1.6 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, 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.

#### 1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
  1. Use scheduling component of Project management software package specified in Section 01 31 00 "Project Management and Coordination," for current Windows operating system.
- B. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting.
  1. In-House Option: Owner may waive requirement to retain a consultant if Contractor employs skilled personnel with experience in scheduling and reporting techniques. Submit qualifications.
  2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- C. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.
  1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- D. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
  1. Activity Duration: Define activities so no activity is longer than twenty (20) days, unless specifically allowed by Architect.
  2. Temporary Facilities: Indicate start and completion dates for the following as applicable:
    - a. Securing of approvals and permits required for performance of the Work.
    - b. Temporary facilities.
    - c. Construction of mock-ups, prototypes and samples.
    - d. Regulatory agency approvals.
    - e. Punch list.
  3. Procurement Activities: Include procurement process activities for the following long lead-time items and major items, requiring a cycle of more than sixty (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. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
  6. Punch List and Final Completion: Include not more than thirty (30) days for completion of punch list items and Final Completion.
- E. 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. 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. Environmental control.
  2. 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. Startup and placement into final use and operation.
  3. 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 to provide for the following:
    - a. Completion of electrical installation.
    - b. Substantial Completion.
- F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- G. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
1. See Section 01 29 00 "Payment Procedures" for cost reporting and payment procedures.
- H. Upcoming Work Summary: 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 the Contract Time.
- I. Contractor's Construction Schedule Updating: At biweekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
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.
- J. Recovery Schedule: When periodic update indicates the Work is fourteen (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, equipment required to achieve compliance, and date by which recovery will be accomplished.
- K. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
  2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.
- 1.8 STARTUP CONSTRUCTION SCHEDULE
- A. Gantt-Chart Schedule: Submit startup, horizontal, Gantt-chart-type construction schedule within seven days of date established for the Notice of Award.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first ninety (90) days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- 1.9 GANTT-CHART SCHEDULE REQUIREMENTS
- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within thirty (30) days of date established for the Notice to Proceed.
1. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in ten (10) percent increments within time bar.

1.10 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. Testing and inspection.
  8. Accidents.
  9. Meetings and significant decisions.
  10. Unusual events.
  11. Stoppages, delays, shortages, and losses.
  12. Emergency procedures.
  13. Orders and requests of authorities having jurisdiction.
  14. Change Orders received and implemented.
  15. Work Change Directives (Project Supplements) received and implemented.
  16. Equipment or system tests and startups.
  17. Partial completions and occupancies.
  18. Substantial Completions authorized.
- 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. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Unusual Event Reports: 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. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
1. Submit unusual event reports directly to Owner within one (1) day of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 32 00

## SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Concealed Work photographs.
3. Periodic construction photographs.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Digital Photographs: Submit image files within three days of taking photographs.

1. Submit photos by uploading to web-based Project management software site. 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 and contact information for photographer.
  - c. Name of Architect.
  - d. Name of Contractor.
  - e. Date photograph was taken.
  - f. Description of location, vantage point, and direction.
  - g. Unique sequential identifier keyed to accompanying key plan.

#### 1.4 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels. Use flash in low light levels or backlit conditions.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- C. File Names: Name media files with date and project area and sequential numbering suffix.

#### 1.5 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.

- B. General: Take photographs with maximum depth of field and in focus.
- C. 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 construction limits 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.
- D. 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. Piping.
  - 2. Electrical conduit.
- E. Periodic Construction Photographs: Take twenty (20) photographs monthly 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.
- F. Time-Lapse Sequence Construction Photographs: Take twenty (20) photographs as indicated, to show status of construction and progress since last photographs were taken.
  - 1. Frequency: Take photographs monthly, on the same date each month.
  - 2. Vantage Points: Following suggestions by Architect and Contractor, photographer shall select vantage points. During each of the following construction phases, take not less than two of the required shots from same vantage point each time, to create a time-lapse sequence as follows:
    - a. Commencement of the Work, through completion of subgrade construction.
    - b. Interior Work, through date of Substantial Completion.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 32 33



## SECTION 01 33 00 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Submittal schedule requirements.
  - 2. Administrative and procedural requirements for submittals.

#### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

#### 1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
  - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  - 2. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first sixty (60) days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  - 3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
  - 4. Format: Arrange the following information in a tabular format:

- a. Scheduled date for first submittal.
- b. Specification Section number and title.
- c. Submittal Category: Action; informational.
- d. Name of subcontractor.
- e. Description of the Work covered.
- f. Scheduled date for Architect's final release or approval.

## 1.5 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
  2. Date.
  3. Name of Architect.
  4. Name of General Contractor.
  5. Name of subcontractor.
  6. Name of firm or entity that prepared submittal.
  7. Names of subcontractor, manufacturer, and supplier.
  8. Unique submittal number, including revision identifier and material tag. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
    - a. E.g. XXXX-04 20 00.01, Resubmittals: XXXX-04 20 00.01.A.
  9. Category and type of submittal.
  10. Submittal purpose and description.
  11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
  12. Drawing number and detail references, as appropriate.
  13. Indication of full or partial submittal.
  14. Location(s) where product is to be installed, as appropriate.
  15. Other necessary identification.
  16. Remarks.
  17. Signature of transmitter.
- B. Options: Identify options requiring selection by Architect.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
1. Submit all submittal types Action and Informational; including but not limited to Shop Drawings, Samples and Product Data sheets in a minimum of one (1) package up to three (3) packages (permitting for material receipt from suppliers). Exceptions to this include items needing to be reviewed in phases such as "Millwork" or "Casework."
- E. Submittals Utilizing Web-Based Project Software: Prepare submittals as PDF files or other format indicated by Project management software.

1.6 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
  - 1. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project management software website. Enter required data in web-based software site to fully identify submittal. Ensure permissions of access by the Architect's team members is complete.
- B. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided in PDF format by Architect for Contractor's use in preparing submittals. CAD files will not be provided except for reflected ceilings to the Fire Protection contractor for preparation of their submittal to the State.
- C. 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 all 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 together under one transmittal.
  - 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, 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.
- D. 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 ten (10) days for initial review of each submittal. Submittals received after 1:00 PM will be considered as received the following working day. 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. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  - 3. Resubmittal Review: Allow ten (10) days for review of each resubmittal.
  - 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow twenty-one (21) days for initial review of each submittal.
  - 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow ten (10) days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
    - a. Submit one (1) copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- E. 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.
- F. 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.
- G. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

#### 1.7 SUBMITTAL REQUIREMENTS

- A. 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 unsuitable for use, submit as Shop Drawings, not as Product Data.
  2. Submit product data in PDF electronic file format.
  3. Mark each copy of each submittal to show which products and options are applicable.
  4. 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.
  5. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams that show factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  6. Submit Product Data before Shop Drawings, and concurrently with Samples.
- B. 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 on 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.
- C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
- 1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
  - 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
    - a. Project name and submittal number.
    - b. Generic description of Sample.
    - c. Product name and name of manufacturer.
    - d. Sample source.
    - e. Number and title of applicable Specification Section.
    - f. Specification paragraph number and generic name of each item.
  - 3. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
  - 4. Disposition: 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 property of Contractor.
  - 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one (1) full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
    - b. Architect may request additional material samples or color charts, as required.
  - 6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.
      - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least two (2) sets of paired units that show approximate limits of variations.

- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  2. Manufacturer and product name, and model number if applicable.
  3. Number and name of room or space.
  4. Location within room or space.
- E. 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.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
1. Certificates and Certifications Submittals: Submit 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. Provide a notarized signature where indicated.
  2. 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.
  3. 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.
  4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
  5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
  6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.
- H. Test and Research Reports:
1. 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 substrate preparation and primers required.
  2. Field Test Reports: Submit written 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.
  3. 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.
  4. 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.

5. Product Test Reports: Submit written reports indicating that 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.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - a. Name of evaluation organization.
  - b. Date of evaluation.
  - c. Time period when report is in effect.
  - d. Product and manufacturers' names.
  - e. Description of product.
  - f. Test procedures and results.
  - g. Limitations of use.

#### 1.8 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 insufficient 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 file and one paper copy of certificate, 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.

#### 1.9 CONTRACTOR'S REVIEW

- A. Action Submittals 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. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp in web-based Project management software. Include 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.
  1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

#### 1.10 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return.

1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action, as follows:
    - a. Reviewed.
    - b. Furnish as Corrected.
    - c. Revise and Resubmit.
    - d. Rejected.
  2. Submittals by Web-Based Project Management Software: Architect will indicate, on Project management software website, the appropriate action, as follows:
    - a. Reviewed.
    - b. Furnish as Corrected.
    - c. Revise and Resubmit.
    - d. Rejected.
- 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 unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Architect will discard submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 33 00



SECTION 01 33 00.13 – ELECTRONIC SUBMITTAL PROCEDURES

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. Shop drawing and product data submittals, contract modifications, RFI's, and other contract related documents shall be transmitted to Architect in electronic (PDF) format using website service designed specifically for transmitting documents between all construction team members.
- B. The intent of electronic documentation is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
- C. The electronic submittal process is not intended for color samples, color charts, or physical material samples.

1.3 DEFINITIONS

- A. Submittal for Review: Submittal for Architect/Engineer's review in accordance with requirements of Contract Documents.
- B. Submittal for Record: Submittal for inclusion into Owner's records prior to Substantial Completion. Submittal will not be reviewed by Architect/Engineer's. Submittal to the Owner to be provided on compact disc.
- C. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's responsive action.
- D. Informational Submittals: Written and graphic information and physical samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements.
- E. 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.

1.4 PROCEDURES

- A. Create submittal logs within the website service by inserting required submittals listed in individual specification sections.
- B. Submittal Preparation: Contractor may use the following options:

1. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via the specified website service.
  2. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via email.
  3. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
- C. Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer, product, dimensions and coordination of information with other parts of the work.
- D. Contractor shall transmit each submittal to Architect using the website service.
- E. Architect and Engineer review comments will be made available on the website service for downloading. Contractor will receive email notice of completed review.
- F. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
- G. Submit paper copies of any reviewed submittals not submitted electronically at project closeout for record purposes in accordance with Section 01 77 00 "Closeout Procedures".

#### 1.5 COSTS

- A. General Contractor shall include the full cost of Submittal Exchange project subscription in their proposal. This cost is included in the Contract Amount. Contact Bob Caylor at Submittal Exchange, (515) 631-6526 to verify cost prior to bid.
- B. The intent is for Submittal Exchange service cost to be in lieu of postage or shipping costs typically paid for paper submittals. Service cost is a net cost savings to Contractor because submittals sent electronically do not need to be shipped physically.
- C. After award of contract, training will be provided by Submittal Exchange regarding use of website and PDF submittals.
1. Contact Bob Caylor at Submittal Exchange at (515) 631-6526.
- D. Internet Service and Equipment Requirements:
1. Email address and Internet access at Contractor's main office.
  2. Adobe Acrobat ([www.adobe.com](http://www.adobe.com)), Bluebeam PDF Revu ([www.bluebeam.com](http://www.bluebeam.com)), or other similar PDF review software for applying electronic stamps and comments.

## PART 2 - PRODUCTS

### 2.1 WEBSITE SERVICE

- A. Basis-of-Design Product: Subject to compliance with the requirements, provide Basis-of-Design or comparable, preapproved submittal service by one of the following:
1. Basis-of-Design: Submittal Exchange website system [www.submittalexchange.com](http://www.submittalexchange.com)
  2. BIM 360 by Autodesk.
  3. Newforma.

4. Procore.
5. Viewpoint

B. Substitutions will not be considered.

## 2.2 PRODUCT REQUIREMENTS

- A. Independently hosted, web-based system for automated tracking, storage, and distribution of contract submittals, Requests for Information, and other contract related documents. FTP sites, e-mail exchanges, and server-based systems hosted from inside a contractor's office will not be considered and are not acceptable.
- B. Utilize 256-bit SSL encryption and hosted at SAS70 Type II compliant data centers.
- C. Minimum five (5) years documented experience of use on comparable commercial construction projects. "Comparable commercial construction projects" shall be defined as documented use on a minimum of five hundred governmental, public-entity, or private sector projects each of \$1 million construction value or greater.
- D. Minimum five (5) years documented 99.5 percent website uptime.
- E. Unlimited individual user accounts and system access for all project subcontractors, general contractor, owner staff, Architect, design consultants, and sub-consultants, with no additional fees for those parties to access the system.
- F. Separate locations for owner, architect, design consultant, and sub-consultant review comments with contractors restricted from viewing comments until final review or release by owner or primary design consultant.
- G. Full version histories and dates of exchanges automatically tracked and available for viewing, searching, and reporting in a linear log format compatible with AIA G712.
- H. Functionality to group submittals as required packages and apply forms and review comments to entire package simultaneously.
- I. Functionality for integrated online PDF viewing and review, including graphical markups and stamps, for owner, architect, design consultants, sub-consultants, and general contractor without need for additional software purchase.
- J. Automatic, configurable email notifications for each project team member for new and reviewed submittals and other items.
- K. Automatic, configurable email reminders of past due items.
- L. Customized, automated PDF form generation for submittals, RFIs, and other documents matching standard templates used by owner, design consultants, sub-consultants, and general contractor. Documentation and demonstration of automatic form generation using each entity's templates must be submitted as part of any substitution request.
- M. Prior to project start, system vendor shall create submittal log with all required items from project manual or submittal register. Owner or primary design consultant shall have full control over required items list and access to edit, add, or remove items during project.

- N. System vendor shall provide minimum one-hour live web meeting training sessions to contractors, design consultants, sub-consultants, and owners staff prior to project start.
- O. System vendor shall make available minimum thirty-minute live web meeting training sessions for subcontractors at least twice weekly for the entire duration of the project.
- P. System vendor shall provide access for owner, design consultants, sub-consultants, general contractor, and subcontractors to live technical support by phone and email minimum of 7 AM to 6 PM CST on standard business days at no additional cost.
- Q. Allowance for scanning and printing services provided by local third-party reprographic vendor to assist with obtaining documents electronically and online print ordering.
- R. At completion of project closeout, system vendor shall provide minimum of four archival discs that include all documents and tracking logs, or the ability to download this information from the live website in a single complete archive package.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 33 00.13

## SECTION 01 35 23 - SAFETY REQUIREMENTS

### 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 CONTRACTOR'S RESPONSIBILITY FOR SAFETY

- A. Contractors shall be solely and completely responsible for safety as set forth in the General Conditions. This requirement shall apply continuously and not be limited to normal working hours. Neither the Owner, Architect, Engineer or their representatives are responsible for safety.

#### 1.3 SAFETY EQUIPMENT

- A. Contractors shall maintain at the job site safety equipment applicable to the work as prescribed by the governing safety authorities including all articles necessary for giving first aid to the injured and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons who may be injured on the job site.
- B. Contractors must take all necessary precautions to protect the general public from hazards including, but not limited to, surface irregularities or unramped grade changes in pedestrian sidewalks or walkways and trenches or excavations in roadways. Barricades, lanterns and proper signs shall be placed as necessary to ensure safety to the public and the work.
- C. Performance of Work and completed construction, particularly with respect to ladders, platforms, structure openings, scaffolding, shoring, lagging and machinery guards, shall be in accordance with the requirements of applicable governing safety authorities.
- D. During progress of the Work, Contractor is to maintain satisfactory temporary fencing, railings, barricades or steel plates, as applicable, at all openings, obstructions or other hazards in streets, sidewalks, floors, roofs, walkways and the like. All barriers shall have adequate warning lights required for public safety.

#### 1.4 ACCIDENT REPORTS

- A. If serious injury or damage occurs, the accident shall be reported immediately by telephone or messenger to the Owner and Architect. In addition, the Contractor must promptly report, in writing to the Owner/Architect, all accidents in connection with the work giving full details, names and statements of witnesses.
- B. If a claim is made by anyone against a Contractor or any Subcontractor resulting from an accident, the Contractor shall promptly report the facts in writing to the Owner and Architect giving full details of the claim including investigation and restitution.

1.5 EMERGENCY ACCESS, PUBLIC TRANSPORTATION AND DELIVERY VEHICLES

- A. Notify the fire department, police department, and Owner's representative(s) at least seven (7) days before closing any access drives or portions thereof. No closing shall be made without approval of the appropriate departments. Notify said departments when the drives are again passable for emergency vehicles. Contractors shall maintain vehicle and pedestrian access to existing facilities, including, but not limited to loading docks, dumpster areas and parking lots and building entrances that are to remain in service.
- B. Contractor shall leave night emergency telephone numbers with the Owner and fire and police departments.
- C. Maintain postal service facilities in accordance with the requirements of the U.S. Postal Service.

1.6 FIRE PREVENTION AND PROTECTION

- A. Contractor shall execute all work in a fire-safe manner. He or she shall provide and maintain adequate fire fighting equipment on-site. The Contractors shall comply with applicable fire protection laws.

1.7 USE OF EXPLOSIVES

- A. Use of explosives is not permitted.

1.8 PROTECTION OF PROPERTY

- A. Contractors shall employ such means and methods as necessary to adequately protect all property against damage. In the event of damage to property, the Contractor shall immediately restore the property to a condition at least equal to its original condition at his or her own expense and to the satisfaction of the Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 35 23

SECTION 01 35 43 – ENVIRONMENTAL PROCEDURES

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. During the project duration, Contractor shall maintain Work areas on- and off-site free from environmental pollution that would be in violation of federal, state, or local regulations.
- B. Any violations, penalties, and/or cleanup shall be the responsibility of the Contractor.
- C. Consider Work specified in this section incidental and include associated costs as part of Base Bid.

1.3 DISPOSAL OF WASTE MATERIALS

- A. Unacceptable disposal sites, as stipulated in NR 180 include, but not limited to, sites within wetland or critical habitat and sites where disposal will have detrimental effect on surface water or groundwater quality.
- B. Make arrangements for disposal subject to submission of proof to Architect that Owner or proposed site(s) has valid fill permit issued by appropriate governmental agency and submission of haul route plan including map or proposed route(s).
- C. Provide watertight conveyance for liquid, semi-liquid or saturated solids which tend to bleed during transport. Liquid loss from transported materials not permitted, whether being delivered to construction site or hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at selected disposal site.

1.4 PROTECTION OF AIR QUALITY

- A. Trash burning not permitted on construction site.
- B. If temporary heating devices are necessary for protection of Work, submit documentation to Architect that they do not cause pollution.

1.5 USE OF CHEMICALS

- A. Chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of U.S. EPA or U.S. Department of Agriculture or any other applicable regulatory agency.
- B. Use of such chemicals and disposal of residues shall be in conformance with manufacturer's instructions.

1.6 NOISE CONTROL

- A. Conduct operations to cause least annoyance to residents in vicinity of Work and comply with applicable local ordinances.
- B. Equip compressors, hoists, and other apparatus with mechanical devices necessary to minimize noise and dust. Equip compressors with silencers on intake lines.
- C. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.
- D. Line storage bins and hoppers with material that will deaden sounds.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 35 43



## SECTION 01 40 00 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection 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 quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

#### 1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five (5) 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.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. 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, assembly, and similar operations.
  - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National

Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

- F. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" shall have the same meaning as the term "testing agency."
- H. 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.
- I. 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. Contractor's quality-control services do not include contract administration activities performed by Architect.

#### 1.4 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 Statement: 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.

#### 1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification 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.

#### 1.6 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 submitted to authorities having jurisdiction before starting work on the following systems:
  - 1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
  - 2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.
- F. Reports: Prepare and submit certified written reports and documents as specified.
- G. Permits, Licenses, and Certificates: For Owner's record, 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.

#### 1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within ten (10) days of Notice of Award, and not less than five (5) 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 and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
  - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
- E. 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 the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and 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.

#### 1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  1. Date of issue.
  2. Project title and number.
  3. Name, address, telephone number, and email address of testing agency.
  4. Dates and locations of samples and tests or inspections.
  5. Names of individuals making tests and inspections.
  6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. 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, telephone number, and email address 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 of whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. 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, telephone number, and email address 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 of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

#### 1.9 QUALITY ASSURANCE

- A. 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, applying, 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.
- 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 is similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged in the activities indicated.
  1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. 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.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following Contractor's responsibilities, including the following:
1. Provide test specimens representative of proposed products and construction.
  2. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
  3. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
  4. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
  5. When testing is complete, remove test specimens and test assemblies, and mockups; do not reuse products on Project.
  6. 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.

#### 1.10 QUALITY CONTROL

- A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  2. Engage a qualified testing agency to perform 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 twenty-four (24) hours in advance of time when Work that requires testing or inspection 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 inspection 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.
- B. 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.
- C. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform duties of Contractor.
- D. 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."
- E. 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.
- F. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives 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 inspection. 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 inspection equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
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. Update and submit with each Application for Payment.
1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
  2. 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.
- 1.11 SPECIAL TESTS AND INSPECTIONS
- A. Special Tests and Inspections: Owner will engage a qualified testing agency or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures, and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected Work.

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 and authorities' having jurisdiction reference during normal working hours.
  1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, 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 01 40 00



SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

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

1.3 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.

1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.
- 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.

#### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Abbreviations and acronyms not included in this list 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." The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.

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

34. ASSP - American Society of Safety Professionals (The); [www.assp.org](http://www.assp.org).
35. ASTM - ASTM International; [www.astm.org](http://www.astm.org).
36. ATIS - Alliance for Telecommunications Industry Solutions; [www.atis.org](http://www.atis.org).
37. AVIXA - Audiovisual and Integrated Experience Association; (Formerly: Infocomm International); [www.avixa.org](http://www.avixa.org).
38. AWEA - American Wind Energy Association; [www.awea.org](http://www.awea.org).
39. AWI - Architectural Woodwork Institute; [www.awinet.org](http://www.awinet.org).
40. AWMAC - Architectural Woodwork Manufacturers Association of Canada; [www.awmac.com](http://www.awmac.com).
41. AWPA - American Wood Protection Association; [www.awpa.com](http://www.awpa.com).
42. AWS - American Welding Society; [www.aws.org](http://www.aws.org).
43. AWWA - American Water Works Association; [www.awwa.org](http://www.awwa.org).
44. BHMA - Builders Hardware Manufacturers Association; [www.buildershardware.com](http://www.buildershardware.com).
45. BIA - Brick Industry Association (The); [www.gobrick.com](http://www.gobrick.com).
46. BICSI - BICSI, Inc.; [www.bicsi.org](http://www.bicsi.org).
47. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); [www.bifma.org](http://www.bifma.org).
48. BISSC - Baking Industry Sanitation Standards Committee; [www.bissc.org](http://www.bissc.org).
49. BWF - Badminton World Federation; (Formerly: International Badminton Federation); [www.bissc.org](http://www.bissc.org).
50. CDA - Copper Development Association; [www.copper.org](http://www.copper.org).
51. CE - Conformance Européenne; [www.ec.europa.eu/growth/single-market/ce-marking](http://www.ec.europa.eu/growth/single-market/ce-marking).
52. CEA - Canadian Electricity Association; [www.electricity.ca](http://www.electricity.ca).
53. CFFA - Chemical Fabrics and Film Association, Inc.; [www.chemicalfabricsandfilm.com](http://www.chemicalfabricsandfilm.com).
54. CFSEI - Cold-Formed Steel Engineers Institute; [www.cfsei.org](http://www.cfsei.org).
55. CGA - Compressed Gas Association; [www.cganet.com](http://www.cganet.com).
56. CIMA - Cellulose Insulation Manufacturers Association; [www.cellulose.org](http://www.cellulose.org).
57. CISCA - Ceilings & Interior Systems Construction Association; [www.cisca.org](http://www.cisca.org).
58. CISPI - Cast Iron Soil Pipe Institute; [www.cispi.org](http://www.cispi.org).
59. CLFMI - Chain Link Fence Manufacturers Institute; [www.chainlinkinfo.org](http://www.chainlinkinfo.org).
60. CPA - Composite Panel Association; [www.compositepanel.org](http://www.compositepanel.org).
61. CRI - Carpet and Rug Institute (The); [www.carpet-rug.org](http://www.carpet-rug.org).
62. CRRC - Cool Roof Rating Council; [www.coolroofs.org](http://www.coolroofs.org).
63. CRSI - Concrete Reinforcing Steel Institute; [www.crsi.org](http://www.crsi.org).
64. CSA - CSA Group; [www.csa-group.org](http://www.csa-group.org).
65. CSI - Cast Stone Institute; [www.caststone.org](http://www.caststone.org).
66. CSI - Construction Specifications Institute (The); [www.csiresources.org](http://www.csiresources.org).
67. CSSB - Cedar Shake & Shingle Bureau; [www.cedarbureau.org](http://www.cedarbureau.org).
68. CTA - Consumer Technology Association; [www.cta.tech](http://www.cta.tech).
69. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); [www.coolingtechnology.org](http://www.coolingtechnology.org).
70. CWC - Composite Wood Council; (See CPA).
71. DASMA - Door and Access Systems Manufacturers Association; [www.dasma.com](http://www.dasma.com).
72. DHA - Decorative Hardwoods Association; (Formerly: Hardwood Plywood & Veneer Association); [www.decorativehardwoods.org](http://www.decorativehardwoods.org).
73. DHI - Door and Hardware Institute; [www.dhi.org](http://www.dhi.org).
74. ECA - Electronic Components Association; (See ECIA).
75. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
76. ECIA - Electronic Components Industry Association; [www.ecianow.org](http://www.ecianow.org).
77. EIA - Electronic Industries Alliance; (See TIA).
78. EIMA - EIFS Industry Members Association; [www.eima.com](http://www.eima.com).
79. EJMA - Expansion Joint Manufacturers Association, Inc.; [www.ejma.org](http://www.ejma.org).
80. EOS/ESD Association; (Electrostatic Discharge Association); [www.esda.org](http://www.esda.org).
81. ESTA - Entertainment Services and Technology Association; (See PLASA).
82. ETL - Intertek (See Intertek); [www.intertek.com](http://www.intertek.com).
83. EVO - Efficiency Valuation Organization; [www.evo-world.org](http://www.evo-world.org).
84. FCI - Fluid Controls Institute; [www.fluidcontrolsintstitute.org](http://www.fluidcontrolsintstitute.org).

85. FGIA - Fenestration and Glazing Industry Alliance; <https://fgiaonline.org>.
86. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); [www.fiba.com](http://www.fiba.com).
87. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); [www.fivb.org](http://www.fivb.org).
88. FM Approvals - FM Approvals LLC; [www.fmapprovals.com](http://www.fmapprovals.com).
89. FM Global - FM Global; (Formerly: FMG - FM Global); [www.fmglobal.com](http://www.fmglobal.com).
90. FRSA - Florida Roofing, Sheet Metal Contractors Association, Inc.; [www.floridarroof.com](http://www.floridarroof.com).
91. FSA - Fluid Sealing Association; [www.fluidsealing.com](http://www.fluidsealing.com).
92. FSC - Forest Stewardship Council U.S.; [www.fscus.org](http://www.fscus.org).
93. GA - Gypsum Association; [www.gypsum.org](http://www.gypsum.org).
94. GANA - Glass Association of North America; (See NGA).
95. GS - Green Seal; [www.greenseal.org](http://www.greenseal.org).
96. HI - Hydraulic Institute; [www.pumps.org](http://www.pumps.org).
97. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
98. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
99. HPVA - Hardwood Plywood & Veneer Association; (See DHA).
100. IAPSC - International Association of Professional Security Consultants; [www.iapsc.org](http://www.iapsc.org).
101. IAS - International Accreditation Service; [www.iasonline.org](http://www.iasonline.org).
102. ICBO - International Conference of Building Officials; (See ICC).
103. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
104. ICEA - Insulated Cable Engineers Association, Inc.; [www.icea.net](http://www.icea.net).
105. ICPA - International Cast Polymer Association; [www.theicpa.com](http://www.theicpa.com).
106. ICRI - International Concrete Repair Institute, Inc.; [www.icri.org](http://www.icri.org).
107. IEC - International Electrotechnical Commission; [www.iec.ch](http://www.iec.ch).
108. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); [www.ieee.org](http://www.ieee.org).
109. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); [www.ies.org](http://www.ies.org).
110. IESNA - Illuminating Engineering Society of North America; (See IES).
111. IEST - Institute of Environmental Sciences and Technology; [www.iest.org](http://www.iest.org).
112. IGMA - Insulating Glass Manufacturers Alliance; (See FGIA).
113. IGSHPA - International Ground Source Heat Pump Association; [www.igshpa.org](http://www.igshpa.org).
114. IHSA - Illinois High School Association; [www.iahsa.org](http://www.iahsa.org).
115. IHSAA - Iowa High School Athletic Association; [www.iahsaa.org](http://www.iahsaa.org).
116. II - Infocomm International; (See AVIXA).
117. ILI - Indiana Limestone Institute of America, Inc.; [www.ili.ai.com](http://www.ili.ai.com).
118. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); [www.intertek.com](http://www.intertek.com).
119. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); [www.isa.org](http://www.isa.org).
120. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
121. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); [www.isfanow.org](http://www.isfanow.org).
122. ISO - International Organization for Standardization; [www.iso.org](http://www.iso.org).
123. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
124. ITU - International Telecommunication Union; [www.itu.int](http://www.itu.int).
125. KCMA - Kitchen Cabinet Manufacturers Association; [www.kcma.org](http://www.kcma.org).
126. LMA - Laminating Materials Association; (See CPA).
127. LPI - Lightning Protection Institute; [www.lightning.org](http://www.lightning.org).
128. MBMA - Metal Building Manufacturers Association; [www.mbma.com](http://www.mbma.com).
129. MCA - Metal Construction Association; [www.metalconstruction.org](http://www.metalconstruction.org).
130. MFMA - Maple Flooring Manufacturers Association, Inc.; [www.maplefloor.org](http://www.maplefloor.org).
131. MFMA - Metal Framing Manufacturers Association, Inc.; [www.metalframingmfg.org](http://www.metalframingmfg.org).
132. MHI - Material Handling Industry; [www.mhi.org](http://www.mhi.org).
133. MIA - Marble Institute of America; (See NSI).
134. MMPA - Moulding & Millwork Producers Association; [www.wmmpa.com](http://www.wmmpa.com).

135. MPI - Master Painters Institute; [www.paintinfo.com](http://www.paintinfo.com).
136. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; [www.mss-hq.org](http://www.mss-hq.org).
137. NAAMM - National Association of Architectural Metal Manufacturers; [www.naamm.org](http://www.naamm.org).
138. NACE - NACE International; (National Association of Corrosion Engineers International); [www.nace.org](http://www.nace.org).
139. NADCA - National Air Duct Cleaners Association; [www.nadca.com](http://www.nadca.com).
140. NAIMA - North American Insulation Manufacturers Association; [www.naima.org](http://www.naima.org).
141. NALP - National Association of Landscape Professionals; [www.landscapeprofessionals.org](http://www.landscapeprofessionals.org).
142. NBGQA - National Building Granite Quarries Association, Inc.; [www.nbgqa.com](http://www.nbgqa.com).
143. NBI - New Buildings Institute; [www.newbuildings.org](http://www.newbuildings.org).
144. NCAA - National Collegiate Athletic Association (The); [www.ncaa.org](http://www.ncaa.org).
145. NCMA - National Concrete Masonry Association; [www.ncma.org](http://www.ncma.org).
146. NEBB - National Environmental Balancing Bureau; [www.nebb.org](http://www.nebb.org).
147. NECA - National Electrical Contractors Association; [www.necanet.org](http://www.necanet.org).
148. NeLMA - Northeastern Lumber Manufacturers Association; [www.nelma.org](http://www.nelma.org).
149. NEMA - National Electrical Manufacturers Association; [www.nema.org](http://www.nema.org).
150. NETA - InterNational Electrical Testing Association; [www.netaworld.org](http://www.netaworld.org).
151. NFHS - National Federation of State High School Associations; [www.nfhs.org](http://www.nfhs.org).
152. NFPA - National Fire Protection Association; [www.nfpa.org](http://www.nfpa.org).
153. NFPA - NFPA International; (See NFPA).
154. NFRC - National Fenestration Rating Council; [www.nfrc.org](http://www.nfrc.org).
155. NGA - National Glass Association (The); (Formerly: Glass Association of North America); [www.glass.org](http://www.glass.org).
156. NHLA - National Hardwood Lumber Association; [www.nhla.com](http://www.nhla.com).
157. NLGA - National Lumber Grades Authority; [www.nlga.org](http://www.nlga.org).
158. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
159. NOMMA - National Ornamental & Miscellaneous Metals Association; [www.nomma.org](http://www.nomma.org).
160. NRCA - National Roofing Contractors Association; [www.nrca.net](http://www.nrca.net).
161. NRMCA - National Ready Mixed Concrete Association; [www.nrmca.org](http://www.nrmca.org).
162. NSF - NSF International; [www.nsf.org](http://www.nsf.org).
163. NSI - National Stone Institute; (Formerly: Marble Institute of America); [www.naturalstoneinstitute.org](http://www.naturalstoneinstitute.org).
164. NSPE - National Society of Professional Engineers; [www.nspe.org](http://www.nspe.org).
165. NSSGA - National Stone, Sand & Gravel Association; [www.nssga.org](http://www.nssga.org).
166. NTMA - National Terrazzo & Mosaic Association, Inc. (The); [www.ntma.com](http://www.ntma.com).
167. NWFA - National Wood Flooring Association; [www.nwfa.org](http://www.nwfa.org).
168. NWRA - National Waste & Recycling Association; [www.wasterecycling.org](http://www.wasterecycling.org).
169. PCI - Precast/Prestressed Concrete Institute; [www.pci.org](http://www.pci.org).
170. PDI - Plumbing & Drainage Institute; [www.pdionline.org](http://www.pdionline.org).
171. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); [www.plasa.org](http://www.plasa.org).
172. RCSC - Research Council on Structural Connections; [www.boltcouncil.org](http://www.boltcouncil.org).
173. RFCI - Resilient Floor Covering Institute; [www.rfci.com](http://www.rfci.com).
174. RIS - Redwood Inspection Service; [www.redwoodinspection.com](http://www.redwoodinspection.com).
175. SAE - SAE International; [www.sae.org](http://www.sae.org).
176. SCTE - Society of Cable Telecommunications Engineers; [www.scte.org](http://www.scte.org).
177. SDI - Steel Deck Institute; [www.sdi.org](http://www.sdi.org).
178. SDI - Steel Door Institute; [www.steeldoor.org](http://www.steeldoor.org).
179. SEFA - Scientific Equipment and Furniture Association (The); [www.sefalabs.com](http://www.sefalabs.com).
180. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
181. SIA - Security Industry Association; [www.siaonline.org](http://www.siaonline.org).
182. SJI - Steel Joist Institute; [www.steeljoist.org](http://www.steeljoist.org).
183. SMA - Screen Manufacturers Association; [www.smainfo.org](http://www.smainfo.org).
184. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; [www.smacna.org](http://www.smacna.org).

185. SMPTE - Society of Motion Picture and Television Engineers; [www.smpte.org](http://www.smpte.org).
186. SPFA - Spray Polyurethane Foam Alliance; [www.sprayfoam.org](http://www.sprayfoam.org).
187. SPIB - Southern Pine Inspection Bureau; [www.spib.org](http://www.spib.org).
188. SPRI - Single Ply Roofing Industry; [www.spri.org](http://www.spri.org).
189. SRCC - Solar Rating & Certification Corporation; [www.solar-rating.org](http://www.solar-rating.org).
190. SSINA - Specialty Steel Industry of North America; [www.ssina.com](http://www.ssina.com).
191. SSPC - SSPC: The Society for Protective Coatings; [www.sspc.org](http://www.sspc.org).
192. STI - Steel Tank Institute; [www.steeltank.com](http://www.steeltank.com).
193. SWI - Steel Window Institute; [www.steelwindows.com](http://www.steelwindows.com).
194. SWPA - Submersible Wastewater Pump Association; [www.swpa.org](http://www.swpa.org).
195. TCA - Tilt-Up Concrete Association; [www.tilt-up.org](http://www.tilt-up.org).
196. TCNA - Tile Council of North America, Inc.; [www.tileusa.com](http://www.tileusa.com).
197. TEMA - Tubular Exchanger Manufacturers Association, Inc.; [www.tema.org](http://www.tema.org).
198. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); [www.tiaonline.org](http://www.tiaonline.org).
199. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
200. TMS - The Masonry Society; [www.masonrysociety.org](http://www.masonrysociety.org).
201. TPI - Truss Plate Institute; [www.tpinst.org](http://www.tpinst.org).
202. TPI - Turfgrass Producers International; [www.turfgrassod.org](http://www.turfgrassod.org).
203. TRI - Tile Roofing Institute; [www.tilerroofing.org](http://www.tilerroofing.org).
204. UL - Underwriters Laboratories Inc.; [www.ul.com](http://www.ul.com).
205. UL LLC - UL LLC; [www.ul.com](http://www.ul.com).
206. UNI - Uni-Bell PVC Pipe Association; [www.uni-bell.org](http://www.uni-bell.org).
207. USAV - USA Volleyball; [www.usavolleyball.org](http://www.usavolleyball.org).
208. USGBC - U.S. Green Building Council; [www.usgbc.org](http://www.usgbc.org).
209. USITT - United States Institute for Theatre Technology, Inc.; [www.usitt.org](http://www.usitt.org).
210. WA - Wallcoverings Association; [www.wallcoverings.org](http://www.wallcoverings.org).
211. WCLIB - West Coast Lumber Inspection Bureau; [www.wclib.org](http://www.wclib.org).
212. WCMA - Window Covering Manufacturers Association; [www.wcmanet.org](http://www.wcmanet.org).
213. WDMA - Window & Door Manufacturers Association; [www.wdma.com](http://www.wdma.com).
214. WI - Woodwork Institute; [www.wicnet.org](http://www.wicnet.org).
215. WIAA - Wisconsin Interscholastic Athletic Association; [www.wiaawi.org](http://www.wiaawi.org).
216. WSRCA - Western States Roofing Contractors Association; [www.wsrca.com](http://www.wsrca.com).
217. WWPA - Western Wood Products Association; [www.wwpa.org](http://www.wwpa.org).

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut für Normung e.V.; [www.din.de](http://www.din.de).
2. IAPMO - International Association of Plumbing and Mechanical Officials; [www.iapmo.org](http://www.iapmo.org).
3. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
4. ICC-ES - ICC Evaluation Service, LLC; [www.icc-es.org](http://www.icc-es.org).

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; [www.usace.army.mil](http://www.usace.army.mil).
2. CPSC - Consumer Product Safety Commission; [www.cpsc.gov](http://www.cpsc.gov).
3. DOC - Department of Commerce; National Institute of Standards and Technology; [www.nist.gov](http://www.nist.gov).
4. DOD - Department of Defense; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
5. DOE - Department of Energy; [www.energy.gov](http://www.energy.gov).
6. EPA - Environmental Protection Agency; [www.epa.gov](http://www.epa.gov).
7. FAA - Federal Aviation Administration; [www.faa.gov](http://www.faa.gov).
8. FG - Federal Government Publications; [www.gpo.gov/fdsys](http://www.gpo.gov/fdsys).

9. GSA - General Services Administration; [www.gsa.gov](http://www.gsa.gov).
10. HUD - Department of Housing and Urban Development; [www.hud.gov](http://www.hud.gov).
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; [www.eetd.lbl.gov](http://www.eetd.lbl.gov).
12. OSHA - Occupational Safety & Health Administration; [www.osha.gov](http://www.osha.gov).
13. SD - Department of State; [www.state.gov](http://www.state.gov).
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; [www.trb.org](http://www.trb.org).
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; [www.ars.usda.gov](http://www.ars.usda.gov).
16. USDA - Department of Agriculture; Rural Utilities Service; [www.usda.gov](http://www.usda.gov).
17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; [www.ojp.usdoj.gov](http://www.ojp.usdoj.gov).
18. USP - U.S. Pharmacopeial Convention; [www.usp.org](http://www.usp.org).
19. USPS - United States Postal Service; [www.usps.com](http://www.usps.com).

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; [www.govinfo.gov](http://www.govinfo.gov).
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
  - a. Available from Defense Standardization Program; [www.dsp.dla.mil](http://www.dsp.dla.mil).
  - b. Available from General Services Administration; [www.gsa.gov](http://www.gsa.gov).
  - c. Available from National Institute of Building Sciences/Whole Building Design Guide; [www.wbdg.org](http://www.wbdg.org).
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; [www.access-board.gov](http://www.access-board.gov).
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; [www.bearhfti.ca.gov](http://www.bearhfti.ca.gov).
2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; [www.calregs.com](http://www.calregs.com).
3. CDHS; California Department of Health Services; (See CDPH).
4. CDPH; California Department of Public Health; Indoor Air Quality Program; [www.cdph.ca.gov/Programs/CCDC/DEOD/EAH/IAQ/Pages/Main-Page.aspx](http://www.cdph.ca.gov/Programs/CCDC/DEOD/EAH/IAQ/Pages/Main-Page.aspx).
5. CPUC; California Public Utilities Commission; [www.cpuc.ca.gov](http://www.cpuc.ca.gov).
6. SCAQMD; South Coast Air Quality Management District; [www.aqmd.gov](http://www.aqmd.gov).
7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; [www.txforestservation.tamu.edu](http://www.txforestservation.tamu.edu).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00



SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

- A. 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 and extensions of services as required for construction operations.
- B. 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.
- C. Natural Gas Service from Existing System: Natural gas 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. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
  - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
  - 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive 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.
  - 3. Indicate methods to be used to avoid trapping water in finished work.

- D. 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. 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.
- E. 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 areas requiring special attention as identified by Owner. Indicate means for complying with Owner's requirements.

## 1.5 QUALITY ASSURANCE

- A. Accessible Temporary Egress: Comply with applicable provisions in the United States Access 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. Portable 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 and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- C. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches.
- D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

## 2.2 TEMPORARY FACILITIES

- A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: 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. Keep office clean and orderly. Furnish and equip offices as follows:
  - 1. Furniture required for Project-site documents, including file cabinets, plan tables, plan racks, and bookcases.
  - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
  - 3. Drinking water and private toilet.
  - 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
  - 5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- C. 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.

## 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.

- C. 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.

### 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, safety shower and eyewash 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. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- E. Natural Gas Service: Connect to Owner's existing natural gas service. Maintain existing equipment in a condition acceptable to Owner.
- F. 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.
- G. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install WiFi cell phone access equipment for each field office.
  - 1. At each telephone, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Contractor's emergency after-hours telephone number.
    - e. Architect's office.

- f. Engineers' offices.
- g. Owner's office.
- h. Principal subcontractors' field and home offices.

- H. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Architect and Owner.

### 3.4 SUPPORT FACILITIES INSTALLATION

- A. Comply with the following:

- 1. Provide construction for temporary field offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.
- 2. Utilize designated area within existing building for temporary field offices.
- 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. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

- C. Storage and Staging: Use designated areas of Project site for storage and staging needs.

- D. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

- E. 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.

### 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. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

- E. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
- F. 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. 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.
  - 2. Paint and maintain appearance of walkway for duration of the Work.
- G. 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 polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches 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 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.
- H. 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. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
  - 3. 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.
  - 4. 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. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

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. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. 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. 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 01 50 00

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## SECTION 01 60 00 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 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.

#### 1.3 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. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
  - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, 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. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
- 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. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
  - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
  - 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
  - 3. Comply with requirements as specified in Sections 01 25 00 "Substitution Procedures" and 01 33 00 "Submittal Procedures".
  - 4. Architect's Action: Architect may request additional information or documentation for evaluation within one week of receipt of comparable product request. Architect will respond within five (5) days of receipt of complete request. Proceed with specified product if determination is not made by Architect within five (5) days.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 01 33 00 "Submittal Procedures."
- F. 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. Resolution of Compatibility Disputes between Multiple Contractors:
    - a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
    - b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
  - 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
  - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
    - a. Name of product and manufacturer.
    - b. Model and serial number.
    - c. Capacity.
    - d. Speed.
    - e. Ratings.
  - 3. See individual identification Sections in Divisions 26 and 28 for additional equipment identification requirements.

1.5 COORDINATION

- A. Modify or adjust 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 that products are undamaged and properly protected.

C. Storage:

1. Provide a secure location and enclosure at Project site 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 and with adequate protection from wind.
5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. 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 standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
2. **Special Warranty:** Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to 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 in the Project Manual, 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."

## 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 meeting 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. Sole 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. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."
  2. Sole 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. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."
  3. Limited List of Products: 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.
    - a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
  4. Non-Limited List of Products: 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.

- a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
  - b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.
5. Limited List of Manufacturers: 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.
- a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
6. Non-Limited List of Manufacturers: 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.
- a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
  - b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.
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 may additionally 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. For approval of products by unnamed manufacturers, comply with requirements in Section 01 25 00 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require the phrase "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 a 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.
- E. Sustainable Product Selection: Where Specifications require product to meet sustainable product characteristics, select products complying with indicated requirements. Comply with requirements in Division 01 sustainability requirements Section and individual Specification Sections.
1. Select products for which sustainable design documentation submittals are available from manufacturer.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: 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 the following requirements:
1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
  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. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 01 33 00 "Submittal Procedures."
1. Form of Approval of Submittal: As specified in Section 01 33 00 "Submittal Procedures."
  2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- C. Submittal Requirements, Two-Step Process: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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. Installation of the Work.
  - 3. Cutting and patching.
  - 4. Progress cleaning.
  - 5. Starting and adjusting.
  - 6. Protection of installed construction.

1.3 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.

1.4 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site.
  - 1. Prior to submitting cutting and patching plan, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Inform Architect of scheduled meeting. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
    - a. Contractor's superintendent.
    - b. Trade supervisor responsible for cutting operations.
    - c. Trade supervisor(s) responsible for patching of each type of substrate.
    - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.
  - 2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- B. Layout Conference: Conduct conference at Project site.

1. Review meanings and intent of dimensions, notes, terms, graphic symbols, and other layout information indicated on the Drawings.
2. Review requirements for including layouts on Shop Drawings and other submittals.
3. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least ten (10) days prior to the time cutting and patching will be performed. Include the following information:
1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
  2. 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.
  3. Products: List products to be used for patching and firms or entities that will perform patching work.
  4. Dates: Indicate when cutting and patching will be performed.
  5. 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.

#### 1.6 QUALITY ASSURANCE

- A. Cutting and Patching: 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. Operational elements include the following:
    - a. Primary operational systems and equipment.
    - b. Fire separation assemblies.
    - c. Air or smoke barriers.
    - d. Fire-suppression systems.
    - e. Plumbing piping systems.
    - f. Mechanical systems piping and ducts.
    - g. Control systems.
    - h. Communication systems.
    - i. Fire-detection and -alarm systems.
    - j. Conveying systems.
    - k. Electrical wiring systems.
    - l. Operating systems of special construction.



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. Other construction elements include but are not limited to the following:
    - a. Water, moisture, or vapor barriers.
    - b. Membranes and flashings.
    - c. Exterior storefront or curtain-wall construction.
    - d. Sprayed fire-resistive material.
    - e. Equipment supports.
    - f. Piping, ductwork, vessels, and equipment.
    - g. Noise- and vibration-control elements and systems.
  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.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
  1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- 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. Use materials that are not considered hazardous.
- C. 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 EXAMINATION

- A. 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.
- B. 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, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
  2. List of detrimental conditions, including substrates.
  3. List of unacceptable installation tolerances.
  4. Recommended corrections.
- C. 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 and Owner 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, submit a request for information to Architect in accordance with 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 existing conditions. If discrepancies are discovered, notify Architect promptly.

### 3.4 INSTALLATION

- A. 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 in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.
- D. 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 of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. 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 with manufacturer.
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.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.
1. Comply with Section 01 77 00 "Closeout Procedures" for repairing or removing and replacing defective Work.

### 3.5 CUTTING AND PATCHING

- 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. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Division 01 Section "Summary" under the "Coordination with Occupants" Article.
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. 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.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 5. Proceed with patching after construction operations requiring cutting are complete. Patching to match existing, adjacent, finishes and construction.
- H. 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.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

- a. 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.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.6 PROGRESS CLEANING

- A. 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 (7) days during normal weather or three (3) days if the temperature is expected to rise above 80 deg F.
  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: 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 Section 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 ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 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."

3.8 PROTECTION AND REPAIR 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. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- D. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 01 73 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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.

1.3 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- 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.

1.4 MATERIALS OWNERSHIP

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

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within thirty (30) days of date established for the Notice of Award.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
  - 1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
  - 2. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - 3. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  - 4. Review waste management requirements for each trade.

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, and waste reduction work plan. Distinguish between demolition and construction waste.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials.
  - 1. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:
    - a. Paper.
    - b. Aluminum cans.
    - c. Glass containers.
    - d. Cardboard boxes.
    - e. Plastic containers.

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.
  - 1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."



- 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. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
  - 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. Comply with requirements in Section 02 41 19 "Selective Demolition" for salvaging demolition waste.
- B. 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.
- C. Salvaged Items for Sale and Donation: Not permitted on Project site.
- D. 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 designated by Owner.
  - 5. Protect items from damage during transport and storage.
- E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- 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: 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 as often as required to prevent overfilling bins.

#### 3.4 RECYCLING DEMOLITION WASTE

- A. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
  - 1. Clean and stack undamaged, whole masonry units on wood pallets.
- B. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- C. 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.
- D. 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.
- E. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location for reclamation by acoustical ceiling tile manufacturer.
- F. Metal Suspension System: Separate metal members, including trim and other metals from acoustical panels and tile, and sort with other metals.
- G. 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.
- H. 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 manufacturer.
- I. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.
- J. Conduit: Reduce conduit to straight lengths and store by material and size.
- K. Lamps: Separate lamps by type and store according to requirements in 40 CFR 273.

### 3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging: As much as possible, request deliveries to utilize reusable packaging materials that may be sent back after unloading.
  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.
- 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.
- D. Paint: Seal containers and store by type.

### 3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged or recycled, 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.

END OF SECTION 01 74 19

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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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.

1.3 DEFINITIONS

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.5 CLOSEOUT SUBMITTALS

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

1.6 MAINTENANCE MATERIAL SUBMITTALS

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

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: 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.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of ten (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.
  2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, 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.
    - 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 Owner's signature for receipt of submittals.
  5. Submit testing, adjusting, and balancing records.
  6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of ten (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. Advise Owner of changeover in utility services.
  7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
  8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  9. Complete final cleaning requirements.
  10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects, without covering permanent labels or nameplates.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of ten (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 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. 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.

#### 1.8 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 in accordance with 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 ten (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. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### 1.9 LIST OF INCOMPLETE ITEMS

- 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.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
  2. Organize items applying to each space by major element, including categories for ceilings, 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:
    - a. PDF Electronic File: Architect will return a final, annotated file.

- b. Web-Based Project Software Upload: Utilize software feature for creating and updating list of incomplete items (punch list).

#### 1.10 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within ten (10) 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.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
  1. Submit on digital media acceptable to Architect.
- E. 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. All subcontractors shall remove their own cartons, construction debris, scraps, leftover materials, tools, equipment, etc., from all areas of the structure wherever they performed work.
  - b. Clean Project site of rubbish, waste material, litter, and other foreign substances.
  - c. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
  - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
  - e. Clean exposed interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition.
  - f. Remove debris and surface dust from limited-access spaces, including plenums, shafts, attics, and similar spaces.
  - g. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
  - h. Vacuum and mop concrete.
  - 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, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  - n. Clean ducts, blowers, and coils.
    - 1) Clean HVAC system in compliance with NADCA ACR. Provide written report on completion of cleaning.
  - o. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
  - p. Clean strainers.
  - q. Leave Project clean and ready for occupancy.
- C. Painting subcontractor will be required to touch up finish painting damaged by trades during completion. Touch-up painting is to be done after substantial completion at the time designated by the Architect. Cost of all touch-up painting shall be included as part of Section 09 91 00 "Painting", and 09 93 00 "Staining and Transparent Finishing", and 09 96 00 "High-Performance Coatings."
- 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 required before requesting inspection for determination of Substantial Completion.
1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
    - a. Restore permanent facilities used during construction to their specified condition.
    - b. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
    - c. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

- d. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory manuals.
  - 2. Systems and equipment operation manuals.
  - 3. Systems and equipment maintenance manuals.
  - 4. Product maintenance manuals.

1.3 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.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved 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 operation and maintenance submittals is acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Manual Contents: Organize contents according to Project Manual structure by specification section number and title; then according to system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single subdocument.
- C. Format: Submit operation and maintenance manuals on two (2) USB flash drives.
  - 1. Submit on digital media acceptable to Architect. Enable reviewer comments on draft submittals.
- D. Initial Manual Submittal: Submit draft copy of each manual at least twenty-one (21) days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

- E. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least fourteen (14) 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 five (5) days of receipt of Architect's comments and prior to commencing demonstration and training.
- F. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

#### 1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. 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: Bookmark 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.

#### 1.6 REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: 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 Architect.
  - 7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  - 8. 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. 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."

#### 1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to operation and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
  - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
  - 2. 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.
  - 3. Tables of Contents: Include a table of contents for each operation and maintenance manual.

#### 1.8 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
  - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. 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.
- C. 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.

D. 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. Seasonal and weekend operating instructions.
6. Required sequences for electric or electronic systems.
7. Special operating instructions and procedures.

#### 1.9 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. 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 warranties and bonds as described below.

C. 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.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
  - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
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.

- E. 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.
- F. 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.
- G. 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.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. 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.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original project record documents as part of maintenance manuals.

#### 1.10 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. 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.
- C. 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.
- D. 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.

E. 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.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. 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 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 23



SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
  - 4. Miscellaneous Record Submittals.

1.3 CLOSEOUT SUBMITTALS

- A. General: Provide PDF electronic files on USB flash drives. Provide two (2) USB flash drives to Owner and one (1) to Architect.
- B. Record Drawings: Comply with the following:
  - 1. Number of Copies:
    - a. Final Submittal:
      - 1) Submit Record Digital Data File plots each to Owner and Architect. Provide one (1) paper-copy set of prints to Owner.
      - 2) Plot each drawing file, whether or not changes and additional information were recorded.
- 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.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one (1) 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 photographic documentation, as required.
  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. Revisions to routing of piping and conduits.
    - d. Revisions to electrical circuitry.
    - e. Actual equipment locations.
    - f. Locations of concealed internal utilities.
    - g. Changes made by Change Order or Project Supplement.
    - h. Changes made following Architect's written orders.
    - i. Details not on the original Contract Drawings.
    - j. Field records for variable and concealed conditions.
    - k. 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 prints with erasable, red-colored pencil. 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 Project Supplement numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Format: Annotated PDF electronic file with comment function enabled.
  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.

1.5 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 annotated PDF electronic file.

1.6 RECORD PRODUCT DATA

- 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. 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, Record Specifications, and Record Drawings where applicable.
- C. Format: Submit Record Product Data as annotated PDF electronic file.
  - 1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.7 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 PDF electronic file.
  - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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.

1.3 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.
- B. Qualification Data: For facilitators and instructors.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Transcript: Submit three (3) copies within seven (7) days of end of each training module.
  - 1. Identification: On each copy, provide an applied label with the following information:
    - a. Name of Project.
    - b. Name of Architect.
    - c. Name of Contractor.
  - 2. Transcript:
    - a. Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
  - 3. 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."

1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Pre-instruction 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 demonstration and training including, but not limited to, the following:
  - 1. Inspect and discuss locations and other facilities required for instruction.
  - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
  - 3. Review required content of instruction.
  - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 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.

1.7 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 has 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.

#### 1.8 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.

#### 1.9 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, through Architect, with at least seven (7) days' advance notice.
- D. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 79 00



## SECTION 02 41 19 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Demolition and removal of selected portions of building or structure.
  - 2. Demolition and removal of selected site elements.
  - 3. Salvage of existing items to be reused or recycled.

#### 1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

#### 1.4 MATERIALS OWNERSHIP

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

#### 1.5 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

#### 1.6 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.
6. Review procedures for noise control and dust control.
7. Review procedures for protection of adjacent buildings.
8. Review storage, protection, and accounting for items to be salvaged and returned to Owner.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. 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.
- B. 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.
- C. Predemolition Photographs: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 01 32 33 "Photographic Documentation." Submit before Work begins.

#### 1.8 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

#### 1.9 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  1. Hazardous materials will be removed by Owner before start of the Work.
  2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

- E. 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.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Standards: Comply with ASSE A10.6 and NFPA 241.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- D. Inventory and record the condition of items to be removed and salvaged.
- E. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs and templates.
  - 1. Comply with requirements specified in Section 01 32 33 "Photographic Documentation."
  - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- 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. 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.

### 3.3 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.

### 3.4 SALVAGE/REINSTALL

- A. Removed and Salvaged Items:
  - 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 designated by Owner.
  - 5. Protect items from damage during transport and storage.
- B. 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.

### 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 24 hours after flame-cutting operations.
  6. Maintain adequate ventilation when using cutting torches.
  7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  10. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- B. 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. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- B. 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, unless preapproved by Architect.

### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 01 74 19 "Construction Waste Management and Disposal."

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

SECTION 04 20 00 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

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

1.4 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops indicated net-area compressive strengths at twenty-eight (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) according to TMS 602/ACI 530.1/ASCE 6.
  - 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
  - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
  - 2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.

C. Samples for Verification: For each type and color of the following:

1. Accessories embedded in masonry.

#### 1.6 INFORMATIONAL SUBMITTALS

A. 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 according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

B. 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 according to TMS 602/ACI 530.1/ASCE 6.

#### 1.7 QUALITY ASSURANCE

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

B. Source Limitations for Mortar Material: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer of each aggregate.

C. Limitations on Aggregates: For concrete masonry units containing recycled materials or post-industrial waste, provide units free of impurities that will cause rusting, staining, or popouts and with a record of successful in-service performance in conditions similar to those expected at Project site.

1. Ferrous material shall be removed by magnetic separation.
2. Aggregates shall contain no combustible materials or coal cinders.
3. Aggregates shall be graded and supplied in consistent gradations from batch to batch.
4. Materials shall be tested according to the following:
  - a. ASTM C 40: Organic Impurities in Fine Aggregates in Concrete.
  - b. ASTM C 136: Sieve Analysis of Fine and Course Aggregate.
  - c. ASTM C 641: Staining Materials in Lightweight Concrete Aggregates.
  - d. ASTM C 151: Autoclave Expansion of Hydraulic Cement (for popouts).
  - e. ASTM C 331: Lightweight Aggregates for Concrete Masonry Units.

#### 1.8 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.

#### 1.9 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 multi-wythe 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. 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 surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
- C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

#### 2.2 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Chipped, cracked, discolored or other defective units are not permitted.

2.3 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 on the drawings.
    - a. Eliminate bullnose units at all walls that receive ceramic tile.
- B. CMUs: ASTM C 90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
  - 2. Density Classification: Light weight, unless otherwise indicated.
  - 3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
  - 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
- C. Decorative CMUs: ASTM C 90.
  - 1. Standard pattern, burnished finish. Salvaged from demolition as indicated on drawings.

2.4 MASONRY LINTELS

- A. 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.

2.5 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II. Provide natural color or white cement as required to produce mortar color indicated.
  - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Mortar Cement: ASTM C 1329/C 1329M.
- E. Aggregate for Mortar: ASTM C 144.
  - 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.
- F. Aggregate for Grout: ASTM C 404.

G. Water: Potable.

## 2.6 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.

1. Interior Walls: Hot-dip galvanized carbon steel.
2. Wire Size for Side Rods: 0.148-inch diameter.
3. Wire Size for Cross Rods: 0.148-inch diameter.
4. Wire Size for Veneer Ties: 0.148-inch diameter.
5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
6. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

C. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods.

## 2.7 TIES AND ANCHORS

A. General: Ties and anchors shall 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 A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
2. Galvanized-Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 zinc coating.
3. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
4. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.

D. 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.

E. 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 or stainless steel wire unless otherwise indicated.
2. Tie Section: Triangular-shaped wire tie made from 0.187-inch-diameter, hot-dip galvanized steel or stainless steel wire unless otherwise indicated.
  - a. Basis-of-Design: Hohmann and Barnard; 359-C and 301W.
  - b. Construction Tie Products.
  - c. Wire-Bond.

- F. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
  - 1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.105-inch-thick steel sheet, galvanized after fabrication.
    - a. Basis-of-Design: Hohmann and Barnard; 305 and 315.
    - b. Construction Tie Products.
    - c. Wire-Bond.

## 2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene or urethane.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).

## 2.9 MASONRY CLEANERS

- A. Masonry Cleaner: Potable water.

## 2.10 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. For reinforced masonry, use portland cement-lime or mortar cement mortar.
- 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 C 270, 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 reinforced masonry, use Type S.
  - 2. For interior nonload-bearing partitions, Type O may be used instead of Type N.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
  - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.

2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

### PART 3 - EXECUTION

#### 3.1 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 reinforcing dowels are properly placed.
  3. 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. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- D. 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.

#### 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 feet, or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2-inch maximum.
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 stack bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by 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 and remove loose masonry units and mortar 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.

### 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. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

### 3.6 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. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### 3.7 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.

### 3.8 MOVEMENT 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 using one of the following methods:
  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. 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.

### 3.9 LINTELS

- A. Provide masonry lintels where indicated.
- B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

### 3.10 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
  1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- 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/ACI 530.1/ASCE 6 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.

### 3.11 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. Cleaning, General:
  1. Cleaning Appearance Standard: Cleaned surfaces to have uniform appearance as inspected by Architect from 20 feet away.
  2. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Ensure dirty residues and rinse water do not wash over dry, previously cleaned surfaces.
  3. Perform cleaning in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, that produces an even effect without streaking or damaging masonry surfaces. Keep wall wet below area being cleaned to prevent streaking from runoff.
  4. Perform additional general cleaning and spot cleaning of small areas that are noticeably different when viewed according to the "Cleaning Appearance Standard", so that cleaned surfaces blend smoothly into surrounding areas.
- D. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- E. 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 masonry and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape. Remove protection after cleaning is completed.
  4. Wet wall surfaces with water.
  5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

### 3.12 FIELD QUALITY CONTROL

- A. Finished Surfaces: Absolutely no chipped, broken, damaged, stained or discolored units will be accepted. Requirements of this section supersede workmanship acceptance of referenced masonry standards.

END OF SECTION 04 20 00

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SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Soffit framing.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Cold-formed steel framing materials.
  - 2. Vertical deflection clips.
  - 3. Single deflection track.
  - 4. Drift clips.
  - 5. Soffit framing.
  - 6. Post-installed anchors.
  - 7. Power-actuated anchors.
- 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.

1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- 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 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.

D. Research Reports:

1. For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
2. For sill sealer gasket, showing compliance with ICC-ES AC380.

1.6 QUALITY ASSURANCE

- A. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- B. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Framing Industry Association or the Steel Stud Manufacturers Association.
- C. 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."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. ClarkDietrich.
  2. MarinoWARE.
  3. Nuconsteel, A Nucor Company.
  4. Telling Industries.
  5. The Steel Network, Inc.

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
  1. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
    - a. Interior Non-Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft..
  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 inch.

- B. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing shall comply with AISI S100, AISI S200, and the following:

1. Wall Studs: AISI S211.
2. Headers: AISI S212.
3. Lateral Design: AISI S213.

### 2.3 COLD-FORMED STEEL FRAMING MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

- B. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:

1. Grade: As required by structural performance.
2. Coating: G60.

- C. Steel Sheet for Vertical Deflection Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:

1. Grade: As required by structural performance.
2. Coating: G60.

### 2.4 SOFFIT FRAMING

- A. Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0538 inch.
2. Flange Width: 1-5/8 inches, minimum.

- B. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

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

- a. ClarkDietrich.
- b. MarinoWARE.
- c. Simpson Strong-Tie Co., Inc.
- d. The Steel Network, Inc.

- C. 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.
- D. 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 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. Gusset plates.
  - 7. Stud kickers and knee braces.
  - 8. Hole-reinforcing plates.
  - 9. Backer plates.

## 2.6 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 hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by mechanically deposition according to ASTM B695, Class 50.
- 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 AC01 as appropriate for the substrate.
  - 1. Uses: Securing cold-formed steel framing to structure.
  - 2. Type: Torque-controlled expansion anchor, Torque-controlled adhesive 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.

## 2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M.
- 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. Non-metallic, Non-shrink Grout: Factory-packaged, non-metallic, non-corrosive, non-staining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.
- D. Shims: Load-bearing, high-density, multi-monomer, non-leaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.

## 2.8 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.
  - 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- 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 shall not 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. 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 INTERIOR NON-LOAD-BEARING 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 non-plumb 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. Connect vertical deflection clips to studs and anchor to building structure.
  - 3. Connect drift clips to cold-formed steel metal 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 18 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 shall not 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 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 05 40 00

SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Wood blocking and nailers.
  - 2. Wood furring.

1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
  - 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM 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.

1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
  - 1. Preservative-treated wood.
  - 2. Fire-retardant-treated wood.
  - 3. Power-driven fasteners.
  - 4. Post-installed anchors.

5. Metal framing anchors.

#### 1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

### PART 2 - PRODUCTS

#### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

#### 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
  1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
  2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

### 2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Treatment shall not promote corrosion of metal fasteners.
2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664, and design value adjustment factors shall be calculated according to ASTM D6841.

- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

- E. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.

- F. Application: Treat items indicated on Drawings, and the following:

1. Concealed blocking.

### 2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Furring.

- B. Dimension Lumber Items: Construction or No. 2 grade lumber of the following species:

1. Hem-fir (north); NLGA.

2. Mixed southern pine or southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB or WWPA.

C. Concealed Boards: 15 percent maximum moisture content 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.

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 blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

## 2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where 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. Screws for Fastening to Metal Framing: ASTM C1002, length as recommended by screw manufacturer for material being fastened.

D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 as appropriate for the substrate.

1. Material: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2.

## 2.6 METAL FRAMING ANCHORS

A. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

B. Hot-Dip, Heavy-Galvanized Steel Sheet: 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.

1. Use for wood-preservative-treated lumber and where indicated.

- C. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.

## 2.7 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.
  - 1. Adhesives shall have a VOC content of 70 g/L or less.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber 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.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. 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.
- F. 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.
- G. Comply with AWWA 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.
- H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- I. Securely attach 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.

2. ICC-ES evaluation report for fastener.

- J. 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 NAILER

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

### 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 Paneling: Install 1-by-3-inch nominal-size furring horizontally at 24 inches o.c.
- C. Furring to Receive Gypsum Board: 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.
- B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 53



SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Interior standing and running trim.
  - 2. Plastic laminate panel.
  - 3. Wood furring, blocking, shims, and hanging strips for installing interior architectural woodwork items that are not concealed within other construction.

1.3 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections, to ensure that interior architectural woodwork can be supported and installed as indicated.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Anchors.
  - 2. Adhesives.
  - 3. Shop finishing materials.
  - 4. Wood-Preservative Treatment:
    - a. Include data and warranty information from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
    - b. Indicate type of preservative used and net amount of preservative retained.
    - c. Include chemical-treatment manufacturer's written instructions for finishing treated material and manufacturer's written warranty.
  - 5. Fire-Retardant Treatment: Include data and warranty information from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
  - 6. Waterborne Treatments: For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

B. Shop Drawings:

1. Include the following:
  - a. Dimensioned plans, elevations, and sections.
  - b. Attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including blocking and reinforcement concealed by construction and specified in other Sections.

C. Samples: For each exposed product and for each shop-applied color and finish specified.

1. Size:
  - a. Panel Products: 12 inches by 12 inches.
  - b. Lumber Products: Not less than 5 inches wide by 12 inches long, for each species and cut, finished on one side and one edge.

D. Samples for Verification: For the following:

1. Lumber for Transparent Finish: Not less than 5 inches wide by 12 inches long, for each species and cut, finished on one side and one edge.
2. Plastic Laminates: 8 by 10 inches, for each type, color, pattern, and surface finish required.
  - a. Provide one sample applied to core material with specified edge material applied to one edge.

1.6 INFORMATIONAL SUBMITTALS

A. Product Certificates: For the following:

1. Composite wood and agrifiber products.
2. High-pressure decorative laminate.
3. Adhesives.

B. Evaluation Reports: For preservative-treated and fire-retardant-treated wood materials, from ICC-ES.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with the Architectural Woodwork Standards, Section 2.

B. Do not deliver interior architectural woodwork until painting and similar finish operations that might damage woodwork have been completed in installation areas.

C. Store woodwork in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1. Handle and store fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install interior architectural woodwork until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.
- B. Field Measurements: Where interior architectural woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings.
  - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being concealed by construction, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where interior architectural woodwork is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL WOODWORK, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
  - 1. The Contract Documents contain requirements that are more stringent than the Architectural Woodwork Standards. Comply with Contract Documents and Architectural Woodwork Standards.

2.2 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

- A. Architectural Woodwork Standards Grade: Premium.
- B. Hardwood Lumber:
  - 1. Wood Species: Red oak.
  - 2. Cut: Plain sliced/plain sawn.
  - 3. Wood Moisture Content: 5 to 10 percent.
  - 4. Finger Jointing: Not allowed.
  - 5. Gluing for Width: Use for lumber trim wider than 6 inches.
  - 6. Veneered Material: Not allowed.

2.3 PLASTIC-LAMINATE-CLAD ARCHITECTURAL PANELS

- A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of cabinets indicated for construction, finishes, installation, and other requirements.
  - 1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.
- B. AWI Default Grade and Duty Level: Premium, 4.
  - 1. Grade and/or duty level specifications by product shall supersede default grade and/or duty level.
- C. High-Pressure Decorative Laminate (PLAM-1): NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on the interior finish legend or comparable product by one of the following:
    - a. Formica Corporation; Formica.
    - b. Panolam Industries International, Inc.; Nevamar brand.
    - c. Panolam Industries International, Inc.; Pionite brand.
    - d. Wilsonart Engineered Surfaces.; Arborite brand.
    - e. Wilsonart Engineered Surfaces.; Wilsonart brand.
- D. Laminate Cladding for Exposed Surfaces:
  - 1. Horizontal Surfaces: Grade HGL.
  - 2. Vertical Surfaces: Grade VGS.
  - 3. Edges: PVC edge banding, 3 mm (0.118-inch) thick, matching laminate in color, pattern, and finish.
  - 4. Pattern Direction: As indicated.
- E. Materials for Semiexposed Surfaces:
  - 1. High-pressure decorative laminate, NEMA LD 3, Grade VGS.
    - a. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
- F. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.
- G. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
  - 1. As indicated by laminate manufacturer's designations on interior finish legend.

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. Wood Moisture Content: 5 to 10 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-3-Exterior Glue.
  - 3. Softwood Plywood: DOC PS 1.
  - 4. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

## 2.5 MISCELLANEOUS MATERIALS

- A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
  - 1. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with matching wood filler.
- B. Furring, Blocking, Shims, and Nailers: Fire-retardant-treated softwood lumber, kiln-dried to less than 15 percent moisture content.
  - 1. Preservative Treatment: Provide softwood lumber treated by pressure process, AWWPA U1; Use Category UC3b.
    - a. Provide where in contact with concrete or masonry.
    - b. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
    - c. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
    - d. Mark lumber with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee's (ALSC) Board of Review.
  - 2. Fire-Retardant Treatment: Complying with requirements; provide where indicated.
- C. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement, urea formaldehyde free.
  - 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

## 2.6 FABRICATION

- A. Fabricate interior architectural woodwork to dimensions, profiles, and details indicated.
  - 1. Ease edges to radius indicated for the following:
    - a. Edges of Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.
    - b. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.
- B. Fabricate architectural panels to dimensions, profiles, and details indicated.
  - 1. Lamination System: Finished end panels, and other decorative exterior laminate surfaces shall be composed of minimum 3/4 inches core, laminated exterior with .028 inches high pressure plastic laminate, and interior with .020 inches high-pressure cabinet liner. Lamination with Type II water resistant adhesives. Total thickness 13/16 inches. No exceptions.

- a. Exposed exterior cabinet ends to be laminated with high-pressure plastic laminate, balanced with high-pressure cabinet liner interior surface.
  - b. Exposed exterior backs shall be high-pressure plastic laminate, balanced with high-pressure cabinet liner.
- C. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site.
1. Disassemble components only as necessary for shipment and installation.
  2. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.
  3. Notify Architect seven (7) days in advance of the dates and times interior architectural woodwork fabrication will be complete.
  4. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled.
    - a. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting.
    - b. Verify that parts fit as intended, and check measurements of assemblies against field measurements indicated on approved Shop Drawings before disassembling for shipment.

## 2.7 SITE FINISHING

- A. Preparation for Finishing: Comply with Architectural Woodwork Standards, Section 5 for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing interior architectural woodwork, as applicable to each unit of work.
1. Back-priming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of interior architectural woodwork. Apply two coats to end-grain surfaces.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

### 3.3 INSTALLATION

- A. Grade: Install interior architectural woodwork to comply with same grade as item to be installed.

- B. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.
- C. Assemble interior architectural woodwork and complete fabrication at Project site to the extent that it was not completed during shop fabrication.
- D. Install interior architectural woodwork level, plumb, true in line, and without distortion.
  - 1. Shim as required with concealed shims.
  - 2. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
- E. Scribe and cut interior architectural woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- F. Preservative-Treated Wood: Where cut or drilled in field, treat cut ends and drilled holes according to AWPA M4.
- G. Fire-Retardant-Treated Wood: Install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
- H. Anchor interior architectural woodwork to anchors or blocking built in or directly attached to substrates.
  - 1. Secure with countersunk, concealed fasteners and blind nailing.
  - 2. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with interior architectural woodwork.
  - 3. For shop-finished items, use filler matching finish of items being installed.
- I. Standing and Running Trim:
  - 1. Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible.
  - 2. Do not use pieces less than 60 inches long, except where shorter single-length pieces are necessary.
  - 3. Scarf running joints and stagger in adjacent and related members.
  - 4. Filling with wood filler is more labor intensive than filling with latex sealant.
  - 5. Stagger joints in adjacent and related standing and running trim.
  - 6. Cope at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint.
  - 7. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting.
  - 8. Fasten to prevent movement or warping.
  - 9. Countersink fastener heads on exposed carpentry work and fill holes.
  - 10. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.

### 3.4 ADJUSTING

- A. Replace interior finish carpentry that is damaged or does not comply with requirements.
  - 1. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.
- B. Adjust joinery for uniform appearance.

3.5 REPAIR

- A. Repair damaged and defective interior architectural woodwork, where possible, to eliminate functional and visual defects and to result in interior architectural woodwork being in compliance with requirements of Architectural Woodwork Standards for the specified grade.
- B. Where not possible to repair, replace defective woodwork.
- C. Field Finish: See Section 09 93 00 "Staining and Transparent Finishing" for final finishing of installed interior architectural woodwork.

3.6 CLEANING

- A. Clean interior finish carpentry on exposed and semi-exposed surfaces.
- B. Replace damaged or soiled material or products and touch up factory-applied finishes if any.

3.7 PROTECTION

- A. Protect installed products from damage from weather and other causes during construction.
- B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.
  - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
- C. Wipe with damp cloth finished wood trims and hardwood caps.

END OF SECTION 06 40 23



SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Glass-fiber blanket insulation for sound attenuation.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- 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.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
  - 1. Surface-Burning Characteristics: ASTM E 84.
  - 2. Fire-Resistance Ratings: ASTM E 119.
  - 3. Fire Propagation Characteristics: NFPA 285.
  - 4. Combustion Characteristics: ASTM E 136.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by 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 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indexes less than Class A, 25 and 450 when tested in accordance with ASTM E84.
- B. Fire-Resistance Ratings: Comply with ASTM E119 or UL 263; 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 listings of another qualified testing agency.
- C. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
- D. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

### 2.2 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

### 2.3 SOUND ATTENUATION BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Knauf Insulation; EcoBatt.
  - 2. Owens Corning; Sound Attenuation Batts.
- B. Provide overall thickness required as indicated on Drawings.
- C. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers.
- D. Surface Burning Characteristics: ASTM E84.
  - 1. Maximum Flame Spread: 10.
  - 2. Maximum Smoke Development: 10.
- E. Combustion Characteristics: Passes ASTM E136.
- F. Fire Resistance Rating: Part of ASTM E119 fire tested wall assemblies.
- G. Sound Transmission Class: Complies with ASTM C423.

## 2.4 ACCESSORIES

### A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
2. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

### B. Miscellaneous Application Accessories:

1. Detailing Foam Insulation for Voids: Urethane foam complying with AAMA 812, low expansion pressure suitable for filling insulation gaps and voids adjacent to openings to protect against water, air, and sound intrusion.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

#### A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

#### A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

### 3.3 INSTALLATION, GENERAL

#### A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

#### B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

#### C. Install insulation with manufacturer's R-value label exposed after insulation is installed.

#### D. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

### 3.4 INSTALLATION OF SOUND ATTENUATION BLANKETS

#### A. Installation:

1. Interior Stud Cavity – Friction fit blankets securely between studs. Butt ends of blankets tightly together and fill all voids, install per manufactures printed instructions.
2. Sound Attenuation Blankets Creased (SAFB) – SAFD to be supplied 1” wider than stud spacing to allow for bowing in stud cavity and install per manufactures printed instructions.

3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 92 00 - JOINT SEALANTS

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. This Section includes joint sealants for the following applications, including those specified by reference to this Section:
  - 1. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
    - a. Tile control and expansion joints.
    - b. Vertical joints on exposed surfaces of interior unit masonry concrete walls and partitions.
    - c. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
    - d. Other joints as indicated.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- E. 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. Provide full range of manufacturer's colors should one not be pre-selected.
- F. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

## 1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
  2. When joint substrates are wet.
  3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

## 1.6 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two (2) years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Twenty (20) years from date of Substantial Completion.
- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
  2. Disintegration of joint substrates from natural causes exceeding design specifications.
  3. Mechanical damage caused by individuals, tools, or other outside agents.
  4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

### 2.2 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.3 MATERIALS, 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 sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Sealants: 250 g/L.
  - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
  - 3. Sealant Primers for Porous Substrates: 775 g/L.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.4 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
  - 1. Single Component Silicone: ASTM C920, Type S, Grade NS, Class 50 Uses NT, M, G, A and O: single component, neutral curing meeting VOC requirements of pertinent CARB and/or SCAQMD Rule for sealants VOC (4 percent by weight VOC or less in less than 16 oz. package or less than 250 g/L in larger package). All non-porous sealant primers must be below 250g/L and primers for porous substrates less than 775 g/L.
    - a. Interior frame perimeters.
    - b. Acceptable Products:
      - 1) Dowsil 795 by The Dow Chemical Company
      - 2) Spectrem 2 by Tremco Incorporated
      - 3) Equal complying products by listed manufactures.
  - 2. Single Component Sanitary Silicone: ASTM C920, Type S, Grade NS, Class 25; Uses NT, A and O: single component, color as selected meeting VOC requirements of pertinent CARB and/or SCAQMD Rule for sealants VOC (4 percent by weight VOC or less in less than 16 oz. package or less than 250 g/L in larger package). All non-porous sealant primers must be below 250g/L and primers for porous substrates less than 775 g/L.
    - a. Interior sanitary applications; countertops, backsplashes, lavatories, plumbing fixtures.
    - b. Acceptable Products:
      - 1) Dowsil 786 by The Dow Chemical Company
      - 2) Tremsil 200 by Tremco Incorporated
      - 3) Pecora 898 by Pecora Corporation
      - 4) Sika GP by Sika Corporation
      - 5) Equal complying products by listed manufactures.
- C. Multi-component, Non-sag, Urethane: ASTM C 920, Type M, Grade NS, Class 25 for Use NT.

1. For use in joints with a minimum depth of 1/4 inch, horizontal applications.
2. Acceptable Products:
  - a. Dymeric 240FC by Tremco Incorporated
  - b. Sikaflex - 2c NS by Sika Corporation
  - c. Dynatred by Pecora Corporation

## 2.5 LATEX JOINT SEALANTS

- A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.
- B. Products:
  1. Pecora Corporation; AC-20+.
  2. Sonneborn, Division of ChemRex Inc.; Sonolac.
  3. Tremco; Tremflex 834.
- C. Uses Related to Joint Substrates: Interior general purpose applications; door frames, wall material intersections and non-sanitary joint applications.

## 2.6 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:
  1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
  2. Products:
    - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
    - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

## 2.7 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, of types indicated below, as approved in writing by joint-sealant manufacturer (based on field experience and laboratory testing) for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
  1. Type B: Soft-Cell material with surface skin.
  2. Type C: Closed-cell material with a surface skin.
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.



- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## 2.8 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 joint-sealant performance.
- 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, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
    - a. Concrete.
    - b. Masonry.
    - c. Unglazed surfaces of ceramic tile.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean nonporous 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 in writing by joint-sealant manufacturer, based on 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 with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. 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. Install sealant backings in as long as possible sections.
  2. Do not leave gaps between ends of sealant backings.
  3. Do not stretch, twist, puncture, or tear sealant backings.
  4. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. 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.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
  2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

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 and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

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SECTION 08 12 13 - HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Interior standard steel frames.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or ANSI/SDI A250.8.
- B. Standard Hollow Metal Frames: Hollow metal frames fabricated according to ANSI/SDI A250.8.

1.4 PREINSTALLATION CONFERENCE

- A. Pre-Installation Conference: Attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, and finishes.
- B. Shop Drawings: Include the following:
  - 1. Elevations of each frame type.
  - 2. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  - 3. Locations of reinforcement and preparations for hardware.
  - 4. Details of each different wall opening condition.
  - 5. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
  - 6. Details of anchorages, joints, field splices, and connections.
  - 7. Details of accessories.
  - 8. Details of moldings, removable stops, and glazing.
  - 9. Details of conduit and preparations for power, signal, and control systems.

- C. Product Schedule: For hollow-metal 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.

#### 1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal frames from single source from single manufacturer.
- B. Quality Standards: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Maintenance Tools:
  - 1. Furnish two (2) unused tamper-resistant TORX screw driver tools and maintenance instructions as needed for Owner's continued adjustment and maintenance.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
  - 1. Provide additional protection to prevent damage to finish of 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 frames under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Do not store in a manner that traps excess humidity.
  - 1. Provide minimum 1/4-inch space between each stacked frame to permit air circulation.

#### 1.8 PROJECT CONDITIONS

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

#### 1.9 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.

#### 1.10 WARRANTY

- A. Manufacturer's standard warranty form in which manufacturer agrees to repair or replace frames that fail in materials or workmanship within two (2) warranty period beginning at time of substantial completion.

- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective frames.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Ceco Door Products; ASSA ABLOY.
  2. Curries Company; ASSA ABLOY.
  3. Deansteel Manufacturing Company, Inc.
  4. Mesker Door Inc.
  5. Pioneer Industries, Inc.
  6. Republic Doors and Frames.
  7. Steelcraft; an Allegion brand.

### MATERIALS

- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.
- E. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.
  1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- F. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- G. Powder-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.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- I. Glazing: Comply with requirements in Division 08 Section "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.2 INTERIOR HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Frames: Fabricated from cold-rolled steel sheet.
  - 1. Fabricate frames with mitered or coped corners.
  - 2. Fabricate frames as full profile standard face welds, ground smooth meeting SDI requirements, joints to be die-metered with integral tabs for reinforcement and interlocking of the jambs and head with a continuously caulked back joint.
  - 3. Frames for Wood Doors: 0.053-inch- thick steel sheet.
- C. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

## 2.3 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 according to ASTM A153/A153M, Class B.

## 2.4 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Ceiling Struts: Minimum 1/4-inch-thick by 1-inch- wide steel.
- C. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

## 2.5 FABRICATION

- A. Fabricate hollow metal frames to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.



- B. Tolerances: Fabricate hollow metal frames to tolerances indicated in SDI 117.
- C. Hollow Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections.
1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
    - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
  3. 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 butt welding.
  4. Light 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 butt welding.
  5. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
    - a. Provide flat or oval head exposed security type screws for all removable glazing stops on interior/exterior of building.
  6. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be packed with insulation.
  7. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
  8. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      - 1) Three anchors per jamb from 60 to 90 inches high.
      - 2) Four anchors per jamb from 90 to 120 inches high.
      - 3) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
    - b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      - 1) Four anchors per jamb from 60 to 90 inches high.
      - 2) Five anchors per jamb from 90 to 96 inches high.
      - 3) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
      - 4) Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.
    - c. Compression Type: Not less than two anchors in each jamb.
    - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

9. Door Silencers: Except on weather-stripped doors, 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.
  - D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
  - E. Hardware Preparation: Factory prepare hollow metal frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
    1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
    2. Reinforce frames to receive nontemplated, mortised and surface-mounted door hardware.
    3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal frames for hardware.
    4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.
  - F. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
    1. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
    2. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior frames. Provide loose stops and moldings on inside of hollow-metal frames.
    3. Glazing: Comply with requirements in Division 08 Section "Glazing" and with the hollow metal frame manufacturer's written instructions.
    4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
    5. Glazing stops on interior/exterior of building to spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.
    6. Provide flat or oval head exposed security type screws for all removable glazing stops on interior/exterior of building.
- 2.6 STEEL FINISHES
- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
    1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
  - B. Finish in field according to 09 96 00 "High-Performance Coatings".

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
  - 1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - 2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
  - 3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - 4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap frames to receive nontemplated, mortised, and surface-mounted door hardware.

#### 3.3 INSTALLATION

- A. General: Install hollow metal frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. 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, leaving surfaces smooth and undamaged.
    - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - b. Install frames with removable glazing stops located on secure side of opening.
    - c. Install door silencers in frames before grouting.

- d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
  - e. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
  4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mineral-fiber insulation.
  5. 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.
  6. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  7. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
  8. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.
    1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

### 3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal frames that are warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal frames immediately after installation.

### 3.5 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. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in 09 96 00 "High Performance Coatings."

END OF SECTION 08 12 13

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SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Five-ply flush wood veneer-faced doors for transparent finish.
  - 2. Factory finishing flush wood doors.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of 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. Factory-machining criteria.
  - 6. Factory- finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:
  - 1. Door schedule indicating door location, type, size, and swing.
  - 2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
  - 3. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
  - 4. Dimensions and locations of blocking for hardware attachment.
  - 5. Dimensions and locations of mortises and holes for hardware.
  - 6. Clearances and undercuts.
  - 7. Requirements for veneer matching.
  - 8. Doors to be factory finished and application requirements.
- C. Samples for Initial Selection: For factory-finished doors.
- D. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Special warranties.

1.7 QUALITY ASSURANCE

- A. A qualified manufacturer that is a member in good standing of the Window and Door Manufacturers Association.
- B. Comply with WDMA I.S.1A. "Architectural Wood Flush Doors" latest edition.
- C. Source Limitations: Obtain flush wood doors from single manufacturer.
- D. Manufacturer's Certification: Licensed participant in AWI's Quality Certification Program.
- E. Product Performance: Provide documents showing compliance to the following WDMA attributes, validating the specified WDMA Performance Duty Level:
  1. Adhesive Bonding Durability: WDMA TM-6
  2. Cycle Slam: WDMA TM-7
  3. Hinge Loading: WDMA TM-8
  4. Screw Holding: WDMA TM-10
    - a. Door Face
    - b. Vertical Door Edge
    - c. Horizontal Door Edge (applies when hardware is attached)

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags.
- C. Mark each door on top rail with opening number used on Shop Drawings.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during remainder of construction period.



1.10 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 shall also include installation and finishing that may be required due to repair or replacement of defective doors.
  3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI/AWMAC/WT's "Architectural Woodwork Standards."
1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with the Contract Documents in addition to those of the referenced quality standard.

2.3 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Doors:
1. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
    - a. Eggers Industries.
    - b. Lambton Doors.
    - c. Masonite Architectural.
    - d. Oshkosh Door Company.
    - e. VT Industries Inc.
  2. Performance Grade: ANSI/WDMA I.S. 1A Extra Heavy Duty.
  3. Architectural Woodwork Standards Grade: Premium.
  4. Faces: Single-ply wood veneer not less than 1/50 inch thick.
    - a. Species: Red oak.
    - b. Cut: Plain sliced (flat sliced).
    - c. Match between Veneer Leaves: Book match.
    - d. Assembly of Veneer Leaves on Door Faces: Center-balance match.
    - e. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.

- f. Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 20 feet or more.
  - g. Room Match: Provide door faces of compatible color and grain within each separate room or area of building.
5. Exposed Vertical and Top Edges: Same species as faces or a compatible species - Architectural Woodwork Standards edge Type A.
- a. 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.
    - 1) Screw-Holding Capability: 550 lbf in accordance with WDMA T.M. 10.
6. Core for Non-Fire-Rated Doors:
- a. ANSI A208.1, Grade LD-2 particleboard.
    - 1) Blocking: Provide wood blocking in particleboard-core doors as follows:
      - a) 5-inch top-rail blocking, in doors indicated to have closers.
      - b) 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
      - c) 5-inch midrail blocking, in doors indicated to have exit devices.
  - b. WDMA I.S. 10 structural composite lumber.
    - 1) Screw Withdrawal, Door Face: 550 lbf.
    - 2) Screw Withdrawal, Vertical Door Edge: 550 lbf.
7. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

## 2.4 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: Manufacturer's standard shape.

## 2.5 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.
- 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.

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."

## 2.6 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 bottom edges, edges of cutouts, and mortises.

B. Transparent Finish (WDFIN-1, WDFIN-3, WDFIN-4):

1. Architectural Woodwork Standards Grade: Premium.
2. Finish: Architectural Woodwork Standards System-11, Polyurethane, Catalyzed.
3. Staining: Match existing doors.
4. Effect: Open-grain finish.
5. 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. Job-Fitted Doors:

1. Align and fit doors in frames with uniform clearances and bevels as indicated below.

- a. Do not trim stiles and rails in excess of limits set by manufacturer.
  2. Machine doors for hardware.
  3. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
  4. Clearances:
    - a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
    - b. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.
    - c. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
  5. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

### 3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Related Sections:

1. Division 06 Section "Miscellaneous Rough Carpentry"
2. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
3. Division 08 Sections:
  - a. "Metal Frames"
  - b. "Flush Wood Doors"
4. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
5. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

A. UL LLC

1. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 101 – Life Safety Code

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

### 1.03 SUBMITTALS

#### A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
  - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
  - b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

#### B. Action Submittals:

1. Product Data: Submit 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.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
  - a. Wiring Diagrams: For power, signal, and control wiring and including:
    - 1) Details of interface of electrified door hardware and building safety and security systems.
    - 2) Schematic diagram of systems that interface with electrified door hardware.
    - 3) Point-to-point wiring.
    - 4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
  - a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule:
  - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
  - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
  - c. Indicate complete designations of each item required for each opening, include:
    - 1) Door Index: door number, heading number, and Architect's hardware set number.
    - 2) Quantity, type, style, function, size, and finish of each hardware item.
    - 3) Name and manufacturer of each item.
    - 4) Fastenings and other pertinent information.
    - 5) Location of each hardware set cross-referenced to indications on Drawings.
    - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
    - 7) Mounting locations for hardware.
    - 8) Door and frame sizes and materials.
    - 9) Degree of door swing and handing.

10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

5. Key Schedule:

- a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
- b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
- c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
- d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
- e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
  - a. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
  - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
  - b. Catalog pages for each product.
  - c. Final approved hardware schedule edited to reflect conditions as installed.
  - d. Final keying schedule
  - e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
  - f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
  - a. Required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
  2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
  3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
    - a. For door hardware: DHI certified AHC or DHC.
    - b. Can provide installation and technical data to Architect and other related subcontractors.
    - c. Can inspect and verify components are in working order upon completion of installation.
    - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
  4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
- B. Certifications:
1. Electrified Door Hardware
    - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
  2. Accessibility Requirements:
    - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.
- C. Pre-Installation Meetings
1. Keying Conference
    - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      - 2) Preliminary key system schematic diagram.
      - 3) Requirements for key control system.
      - 4) Requirements for access control.
      - 5) Address for delivery of keys.
  2. Pre-installation Conference
    - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - b. Inspect and discuss preparatory work performed by other trades.
    - c. Inspect and discuss electrical roughing-in for electrified door hardware.



- d. Review sequence of operation for each type of electrified door hardware.
- e. Review required testing, inspecting, and certifying procedures.
- f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:

- a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

D. Job Site Verification of Existing Conditions

- 1. General contractor along with door hardware supplier to review existing door, frame and hardware conditions. This will apply to openings where an existing door, frame or hardware will remain.
  - a. For existing frames to remain, verify all hardware preps in existing frame for compatibility with specified hardware. This includes but not limited to: hinge size, depth and backset. Existing strike locations and sizes, etc.
  - b. Verify existing frames for proper reinforcements for new hardware.
  - c. Where existing hardware is removed fill and finish any holes left by the removal of hardware.
- 2. General contractor along with door hardware supplier to verify existing door and frame condition for new locks and cylinders.
  - a. Any discrepancies between specified hardware and existing door and frame preps are to be brought to the attention of the Architect. Provide alternate solutions to maintain use of existing door and frame.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

#### 1.07 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
  - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
  - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    - a. Mechanical Warranty
      - 1) Locks
        - a) Best 45H Series: 10 years
      - 2) Exit Devices
        - a) Von Duprin: 3 years
      - 3) Closers
        - a) LCN 4000 Series: 30 years
    - b. Electrical Warranty
      - 1) Locks
        - a) Best: 1 year
      - 2) Exit Devices
        - a) Von Duprin: 1 year
      - 3) Closers
        - a) LCN: 2 years

#### 1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

- B. Turn over unused materials to Owner for maintenance purposes.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
  - 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

### 2.02 MATERIALS

- A. Fabrication
  - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
  - 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
  - 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Frames" and "Flush Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
  - 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- C. Cable and Connectors:
  - 1. 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.
  - 2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.

3. 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.

## 2.03 HINGES

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Ives 5BB series
2. Acceptable Manufacturers and Products:
  - a. Hager BB1191/1279 series
  - b. McKinney TB series
  - c. Stanley FBB series

### B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
  - a. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
  - a. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. 2 inches or thicker doors:
  - a. Interior: Heavy weight, steel, 5 inches (127 mm) high
6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - a. Steel Hinges: Steel pins
  - b. Non-Ferrous Hinges: Stainless steel pins
  - c. Out-Swinging Interior Lockable Doors: Non-removable pins
  - d. Interior Non-lockable Doors: Non-rising pins
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

## 2.04 ELECTRIC POWER TRANSFER

### A. Manufacturers:

1. Scheduled Manufacturer and Product:

- a. Von Duprin EPT-10
2. Acceptable Manufacturers and Products:
  - a. No Substitute
- B. Requirements:
  1. 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.
  2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

## 2.05 MORTISE LOCKS

- A. Manufacturers and Products:
  1. Scheduled Manufacturer and Product:
    - a. Best 45H Series
  2. Acceptable Manufacturers and Products:
    - a. No Substitute
- B. Requirements:
  1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1.
  2. Indicators: Where specified, provide indicator window measuring a minimum 2-inch x 1/2 inch with 180-degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
  3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
  4. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
  5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
  6. Provide motor based electrified locksets that comply with the following requirements:
    - a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
    - b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
    - c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
    - d. 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.
    - e. Connections – provide quick-connect Molex system standard.
  7. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

## 2.06 EXIT DEVICES

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Von Duprin 99/33A series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

### B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide grooved touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide electrified options as scheduled.
14. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
15. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.
16. Special Options:
  - a. SI
    - 1) Provide dogging indicators for visible indication of dogging status.

## 2.07 ELECTRIC STRIKES

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. HES 1600-CS series
2. Acceptable Manufacturers and Products:

a. Von Duprin

B. Requirements:

1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary resistant that are tested to a minimum endurance test of 1,000,000 cycles.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.08 POWER SUPPLIES

A. Manufacturers and Products:

- a. Scheduled Manufacturer and Product:
- b. Schlage/Von Duprin PS900 Series

2. Acceptable Manufacturers and Products:

- a. No Substitute

B. Requirements:

1. Provide power supplies approved by manufacturer of supplied electrified hardware.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
4. Provide power supplies with the following features:
  - a. 12/24 VDC Output, field selectable.
  - b. Class 2 Rated power limited output.
  - c. Universal 120-240 VAC input.
  - d. Low voltage DC, regulated and filtered.
  - e. Polarized connector for distribution boards.
  - f. Fused primary input.
  - g. AC input and DC output monitoring circuit w/LED indicators.
  - h. Cover mounted AC Input indication.
  - i. Tested and certified to meet UL294.
  - j. NEMA 1 enclosure.
  - k. Hinged cover w/lock down screws.
  - l. High voltage protective cover.

2.09 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer and Product:
  - a. Best Keying Systems
2. Acceptable Manufacturers and Products:

a. No Substitute

B. Requirements:

1. Provide cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

2.10 KEYING

A. Scheduled System:

- a. Existing factory registered system:
- b. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:

- a. Replaceable Construction Cores.
  - 1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
    - a) 3 construction control keys
    - b) 12 construction change (day) keys.
  - 2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2. Permanent Keying:

- a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
  - 1) Master Keying system as directed by the Owner.
- b. Forward biting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
- c. Provide keys with the following features:
  - 1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
  - 2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
- d. Identification:
  - 1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
  - 2) Identification stamping provisions must be approved by the Architect and Owner.



- 3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
  - 4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
  - 5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
- e. Quantity: Furnish in the following quantities.
- 1) Change (Day) Keys: 3 per cylinder/core.
  - 2) Permanent Control Keys: 3.
  - 3) Master Keys: 6.

## 2.11 DOOR CLOSERS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. LCN 4040XP series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

### B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. 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.

## 2.12 DOOR TRIM

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Trimco
  - b. Burns
  - c. Rockwood

### B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

## 2.13 PROTECTION PLATES

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Trimco
  - c. Rockwood

### B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.

## 2.14 DOOR STOPS AND HOLDERS

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Trimco
  - b. Burns
  - c. Rockwood

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.15 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Zero International
2. Acceptable Manufacturers:
  - a. National Guard
  - b. Reese
  - c. Legacy
  - d. Pemko

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
3. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.16 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Rockwood
  - c. Trimco

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

## 2.17 DOOR POSITION SWITCHES

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Schlage
2. Acceptable Manufacturers:
  - a. GE-Interlogix

### B. Requirements:

1. Provide recessed or surface mounted type door position switches as specified.
2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

## 2.18 FINISHES

### A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
2. Protection Plates: BHMA 630 (US32D)
3. Overhead Stops and Holders: BHMA 630 (US32D)
4. Door Closers: Powder Coat to Match
5. Wall Stops: BHMA 630 (US32D)
6. Latch Protectors: BHMA 630 (US32D)
7. Weatherstripping: Clear Anodized Aluminum
8. Thresholds: Mill Finish Aluminum

### B. FINISH: BHMA 630 (US32D); EXCEPT:

1. Door Closers: Powder Coat to Match
2. Weatherstripping: Clear Anodized Aluminum
3. Thresholds: Mill Finish Aluminum

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
  - 1. Standard Steel Frames: ANSI/SDI A250.8.
  - 2. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
  - 3. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
  - 1. Install construction cores to secure building and areas during construction period.
  - 2. Replace construction cores with permanent cores as indicated in keying section.
  - 3. Furnish permanent cores to Owner for installation.
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
  - 1. Conduit, junction boxes and wire pulls.
  - 2. Connections to and from power supplies to electrified hardware.
  - 3. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
  - 4. Connections to panel interface modules, controllers, and gateways.
  - 5. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- M. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

- N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- S. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

### 3.03 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  - 1. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
  - 2. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

### 3.04 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.


### 3.05 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

Abbreviation	Name
BES	Best Locking Systems
GLY	Glynn-Johnson Corp
IVE	H.B. Ives
LCN	Len Commercial Division
SCE	Schlage Electronic Security
SCH	Schlage Lock Company
VON	Von Duprin
ZER	Zero International Inc






Legend:

-  Link to catalog cut sheet
-  Electrified Opening

Hardware Group No. G01

For use on Door #(s): 1009-A, 1009-B, 1142, 1144

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	ELECTRIC STRIKE	1600-CS		630	HES
1	EA	DOOR POSITION SWITCH	679-05 HM/WD AS REQ'D			BLK SCE
1	EA	POWER SUPPLY	PS906 900-8F-FA			VON

DOOR SUPPLIER AND GENERAL CONTRACTOR TO VERIFY ELECTRIC STRIKE COMPATIBILITY WITH EXISTING DOOR HARDWARE TO BE RE-USED. ONE POWER SUPPLY TO POWER 1009-A, 1009-B, 1142, 1144, 1007.1, C118, 1009.1. LOCATE POWER SUPPLY AT CENTRAL LOCATION AS DETERMINED BY ARCHITECT AND GC.

DOOR NORMALLY CLOSED, LATCHED AND SECURE. ENTRY BY VALID CREDENTIAL. FREE EGRESS ALLOWED. ACCESS CONTROL SYSTEM, CREDENTIALS, CARD READERS, REMOTE RELEASE BUTTONS, AND OTHER SYSTEM COMPONENTS NOT LISTED HERE ARE BY THE SECURITY CONTRACTOR.

Hardware Group No. G02 – NOT USED

Hardware Group No. G03

For use on Door #(s):  
 1009.1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10		SP28	VON
1	EA	ELECTRONIC MORTISE LOCK	45H-W-7-DEU 15R		626	BES
1	EA	SURFACE CLOSER	4040XP REG		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		US32D	IVE
1	EA	WALL STOP	WS406/407CVX		US32D	IVE
1	EA	DOOR POSITION SWITCH	679-05 HM/WD AS REQ'D		BLK	SCE

DOOR NORMALLY CLOSED, LATCHED AND SECURE. ENTRY BY VALID CREDENTIAL. FREE EGRESS ALLOWED. ACCESS CONTROL SYSTEM, CREDENTIALS, CARD READERS, REMOTE RELEASE BUTTONS, AND OTHER SYSTEM COMPONENTS NOT LISTED HERE ARE BY THE SECURITY CONTRACTOR. POWER SUPPLY IN SET G01.

Hardware Group No. G04

For use on Door #(s):  
 C118

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
2	EA	POWER TRANSFER	EPT10		SP28	VON
1	EA	KEYED REMOVABLE MULLION	KR4954		689	VON
1	EA	ELEC PANIC HARDWARE	SD-LX-RX-QEL-99-L-DT-06 24 VDC		626	VON
1	EA	ELEC PANIC HARDWARE	SD-LX-RX-QEL-99-L-NL-06 24 VDC		626	VON
1	EA	RIM CYLINDER	12E-72 S2 RP		626	BES
3	EA	MORTISE CYLINDER	1E-74 C4 RP2		626	BES
2	EA	SURFACE CLOSER	4040XP CUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	DOOR POSITION SWITCH	679-05 HM/WD AS REQ'D		BLK	SCE

DOOR NORMALLY CLOSED, LATCHED AND SECURE. ENTRY BY VALID CREDENTIAL. FREE EGRESS ALLOWED. ACCESS CONTROL SYSTEM, CREDENTIALS, CARD READERS, REMOTE RELEASE BUTTONS, AND OTHER SYSTEM COMPONENTS NOT LISTED HERE ARE BY THE SECURITY CONTRACTOR. POWER SUPPLY IN SET G01.

Hardware Group No. N01 – NOT USED

Hardware Group No. N02 – NOT USED



Hardware Group No. N03

For use on Door #(s):  
 C001B.1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
2	EA	POWER TRANSFER	EPT10	⚡	SP28	VON
1	EA	KEYED REMOVABLE MULLION	KR4954		689	VON
1	EA	ELEC PANIC HARDWARE	SD-LX-RX-QEL-99-L-DT-06 24 VDC	⚡	626	VON
1	EA	ELEC PANIC HARDWARE	SD-LX-RX-QEL-99-L-NL-06 24 VDC	⚡	626	VON
1	EA	RIM CYLINDER	12E-72 S2 RP		626	BES
3	EA	MORTISE CYLINDER	1E-74 C4 RP2		626	BES
2	EA	SURFACE CLOSER	4040XP CUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS406/407CVX		US32D	IVE
2	EA	DOOR POSITION SWITCH	679-05 HM/WD AS REQ'D	⚡	BLK	SCE

DOOR NORMALLY CLOSED, LATCHED AND SECURE. ENTRY BY VALID CREDENTIAL. FREE EGRESS ALLOWED. ACCESS CONTROL SYSTEM, CREDENTIALS, CARD READERS, REMOTE RELEASE BUTTONS, AND OTHER SYSTEM COMPONENTS NOT LISTED HERE ARE BY THE SECURITY CONTRACTOR. POWER SUPPLY IN SET N01

Hardware Group No. N04

For use on Door #(s):  
 C001B.2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
2	EA	POWER TRANSFER	EPT10	⚡	SP28	VON
1	EA	KEYED REMOVABLE MULLION	KR4954		689	VON
2	EA	ELEC PANIC HARDWARE	SD-LX-RX-QEL-99-L-DT-06 24 VDC	⚡	626	VON
1	EA	RIM CYLINDER	12E-72 S2 RP		626	BES
3	EA	MORTISE CYLINDER	1E-74 C4 RP2		626	BES
2	EA	SURFACE CLOSER	4040XP CUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	DOOR POSITION SWITCH	679-05 HM/WD AS REQ'D	⚡	BLK	SCE

DOOR NORMALLY CLOSED, LATCHED AND SECURE. ENTRY BY VALID CREDENTIAL. FREE EGRESS ALLOWED. ACCESS CONTROL SYSTEM, CREDENTIALS, CARD READERS, REMOTE RELEASE BUTTONS, AND OTHER SYSTEM COMPONENTS NOT LISTED HERE ARE BY THE SECURITY CONTRACTOR. POWER SUPPLY IN SET N01

Hardware Group No. N05

For use on Door #(s):

001A.1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10		SP28	VON
1	EA	ELECTRONIC MORTISE LOCK	45H-W-7-DEU 15R		626	BES
1	EA	SURFACE CLOSER	4040XP REG		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		US32D	IVE
1	EA	WALL STOP	WS406/407CVX		US32D	IVE
1	EA	DOOR POSITION SWITCH	679-05 HM/WD AS REQ'D		BLK	SCE

DOOR NORMALLY CLOSED, LATCHED AND SECURE. ENTRY BY VALID CREDENTIAL. FREE EGRESS ALLOWED. ACCESS CONTROL SYSTEM, CREDENTIALS, CARD READERS, REMOTE RELEASE BUTTONS, AND OTHER SYSTEM COMPONENTS NOT LISTED HERE ARE BY THE SECURITY CONTRACTOR. POWER SUPPLY IN SET N01

Hardware Group No. S01

For use on Door #(s):

019A.1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
2	EA	POWER TRANSFER	EPT10		SP28	VON
1	EA	KEYED REMOVABLE MULLION	KR4954		689	VON
1	EA	ELEC PANIC HARDWARE	SD-LX-RX-QEL-99-L-DT-06 24 VDC		626	VON
1	EA	ELEC PANIC HARDWARE	SD-LX-RX-QEL-99-L-NL-06 24 VDC		626	VON
1	EA	RIM CYLINDER	12E-72 S2 RP		626	BES
3	EA	MORTISE CYLINDER	1E-74 C4 RP2		626	BES
2	EA	SURFACE CLOSER	4040XP CUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	DOOR POSITION SWITCH	679-05 HM/WD AS REQ'D		BLK	SCE
1	EA	POWER SUPPLY	PS906 900-8F-FA			VON

DOOR NORMALLY CLOSED, LATCHED AND SECURE. ENTRY BY VALID CREDENTIAL. FREE EGRESS ALLOWED. ACCESS CONTROL SYSTEM, CREDENTIALS, CARD READERS, REMOTE RELEASE BUTTONS, AND OTHER SYSTEM COMPONENTS NOT LISTED HERE ARE BY THE SECURITY CONTRACTOR.







ONE POWER SUPPLY TO POWER 009-2, 019A.1, 019A.2, 019A.3. LOCATE POWER SUPPLY AT CENTRAL LOCATION AS DETERMINED BY ARCHITECT AND GC.

Hardware Group No. S02

For use on Door #(s):

019A.2 003.1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10		✂ SP28	VON
1	EA	ELECTRONIC MORTISE LOCK	45H-W-7-DEU 15R		✂ 626	BES
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		US32D	IVE
1	EA	WALL STOP	WS406/407CVX		US32D	IVE
1	EA	DOOR POSITION SWITCH	679-05 HM/WD AS REQ'D		✂ BLK	SCE

END OF SECTION 08 71 00

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## SECTION 08 71 13 - POWER DOOR OPERATORS

### 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. Low-energy door operators for swinging doors.

#### 1.3 DEFINITIONS

- A. AAADM: American Association of Automatic Door Manufacturers.
- B. Activation Device: A control that, when actuated, sends an electrical signal to the door operator to open the door.
- C. Double-Swing (Doors): A pair of doors that swing with the two doors moving in opposite directions with a mullion between them; each door functioning as a single-swing door.
- D. Safety Device: A control that, to avoid injury, prevents a door from opening or closing.
- E. For automatic door terminology, see BHMA A156.10 for definitions of terms.

#### 1.4 COORDINATION

- A. Coordinate sizes and locations of recesses in concrete floors for recessed control mats that control automatic door operators. Concrete, reinforcement, and formwork requirements are specified elsewhere.
- B. Templates: Distribute for doors, frames, and other work specified to be factory prepared and reinforced for installing automatic door operators.
- C. Coordinate hardware for doors with operators to ensure proper size, thickness, hand, function, and finish.
- D. Electrical System Roughing-in: Coordinate layout and installation of automatic door operators with connections to power supplies.

#### 1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for automatic door operators.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For automatic door operators.

1. Include plans, elevations, sections, hardware mounting heights, and attachment details.
2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Indicate locations of activation and safety devices.
4. Include diagrams for power, signal, and control wiring.
5. Include plans, elevations, and sections.

1.7 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For automatic door operators, safety devices, and control systems, to include in maintenance manuals.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer for 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.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of automatic door operators that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
  - a. Faulty or sporadic operation of automatic door operator, including controls.
  - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering or use.
2. Warranty Period: Two (2) years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 POWER DOOR OPERATORS, GENERAL

- A. General: Provide operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for occupancy type indicated; and according to UL 325. Coordinate operator mechanisms with door operation, hinges, and activation and safety devices.
  - 1. Emergency Breakaway: Where indicated for center-pivoted doors, provide emergency breakaway feature for reverse swing of doors. Equip system to discontinue power to automatic door operator when door is in emergency breakaway position, to return door to closed position after breakaway, and to automatically reset.
- B. Electrical Operating System: Manufacturer's standard control box and motor/gear box.
  - 1. Power Supply: 115 VAC.
  - 2. Microprocessor Control: 115 VAC.
- C. Hinges: See Section 08 71 00 "Door Hardware" for hinge type for each door that door operator shall accommodate.
- D. Housing for Overhead Concealed Operators: Fabricated from minimum 0.125-inch- thick, extruded or formed aluminum and extending full width of door opening including door jambs to conceal door operators and controls. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.
- E. Brackets and Reinforcements: Fabricated from aluminum with nonstaining, nonferrous shims for aligning system components.
- F. 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.

### 2.2 LOW-ENERGY DOOR OPERATORS

- A. Manufacturer: Subject to compliance with requirements, provide the following:
  - 1. LCN, an Allegion Company; LCN 9500 Senior Swing.
- B. Standard: BHMA A156.19.
- C. Performance Requirements:
  - 1. Rated operation for door panel weight of 200 lbs., minimum.
  - 2. Opening Force if Power Fails: Not more than 15 lbf required to release latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
  - 3. Entrapment-Prevention Force: Not more than 15 lbf required to prevent stopped door from closing or opening.
- D. Configuration: Operator to control each swinging door.
  - 1. Mounting: Surface mounted.

- E. Operation: Power opening and power-assisted spring closing. Provide time delay for door to remain open before initiating closing cycle as required by BHMA A156.19. When not in automatic mode, door operator shall function as manual door closer, with or without electrical power.
- F. Operating System: Electric.
- G. Microprocessor Control Unit: Solid-state controller.
- H. Features:
  - 1. Adjustable opening and closing speed.
  - 2. Adjustable opening and closing force.
  - 3. Adjustable backcheck.
  - 4. Adjustable hold-open time from zero to 30 seconds.
  - 5. Adjustable time delay.
  - 6. Adjustable acceleration.
  - 7. Obstruction recycle.
  - 8. On-off/hold-open switch to control electric power to operator; key operated.
- I. Activation Device: Push-plate switch to activate door operator.
- J. Exposed Finish: Manufacturer's standard Class I, clear anodic finish.

## 2.3 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  - 1. Extrusions: ASTM B 221.
  - 2. Sheet: ASTM B 209.
- B. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

## 2.4 CONTROLS

- A. General: Provide controls, including activation and safety devices, according to BHMA standards; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for occupancy type indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.
- B. Photoelectric Beams: Pulsed infrared, sender-receiver assembly for recessed mounting. Beams shall not be active when doors are fully closed.
- C. Push-Plate Switch (Mullion Install): Momentary-contact, UL-listed door control switch, 15 A, 125 VAC with flat push-plate actuator with contrasting-colored, engraved message.
  - 1. Product: LCN 8310 Series.
  - 2. Configuration: Mullion style, 1 1/2-inches wide.
    - a. Mounting: Mullion mounted.
  - 3. Push-Plate Material: Stainless steel.
  - 4. Message: "Push to Open" in blue letters.



- D. Push-Plate Switch (Wall Install): Momentary-contact door control switch, battery operated transmitter and receiver, and flat push-plate actuator with contrasting-colored, engraved message.
  - 1. Product: LCN 8310 Series.
  - 2. Configuration:
    - a. Mounting: Wall mounted.
  - 3. Push-Plate Material: Stainless steel.
  - 4. Message: International symbol of accessibility.
- E. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

## 2.5 FABRICATION

- A. Factory fabricate automatic door operators to comply with indicated standards.
- B. Form aluminum shapes before finishing.
- C. Fabricate exterior components to drain condensation and water passing joints within operator enclosure to the exterior.
- D. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, finished to match operator.
- E. Provide metal cladding, completely covering visible surfaces before shipment to Project site. Fabricate cladding with concealed fasteners and connection devices, with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion, and with allowance for thermal expansion at exterior doors.

## 2.6 ACCESSORIES

- A. Signage: As required by cited BHMA standard for type of door and its operation.
  - 1. Application Process: Operator manufacturer's standard process.
  - 2. Provide sign materials with instructions for field application when operators are installed.

## 2.7 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
- B. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.
- 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 range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, door and frame preparation and reinforcements, and other conditions affecting performance of automatic door operators.
- B. Examine roughing-in for electrical systems to verify actual locations of power connections before automatic door operator installation.
- C. Verify that full-height finger guards are installed at each door with pivot hinges where door has a clearance at hinge side greater than 1/4 inch and less than 3/4 inch with door in any position.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install automatic door operators according to manufacturer's written instructions and cited BHMA standard for type of door operation and direction of pedestrian travel, including signage, controls, wiring, remote power units if any, and connection to building's power supply.
  - 1. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion.
  - 2. Install operators true in alignment with established lines and door geometry without warp or rack. Anchor securely in place.
- B. Controls: Install activation and safety devices according to manufacturer's written instructions and cited BHMA standard for operator type and direction of pedestrian travel. Connect control wiring according to Division 26 Section related to low-voltage electrical power conductors and cables.
- C. Signage: Apply on both sides of each door as required by cited BHMA standard for type of door operator and direction of pedestrian travel.

3.3 FIELD QUALITY CONTROL

- A. Certified Inspector: Engage a Certified Inspector to test and inspect components, assemblies, and installations, including connections.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. Test and inspect each automatic door operator installation, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.
- C. Automatic door operators will be considered defective if they do not pass tests and inspections.

- D. Prepare test and inspection reports.

#### 3.4 ADJUSTING

- A. Adjust automatic door operators to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.
  - 1. Adjust operators on exterior doors for weathertight closure.
- B. After completing installation of automatic door operators, inspect exposed finishes on doors and operators. Repair damaged finish to match original finish.
- C. Readjust automatic door operators and controls after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles).
- D. Occupancy Adjustment: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

#### 3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic door operators.

END OF SECTION 08 71 13

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SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Glass products.
  - 2. Laminated glass.
  - 3. Miscellaneous glazing materials.

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.
- C. IBC: International Building Code.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 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.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturers of fabricated glass units, glass testing agency and sealant testing agency.
- B. Product Certificates: For glass.

- C. Sample Warranties: For special warranties.

#### 1.7 QUALITY ASSURANCE

- A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.

#### 1.8 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.

#### 1.9 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: Five (5) years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- B. 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 6 mm thick.
  - 2. For laminated-glass lites, properties are based on products of construction indicated.
  - 3. 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. 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 another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Thickness: Where glass thickness is indicated, it is a minimum.
  - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.
- D. Strength: 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.

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 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 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.

## 2.7 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. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- D. 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.
- E. 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.
- F. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- G. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

### 3.4 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.

### 3.5 LAMINATED GLASS SCHEDULE

- A. Clear Laminated Glass Type (GL-2): Two plies of fully tempered float glass.
  - 1. Minimum Thickness of Each Glass Ply: 5 mm.
  - 2. Interlayer Thickness: 0.090 inch.
  - 3. Safety glazing required.

END OF SECTION 08 80 00

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**Flooring Pre-Installation Report**

(Attach additional sheets/information as necessary)

(One report is required for each type/product of flooring to be installed)

This form must be sent to General Contractor, and Architect immediately to expedite required corrective measures. Starting install means acceptance of existing conditions. Attach concrete tests, listing results and corrective actions required/taken and acceptance by flooring manufacturer and installer. This report shall be included as part of the project close-out submittal. Factory installation technician must be present at start of installation.

Project Name \_\_\_\_\_

Project Location \_\_\_\_\_

Date \_\_\_\_\_ Anticipated Installation Date \_\_\_\_\_

Manufacturer's Factory Installation Technician \_\_\_\_\_  
(Name)

Phone No. \_\_\_\_\_

Flooring Manufacturer \_\_\_\_\_ Product Color/Pattern \_\_\_\_\_

Manufacturer's Order/Lot No. and Quantity \_\_\_\_\_

Flooring Adhesive Mfg/Name/No. \_\_\_\_\_

Flooring Product Name \_\_\_\_\_

List any conditions (by room number) which in the opinion of the manufacturer/installer if not corrected would adversely affect achieving a 100% proper and successful (fully warranted) flooring installation (attach additional sheets if necessary). State corrective measures required, party responsible, cost involved, delays, etc.

\_\_\_\_\_  
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\_\_\_\_\_

Flooring Manufacturer Signature \_\_\_\_\_

Flooring Installation Contractor Signature \_\_\_\_\_

FCIB Number \_\_\_\_\_ Date \_\_\_\_\_

IFCI Number \_\_\_\_\_ Date \_\_\_\_\_

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## **Flooring Maintenance Orientation Report**

A copy of this report shall be included as part of the project close-out requirements.

Project Name \_\_\_\_\_

Project Location \_\_\_\_\_

Date \_\_\_\_\_

Flooring Installation Contractor \_\_\_\_\_

Address \_\_\_\_\_

Phone No. \_\_\_\_\_

Name of Contractors Rep Conducting Orientation: \_\_\_\_\_

I.F.C. Cert. No. (state none if not certified) \_\_\_\_\_

I.F.C. Expiration. Date \_\_\_\_\_

Installation Completion Date \_\_\_\_\_

A \_\_\_\_\_ flooring maintenance orientation was held on \_\_\_\_\_ 202\_\_, as part of specified contract requirements of Bray Associates Architects, Inc. The orientation covered all aspects of flooring care and maintenance necessary to ensure acceptable appearance and function to the terms stated in the manufacturer's product warranty. The orientation also covered improper maintenance techniques and potential results of same and the effects on manufacturer's warranty liability. Attach a copy of handout literature provided attendees.

### **Name of Owner's Personnel Attending**

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

### **Signature**

**Years of previous  
commercial \_\_\_\_\_  
flooring maintenance  
experience  
(state none if none)**

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

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## **Concrete Slab Test Report**

(This form may be reproduced as required)

Sheet \_\_\_ of \_\_\_

Concrete Slab Test Reports are required to be performed prior to installation of finished flooring materials and shall provide the basis of acceptance of the slab conditions by both the finish flooring manufacturer and installer. A test report shall be provided for each room/area. Submit report directly to General Contractor and Architect prior to flooring installations. Include additional copies of this form as necessary. Copies of this form are also to be included as part of the project close-out requirements.

**PROJECT NAME** \_\_\_\_\_

**PROJECT LOCATION** \_\_\_\_\_

**FLOORING CONTRACTOR** \_\_\_\_\_

**SPECIFICATION SECTION** \_\_\_\_\_

**TESTS PERFORMED BY (name)** \_\_\_\_\_

**DATE TEST PERFORMED** \_\_\_\_\_ **TIME TEST PERFORMED** \_\_\_\_\_

---

**Room Name and No.** (from Drawings) \_\_\_\_\_

• Moisture Test (specify type of test and result) \_\_\_\_\_

• Alkalinity Test (specify type of test and resultant pH) \_\_\_\_\_

• Evidence of curing/sealing/hardening compound present? Yes \_\_\_\_\_ No \_\_\_\_\_

• Other tests (as required by flooring mfg.'s and results) \_\_\_\_\_

• Overall slab condition/observations \_\_\_\_\_

• Remedial action required (if costs incurred, indicate party responsible) \_\_\_\_\_

---

**Room Name and No.** (from Drawings) \_\_\_\_\_

• Moisture Test (specify type of test and result) \_\_\_\_\_

• Alkalinity Test (specify type of test and resultant pH) \_\_\_\_\_

• Evidence of curing/sealing/hardening compound present? Yes \_\_\_\_\_ No \_\_\_\_\_

• Other tests (as required by flooring mfg.'s and results) \_\_\_\_\_

• Overall slab condition/observations \_\_\_\_\_

• Remedial action required (if costs incurred, indicate party responsible) \_\_\_\_\_

---

**Room Name and No.** (from Drawings) \_\_\_\_\_

- Moisture Test (specify type of test and result) \_\_\_\_\_  
\_\_\_\_\_
- Alkalinity Test (specify type of test and resultant pH) \_\_\_\_\_  
\_\_\_\_\_
- Evidence of curing/sealing/hardening compound present? Yes \_\_\_\_\_ No \_\_\_\_\_
- Other tests (as required by flooring mfg.'s and results) \_\_\_\_\_  
\_\_\_\_\_
- Overall slab condition/observations \_\_\_\_\_  
\_\_\_\_\_
- Remedial action required (if costs incurred, indicate party responsible) \_\_\_\_\_  
\_\_\_\_\_

**Room Name and No.** (from Drawings) \_\_\_\_\_

- Moisture Test (specify type of test and result) \_\_\_\_\_  
\_\_\_\_\_
- Alkalinity Test (specify type of test and resultant pH) \_\_\_\_\_  
\_\_\_\_\_
- Evidence of curing/sealing/hardening compound present? Yes \_\_\_\_\_ No \_\_\_\_\_
- Other tests (as required by flooring mfg.'s and results) \_\_\_\_\_  
\_\_\_\_\_
- Overall slab condition/observations \_\_\_\_\_  
\_\_\_\_\_
- Remedial action required (if costs incurred, indicate party responsible) \_\_\_\_\_  
\_\_\_\_\_

**Room Name and No.** (from Drawings) \_\_\_\_\_

- Moisture Test (specify type of test and result) \_\_\_\_\_  
\_\_\_\_\_
- Alkalinity Test (specify type of test and resultant pH) \_\_\_\_\_  
\_\_\_\_\_
- Evidence of curing/sealing/hardening compound present? Yes \_\_\_\_\_ No \_\_\_\_\_
- Other tests (as required by flooring mfg.'s and results) \_\_\_\_\_  
\_\_\_\_\_
- Overall slab condition/observations \_\_\_\_\_  
\_\_\_\_\_
- Remedial action required (if costs incurred, indicate party responsible) \_\_\_\_\_  
\_\_\_\_\_



SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Framing systems.

1.3 SUBMITTALS

- A. Product Data:
  - 1. Framing systems.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.
- B. Evaluation Reports: For high-strength steel studs and tracks, post-installed anchors, and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Framing Industry Association.

1.6 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 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. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, in accordance with ASTM E90 and classified in accordance with ASTM E413 by an independent testing agency.
- B. Horizontal Deflection: For wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 10 lbf/sq. ft.
- C. Design framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing - Nonstructural Members," unless otherwise indicated.
- D. Design Loads: As indicated on drawings or 5 lbf/sq. ft. minimum as required by the IBC.
- E. Design framing systems to maintain clearances at openings, accommodate deflection of primary building structure and construction tolerances, and to withstand design loads with a maximum deflection of 3/4 inch.

### 2.2 FRAMING SYSTEMS, GENERAL

- 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.

### 2.3 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners: ASTM C645.
  - 1. Minimum Base-Metal Thickness: Not less than 0.0312 inch design thickness and 0.0296 inch base metal thickness as in accordance with sections 4.3 and 8.1 of ASTM C645.
  - 2. Depth: As indicated on Drawings.
- B. Slip-Type Head Joints: Where indicated, provide one of the following:
  - 1. Single Long-Leg Runner System: ASTM C645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
  - 2. Double-Runner System: ASTM C645 top runners, inside runner with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
  - 3. Deflection Track: Steel sheet top runner 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.

- C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
  - 1. Minimum Base-Steel Thickness: 0.0312 inch.
- D. Cold-Rolled Channel Bridging: 0.0538-inch bare-steel thickness, with minimum 1/2-inch- wide flanges.
  - 1. Depth: As indicated on Drawings.
  - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.
- E. Hat-Shaped, Rigid Furring Channels: ASTM C645.
  - 1. Minimum Base Metal Thickness: Not less than 0.0312 inch design thickness and 0.0296 inch base metal thickness as in accordance with sections 4.3 and 8.1 of ASTM C645.
  - 2. Depth: As indicated on Drawings.
- F. Cold-Rolled Furring Channels: 0.0538-inch bare-steel thickness, with minimum 1/2-inch- wide flanges.
  - 1. Depth: As indicated on Drawings.
  - 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare-steel thickness of 0.0312 inch.
  - 3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.0625-inch- diameter wire, or double strand of 0.0475-inch- diameter wire.

## 2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
  - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide 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 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754, except comply with framing sizes and spacing indicated.

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.

### 3.3 INSTALLING OF FRAMING SYSTEMS

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- 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 (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
  1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
  2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
    - a. Install two studs at each jamb, 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. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring:
  1. Screw to wood framing.
  2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 09 22 16

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Interior gypsum board.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Abuse, mold and mildew-resistant gypsum board.
  - 2. Mold-resistant gypsum board.
  - 3. Interior trim.
  - 4. Joint treatment materials.
  - 5. Laminating adhesive.
- 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.

1.4 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.

1.5 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. 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. Abuse, Mold and Mildew-Resistant Gypsum Board: ASTM C1396/C1396M gypsum board, tested according to ASTM C1629/C1629M.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Georgia-Pacific Gypsum LLC; Dens Armor Plus Abuse Guard.
    - b. National Gypsum Company; Gold Bond Hi-Abuse XP Gypsum Board.
    - c. USG Corporation; USG Sheetrock Brand Mold Tough Abuse-Resistant Firecode.
  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 2 requirements.
  6. Long Edges: Tapered.
  7. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.
  8. Location:
    - a. Abuse Resistant, Mold and Mildew Resistant wallboard to be used on walls up to a height of 8 feet above finished floor line; regular Mold and Mildew Resistant wallboard can be used above 8 feet.
    - b. Abuse Resistant, Mold and Mildew Resistant wallboard to be used on ceilings and soffits 9 feet-4 inches and less above finished floor line; regular Mold and Mildew Resistant wallboard can be used above 9 feet-4 inches.

- B. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Georgia-Pacific Gypsum LLC; ToughRock Mold-Tough Gypsum Board.
    - b. National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board.
    - c. USG Corporation; USG Sheetrock Brand Mold Tough Firecode X Panels.
  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. Cornerbead.
    - b. Bullnose bead.
    - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
    - d. L-Bead: L-shaped; exposed long flange receives joint compound.
    - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    - f. Expansion (control) joint.

## 2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
1. Interior Gypsum Board: 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 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 drying-type, all-purpose compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  3. Fill Coat: For second coat, use drying-type, all-purpose compound.
  4. Finish Coat: For third coat, use drying-type, all-purpose compound.

## 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 by panel manufacturer for directly adhering gypsum panels to continuous substrate.
  - 1. Adhesives shall have a VOC content of 50 g/L or less.
- 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: As specified in Section 07 21 00 "Thermal Insulation."
- E. Acoustical Sealant: As specified in Section 07 92 00 "Joint Sealants."

### 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 types as indicated on the Drawings.
- B. Single-Layer Application:
  1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
  2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
  3. 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 face 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. Fastening Methods: Fasten base layers and face layers separately to supports with screws.
- 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 C 840 and in specific locations approved by Architect for visual effect. Provide proposed layout for Architect's review.
- C. Interior Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners.
  - 2. LC-Bead: Use at exposed panel edges, where indicated.
  - 3. L-Bead: Use where indicated.
  - 4. U-Bead: Use at exposed panel edges, where indicated.

### 3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
  - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  - 2. Level 2: Panels that are substrate for tile.
  - 3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
    - a. Primer and its application to surfaces are specified in Division 09 Section "Painting."

### 3.6 PROTECTION

- A. Protect adjacent surfaces from joint compound and promptly remove from floors and other non-gypsum board surfaces. Repair surfaces stained, marred, or otherwise damaged during gypsum board 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 09 29 00

SECTION 09 30 13 – CERAMIC TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Glazed wall tile.

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification:
  - 1. Full-size units of each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.
- C. Qualification Data: For qualified Installer.
- D. Product Certificates: For each type of product, signed by product manufacturer.

- E. Material Test Reports: For each tile-setting and -grouting product.

#### 1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
  - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
  - 1. Installer is a Five-Star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.
  - 2. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.
  - 3. Installer employs only Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers for Project.
  - 4. Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of membranes and shower receptors.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

#### 1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.
  - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
  - 1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.
- C. Basis of Design Products: Subject to compliance with requirements, provide Basis-of-Design products as indicated on the interior finish legend.

### 2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
  - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- D. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

### 2.3 TILE PRODUCTS

- A. Tile Type (CT-1, CT-2): Ceramic, glazed wall tile.
  - 1. Basis of Design: As indicated on interior finish legend.
  - 2. Size: As indicated on interior finish legend.
  - 3. Color: As indicated on interior finish legend.
  - 4. Finish: Glossy.
  - 5. Grout Color: As indicated on interior finish legend.

### 2.4 SETTING MATERIALS

- A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Custom Building Products.
    - b. Laticrete International, Inc.
    - c. MAPEI Corporation.
    - d. TEC; a subsidiary of H. B. Fuller Company.
  2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
  3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.
- B. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Custom Building Products.
    - b. Laticrete International, Inc.
    - c. MAPEI Corporation.
    - d. TEC; a subsidiary of H. B. Fuller Company.
  2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F and 212 deg F, respectively, and certified by manufacturer for intended use.
- C. Organic Adhesive: ANSI A136.1, Type I.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Custom Building Products.
    - b. H.B. Fuller Construction Products Inc. / TEC.
    - c. LATICRETE SUPERCAP, LLC.
    - d. MAPEI Corporation.
- 2.5 GROUT MATERIALS (GT-1)
- A. Urethane Tile Grout:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Basis-of-Design or comparable products by one of the following:
    - a. Basis-of-Design: Bostik Inc.; TruColor RapidCure.
    - b. H.B. Fuller Construction Products Inc.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.
    - e. MAPEI Corporation.
  2. Description: Premium, premixed, urethane, water-based grout with color consistency and antimicrobial protection; no color fading, streaking or shading; chemical and stain resistant; and UV-stable.
  3. VOC Content: 35 g/L as calculated by SCAQMD Rule 1168.

4. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F and 212 deg F, respectively, and certified by manufacturer for intended use.
- B. Provide manufacturer recommended grout additive for stain and mildew resistance.
- C. Color: As indicated on interior finish legend.

## 2.6 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."
  1. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  2. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

## 2.7 MISCELLANEOUS MATERIALS

- A. Temporary Protective Coating: Product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
  1. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- B. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

## 2.8 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
  - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
  - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- B. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

#### 3.3 TILE INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
- E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
  - 1. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.



2. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
1. Glazed Wall Tile: 1/16 inch.
- G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- H. Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
1. Movement joints shall conform to ANSI Specification A108.01-3.7; A108.02-4.4 and TCNA Details EJ171.
  2. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
  3. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
    - a. Provide expansion type (sealant) joints to match color and texture of grout. Provide at all cold joints/saw cut joints in concrete floor slabs, at perimeter joints (floor tile to base or wall) and at locations recommended in the TCNA "Handbook for Ceramic Tile Installation Edition" latest edition. Install per TCNA "Handbook for Ceramic Tile Installation Edition".
      - 1) Joints for the control of changes in liner dimensions and isolation:
        - a) Space expansion joints 24'-0" on center each direction the width of the grout joint in interior floors not subject to moisture and direct sunlight.
        - b) Space expansion joints 12'-0" on center each direction the width of the grout joint in interior floors subject to direct sunlight and moisture.
        - c) Provide isolation joints at locations where flooring meets surfaces such as perimeter walls, columns, piers, dissimilar flooring materials, etc.
  4. Provide joint preparation for isolated cracks as outlined below and recommended by membrane manufacturer.
    - a. Provide non-asbestos fiber reinforced polymer modified bitumen sheet membrane for treatment of cracks in substrate. Membrane sheet width – 3 tiles minimum, 1 full tile over joint plus 1 full tile on each side. Materials by N.A.C. Products "ECB Membrane", the Noble Company "Nobleseal CIS" or equal.

### 3.4 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
  2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than ten (10) days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
  3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.

4. Clean tile with a neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

### 3.5 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Walls, Metal Studs or Furring:
  1. TCNA W245: Thin-set mortar on glass-mat, water resistant gypsum backer board.
    - a. Tile Type: Glazed wall tile.
    - b. Mortar: Latex-portland cement mortar.
    - c. Grout: Premium, premixed, urethane grout.
- B. Interior Walls, Masonry or Concrete:
  1. TCNA W202: Thin-set mortar.
    - a. Tile Type: Glazed wall tile.
    - b. Mortar: Latex-portland cement mortar.
    - c. Grout: Premium, premixed, urethane grout.

END OF SECTION 09 30 13

## SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Acoustical panels.
  - 2. Metal suspension system.
  - 3. Metal edge moldings and trim.
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

#### 1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
  - 1. Acoustical Panels: Set of 6-inch-square Samples of each type, color, pattern, and texture.
  - 2. Exposed Suspension-System Members, Moldings, and Trim: Set of 12-inch- long Samples of each type, finish, and color.
  - 3. Clips: Full-size hold-down clips.
- D. Delegated-Design Submittal: For design of attachment devices.

#### 1.5 INFORMATIONAL SUBMITTALS

- 1. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
- 2. Size and location of initial access modules for acoustical panels.
- 3. Items penetrating finished ceiling and ceiling-mounted items including the following:
  - a. Lighting fixtures.

- b. Diffusers.
- c. Grilles.
- d. Speakers.
- e. Sprinklers.
- f. Access panels.
- g. Perimeter moldings.

4. Show operation of hinged and sliding components covered by or adjacent to acoustical panels.

- B. Qualification Data: For testing agency.
- C. Product Test Reports: For each acoustical panel ceiling, for tests performed by a qualified testing agency.
- D. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.
- E. Field quality-control reports.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

#### 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full-size panels, 1 box for every 50 boxes installed, with a minimum of 2 boxes for each type, pattern, color and size of tile installed.
  - 2. Suspension-System Components: Quantity of each exposed component equal to 5 percent of quantity installed.
  - 3. Hold-Down Clips: Equal to 5 percent of quantity installed.

#### 1.8 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.

#### 1.9 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.
  - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

1.10 WARRANTY

- A. Provide manufactures standard written system warranty against visible sag, mold/mildew and bacterial growth and a ten (10) year no visible red rust on exposed to view surfaces 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 attachment devices.
- B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: Class A according to ASTM E1264.
  - 2. Smoke-Developed Index: 50 or less.
- 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 or from the listings of another qualified testing agency.

2.2 ACOUSTICAL PANELS (APC-1)

- A. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Armstrong Ceiling & Wall Solutions; School Zone Fine Fissured, 1713.
  - 2. CertainTeed Corporation; Fine Fissured High NRC, HHF-457-HNRC.
  - 3. USG Corporation; Radar Education High NRC, 22421.
- B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- C. Classification: Provide fire-resistance-rated 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 35.
- 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 D3273, ASTM D3274, or ASTM G21 and evaluated according to ASTM D3274 or ASTM G21.

### 2.3 METAL SUSPENSION SYSTEM

- A. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C635/C635M and designated by type, structural classification, and finish indicated.
  - 1. High-Humidity Finish: Where indicated, provide coating tested and classified for "severe environment performance" according to ASTM C635/C635M.
- B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main, cross runners, base metal, end detail and channel perimeter molding fabricated from minimum G30, hot-dipped galvanized/electro-galvanized/prime painted complying with ASTM A 651 (guaranteed 10 years against any visible red rust on exposed to view surfaces), cold-rolled steel sheet, with prefinished 15/16-inch-wide metal caps on flanges.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Basis-of-Design or comparable product by one of the following:
    - a. Basis-of-Design Product: Armstrong World Industries: Prelude XL 15/16-inch Exposed Tee System.
    - b. Rockfon (Rockwool International); Chicago Metallic; 200 Snap Grid 15/16-inch.
    - c. USG Corporation; Donn DX.
    - d. CertainTeed Corporation; 15/16 EZ Stab Classic System.
  - 2. Structural Classification: Intermediate-duty system.
  - 3. End Condition of Cross Runners: Override (stepped) type.
  - 4. Face Design: Flat, flush.
  - 5. Cap Material: Cold-rolled steel.
  - 6. Cap Finish: As indicated on interior finish legend.

### 2.4 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
  - 1. 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 five times that imposed by ceiling construction, as determined by testing according to ASTM E488/E488M or ASTM E1512 as applicable, conducted by a qualified testing and inspecting agency.
    - a. Type: Cast-in-place or Postinstalled expansion anchors.
    - b. Corrosion Protection: Carbon-steel components zinc plated according to ASTM B633, Class SC 1 (mild) service condition.
    - c. Corrosion Protection: Stainless-steel components complying with ASTM F593 and ASTM F594, Group 1 Alloy 304 or 316.

- d. Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B164 for UNS No. N04400 alloy.
  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 according to ASTM E1190, conducted by a qualified testing and inspecting agency.
- B. Wire Hangers, Braces, and Ties: Provide wires as follows:
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. Nickel-Copper-Alloy Wire: ASTM B164, nickel-copper-alloy UNS No. N04400.
  4. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, 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.
- E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.
- F. Hold-Down Clips: Manufacturer's standard hold-down clips spaced to secure acoustical panels in place to molding and trim at perimeter.

## 2.5 METAL EDGE MOLDINGS AND TRIM

- A. Roll-Formed, Sheet-Metal Edge Moldings and Trim for Suspension Grid Perimeters: Provide manufacturer's roll-formed moldings and trim of profile indicated 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.
    - a. Type: Channel, with single flange exposed.
  2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- B. Finish:
1. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils. Comply with ASTM C635/C635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
    - a. Color: White.

2.6 ACOUSTICAL SEALANT

- A. Acoustical Sealant: As specified in Section 07 92 00 "Joint Sealants."

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 C636/C636M 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. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that do not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 5. Secure flat, angle, channel, and rod hangers to ceiling suspension members and 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 the 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, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  8. Do not attach hangers to steel deck tabs.
  9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
  11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
  3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
  4. At installation of channel perimeter molding to concrete masonry walls, avoid mortar joints to prevent spalling.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
1. Arrange directionally patterned acoustical panels as follows:
    - a. As indicated on reflected ceiling plans.
  2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
  3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
  4. Align joints in adjacent courses to form uniform, straight joints parallel to room axis in both directions unless otherwise indicated.
  5. Fit adjoining units to form flush, tight joints.
  6. Install hold-down clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.
    - a. Hold-Down Clips: Provide one (1) hold down clip on each side of ceiling panels in all building entrance vestibules and stairways.
  7. Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.

3.4 ERECTION TOLERANCES

- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections of completed installations of acoustical panel ceiling hangers and anchors and fasteners in successive stages and when installation of ceiling suspension systems on each floor has reached 20 percent completion, but no panels have been installed. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations of acoustical panel ceiling hangers show compliance with requirements.
  - 1. Within each test area, testing agency will select one of every ten power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf of tension.
  - 2. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until twenty pass consecutively and then will resume initial testing frequency.
- C. Acoustical panel ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.6 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Resilient base.
  - 2. Resilient molding accessories.

1.3 SUBMITTALS

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

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 63 deg F or more than 75 deg F, in spaces to receive resilient products during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 72 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 63 deg F or more than 75 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

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. Furnish not less than 15 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.7 WARRANTY

- A. Provide manufacturer's standard Two (2) year limited warranty.

PART 2 - PRODUCTS

2.1 RESILIENT BASE (WB-1, WB-2)

- A. Basis-of-Design: Subject to compliance with requirements, provide Basis-of-Design or comparable products by one of the following:
1. Basis-of-Design: Johnsonite, a Tarkett company.
  2. Armstrong World Industries.
  3. Mannington.
- B. Traditional Wall Base
1. Resilient Base Standard: ASTM F 1861, Type TV (vinyl, thermoplastic).
    - a. Manufacturing Method: Group I (solid, homogeneous).
    - b. Style: Cove (base with toe), unless indicated otherwise.
  2. Minimum Thickness: 0.125 inch.
  3. Height: 4 inches.
  4. Lengths: Coils in manufacturer's standard length. 4-foot lengths are not acceptable.
  5. Outside Corners: Job formed. Mitered outside corners are not acceptable.
  6. Inside Corners: Job formed.
  7. Colors: As indicated on the interior finish legend.

2.2 RESILIENT MOLDING ACCESSORY (TRS-5A, TRS-5B)

- A. Resilient Molding Accessory:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Basis-of-Design or comparable products by one of the following:
    - a. Basis-of-Design: Johnsonite, a Tarkett company.
    - b. Burke Mercer Flooring Products; Division of Burke Industries, Inc.
    - c. Roppe Corporation, USA.
- B. Description: Transition strips between resilient flooring and carpet, carpet to concrete, and resilient flooring to concrete.
- C. Material: Rubber.
- D. Profile and Dimensions: As indicated by manufacturer's designations.
- E. Color(s): As indicated on the interior finish legend.

### 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 manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
  - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
    - a. Cove Base Adhesives: Not more than 50 g/L.
    - b. Rubber Floor Adhesives: Not more than 60 g/L.

## 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.
- B. 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.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by 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 F2170. 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 and remove bumps and ridges to produce a uniform and smooth substrate.

- D. Do not install resilient products until they are same temperature as the space where they are to be installed.
  - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

### 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 practicable 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. Job-Formed Corners: Mitered outside corners are not acceptable.
  - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
  - 2. Inside Corners: Use straight pieces of maximum lengths possible.

### 3.4 RESILIENT MOLDING ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient molding accessories.
- B. Resilient Molding Accessories:
  - 1. Butt to adjacent materials and tightly adhere to substrates throughout length of each piece.
  - 2. Install reducer strips at edges of resilient floor covering that would otherwise be exposed.

### 3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.

- C. Protect 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 09 65 13

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SECTION 09 65 19 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Vinyl composition floor tile

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Full-size units of each color and pattern of floor tile required.
- C. Product Schedule: For floor tile. Use same designations indicated on Drawings.
- D. Qualification Data: For qualified Installer.
- E. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation indicated.
  - 1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.
- B. Fire-Test-Response Characteristics: 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.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

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. Floor Tile: Furnish 3 percent extra material of each type, color, and pattern of floor tile installed. Provide extra material in unopened boxes.

1.8 WARRANTY

- A. Resilient Floor Tile: Provide manufacturer's standard fifteen (15) year limited warranty.

PART 2 - PRODUCTS

2.1 VINYL COMPOSITION FLOOR TILE

- A. Vinyl Composition Floor Tile (VCT-1, VCT-2, VCT-3):
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Basis-of-Design product or a comparable product by one of the following:
    - a. Basis-of-Design: Armstrong World Industries; Standard Excelon or Premium Excelon Crown Texture.
    - b. Tarkett Company.
    - c. Congoleum Corporation.
  - 2. Tile Standard: ASTM F1066, Class 2, through pattern.
  - 3. Wearing Surface: Smooth.
  - 4. Thickness: 0.125 inch.
  - 5. Size: 12 by 12 inches.
  - 6. Colors and Patterns: As indicated on the interior finish legend.
  - 7. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

## 2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
  - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
    - a. Floor Tile Adhesives: Not more than 60 g/L.

## 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.
- B. 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.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare substrates according to 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 manufacturer. Do not use solvents.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
  - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
    - a. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.
- C. Use trowelable leveling and patching compounds, according to flooring manufacturer's and moisture vapor emission control system 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. Remove bumps and ridges to produce a uniform and smooth substrate.

- D. Do not install floor tiles until they are same temperature as space where they are to be installed.
  - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

### 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 on finish plans.
- 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, nonstaining marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

### 3.4 CLEANING AND PROTECTION

- A. Protect moisture vapor emission system for minimum of 72-hour curing period following installation.
- B. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- C. Perform the following operations immediately after completing floor tile installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.

- D. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- E. Sealers and Finish Coats for Vinyl Composition Floor Tile: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid cleaners, sealers, and finish products.
  - 1. Sealer: Apply two base coats of liquid sealer.
  - 2. Finish: Apply two coats of liquid floor finish.
- F. Cover resilient products subject to wear and foot traffic, with materials recommended by manufacturer, until Substantial Completion.

END OF SECTION 09 65 19

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SECTION 09 68 13 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes:
  - 1. Modular, fusion-bonded carpet tile.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review methods and procedures related to carpet installation including, but not limited to, the following:
    - a. Review delivery, storage, and handling procedures.
    - b. Review ambient conditions and ventilation procedures.
    - c. Review subfloor preparation procedures.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
  - 2. Include installation recommendations for each type of substrate.
- B. 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. Tile Carpeting: Full-size Sample.
- C. Product Schedule: For tile carpeting, use same designations indicated on Drawings.
- D. Qualification Data: For Installer.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.
- F. Maintenance Data: For floor tiles to include in maintenance manuals. Include the following:

1. Methods for maintaining floor 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.

G. Warranty: Special warranty specified in this Section.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
- B. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.

#### 1.7 PROJECT CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not install floor tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install floor 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.

#### 1.8 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which 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, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.
  3. Warranty Period: Ten (10) years from date of Substantial Completion.

#### 1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials described below, before installation begins, 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 3 percent of amount installed for each type indicated, but not less than 8 sq. yd.

## PART 2 - PRODUCTS

### 2.1 CARPET TILE (CPT-2, CPT-3)

- A. Subject to compliance with requirements, provide by one of the following:
  1. Mannington Mills.
  2. Milliken.
  3. Shaw.
- B. Basis-of-Design Styles and Colors: As indicated on the interior finish legend.
- C. Primary Backing/Backcoating: Manufacturer's standard recycled backing.
- D. Secondary Backing: Manufacturer's standard recycled backing material.
- E. Size: As indicated on interior finish legend.
- F. Applied Soil-Resistance Treatment: Manufacturer's standard material.
- G. Antimicrobial Treatment: Manufacturer's standard material.
  1. 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; no fungal growth; per AATCC 174.
  2. Electrostatic Propensity: Less than 3.5 kV per AATCC 134.
  3. VOC Limits: Provide carpet tile that complies with the following limits for VOC content when tested according to ASTM D 5116:
    - a. Total VOCs: 0.5 mg/sq. m x h.
    - b. 4-PC (4-Phenylcyclohexene): 0.05 mg/sq. m x h.
    - c. Formaldehyde: 0.05 mg/sq. m x h.
    - d. Styrene: 0.4 mg/sq. m x h.

### 2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by tile carpeting manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed tile carpeting and is recommended by flooring tile manufacturer for installation.
  1. VOC Limits: Provide adhesives that comply with the following limits for VOC content when tested according to ASTM D 5116:
    - a. Total VOCs: 10.00 mg/sq. m x h.
    - b. Formaldehyde: 0.05 mg/sq. m x h.
    - c. 2-Ethyl-1-Hexanol: 3.00 mg/sq. m x h.

## 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 tile carpeting performance.
- B. Examine tile carpeting 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 1000 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 F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
    - b. Perform additional moisture tests recommended in writing by adhesive and floor 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 CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates.
- B. Use trowelable leveling and patching compounds, according to flooring manufacturers and moisture vapor emission control system manufacturers' 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. 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 carpet tile manufacturers.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

### 3.3 FLOORING INSTALLATION

- A. General: Comply with CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by flooring tile manufacturer.
- C. Maintain dye lot integrity. Do not mix dye lots in same area.

- D. Cut and fit tile carpeting 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 flooring tile manufacturer.
- E. Extend tile carpeting into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- G. Install pattern parallel to walls and borders.

#### 3.4 CLEANING AND PROTECTION

- A. Protect moisture vapor emission system for minimum of 72-hour curing period following installation.
- B. Perform the following operations immediately after installing floor tile:
  - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by flooring tile manufacturer.
  - 2. Remove yarns that protrude from flooring tile surface.
  - 3. Vacuum carpet tile using commercial machine with face-beater element.
- C. Protect installed carpet tile to comply with CRI 104, Section 13.7.
- D. Protect tile carpeting against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods recommended in writing by flooring tile manufacturer.

END OF SECTION 09 68 13

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SECTION 09 68 16 - SHEET CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Tufted carpet.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review methods and procedures related to carpet installation including, but not limited to, the following:
    - a. Review delivery, storage, and handling procedures.
    - b. Review ambient conditions and ventilation procedures.
    - c. Review subfloor preparation procedures.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include manufacturer's written data on physical characteristics and durability.
  - 2. Include manufacturer's written installation recommendations for each type of substrate.
- B. 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: 12-inch-square Sample.
  - 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.
  - 3. Carpet Seam: 6-inch Sample.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For carpet, for tests performed by a qualified testing agency.
- C. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet to include in maintenance manuals. Include the following:
1. Methods for maintaining carpet, 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.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Carpet: Full-width rolls equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd..

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.
- B. Deliver carpet in original mill protective covering with mill register numbers and tags attached.

1.10 FIELD CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet 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 over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.

1.11 WARRANTY

- A. Special Warranty for Carpet: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.
1. Warranty does not include deterioration or failure of carpet 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 loss of face fiber, edge raveling, snags, and runs.
    - b. Loss of tuft bind strength.
    - c. Excess static discharge.

- d. Delamination.
- 3. Warranty Period: Ten (10) years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 TUFTED CARPET (CPT-1)

- A. Subject to compliance with requirements, provide products by one of the following:
  - 1. Interface, LLC.
  - 2. J&J Invision; J&J Industries, Inc.
  - 3. Milliken & Company.
  - 4. Mohawk Group (The); Mohawk Carpet, LLC.
  - 5. Shaw Contract Group; a Berkshire Hathaway company.
  - 6. Tandus; a Tarkett company.
- B. Color and Pattern: As indicated on the interior finish legend.
- C. Primary Backing: Manufacturer's standard material.
- D. Backcoating: Manufacturer's standard material.
- E. Roll Width: 13.5 feet.
- F. Applied Treatments:
  - 1. Applied Soil-Resistance Treatment: Manufacturer's standard material.
  - 2. Antimicrobial Treatment: Manufacturer's standard material.
    - 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.
- G. Performance Characteristics:
  - 1. Appearance Retention Rating: Severe traffic, 3.5 minimum according to ASTM D7330.
  - 2. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.
  - 3. Dry Breaking Strength: Not less than 100 lbf according to ASTM D2646.
  - 4. Tuft Bind: Not less than 10 lbf according to ASTM D1335.
  - 5. Delamination: Not less than 3.5 lbf/in. according to ASTM D3936.
  - 6. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.
  - 7. Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) according to AATCC 16, Option E.
  - 8. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

### 2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.

- B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer.
  - 1. Verify adhesives have a VOC content of 50 g/L or less.
- C. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

### 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 performance.
- B. Examine carpet for type, color, pattern, and potential defects.
- C. Concrete Slabs: Verify 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. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
    - b. Perform additional moisture tests recommended in writing by adhesive and carpet 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 CRI 104 and carpet manufacturer's written installation instructions for preparing substrates.
- 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 manufacturers.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet.



### 3.3 INSTALLATION

- A. Comply with the Carpet and Rug Institute's CRI 104 and carpet manufacturer's written installation instructions for the following:
  - 1. Direct-glue-down installation.
  - 2. Carpet with attached-cushion installation.
- B. Comply with carpet manufacturer's written instructions and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.
- C. Install pattern as indicated on Drawings.
- D. Do not bridge building expansion joints with carpet.
- E. Cut and fit carpet 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 manufacturer.
- F. Extend carpet 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 as marked on subfloor. Use nonpermanent, nonstaining marking device.

### 3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet:
  - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
  - 2. Remove yarns that protrude from carpet surface.
  - 3. Vacuum carpet using commercial machine with face-beater element.
- B. Protect installed carpet to comply with CRI 104, Section 13.7.
- C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods recommended in writing by carpet manufacturer and carpet adhesive manufacturer.

END OF SECTION 09 68 16

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SECTION 09 91 00 - PAINTING

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. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.
  - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
  - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, exposed structural steel and other ferrous metal components, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
  - 1. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
  - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
  - 2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
  - 3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
  - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- A. Samples for Verification: For each type of coating system and in each color and gloss of finish coat indicated submit three (3) drawdowns applied using a 4 mil WFT drawdown bar on Leneta form. Slip sheet each draw down.
1. Submit on white coated cards, 4 by 6 inches.
  2. Step coats on Samples to show each coat required for system.
  3. Label each coat of each Sample with the following:
    - a. Job name.
    - b. Date.
    - c. Product name.
    - d. Product number.
    - e. Color number as stated in the finish legend.
  4. Label each Sample for location and application area.
- B. Product List: For each product indicated. Cross-reference products to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules.

#### 1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain primers for each coating system from the same manufacturer as the finish coats.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
1. Product name or title of material.
  2. Product description (generic classification or binder type).
  3. Manufacturer's stock number and date of manufacture.
  4. Contents by volume, for pigment and vehicle constituents.
  5. Thinning instructions.
  6. Application instructions.
  7. Color name and number.
  8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

#### 1.7 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
  - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

#### 1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
  - 1. Quantity: Furnish Owner with an additional 5 percent, but not less than 1 gal. or 1 case, as appropriate, of each material and color applied.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
- B. Products: Subject to compliance with requirements, provide products comparable to named product by one of the following:
  - 1. Benjamin Moore.
  - 2. Diamond Vogel.
  - 3. PPG Paints.
  - 4. Sherwin-Williams.

#### 2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
  - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

- 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. Flat Paints and Coatings: 50 g/L.
  - 2. Nonflat Paints and Coatings: 50 g/L.
  - 3. Primers, Sealers, and Undercoaters: 100 g/L.
  - 4. Rust-Preventive Coatings: 100 g/L.
  - 5. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
  - 6. Pretreatment Wash Primers: 420 g/L.
- D. Low-Emitting Materials: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- E. Colors: As indicated on interior finish legend.

### 2.3 CONCRETE AND UNIT MASONRY BLOCK FILLER/PRIMER

- A. Concrete Unit Masonry Block Filler: Factory-formulated high-performance latex block fillers.
  - 1. Sherwin-Williams; Preprite Block Filler, B25W25 Series: Applied at a dry film thickness of not less than 8.0 mils.
  - 2. PPG Paints; Speedhide Masonry Latex Block Filler, 6-7 Series: Applied at a dry film thickness of not less than 7.1 mils.

### 2.4 INTERIOR PRIMERS

- A. Interior Gypsum Board Wall Primer: Factory-formulated latex-based primer for interior application.
  - 1. Sherwin-Williams; ProMar 200 Zero VOC Latex Wall Primer B28W2600 Series: Applied at a dry film thickness of not less than 1.6 mils.
- B. Interior Gypsum Board Ceiling Primer: Factory-formulated latex-based primer for interior application.
  - 1. Sherwin-Williams; ProMar 200 Latex Wall Primer B28W8200 Series: Applied at a dry film thickness of not less than 3.2 mils.
- C. Interior Plaster Wall and Ceiling Primer: Factory-formulated high-performance coating.
  - 1. Sherwin-Williams; Loxon Concrete and Masonry Primer LX02 Series: Applied at a dry film thickness of not less than 3.2 mils.
  - 2. PPG Paints; Perma-Crete Interior/Exterior Alkali Resistant Primer; 4-603XI. Applied at a dry film thickness of not less than 3.2 mils.

### 2.5 INTERIOR FINISH COATS

- A. Interior Finish Coats for Gypsum Board, CMU, and Exposed Precast Panels:
  - 1. Interior Flat Acrylic Enamel (Gypsum Board Ceilings): Factory-formulated flat acrylic-latex enamel.

- a. Sherwin-Williams; ProMar 200 Zero Flat Enamel B30-4650 Series: Applied at a dry film thickness of not less than 3.6 mils.
2. Interior Low-Luster Acrylic Enamel (CMU, Gypsum Board, and Plaster): Factory-formulated eggshell acrylic-latex enamel.
  - a. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Eggshell Enamel B20W2600 Series: Applied at a dry film thickness of not less than 1.6 mils.
3. Interior Semigloss Acrylic Enamel (Corridors): Factory-formulated semigloss acrylic-latex enamel.
  - a. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Semigloss Enamel B31W2600 Series: Applied at a dry film thickness of not less than 1.6 mils.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
  1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
  2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
  1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

#### 3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
  1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
  1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
  2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
  3. Use only thinners approved by paint manufacturer and only within recommended limits.

### 3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
  2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  3. Provide finish coats that are compatible with primers used.
  4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
  5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  6. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  7. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  8. Sand lightly between each succeeding enamel coats.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
  2. Omit primer over metal surfaces that have been shop primed and touchup painted.
  3. If undercoats or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
  4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
  2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
  3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required. Do not spray in areas that would effect occupied areas.



- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- F. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- G. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

### 3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when coatings are being applied:
  - 1. Engage the services of a qualified testing agency to sample coating material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
  - 2. Testing agency will perform tests for compliance with specified requirements.
  - 3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with specified requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.
- B. 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

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
  - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

### 3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
  - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

### 3.7 INTERIOR PAINT SCHEDULE

- A. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces at location indicated on drawings for sheen:
  - 1. Flat Acrylic-Enamel Finish (at Ceilings): Two finish coats over a primer.
    - a. Primer: Interior gypsum board ceiling primer.
    - b. Finish Coats: Interior flat acrylic enamel.
  - 2. Semi-Gloss Acrylic-Enamel Finish: Two finish coats over a primer.
    - a. Primer: Interior gypsum board primer.
    - b. Finish Coats: Interior semi-gloss acrylic enamel.
  - 3. Low-Luster Acrylic-Enamel Finish: Two finish coats over a primer.
    - a. Primer: Interior gypsum board primer.
    - b. Finish Coats: Interior low-luster acrylic enamel.
- B. Plaster: Provide the following finish systems over interior plaster surfaces at location indicated on drawings for sheen:
  - 1. Flat Acrylic-Enamel Finish (at Ceilings): Two finish coats over a primer.
    - a. Primer: Interior plaster primer.
    - b. Finish Coats: Interior flat acrylic enamel.
  - 2. Semi-Gloss Acrylic-Enamel Finish: Two finish coats over a primer.
    - a. Primer: Interior plaster primer.
    - b. Finish Coats: Interior semi-gloss acrylic enamel.
  - 3. Low-Luster Acrylic-Enamel Finish: Two finish coats over a primer.
    - a. Primer: Interior plaster primer.
    - b. Finish Coats: Interior low-luster acrylic enamel.
- C. Concrete Masonry Units:
  - 1. Low-Luster Acrylic-Enamel Finish: Two finish coats over a concrete and unit masonry block filler.
    - a. Primer: Concrete and unit masonry block filler.
    - b. Finish Coats: Interior latex eggshell enamel.
  - 2. Semigloss Acrylic-Enamel Finish (Corridors): Two finish coats over a concrete and unit masonry block filler.

- a. Primer: Concrete and unit masonry block filler.
- b. Finish Coats: Interior latex semigloss enamel.

END OF SECTION 09 91 00

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SECTION 09 93 00 - STAINING AND TRANSPARENT FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
  - 1. Surface preparation and application of wood stains and transparent finishes on the following substrates:
    - a. Dressed lumber (interior architectural woodwork).

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.
- B. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
- C. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.
- D. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.
- E. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

1.4 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 product.
- C. Samples for Verification: For each type of finish system and in each color and gloss of finish required.
  - 1. Submit Samples on representative samples of actual wood substrates, 8 inches square.
  - 2. Apply coats on Samples in steps to show each coat required for system.
  - 3. Label each coat of each Sample.
  - 4. Label each Sample for location and application area.

- D. Product List: Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

#### 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. Stains and Transparent Finishes: 5 percent, but not less than 1 gal. of each material and color applied.

#### 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 finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply finishes in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent, at temperatures less than 5 deg F above the dew point, or to damp or wet surfaces.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Basis-of-Design or a comparable product by one of the following:
  - 1. Basis-of-Design: Sherwin-Williams.
  - 2. Benjamin Moore.
  - 3. Diamond Vogel Paints.
  - 4. PPG Paints.

#### 2.2 MATERIALS, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products List."
- B. Material Compatibility:
  - 1. Materials for use within each stain 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 stain system, products shall be recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. VOC Content: For field applications that are inside the weatherproofing system, verify stains and coatings comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
1. Clear Wood Finishes, Varnishes: 350 g/L.
  2. Clear Wood Finishes, Lacquers: 550 g/L.
  3. Shellacs, Clear: 730 g/L.
  4. Stains: 250 g/L.
- D. Stain Colors: As indicated in the interior finish legend.

### 2.3 TESTING

- A. Testing of Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample wood finishing materials. Contractor will be notified in advance and may be present when samples are taken. If 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.
  2. Testing agency will perform tests for compliance with product requirements.
  3. Owner may direct Contractor to stop applying wood finishes if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying materials from Project site, pay for testing, and refinish surfaces finished with rejected materials. Contractor will be required to remove rejected materials from previously finished surfaces before refinishing with complying materials if the two finishes are incompatible or produce results that, in the opinion of the Architect, are aesthetically unacceptable.

## 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 Interior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with finish application only after unsatisfactory conditions have been corrected.
  1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

- B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
  - 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each substrate condition and as specified.
  - 1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
  - 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
- D. Wood Substrates:
  - 1. Scrape and clean knots and apply coat of knot sealer before applying primer.
  - 2. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.
  - 3. Sand surfaces exposed to view and dust off.
  - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dry.
  - 5. Countersink steel nails, if used, and fill with putty or plastic wood filler tinted to final color. Sand smooth when dried.

### 3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
  - 1. Use applicators and techniques suited for finish and substrate indicated.
  - 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
  - 3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

### 3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage 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 finished wood surfaces.



3.5 WOOD -FINISH-SYSTEM SCHEDULE

A. Wood Substrates: Interior architectural woodwork.

1. Water-Based Varnish over Stain System (WDFIN-2):

a. Stain Coat: Stain, semitransparent, for interior wood.

1) Sherwin-Williams: Minwax Water-Based Oil-Modified Polyurethane.

b. First Intermediate Coat: Water-based varnish matching topcoat.

c. Second Intermediate Coat: Water-based varnish matching topcoat.

d. Topcoat: Varnish, water based, clear, satin (MPI Gloss Level 4).

1) Sherwin Williams; Minwax Fast-Drying Polyurethane 350 VOC.

END OF SECTION 09 93 00

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SECTION 09 96 00 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
  - 1. Surface preparation and application of high-performance coating systems on the following substrates:
    - a. Interior Substrates: Steel (not otherwise coated).

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each type of coating system and in each color and gloss of finish coat indicated submit three (3) drawdowns applied using a 4 mil WFT drawdown bar on Leneta form. Slip sheet each draw down.
  - 1. Submit on white coated cards, 4 by 6 inches.
  - 2. Step coats on samples to show each coat required for system.
  - 3. Label each coat of each sample with the following:
    - a. Job name.
    - b. Date.
    - c. Product name.
    - d. Product number.
    - e. Color number as stated in the finish legend.
  - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated. Cross-reference products to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain primers for each coating system from the same manufacturer as the finish coats.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
  - 1. Product name or title of material.
  - 2. Product description (generic classification or binder type).
  - 3. Manufacturer's stock number and date of manufacture.
  - 4. Contents by volume, for pigment and vehicle constituents.
  - 5. Thinning instructions.
  - 6. Application instructions.
  - 7. Color name and number.
  - 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
  - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.6 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
  - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra paint materials from the same production run as the materials applied and, in the quantities, described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
  - 1. Quantity: Furnish Owner with an additional 5 percent, but not less than 1 gal. or 1 case, as appropriate, of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide products comparable to named product by one of the following:
  - 1. Benjamin Moore.

2. Diamond Vogel.
3. PPG Paints.
4. Sherwin-Williams.

## 2.2 HIGH-PERFORMANCE COATINGS, GENERAL

- A. Material Compatibility: Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
  1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Prepare metals according to SSPC-SP guidelines.

## 2.3 METAL PRIMERS

- A. Ferrous Metal Primer:
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Benjamin Moore & Co.; COROTECH Universal Metal Primer CV131.
    - b. PPG Paints; Speedhide Interior/Exterior Rust Inhibitive Primer, 6-208 Series.
    - c. Sherwin-Williams Company (The); Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series.

## 2.4 HIGH-PERFORMANCE ARCHITECTURAL LATEX COATINGS

- A. High-Performance Alkyd Urethane, Semigloss Finish:
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Benjamin Moore & Co.; COROTECH Alkyd Urethane Enamel, Semi-Gloss V201.
    - b. Sherwin-Williams Company (The); Pro-Industrial Waterbased Alkyd Urethane, Semi-Gloss, B53-1150 Series.
  2. Colors: As indicated on the interior finish legend.

## 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 work.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
  - 1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.
- C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers 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.

### 3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions.
  - 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 back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- 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. Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when coatings are being applied:
  - 1. Engage the services of a qualified testing agency to sample coating material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
  - 2. Testing agency will perform tests for compliance with specified requirements.
  - 3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with specified requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.
- B. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
  - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
  - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### 3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

### 3.6 HIGH-PERFORMANCE COATING SCHEDULE

- A. Steel Substrates (Including but not limited to Hollow Metal Frames, Steel Columns):
  - 1. High-Performance Architectural Latex Coating System:
    - a. Prime Coat: Acrylic metal primer.
    - b. Intermediate Coat: Not required.
    - c. Topcoat: High-performance alkyd urethane, semigloss finish.

END OF SECTION 09 96 00

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SECTION 10 26 03 - WALL PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Corner guards.

1.3 ACTION SUBMITTALS

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

- 1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.

- B. Shop Drawings: For each type of wall protection showing locations and extent.

- 1. Include plans, elevations, sections, and attachment details.

- C. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:

- 1. Corner Guards: 12 inches long. Include example top caps.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of wall protection.

- B. Material Certificates: For each type of exposed plastic material.

- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of wall protection product to be included in maintenance manuals.

- 1. Include recommended methods and frequency of maintenance for maintaining the best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Corner Guard Covers: Full-size plastic covers of maximum length equal to two (2) percent of each type, color, and texture of cover installed, but no fewer than two (2), 48-inch- long units.
  2. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store wall protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.
  2. Keep plastic materials out of direct sunlight.
  3. Store plastic wall-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.
    - a. Store corner-guard covers in a vertical position.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of wall-protection units that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
    - a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
    - b. Deterioration of metals, metal finishes, plastics, and other materials beyond normal use.
  2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain wall-protection products of each type from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Surface Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
  2. Smoke-Developed Index: 450 or less.

- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1.

## 2.3 CORNER GUARDS

- A. Surface-Mounted, Plastic-Cover Corner Guards (CG-A1): Manufacturer's standard assembly consisting of snap-on, resilient plastic cover installed over retainer; including mounting hardware; fabricated with 90-degree turn to match wall condition.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Basis-of-Design product or comparable product by one of the following:
    - a. Basis-of-Design; Inpro Corporation; 160 High Impact Surface Mount Corner Guard.
    - b. Construction Specialties, Inc.
    - c. Korogard Wall Protection Systems; a division of RJF International Corporation.
  - 2. Cover: Extruded rigid plastic, minimum 0.080-inch wall thickness; as follows:
    - a. Profile: Nominal 2-inch-long leg and 1/4-inch corner radius.
    - b. Height: 4 feet.
    - c. Colors and Textures: As indicated by manufacturer's designations on interior finish legend.
  - 3. Continuous Retainer: Minimum 0.070-inch-thick, one-piece, extruded aluminum.
  - 4. Retainer Clips: Manufacturer's standard impact-absorbing clips.
  - 5. Top and Bottom Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.

## 2.4 MATERIALS

- A. Plastic Materials: Chemical- and stain-resistant, high-impact-resistant plastic with integral color throughout; extruded and sheet material as required; thickness as indicated.
- B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

## 2.5 FABRICATION

- A. Fabricate wall protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.
- B. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- C. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.6 FINISHES

- A. Protect 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 and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine walls to which wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing wall protection.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. Installation Quality: Install wall protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
- B. Mounting Heights: Install wall protection in locations and at mounting heights indicated on Drawings. If not indicated on Drawings, install at heights indicated below:
  - 1. Corner Guards: 4-inches above finished floor to bottom of guard.
- C. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.
  - 1. Provide anchoring devices and suitable locations to withstand imposed loads.
  - 2. Adjust caps as required to ensure tight seams.

3.4 CLEANING

- A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.

END OF SECTION 10 26 03

## SECTION 12 21 13 - HORIZONTAL LOUVER BLINDS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Horizontal louver blinds, aluminum slats.

#### 1.3 ACTION SUBMITTALS

- A. Product Data Submittal: For each type of product.
  - 1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For horizontal louver blinds.
  - 1. Fabrication and installation details.
- C. Samples for Initial Selection: For each type and color of horizontal louver blind.
  - 1. Include Samples of accessories involving color selection.
- D. Samples for Verification: For each type and color of horizontal louver blind indicated.
  - 1. Slat: Not less than 12 inches long.
  - 2. Tapes: Full width, not less than 6 inches long.
  - 3. Horizontal Louver Blind: Full-size unit, not less than 16 inches wide by 24 inches long.
  - 4. Valance: Full-size unit, not less than 12 inches wide.
- E. Product Schedule: For horizontal louver blinds. Use same designations indicated on Drawings.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For horizontal louver blinds 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. Horizontal Louver Blinds: Full-size units equal to 5 percent of quantity installed for each size, color, texture, pattern, and gloss indicated, but no fewer than two units.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

#### 1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet-work 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 horizontal louver blinds 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.

#### 1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of motorized products that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Faulty operation of motorized operating system components.
  2. Warranty Period: Five (5) years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 SOURCE LIMITATIONS

- A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Window Covering Safety Standard: Provide horizontal louver blinds that comply with ANSI/WCMA A100.1 - 2022 and are listed and labeled as "Best for Kids" by a qualified testing agency.

#### 2.3 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS (WDWT-1)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Basis-of-Design or a comparable product by one of the following:
  1. Basis-of-Design: Springs Window Fashions; Classic 1" Cordless Mini Blinds.

2. Hunter Douglas Contract; Modern Precious Metals, Mini Blinds.
  3. Levolor; Riviera Select.
- B. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners.
1. Width: 1-inch.
  2. Thickness: Manufacturer's standard, not less than 0.006-inch.
  3. Spacing: Manufacturer's standard.
  4. Finish: Ionized antistatic, dust-repellent, brushed aluminum finish.
  5. Features:
    - a. Lift-Cord Rout Holes: Minimum size required for lift cord and located near back (outside) edge of slat to maximize slat overlap and minimize light gaps between slats.
- C. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.
1. Type: Braided cord.
- D. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
1. Capacity: One blind(s) per headrail unless otherwise indicated.
  2. Ends: Capped or plugged.
- E. Manual Cordless Operation:
1. Lift Mechanism: Manufacturer's standard lift- or tension-control mechanism that allows blinds to be raised or lowered into position by manually pushing the bottom rail up or pulling it down.
  2. Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
  3. Tilt Position: Full.
  4. Tilt Operator: Corrosion-resistant steel rod.
  5. Tilt Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over-rotation of gear.
  6. Tilt-Operator Length, Wand or Rod: Manufacturer's standard.
  7. Tilt-Operator Locations: Right side and left side of headrail, respectively, unless otherwise indicated.
- F. Bottom Rail: Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or color-coordinated, metal-capped ends.
1. Type: Top contoured to match crowned shape of slat.
  2. Finish: Ionized antistatic, dust-repellent, brushed aluminum finish, to match slat finish.
- G. Integrated Headrail/Valance: Curved face.
- H. Valance: PVC strip.
- I. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
1. Type: Wall for inside sidelite hollow metal frame.
  2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.
- J. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.

K. Colors, Textures, Patterns, and Gloss:

1. Basis-of-Design Slats: As indicated on the interior finish legend.
2. Components: Rails, cords, ladders, and materials exposed to view to be selected by Architect from manufacturer's full range.

2.4 FABRICATION OF HORIZONTAL LOUVER BLINDS

- A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped 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 blind 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 dimension of opening in which blind 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 blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- C. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
1. Lift-and-Tilt Mechanisms: With permanently lubricated moving parts.
- D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.
- E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.
- F. Color-Coated Finish:
1. Metal: For components exposed to view, unless anodized or plated finish is indicated, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF HORIZONTAL LOUVER BLINDS

- A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.



1. Locate so exterior slat edges are not closer than 1 inch from interior faces of glass and not closer than 1/2 inch from interior faces of glazing frames through full operating ranges of blinds.
2. Install mounting and intermediate brackets to prevent deflection of headrails.
3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

### 3.3 ADJUSTING

- A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

### 3.4 CLEANING AND PROTECTION

- A. Clean horizontal louver blind 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 ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

### 3.5 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 12 21 13

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SECTION 26 05 00 – ELECTRICAL CONTRACT REQUIREMENTS

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work under this Section.

1.2 APPLICABLE PUBLICATIONS

- A. Publications, standards and listing requirements called out in the Sections of this Division of Labor shall form a part of these specifications as if contained herein.
- B. The requirements of the Contract Documents, including the General Conditions, and Supplementary Conditions, and Division 01 - General Requirements, apply to this section except as modified herein.

1.3 DESCRIPTION OF WORK

A. Sections Included:

1. Section 26 05 00 - ELECTRICAL CONTRACT REQUIREMENTS
2. Section 26 05 01 - PROJECT SPECIAL CONDITIONS
3. Section 26 05 02 - ELECTRICAL DEMOLITION
4. Section 26 05 04 - DOCUMENTATION
5. Section 26 05 19 - WIRE AND CABLE
6. Section 26 05 26 - GROUNDING
7. Section 26 05 29 - SUPPORTING DEVICES
8. Section 26 05 34 - RACEWAYS
9. Section 26 05 35 - ELECTRICAL BOXES
10. Section 26 05 37 - LOCATION OF OUTLETS AND EQUIPMENT
11. Section 26 27 26 - WIRING DEVICES
12. Section 26 51 13 - INTERIOR LIGHTING FIXTURES
13. Section 28 24 00 - ACCESS CONTROL SYSTEM
14. Section 28 32 00 - FIRE ALARM SYSTEM

B. Work Included:

1. The work covered by this Division of the specifications includes the furnishing of all labor, materials, tools, equipment, permits, certificates and temporary protection necessary for or incidental to executing and completing the electrical work, communications work, and work on related systems.
2. All work shall be as specified and indicated on the drawings unless specifically excepted on the drawings or herein.
3. Read all other Divisions of the Specifications which are applicable to this work, including the General Conditions section applicable to all bidders.
4. The Electrical Contract Requirements section is a supplement to and not a replacement for the project General Conditions section.
5. In cases of conflict with information in the General Conditions, the more stringent of the contract requirements shall be considered applicable.
6. Prior to submitting bid, call to the attention of the Electrical Engineer any material or apparatus believed to be inadequate or any necessary items or work omitted.
7. Address any questions regarding the interpretation of the plans and/or specifications at least 12 days before the bid opening.
8. The Electrical Engineer reserves the right to interpret his own specifications and plans after bids are received, and to demand that the installation conform to his intent.
9. Failure to become acquainted with existing conditions at the site shall in no way relieve the responsibility for making installation in conformance with plans and specifications without additional cost to the owner.

- C. Examination of Plans, Specifications and Site:
1. Before submitting a bid, the bidder shall familiarize himself with all features of the building and site which may affect the execution of his work.
  2. No extra payment will be allowed for the failure to obtain this information.
  3. If there are omissions or errors in the plans or specifications, they shall be clarified with the architect prior to submitting bid.
  4. For all remodeling projects, a site visit to the premises, for the purpose of the noting of all existing conditions which may affect work is required.
  5. Knowledge of all existing conditions, which may affect work in a renovation project, shall be included in the preparation of bid.
  6. Lack of information on existing conditions shall not be allowed for a valid cause for additional compensation.
- D. Codes, Permits, and Inspection Fees:
1. All work and materials shall conform in every respect to the current rules and requirements of the National Fire Protection Association, National and State Electrical Codes, Local Codes and Ordinances, Local Utility Regulations and OSHA.
  2. Give to the proper authorities all required notices relating to the project, obtain all official permits and licenses required, pay all fees incidental thereto, deliver upon completion of the work and without cost to the Owner all required certificates of inspection and approval.

#### 1.4 RELATED WORK ELSEWHERE

- A. Applicable provisions of Division 01: General Conditions shall govern work in this section.
- B. All other Divisions of the Specifications which are applicable to or interface with work in Division 26 05 00.
- C. Division 26 contractor to include all costs for divisions 27 and 28.

#### 1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.
- B. Submit shop drawings following Section specific Shop drawing submittal guidelines.

#### 1.6 OPERATION & MAINTENANCE MANUALS

- A. Submit operation and maintenance manuals in accordance with Section 26 05 04.
- B. Submit operation and maintenance manuals following Section specific shop drawing submittal guidelines.

#### 1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. All materials, equipment and parts are to be new, undamaged and unused of current manufacture.
- C. Acknowledges acquaintance with the plans and specifications and their respective requirements.
- D. Guarantee that the electrical system has been installed strictly in accordance with the electrical plans and specifications using only the best of materials available, installed in a substantial manner by experienced labor.
- E. Various components of the electrical system shall be placed in service prior to completion date as instructed by Owner. This shall not change the guarantee period which shall be one year after acceptance by Owner.
- F. Replace and/or repair any items failing from causes of faulty workmanship, materials or design without cost to Owner at any time within one year from date of final acceptance.

#### 1.8 WARRANTY

- A. Equipment shall be warranted for a period of not less than 2 years from the date of commissioning against defects in material and workmanship.

- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. It is the intent of these specifications that all the necessary material, apparatus, and devices to complete the installation as specified herein, except such parts as are specifically excepted, shall be provided.
- B. If an item is either shown on the plan or called for in these specifications, it shall be considered sufficient of said item in this contract.
- C. All sizes given are as minimum.
- D. Material and labor shall be first class and workmanlike and to the satisfaction of the Electrical Engineer and shall be subject to inspection test and approval at all times from commencement until acceptance of completed work.
- E. Manufacturers shall be responsible for providing material listed by U.L. or other approved agencies, and all governing codes and ordinances.
- F. All material must bear U.L. and/or other approved labels where possible.
- G. Items specified by catalog number or brand name and approval of shop drawings will not relieve the manufacturer of this responsibility.

### 2.2 MATERIALS: ALTERNATE MATERIALS

- A. Where materials, equipment apparatus, or other products are specified by manufacturer, brand name, and type of catalog number such designation is to establish standards of desired quality and style and shall be the basis of the bid.
- B. Substitutions shall not be made unless there are "equals" listed in the specifications or on the plan.
- C. Substitutions may be bid as alternates.
- D. Burden of proof that materials are equal shall be upon bidder requesting their use; therefore, bidder shall furnish, with their request for approval all supporting data.
- E. Assume responsibility for substituted material and state name of manufacturer, type or brand or equipment and addition to or deduction from base bid.
- F. Materials and equipment must meet all requirements as to type, quality, function, appearance and physical dimensions shown.
- G. Assume responsibility for any costs to other Divisions as a result of the use of alternate materials.
- H. Submit supporting data to Architect/Electrical Engineer within 15 days after the bid date.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Equipment Submittal Drawings:
  - 1. Within 45 days after a notice to proceed and prior to ordering equipment, furnish to the Electrical Engineer submittal drawings for review (see section 26 05 04).
  - 2. Review of any submittal drawings does not waive any condition of the specifications unless specifically noted thereon.
  - 3. No fabrication or ordering of equipment shall be started until reviewed drawings are returned.

### 3.2 FIELD MEASUREMENTS

- A. Job Drawings:
  - 1. Maintain, at the job site, one (1) complete set of up-to-date plans and written specifications, complete with all addenda items.
  - 2. This complete plan and specification set shall be reserved for all field markings to show minor revisions and detailed construction notes.

3. These marked plans shall be returned to the Electrical Engineer prior to contract completion and final payment.
4. Assist the Electrical Engineer in transferring applicable field notes to the project drawings for record purposes.

### 3.3 DELIVERY, STORAGE AND HANDLING

#### A. Material on Site and Storage:

1. Maintain proper care and storage of material and equipment on site.
2. Any material damaged by rust corrosion, warping, breakage, finish damage, etc. shall be replaced by the Contractor to the satisfaction of the Engineer.

### 3.4 INSTALLATION

#### A. Field Change Orders:

1. No revisions to the contract price shall be allowed unless such revisions have been authorized in writing by both Owner and the change order submitter.
2. All work completed prior to completion of a written contract change order will not be compensated for by the Owner.
3. Any work item that is proposed to perform, on the basis of a proposed contract adder, must be announced in advance such that time is available for the Architect, Owner and the Electrical Engineer to determine if a change in contract price is allowable.

#### B. Change Orders:

1. Change orders may be requested as a part of this project.
2. Assume the following in regards to change orders:
  - a. Work and equipment associated with change orders shall be installed per the specified equipment on this project.
  - b. All change orders shall be accounted for on as-built drawings.
  - c. Change order additions to special systems where riser diagrams have been furnished, shall be included as a part of the riser diagram.
  - d. A break down of all costs associated with the change order is required.
  - e. The cost breakdown shall be as follows:
    - 1) Itemized list of all materials.
    - 2) Materials shall be priced at Best Column in a national pricing service book.
    - 3) Cost for subcontractor services.
    - 4) Subcontractor services shall be shown as actual costs from subcontractor.
    - 5) Material mark-up.
    - 6) Maximum allowed is 8%.
    - 7) Number of hours of labor at standard charge out rate.
    - 8) Tax on material.
    - 9) Total change order cost.
3. If equipment or materials are deducted as a part of this change order, credit shall also be shown on change order.

#### C. Installation: General

1. Connections to Equipment Furnished by Others.
  - a. Included in Division 26 are electrical connections to equipment provided by others.
  - b. Refer to final shop drawings for equipment provided by other divisions for exact location of electrical outlets and the connections required.

- c. Provide energization to the equipment furnished by other Divisions only at the request of the providing party.
  - d. Assume that once the equipment has been started up, that it shall be shut off unless it is requested that it be left on by the providing party.
  - e. Only start up and turn on equipment if requested so by the party providing said equipment.
  - f. If required, power shall not be activated to the equipment until qualified starting personnel are on site.
  - g. After making a permanent power connection, the breaker shall be left in an off position and a "hold" tag or some other device be utilized to keep the power turned off to the equipment.
2. Equipment Access & Location.
- a. All equipment, junction and pull boxes, and accessories shall be installed to permit access to equipment for maintenance.
  - b. Any relocation of conduits, equipment, or accessories required to provide maintenance access shall be accomplished at no additional cost.
  - c. Equipment shall be installed with ample space allowed for removal, repair or changes to the equipment.
  - d. Ready accessibility to equipment and wiring shall be provided without moving other equipment which is to be installed or which is already in place.
  - e. Locate electrical outlets and equipment to fit the details, panels, decorating or finish at the space.
  - f. The Architect shall reserve the right to make minor position changes up to 10' of the outlets before the work has been installed.
  - g. Verify door swings before installing room lighting switch boxes and install boxes on the latch side of door unless noted otherwise.
  - h. Furnish information as to exact location and size of sleeves for openings for new construction.
  - i. Provide and set in place all required sleeves, inserts, forms, etc. and coordinate this work with all other divisions of work.
3. Cutting and patching.
- a. Beams or columns shall not be pierced without permission of the Architect and then only as directed.
  - b. If any openings are required through walls or floors where no sleeve has been provided, the hole for the sleeve shall be core drilled to avoid all unnecessary damage and structural weakening.
  - c. Provide all cutting and patching required for complete installation of systems unless specifically noted elsewhere.
  - d. All new or existing work cut or damaged shall be patched and restored to its original condition.
  - e. Coordinate the location of sleeves, openings, chases, furred spaces, etc.
  - f. Provide during the progress of construction all sleeves, hangers and inserts that are to be built into the structure.
  - g. Provide sleeves for cables passing through masonry, concrete or other similar construction.
  - h. Sleeves shall be of metal conduit and shall extend completely through the construction.
  - i. Conduits or cables penetrating smoke or fire barriers must not destroy the barrier's integrity.
  - j. Grout openings between sleeves and concrete or masonry walls and floors.
  - k. Pack annular space between sleeves and conduits with fiberglass.
  - l. Where penetrations occur through fire rated walls or floors, fill space with fire resistive caulk.

- m. Wherever cables must pass through fire or smoke rated walls or floors, provide approved, sleeved, foam filled fire stops around cables as manufactured by O.Z., Dow, Square D, or equal.
  - n. Provide all materials required for patching unless otherwise noted.
  - o. Where alterations disturb lawns, paving, walks, etc., the surfaces shall be repaired, refinished and left in the condition existing prior to commencement of work.
4. Excavation and backfill.
- a. Backfilling of all trenches beneath concrete floor and stair slabs within building shall be accomplished with gravel fill and shall be specially compacted to same density as surrounding area.
  - b. Lines passing under foundation walls shall have a minimum of 1 1/2 inch clearance.
  - c. Care shall be taken to insure no disturbance of bearing soil under foundations.
5. Attachments and supports.
- a. Be responsible for proper fittings and support for each item of equipment and materials installed under Division 26.
  - b. Be responsible for the proper application, installation and location of all necessary and required inserts, supports and anchor bolts.
  - c. Where same are to be installed by other Divisions of work, supply same to the contractor in whose work they occur with instructions for placement and proper installation.
  - d. Establish the method and nature and select accessories necessary for proper support appropriate to item and point of attachment with due consideration given to ambient/environmental conditions and service duty.
  - e. Attachments, supporting devices and accessories shall be specifically designed for the application, suitable for the duty imposed in service and acceptable to the Architect.
  - f. Attachments shall be made to structural components of the structure in such manner not to jeopardize the integrity of the structure and otherwise consistent with trade practices.
  - g. Generally, anchors shall be concrete insert type in poured concrete and drilled expansion type in precast concrete.
  - h. Powder actuated anchors shall not be used in concrete work.
  - i. Provide all mounting backboards as required to mount electrical and electronic equipment.
  - j. That equipment which is normally assumed to be mounted on some type of a backboard shall be mounted on backboards provided by Division 26.
  - k. All mounting backboards used by the contractor shall be 3/4" AC grade marine duty plywood.
  - l. All plywood shall be painted on both sides and edges with two coats of fire resistant gray enamel paint.
  - m. Provide back mounting panels to meet this specification.
  - n. Steel channel interior to be painted or galvanized.
  - o. Exterior conduit mounting channel shall be stainless steel.
  - p. All sleeves to be furnished and installed by Division 26.
- D. Installation: Trial Usage of Electrical Systems
- 1. The Electrical Engineer has the privilege of the trial usage of electrical systems or parts thereof for the purpose of testing under load the new installation and learning the operational procedures.
  - 2. The trial usage shall be continued for a length of time as deemed reasonable by the Electrical Engineer and all related costs shall be included in the bid, with the exception of the electrical power cost which will be paid by the Owner.



3. The operations shall be carried out only with the express knowledge and under supervision of the responsible sub-trade who shall not waive any responsibility because of trial usage.
  4. While trial usage will be kept to a minimum, it shall not be construed as acceptance by the Electrical Engineer.
- E. Installation: Cooperation/Coordination
1. Coordinate and cooperate with other Divisions of work and Owner by scheduling and installing work to facilitate the construction progresses and the Owners use of the building.
  2. Any deviation from contract plans shall be approved by the Electrical Engineer before proceeding.
  3. Study the plans of other trade divisions of work and to fit work into the work of others in a coordinated manner.
  4. Lay out work and be responsible for measurements.
  5. Check facilities provided by others which require electrical connections and provide outlets suitably located for them.
  6. Take such measurements as may be necessary to assure approved fitting and proper installation of his work and all other work depending thereon.
  7. Cooperate with other contractors to avoid complications between the installation of electrical equipment and equipment installed by others.
- F. Installation: Finish and Painting
1. Equipment and materials such as transformers, panels and switches, shall be furnished with the manufacturer's standard finishes, consisting of a prime coat and baked enamel finish coat, unless otherwise noted.
  2. Roof mounted equipment and other exterior materials including support hardware shall have a factory or field applied prime coat and finish coat of color selected by the Owner's Representative.
  3. In general painting will be done by other trades. Assume responsibility to coordinate work with the painters so that all equipment is installed prior to painting.
  4. Assume responsibility for additional expense required to paint support channels, panel trims, flush junction box covers, fixture hangers and other electrical devices not in place prior to normal routine painting.
  5. An undamaged finish is required on all equipment.
  6. If finish becomes rusted, corroded, scratched, or flaked during storage or installation, be responsible for refinishing the equipment to the satisfaction of the Architect.
  7. Finish painting on the job site is not required by the electrical contractor, except where noted.
  8. Refer to other areas of this Division 26 for painting of equipment furnished by the Division 26.
  9. Where painting is required to be done by the electrical contractor, the painting shall be done in accordance with the painting portion of the general specification.
- G. Installation: Damage to Other Work
1. Assume responsibility for all damages resulting from the execution of work under Section 26 05 00.
  2. Assume responsibility to adequately protect Division 26 work at all times.
  3. All damages resulting from their operations shall be repaired, or the damaged portions replaced by the party originally performing the work (to the entire satisfaction of the Architect), and all cost thereof shall be borne by those responsible for the damage.
- H. Installation: Clean-Up
1. At all times, keep the premises free from excessive accumulation of waste materials or rubbish resulting from work, including tools, scaffolding, and surplus materials and leave work room or it's equivalent, clean.

2. In case of dispute, the Architect may order the removal of such rubbish and charge the cost to the responsible Division of work as determined by the Architect.
  3. At the time of final clean-up, all fixtures and equipment shall be thoroughly cleaned and left in proper conditions for their intended use.
- I. Installation: Drawing Schedules and Details
1. The electrical drawings include a number of standard and job specific details.
  2. These details may or may not be specifically referenced on the drawings and in the specification.
  3. Assume that even if the detail is not specifically referenced, that it shall apply to this project. (As an example, if a detail is shown for the exterior mounted receptacles, but the detail is not referenced from the plan sheets, the contractor shall assume that all exterior mounted receptacles shall be installed per the detail.)
  4. Details and schedules are shown as a means to aid the electrical contractor and are not meant to be all inclusive of all devices.
  5. Assume responsibility for making takeoff of equipment required, (i.e., additional circuit breakers, motor connections, etc.) and ancillary equipment and appurtenances for a complete connection or circuit.
  6. Verify all sizes of electrical equipment with shop drawings and nameplate rating of the equipment it serves.
- J. Installation: Coordination Drawings
1. Prepare coordination drawings to a scale of  $\frac{1}{4}'' = 1'0$  or larger; detailing major elements, components, and systems of electrical equipment and materials in relationship with other systems, installations, and building components.
  2. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the work, including, (but not limited to) the following:
  3. Indicate the proposed locations of major raceway systems, equipment, and materials. Include the following:
    - a. Clearances for servicing equipment, including space for equipment disassembly required for periodic maintenance.
    - b. Exterior wall and foundation penetrations.
    - c. Fire-rated wall and floor penetrations.
    - d. Equipment connections and support details.
    - e. Sizes and location of required concrete pads and bases.
  4. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
  5. Locations include, but are not limited to, electrical rooms and other specialty electrical and communication rooms where equipment is being provided.
- K. Installation: Bid Drawings
1. It must be understood that electrical drawings and details bid drawings are diagrammatic.
  2. Electrical drawings and details bid drawings are not intended to be shop drawings.
  3. It is expected that it may be necessary to move conduit, outlets and/or equipment in some cases to get coordinated installation and such changes are considered a part of the Contract obligation without cost to the Owner.
  4. No outlets or equipment shall be located where the usefulness and/or operation will be affected by the work of other trades, door swing, counter, equipment, etc.
- L. Installation: Contract Termination Requirements
1. Furnish Owner with service manuals for all items furnished under this Contract.
  2. Service manuals shall be complete with drawings, diagrams, operations and installation instructions and parts lists.

3.5 OWNER TRAINING

A. Provide as outlined per section.

3.6 SPARE EQUIPMENT

A. Provide as outlined per section.

END OF SECTION 26 05 00

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SECTION 26 05 01 – PROJECT SPECIAL CONDITIONS

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. This specification covers those conditions that are particular to this project. This section further explains and outlines other portions of these specifications.

PART 2 - PRODUCTS

2.1 CASE WORK/CONNECTIONS TO BUILT-IN-PLACE & FREE-STANDING COUNTERS/DESKS

- A. For those areas indicated as having a built-in-place counter or desk, such as offices, provide the electrical equipment shown within the desk. All equipment items shall be cut into the work side front of the desk. Cut in all devices flush and wiring concealed.
- B. Coordinate the actual device locations with the Owner or in a meeting with the Owner and with the counter/desk supplier. For counters mounted adjacent to the wall, provide junction boxes in the wall, and wire from these junction boxes into the counter. Provide EMT or flexible conduits through the counter hollow spaces to the various outlets shown.
- C. Provide all rough-in through the floor and all wiring hidden within the counter space to make connections to the equipment. Where low voltage-type outlets are shown, such as telephone, data, cable television, or empty boxes, provide a minimum 3/4" conduit stubbed from the box shown into the floor, up the nearest adjacent wall to the ceiling space where the conduit shall be terminated and marked as to its function.

2.2 EQUIPMENT FURNISHED BY OWNER FOR DIVISION 26 INSTALLATION

- A. Be responsible for installation of all equipment that is being furnished directly by the Owner. Include costs in bid to move the equipment from the owner's storage to the project site, unpack the equipment, inspect the equipment for damage and call to the Owners attention any problems, dispose of packaging materials, and provide all connection and adjustment.

2.3 WIRING OF HANDICAP ACCESSIBLE MOTORIZED DOORS (NORTH HILL)

- A. The handicap door operators will be furnished by other contractors. Provide wiring to the door operator. Work will consist of the following:
  - 1. Verify voltage and phase with door supplier prior to rough-in.
  - 2. Determine type of connection to doors.
  - 3. Wire any limit switches or other controls associated with the door.
  - 4. Interconnect with keyless entry system to allow door to operate only if inside push paddle is activated. If door is in locked position with electric strike and paddle is activated from exterior the door will not open.
  - 5. Electrical contractor shall review the specifications to determine exact requirements.

2.4 LOW VOLTAGE SYSTEM CABLE SLEEVES

- A. Provide low voltage system cable sleeves throughout the building. Provide sleeves as follows:
  - 1. All sleeves are to be steel and are to have insulated connectors on the end, or other type of cable protection.
  - 2. Sleeves are to extend a minimum of 6" out from the wall.
  - 3. A 1" sleeve shall be placed above the ceiling, through the wall, between all offices and corridors, and classrooms and corridors, or other areas where cables are to be routed. When there is more than one floor provide vertical conduit between floors as required to accommodate all low voltage cabling plus 50% spare.
  - 4. In area where there is no finished ceiling, a conduit shall be extended from the communications outlet box, directly into an accessible ceiling area.

5. Cable shall be installed in conduit in all mechanical rooms, penthouses, gymnasiums, and any other open-structure rooms.
6. In addition to these sleeves, also provide the sleeves that are shown on the floor plans.
7. All low voltage devices in walls, including fire alarm devices, must have conduit stubbed from box in wall to above accessible ceiling.
8. No low voltage cabling can penetrate a wall without a conduit sleeve.

## 2.5 CASE WORK CONNECTIONS

- A. Case work where wiring devices are furnished as part of the equipment, but wired by Division 26, Division 26 to assume the following:
  1. Furnished with Case Work:
    - a. Opening in case work top or front for mounting of device.
    - b. Face plates, outlet box for flush mounted type devices.
    - c. Pedestal box receptacle and pipe nipple through top for pedestal mounted devices.
  2. Furnished by Division 26:
    - a. The rough-in stub-up through floor or walls for connections to device.
    - b. Flexible conduit with ground wire from stub-up to a wiring device junction box.
    - c. Mounting and attachment of wiring device.
    - d. Installation of wiring device outlet box, pedestal into case work.
    - e. Spare conduit as shown on details.
    - f. Wiring devices.

## 2.6 MULTI-POLE CIRCUITS

- A. Multi-pole circuits are not allowed for single-phase line to neutral loads.

## PART 3 - EXECUTION

### 3.1 ALLOWANCES

- A. N/A

### 3.2 ALTERNATES

- A. N/A

END OF SECTION 26 05 01

SECTION 26 05 02 – ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

2.2 CONNECTING TO AND REUSING EXISTING BREAKERS

- A. Whenever new loads are connected into existing panelboards, assume you cannot connect to the existing circuit breakers that are in the panel in use. Replace said circuit breakers with new circuit breakers. The exception to this is that the contractor can have the circuit breaker tested and furnish a test report indicating that it was tested and is operating properly.

2.3 ROUTING CONDUITS TO EXISTING FLUSH MOUNTED PANELS

- A. Existing flush mounted panels are being reused to feed new equipment. Assume responsibility for installing new conduits into the panel. However if existing conduits have adequate space, they may be reused for the additional circuits.
- B. For new conduits into panel, assume responsibility for cutting and patching wall to install conduits. Wall surface shall be patched back to its original finish, material, and color.

2.4 REINSTALLATION OF EXISTING GRID FIXTURES

- A. Where existing lighting fixtures are reinstalled into a grid ceiling, provide the code required grid attachment clips, if they are not an integral part of the light fixture.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Beginning of demolition means electrical & communication contractor accepts existing conditions.

3.2 PREPARATION

- A. Disconnect electrical & communication systems in underground excavated walls, floors, and ceilings scheduled for removal.
- B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- C. Existing Fire Alarm Systems: Maintain existing system in service. Disable system only to make switchovers and connections. Notify Owner at least 48 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.3 CONNECTIONS TO EXISTING EQUIPMENT

- A. On remodeling projects there are various references made on the electrical & communication contract drawings which indicate connections to existing equipment and distribution panelboards. Visit the job site prior to assembling bid to investigate how to make connections to existing equipment. In many cases the plans do not specifically delineate how these connections are to be made.
- B. Connections to existing panelboards, disconnects, wireways, transformers and switchboards shall be thoroughly investigated by the ELECTRICAL CONTRACTOR. For connections to existing panelboards "or existing panel in area" he shall provide circuit breakers or fusible units to be installed within the existing equipment.

### 3.4 EXISTING PANEL DIRECTORIES

- A. For existing panelboard where the circuits are being revised provide updated type written panel directories.

### 3.5 DEVICES IN EXISTING WALLS THAT REMAIN

- A. In any areas where there are existing wiring devices or panelboards or other electrical & communication equipment that are no longer being used as part of the project, remove those wiring devices and panelboards, and in their place, provide a paintable steel, 16 gauge, finished plate. Use oval-head screws to attach plate to existing box. Grind edges smooth and round corners. Steel shall be cleaned and prime painted by the electrical & communication contractor for finish painting by other contractors. Prime paint shall be an oil-based paint or other primer that is compatible with the wall paint being used in the area where the cover is being installed.
- B. If there is an existing device on or in the wall in an area where there is remodeling, and if that device is not indicated as being reused, include the cost to remove that device and patch the hole. However, prior to removal, verify with the Owner and Architect if this device is to be removed and not reused.

### 3.6 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Work with the general contractor and all other contractors to provide all electrical work as required to disconnect all electrical connections in the demolished area.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. For all removed electrical equipment, assume responsibility for removing the conduit and wire feeding that equipment back to power source; i.e. panelboard. Remove all unused control wires and/or cable above demolished ceilings. All wire shall be removed back to the point of supply. If that equipment was connected to a circuit breaker, the wire to the circuit breaker shall be entirely removed and the circuit breaker shall be tagged as spare.
- D. Assume that any circuits that are interrupted by the remodeling that require continued service shall be reconnected and routed around the remodeled area.
- E. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- F. Disconnect abandoned outlet boxes and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlet boxes which are not removed.
- G. Disconnect and remove abandoned panelboards and distribution equipment. Extend existing circuits as required to new panelboard or other panelboards with space.
- H. Disconnect and remove electrical & communication devices and equipment serving utilization equipment that has been removed.
- I. Disconnect and remove abandoned luminaries. Remove brackets, stems, hangers, and other accessories.
- J. Repair adjacent construction and finishes damaged during demolition and extension work.
- K. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- L. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.



- M. Check with Owner to determine if the Owner wants to retain the removed equipment. If so, move it to the Owner's storage, assumed not to be in the same building, but within 5 miles of site. If not, remove material and dispose of properly at own expense.

### 3.7 EXISTING CEILING WORK

- A. In areas where existing ceilings are installed and must be removed and reinstalled to facilitate the installation of electrical equipment, assume responsibility for removal and reinstallation of ceiling tiles. Replace ceiling panels and tiles that are broken during this removal and reinstallation. The only time that the contractor shall be relieved of this responsibility is if it is so stated on the drawings.
- B. In areas where ceilings are being removed and reinstalled or to facilitate installation of ductwork or other mechanical systems above the ceilings, or where the ceilings remain in place and other mechanical systems are installed above the ceiling, assume the following:
1. Junction boxes that are located above the new mechanical equipment, including ductwork, HVAC piping, plumbing piping or mechanical equipment shall be relocated to provide code required box clearances.
  2. Light fixtures within the ceiling must be removed, stored and reinstalled. This should be coordinated with the mechanical contractor or other contractor working in the ceiling.
  3. Junction boxes that are located above the new ductwork which are no longer accessible are to be relocated into an area of accessibility.
- C. In areas where existing ceilings are to be removed and new ceilings are being installed in the area, assume the following in regard to work in those spaces:
1. Electrical equipment on walls that are being revised shall be lowered to accommodate new ceiling. Existing junction boxes shall be lowered and walls patched. Do not leave existing junction boxes in place, unless approved by the Architect.
  2. Existing conduit and cables above the existing ceilings shall be required to be reinstalled when the old ceiling is removed. Assume the existing conduit is attached to the old ceiling and by the old ceiling being demolished, will also be removed. Assume to provide a new feeder from the panelboard into the area. Ceiling mounted junction boxes shall feed the existing switches; new light fixtures or existing light fixtures, if they are to remain; and all existing receptacles and other electrical equipment in the area.
  3. All existing cable shall be resupported off of ceiling grid as required.
  4. All existing conduit shall be resupported to comply with NEC.

### 3.8 EXISTING WALLS WITH NEW WALL FINISHES

- A. On existing walls that are covered with new wall finishes, remove the existing device and plate, install a box extension to match the new wall surface and reinstall a new device and new plate.

### 3.9 REMOVAL OF EXISTING LIGHT FIXTURES

- A. For the removal of all existing light fixtures, provide proper disposal of all light fixture components including ballasts and lamps.

### 3.10 WORK IN EXISTING CORRIDORS AND ROOM SPACES

- A. Review the HVAC drawings and in those corridors and room spaces where ductwork or other piping is being routed through the existing corridor or room space, assume to coordinate the ductwork installation with the HVAC contractor so that it does not interfere with the existing conduit raceways in the ceiling. In bid, assume relocation of the existing conduit junction boxes and raceways that will be located above the new ductwork. Junction boxes and raceways shall be moved to one side or the other so as not to be blocked by the ductwork.
- B. In those corridors and room spaces where HVAC ductwork is being installed and the ceiling is being removed, remove, store, and reinstall lighting fixtures, smoke detectors and any other electrical equipment that is mounted in or on the ceiling space.

3.11 RECONNECTION TO EXISTING CIRCUITS

- A. Where it is indicated on the drawings as 'reconnect to existing circuit' assume that the note references reusing the panelboard circuit. Make determination if existing raceways and conductors are in place for that connection. Extend the circuit from the new equipment back to the point where conduit and wire are available. Coordinate with the demolition contractor to maintain conduits and conductors that the electrical contractor may require to remain in place for reuse. Provide new raceway supports, conduit extensions, and circuit extensions as required.

3.12 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.
- C. Luminaries: Remove existing luminaries for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps and broken electrical parts.

3.13 REMOVAL NOTES ON DRAWINGS

- A. The removal notes on the drawings are meant to aid the contractor to remove items that the contractor may normally leave in place because the room remains similar.
- B. It is the intent that these removed devices are devices that are in addition to the other devices that must be removed, bypassed, etc. as a part of the demolition work.
- C. Disconnect, remove, and close openings of all electrical equipment that serve functions in existing rooms when those rooms change function. Clarify this with the Owner and Architect prior to removal.

3.14 INSTALLATION

- A. Re-install relocated materials and equipment.

3.15 EXISTING COMMUNICATIONS CABLES IN DEMOLISHED AREAS

- A. In areas of demolition, assume there may be low voltage communication and data cables traveling through the area of demolition. Maintain the integrity of these existing circuits and provide the services of a qualified electrician to do whatever work is necessary to reroute or reconnect these cables.

END OF SECTION 26 05 02

SECTION 26 05 04 – DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 SYSTEM PRE-INSTALLATION INFORMATION

- A. Provide system pre-installation information for all equipment indicated on the Project Documentation Submittal List. Information shall include:

1. System wiring diagrams.

- a. System wiring diagrams for the systems listed below shall be provided as a complete riser diagram. This riser diagram shall include all components of the system, as well as a designation adjacent to each component indicating the room or space in which it is located. Cable type used shall also be identified. This designation shall be by description of space or by room number.

- 1) Spec section 28 24 00 – access control.
- 2) Spec section 28 31 10 –addressable fire alarm system.

2. Diagram format.

- a. All riser diagrams shall be done in the following manner:

- 1) CAD drawings.
- 2) All symbols used shall be the same symbols are used on the electrical contract documents.

- b. Each component of the built-up system must have the following information provided:

- 1) Each component must be indicated on a riser diagram and shown how it interconnects to other parts of the system.
- 2) Provide front elevation of rack or enclosure for system.
- 3) Size of enclosure shall be indicated.
- 4) Spacing or special mounting requirements shall be indicated.
- 5) Signal candela level.



- B. System installation information shall be updated to reflect the installed system. This updated information shall be included as a part of the final O&M manual.
- C. Drawings shall be supplied for each existing building system that is revised or added to. The drawings do not have to show all existing building equipment, only those items where the new system is extended from. A brief description should be given of the existing system and how it was extended.
- D. Record drawings shall be reduced to 11" X 17" or 8 1/2" x 11" and included with the equipment drawings in the final O&M manual. See O&M MANUAL Description in this specification section.

### 1.3 FINAL TESTS AND DEMONSTRATIONS

- A. Test all work and all equipment installed to ensure its proper and safe operation. Check all interlocking and automatic control sequences and test the operation of all safety and protective devices. Rectify all defects. Coordinate this work with the Power Company, supplier's representative and all other persons as directed by the OWNER or his representatives, in order to achieve the proper and intended operation of all equipment.
- B. Test, adjust and record operating voltages at each system level before energizing branch circuits. Transformer taps must be adjusted to obtain as near as possible nominal system voltage. Where transformer is under Utility jurisdiction, obtain services of Utility to correct voltage. Be responsible for replacement of all devices and equipment damaged due to failure to comply with this requirement.
- C. Balance load among feeder conductors at each panelboard and reconnect loads as may be necessary to obtain a reasonable balance of load on each phase. Electrical unbalance shall not exceed 10%.
- D. Provide all instruments and equipment necessary to perform required tests.
- E. All checks and tests shall be permanently recorded and made available to the OWNER or his representatives. The tests shall include:
  - 1. System grounding.
  - 2. Fuses:
    - a. Equipment nameplate requirement
    - b. Actual fuse rating
  - 3. Breakers:
    - a. Nameplate
    - b. Actual rating
  - 4. Motors:
    - a. Complete nameplate data
    - b. Overload relay element
    - c. Voltage and current phase readings
    - d. Direction of rotation
  - 5. Ampere readings on any cable operating in parallel to insure an even division of current.
- F. The above reading shall be made for all fuses, breakers, motors and parallel cables installed as part of this contract and connected to by Division 26. This testing shall be for all new equipment, whether furnished by the electrical contractor or not.
- G. Upon request, demonstrate proper operation of all electrical systems and equipment in the presence of the Architect's Consulting Electrical Engineer and/or other designated persons.

### 1.4 PROJECT CLOSEOUT CHECKLIST

- A. Submit the following:

ITEM	SUPPLIED TO:	CHECK OFF
Accounting of all additional items as detailed in spec section 26 05 01.	ARCHITECT	_____
Spare Fuses (SPEC 26 27 28)	OWNER	_____
Spare occupancy sensors (SPEC 26 09 23)	OWNER	_____
Spare wiring devices (SPEC 26 27 26)	OWNER	_____
Generator test report (SPEC 26 32 00)	ARCHITECT	_____
Fire Alarm Checklist (SPEC 28 31 10)	ARCHITECT	_____
Spare fire alarm devices (SPEC 28 31 10)	OWNER	_____
Structured Wiring Documentation (SPEC 27 10 00)	ARCHITECT	_____
Structured Wiring Tabulations (SPEC 27 10 00)	ARCHITECT	_____
Structured Wiring Reduced Floorplans (SPEC 27 10 00)	ARCHITECT	_____
Structured Wiring Data Warranty (SPEC 27 10 00)	ARCHITECT	_____
Data Cable Installation Warranty (SPEC 27 10 00)	ARCHITECT	_____
Letter stating all specified spare equipment was delivered to owner. The letter should list the equipment supplied.	ARCHITECT	_____
O&M Manual	ARCHITECT	_____
Certificate from systems suppliers stating that the system was started up, tested and Owner's instructions were given. Certificate shall have date of instructions and test and shall have the owner's representative's signature.	ARCHITECT	_____
Copy of marked up record drawing.	ARCHITECT	_____

Provide warranty for all  
equipment.

ARCHITECT

\_\_\_\_\_

END OF SECTION 26 05 04

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SECTION 26 05 19 – WIRE AND CABLE

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. American National Standards Institute/National Fire Protection Agency (ANSI/NFPA), Specifications and Standards, current edition:
  - 1. NFPA 70 – National Electrical Code.
  - 2. ANSI/TIA/EIA-568-B.2.
- B. National Electrical Contractors Association (NECA), Standard of Installation, current edition.
- C. National Electrical Manufacturers Association (NEMA), Specifications and Standards, current edition.
- D. Underwriters Laboratories, Inc. (UL).

1.3 DESCRIPTION OF WORK

- A. Furnish and install a complete and operable wire and cable system as indicated on the drawings and as specified herein.

1.4 RELATED WORK ELSEWHERE

- A. Division 26, 27, and 28: Electrical

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.

1.6 OPERATION & MAINTENANCE MANUALS

- A. Submit Operations & Maintenance Manuals in accordance with Section 26 05 04.
- B. The following information shall be submitted in addition to the items listed above:
  - 1. Manufacturer literature in scope to demonstrate compliance with the requirements of this specification.
  - 2. Clearly identify the types of wire and cable proposed.

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. Wire and cable manufacturers shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development and production in accordance with ISO 9001.
- C. All materials, equipment, and parts shall be new and unused of current manufacture.
- D. Provide all necessary accessories required for a complete and operable system.

1.8 WARRANTY

- A. Wire and cable shall be warranted for a period of not less than 2 years from the date of commissioning against defects in material and workmanship.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Approved manufacturer:
  - 1. Contractor's option.
- B. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

2.2 WIRE AND CABLE – GENERAL PURPOSE (600V)

- A. General:
  - 1. All conductors with ampacity of 100A or less shall be copper. Aluminum conductors are allowed for feeders with ampacity greater than 100A with exception of conductors feeding HVAC motors, HVAC equipment, generators, transfer switches and elevator. Feeders for this equipment must be copper.
  - 2. THWN or THHN general purpose building wire insulated with polyvinyl chloride (PVC) and covered with protective sheath of nylon intended for lighting and power circuits at 600 volts or less, in residential, commercial, and industrial buildings.
  - 3. The wire shall be suitable for 90°C maximum continuous conductor temperature in dry locations and 75°C in wet locations and listed by Underwriters Laboratories for use in accordance with Article 310 of the National Electrical Code.
- B. Conductors:
  - 1. Class B or Class C stranded, annealed uncoated copper per UL Standard 83 or 1063.
  - 2. Where aluminum conductors are allowed, aluminum alloy conductors shall be compact stranded conductors of a recognized Aluminum Association 8000 Series aluminum alloy conductor material (AA-8000 series alloy).
- C. Insulation:
  - 1. Each conductor shall be insulated with PVC and sheathed with nylon complying with the requirements of UL Standard 83 for Types THHN or THWN and UL Standard 1063 for Type MTW and CSA C22.2 No. 75 for T90 Nylon.
  - 2. Types THWN or THHN shall comply with the optional Gasoline and Oil Resistance rating of UL Standard 83. The insulation shall also comply with UL requirements for 105°C Appliance Wiring Material.
  - 3. The average thickness of PVC insulation, for a given conductor size, shall be as specified in UL Standard 83 for THWN or THHN. The minimum thickness at any point, of the PVC insulation, shall be not less than 90 percent of the specified average thickness.
  - 4. The minimum thickness at any point of the nylon sheath shall be as specified in UL Standard 83 for Types THWN or THHN.
  - 5. Where aluminum feeders are allowed, insulation to meet requirements of XHHW-2 Standards.
  - 6. The PVC insulation shall be applied tightly to the conductor and shall be free-stripping.
- D. Identification:
  - 1. The wire shall be identified by surface marking indicating manufacturer's identification, conductor size and metal, voltage rating, UL Symbol, type designations, and optional ratings. The wire shall also be identified as C (UL) Type T90 Nylon or TWN 75, FT1.
- E. Tests:

1. Wire shall be tested in accordance with the requirements of UL Standard 83 for Types THWN or THHN wire and for the optional Gasoline and Oil Resistance listing; as Type MTW to UL Standard 1063 (stranded items); as AWM to UL Standard 758 (stranded items); and as C(UL) Type T90 Nylon or TWN75.

F. Usage:

1. General use power wiring, minimum size No. 12 AWG.
2. General use control wiring, minimum size No. 14 AWG.

### 2.3 WIRING CONNECTORS

A. Polaris Type Mechanical Connectors:

1. 8 AWG and larger wire for all motor connections.

B. Spring Wire Connectors:

1. 10 AWG and smaller wire.

C. Compression Connectors (T&B Sta-Kon or equal):

1. Fire alarm wiring.
2. Control wiring.
3. For those devices that are not rated to accept stranded wire.

D. Cord Connectors. All cord connectors should be Kellums type using wire mesh cord restraint.

E. Provide watertight Crouse-Hinds or equal cord grips in appropriate areas.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that wire is in compliance with specifications.
- B. Verify that interior of building has been protected from weather.
- C. Verify that mechanical work likely to damage wire and cable has been completed.
- D. Inspect wire for physical damage and proper connection.
- E. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- F. Verify continuity of each conductor.

### 3.2 FIELD MEASUREMENTS

- A. Field verify all measurements. Do not base on contract drawings.
- B. Identify conflicts with the work of other trades prior to installation of work.
- C. Adjust system to satisfy field requirements.

### 3.3 DELIVERY, STORAGE AND HANDLING

- A. Receive, sign for and store all equipment in this section.
- B. Maintain original quality and condition of wire while it is in storage.

### 3.4 INSTALLATION

A. General:

1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.

B. Pre-Installation:

1. Verify that interior of building has been protected from weather.
  2. Verify that mechanical work likely to damage wire has been completed.
  3. Completely and thoroughly swab raceway prior to installation.
  4. Verify that field measurements are as shown on drawings.
  5. Wire and cable routing shown on drawings is approximate unless dimensioned. Route wire and cable to satisfy project conditions.
  6. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.
  7. Determine required separation between cable and other work.
  8. Determine cable routing to avoid interference with other work.
- C. Conductor Sizing:
1. Conductor sizes are based on copper.
  2. Use conductor not smaller than No.12 AWG for power and lighting circuits.
  3. Use No.10 AWG conductors for 20 ampere, 120-volt branch circuits longer than 75 feet.
  4. Use No. 10 AWG conductors for 20 ampere, 277-volt branch circuits longer than 200 feet.
  5. Where circuit wiring length exceeds 100 feet, increase wire size as needed to maintain a maximum voltage drop of three percent.
  6. Use conductor not smaller than No.14 AWG for control circuits.
  7. Wire and cable size shall be increased from size indicated or required by code to meet the following voltage drop requirements:
    - a. 3% drop for branch circuits.
    - b. 5% drop for motor circuits.
- D. Wire Pulling:
1. Pull all conductors into raceway at same time.
  2. No.4 AWG and larger wire and power cables shall be lubricated with pulling lubricant to reduce pulling tension and abrasion damage. The lubricant shall be water or wax based containing no oils or greases that may adversely affect cable jackets.
  3. The minimum bend radius and maximum pulling tension ratings of the wire and cable shall not be exceeded.
- E. Splices and Terminations:
1. Splices and terminations shall not be made within raceways.
  2. Clean conductor surfaces before splicing or terminating.
  3. Make splices, taps, and terminations to carry full amp capacity of conductors with no perceptible temperature rise.
  4. Wire nuts, "ScotchLocks", and similar devices may be used to splice 120V power circuits.
  5. Control, communication, and data transmission wire and cable shall not be spliced.
  6. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure. Do not rest cable on ceiling panels or support for the ceiling suspension system per NEC.
  7. Neatly train and lace wiring inside boxes, equipment, and panelboards.
  8. Clean conductor surfaces before installing lugs and connectors.
  9. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
  10. All aluminum conductors shall terminate on tin plated, aluminum-bodied compressor lug or compression adapter. An oxide-inhibiting joint compound must be applied on the aluminum conductor during termination. The compression connectors shall be installed according to manufacturers' instructions with the compression tool recommended by the manufacturer of the connector.

11. Perform an infrared survey of all aluminum conductor connections after the installation is complete and in normal service. Infrared surveys shall be performed during periods of maximum possible loading with at least 30% of rated load of the equipment being inspected. All connections with elevated temperatures shall be corrected by the contractor.
12. Use polaris type mechanical connectors for copper conductor splices and taps, 8 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
13. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

F. Motors:

1. Motor wiring to motors less than 10 horsepower shall be spliced and terminated with fully insulated crimp-on end cap with a layer of self-vulcanizing rubber tape, followed by five layers of vinyl electrical tape. "SkotchLocks" and similar devices shall not be used.
2. Motor wiring to motors 10 horsepower or larger shall be spliced and terminated with crimp-on ring terminal lugs, brass nuts, bolts and washers with a layer of self-vulcanizing rubber tape, followed by five layers of vinyl electrical tape. "SkotchLocks" and similar devices shall not be used.

G. Wire Marking:

1. The ends of each conductor shall be marked with circuit number, motor number, wire or terminal number.
2. Labels shall be typed in black lettering with indelible ribbons on a white, heat shrink sleeve. Markers shall be shrunk around the wire to provide a tight, non-slip bond with a compatible heat gun.
3. Heat shrink wire markers shall be Brady Bradysleeve Type B-321 or B-322

H. Color Coding:

1. Color coding shall be as follows:
 

	120/208V	120/208V
	System	System
Phase A	Black	Black
Phase B	Red	Red
Phase C	Blue	
Neutral	White	White
Ground	Green	Green

I. Ground Wire Color Coding

1. Provide green insulated ground wire for #8 and smaller. #6 wire shall have green band per code.

J. Control Panels

1. Control panel wiring. Wiring within control cabinets shall be stranded type MTW.

K. Neutrals

1. Provide phase color banding on neutrals to match phase conductor.

L. Shared Neutrals

1. All branch circuits shall have its own neutral.

END OF SECTION 26 05 19

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SECTION 26 05 26 – GROUNDING

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.
- B. Conform to current Underwriters Laboratories (UL) Specifications and Standards.
- C. Conform to current Telecommunication Industry Association (TIA/EIA).
- D. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”.
- E. Product specific standards and requirements are included in product specifications.
- F. EIA/TIA-607.

1.3 DESCRIPTION OF WORK

- A. Furnish and install a complete and operable grounding and bonding system as indicated on drawings and specified herein.
- B. Ground and bond all equipment required per all applicable codes whether or not specifically shown on drawings.
- C. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and plumbing systems.
- D. Provide grounding from main electric service to telecommunications ground bus per drawing details. Bond to all metal enclosures and racks. Bond all cable trays and conduit stubs.

1.4 RELATED WORK ELSEWHERE

- A. Division 26, 27, and 28: Electrical

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.
- B. The following information shall be submitted in addition to items listed above:
  - 1. Complete riser diagram indicating copper backbone from main service ground to telecommunications ground bus.

1.6 OPERATION & MAINTENANCE MANUALS (NONE)

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.

1.8 WARRANTY

- A. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.
- C. Submit a written warranty executed by the installer indicating ground test was completed.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).
- B. Provide a complete and fully functional grounding system using materials and equipment of types, sizes, and rating as required to meet performance requirements. Use materials and equipment that comply with referenced standards and manufacturer's standard design and construction, in accordance with published product information. Coordinate the features of all materials and equipment so they form an integrated system, with components and interconnections matched for optimum performance of specified functions. Provide all accessories necessary for a fully functioning system.

## 2.2 MECHANICAL CONNECTORS

- A. The mechanical connector bodies shall be manufactured from high strength, high conductivity cast copper alloy material. Bolts, nuts, washers, and lockwashers shall be made of silicon bronze and supplied as a part of the connector body and shall be of the two bolt type.
- B. Split bolt connector types are not allowed.
- C. The connectors shall meet or exceed UL 467 and be clearly marked with the catalog number, conductor size and manufacturer.

## 2.3 COMPRESSION CONNECTORS

- A. The compression connectors shall be manufactured from pure wrought copper. The conductivity of this material shall be no less than 99 percent.
- B. The connectors shall meet or exceed the performance requirements of IEEE 837, latest revision.
- C. The installation of the connectors shall be made with a compression, tool and die system, as recommended by the manufacturer of the connectors.
- D. The connectors shall be clearly marked with the manufacturer, catalog number, conductor size, and the required compression tool settings.
- E. Each connector shall be factory filled with an oxide-inhibiting compound.

## 2.4 EXOTHERMIC CONNECTIONS

- A. Select the appropriate kit for specific types, sizes, and combinations of conductors and other items to be connected. Field personnel shall be trained in execution of welds.

## 2.5 WIRE

- A. Material: Stranded copper (aluminum permitted only with aluminum conductors).
- B. Grounding Electrode Conductor: Size as shown on drawings, specifications, or required by NFPA 70, whichever is larger.
- C. Feeder and Branch Circuit Equipment Ground: Size as shown on drawings, in specifications, or as required by NFPA 70, whichever is larger. Differentiate between the normal ground and the isolated ground when both are used on the same facility.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Verify proper labeling is provided on all telecommunications bus bars.

### 3.2 FIELD MEASUREMENTS

- A. Adjust grounding system installation to satisfy field requirements.
- B. Adjust grounding system installation to satisfy field requirements.

### 3.3 DELIVERY, STORAGE AND HANDLING



- A. Receive, sign for and store all equipment in this section.

3.4 INSTALLATION

A. General:

1. Provide a separate, insulated equipment grounding conductor in all raceways.
2. Provide ground wire in all surface metal raceways, and wireways.
3. Receptacle grounding:
  - a. For all receptacle circuits, provide separate green ground wire in raceway system.
  - b. Receptacles shall be isolated ground type where called for specifically on the drawing in other areas.
  - c. Standard receptacles may be used and green wire shall be directly connected to receptacle or to pigtail.
  - d. Provide #12 pigtail to ground all metal boxes.
  - e. Stranded wire twisted on ground terminal on device is not allowed.

END OF SECTION 26 05 26

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SECTION 26 05 29 – SUPPORTING DEVICES

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.
- B. Conform to current American National Standards Institute (ANSI) standards.
- C. Conform to current American National Standards Institute ANSI B31.1 standards.
- D. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”

1.3 DESCRIPTION OF WORK

- A. Furnish and install complete and operable support devices as required.
- B. Metal supporting devices shall be zinc galvanized or cadmium plated steel or malleable iron.
- C. Equipment and materials shall be supported with devices designed for such purpose. Wire or plastic ty-raps not acceptable.
- D. Where so specified on the drawings, provide stainless steel, PVC covered, or hot dipped galvanized.
- E. Refer to drawings or other portions of the specifications for particular pieces of equipment which may require more stringent equipment specifications than listed in this specification.

1.4 RELATED WORK ELSEWHERE

- A. Division 03: Concrete
- B. Division 04: Masonry
- C. Division 07: Thermal and Moisture Protection
- D. Division 23: Heating, Ventilation and Air Conditioning
- E. Division 26, 27, and 28: Electrical

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.

1.6 OPERATION & MAINTENANCE MANUALS (NONE)

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. All materials, equipment and parts are to be new, undamaged and unused of current Manufacture.

1.8 WARRANTY

- A. Equipment shall be warranted for a period of not less than 2 years from the date of commissioning against defects in material and workmanship.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

## 2.2 LIGHTING FIXTURE SUPPORT

- A. Provide items such as stems, hickey, bar hangers, and clips required to securely attach fixtures to ceilings or walls.
- B. Provide troffer arms for supports, lay-in troffers for exposed grid ceiling and grid troffer support clips in accordance with NEC and manufacturer's recommendations.
- C. Provide and install channel supports across main grid runners or grid supports, securely tied down or anchored for fixtures and devices mounted in suspended ceiling systems not causing tile to sag and so fixture or device cannot be lifted, rotated or displaced.
- D. Provide spacers or stabilizers to eliminate fixture instability.
- E. Drilled expansion insert type anchors suitable for load and application requirements such as sleeve anchors, lag shields, and plastic anchors.
- F. Provide auxiliary supports so fixtures can be drawn up tightly, tilted or rotated, and not affected by vibrations.

## 2.3 SUPPORTING STRUCTURES

- A. Rack supports of galvanized steel channel sections with adequate feet to allow secure mounting. Weld sections, do not use bolts.

## 2.4 CONDUIT SUPPORTS

- A. 1- hole galvanized steel straps for EMT, 2-hole galvanized steel straps for all other conduits. Do not use perforated hanger iron.

## 2.5 VERTICAL CABLE SUPPORT

- A. Support conductors in vertical raceways using suitable cable supports. Locate supports so each 25 ft-0 in. length of conductor in vertical raceway will be complete with support.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify locations prior to rough in.
- B. Verify mounting details

### 3.2 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings.

### 3.3 DELIVERY, STORAGE AND HANDLING

- A. Receive, sign for and store all equipment in this section.
- B. Accept equipment on site. Inspect for damage.
- C. Protect equipment from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

### 3.4 INSTALLATION

- A. General:
  - 1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
  - 2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.

- B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
- C. Do not fasten supports to pipes, ducts, mechanical equipment, or other conduit.
- D. Do not use spring steel clips on ceiling support wires.
- E. Do not use powder actuated anchors.
- F. Obtain permission from Architect before drilling or cutting structural members.
- G. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present a neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- H. Install surface mounted cabinets with minimum of four anchors.
- I. In wet and damp locations use steel channel supports to stand cabinets one inch off wall.
- J. Use steel metal channel to bridge studs above and below cabinets recessed in hollow partitions.
- K. Degrease and clean surfaces to receive nameplates and labels.
- L. Install nameplate and label parallel to equipment lines.
- M. Secure nameplates to equipment fronts using screws if so specified on drawings.
- N. Anchors:
  - 1. Install anchors at proper locations to prevent stresses from exceeding those permitted by ANSI B31 and transfer of loading and stresses to connected equipment.
  - 2. Installation methods shall be in conformity with manufacturer's recommendations for maximum holding power.
- O. Conduit Supports:
  - 1. Support conduit as follows:
    - a. Vertical Surfaces: Galvanized, heavy-duty, sheet steel straps; back straps provided for exposed conduit and conduit on exterior walls.
    - b. Horizontal Surfaces: Single or double rack channel trapeze, complete with conduit straps as required; supported with threaded hanger rods.
  - 2. Support 1 3/4 in. and larger conduit runs passing through floors at each floor with riser pipe clamps.
- P. Conduit Extending Through Roof:
  - 1. Conduit extending through roof shall pass through ceiling box at roof line.
  - 2. Provide 14 ga minimum galvanized 12 gauge box complete with watertight soldered seams and flanged to serve as pitch pocket for each conduit or provide a neoprene boot as compatible with roof.
  - 3. Install conduit and pitch pocket in advance of roofing work.
  - 4. Coordinate with roofer for providing all appurtenances required so that the installed system complies with roofing installation.

END OF SECTION 26 05 29

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SECTION 26 05 34 – RACEWAYS

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.
- B. Conform to current National Electrical Manufacturers Association (NEMA) Standards.
- C. Conform to current Underwriters Laboratories (UL) Specifications and Standards.
- D. Conform to current Telecommunication Industry Association (TIA/EIA).
- E. Conform to current American National Standards Institute (ANSI) standards.
- F. Conform to National Electrical Contractors Association (NECA) "Standards of Installation".
- G. Product specific standards and requirements are included in Product Specifications.

1.3 DESCRIPTION OF WORK

- A. Furnish and install a complete and operable conduit/raceway system as indicated on the drawings and as specified herein.
- B. All wire shall be in conduit or surface raceway. All conduit in finished areas shall be concealed. In unfinished areas, such as utility and mechanical rooms, the contractor shall conceal the branch wiring such as receptacles and light switches.
- C. Where conduit passes through areas of differing temperatures, such as into or out of cool-rooms, freezers, unheated and heated spaces, buildings, provide listed conduit seals to prevent the passage of moisture and water vapor through the conduit.
- D. Materials Included:
  - 1. Metal conduit.
  - 2. Flexible metal conduit.
  - 3. Liquidtight flexible metal conduit.
  - 4. Electrical metallic tubing.
  - 5. Nonmetallic conduit.
  - 6. Surface metal raceways.
  - 7. Wireways.

1.4 RELATED WORK ELSEWHERE

- A. Division 03: Concrete
- B. Division 04: Masonry
- C. Division 09: Finishes
- D. Division 12: Furnishing
- E. Division 23: Heating, Ventilation and Air Conditioning
- F. Division 26, 27, and 28: Electrical

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.

1.6 OPERATION & MAINTENANCE MANUALS

- A. Submit Operations & Maintenance Manuals in accordance with Section 26 05 04.

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. All materials, equipment and parts are to be new, undamaged and unused of current manufacture.

1.8 WARRANTY

- A. Equipment shall be warranted for a period of not less than 2 years from the date of commissioning against defects in material and workmanship.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

2.2 CONDUIT GENERAL REQUIREMENTS

- A. Minimum Size: 3/4 inch.
- B. Conduit types not listed below are prohibited.
- C. Rigid heavy wall galvanized steel conduits:
  - 1. Are to be used in the following locations:
    - a. Outdoors.
    - b. Underground, unless PVC is shown on drawings or called out in other portions of this specification.
    - c. In and under ALL concrete slabs, except for where PVC is allowed as stated in nonmetallic conduit portion of this specification.
    - d. In areas having moisture, dust or gases.
    - e. Exposed conditions where such mechanical protection is required.
  - 2. Manufacturer: CONTRACTOR option.
  - 3. Conduit:
    - a. Impact and crush resistant mild steel tube with an accurate circular cross section, a uniform wall thickness, a defect free interior surface, and a continuous welded seam.
    - b. Interior and exterior surfaces thoroughly and evenly coated with zinc using the hot-dip galvanizing process.
    - c. Top-coated with a compatible organic layer to inhibit white rust and increase corrosion resistance.
    - d. Factory cut threads, 0.75-inch taper per foot, protected after cutting with an application of molten zinc.
  - 4. Conduit Bodies:
    - a. Ferrous metal construction electro-galvanized inside and out and coated with aluminum acrylic paint.
    - b. Tapered, threaded hubs with integral bushing.
    - c. Stainless steel hardware.
    - d. Cover constructed of same material with solid gasket.
  - 5. Fittings:
    - a. Ferrous metal construction electro-galvanized inside and out.
    - b. Components critical to performance such as set screws, split rings, and locknuts constructed of hardened steel or adequately designed to insure positive bonds.



- D. IMC (Intermediate Metal Conduit) is applicable in place of rigid heavy wall galvanized steel conduit in the following locations:
1. All areas except primary raceways.
  2. Outdoors.
  3. Underground.
- E. Thinwall Aluminum conduit:
1. May be used in the following locations:
    - a. Indoors in dry locations (walls, ceilings, exposed).
    - b. Above ground only
  2. Manufacturer: CONTRACTOR option.
  3. Conduit:
    - a. Mild aluminum tube with an accurate circular cross section, a uniform wall thickness, a defect free interior surface, and a continuous welded seam.
  4. Fittings:
    - a. Setscrew, steel construction electro-galvanized inside and out.
    - b. Components critical to performance such as set screws, split rings, and locknuts constructed of hardened steel or adequately designed to insure positive bonds.
- F. Thinwall EMT conduit:
1. May be used in the following locations:
    - a. Indoors in dry locations (walls, ceilings, exposed).
  2. Manufacturer: CONTRACTOR option.
  3. Conduit:
    - a. Mild steel tube with an accurate circular cross section, a uniform wall thickness, a defect free interior surface, and a continuous welded seam.
    - b. Interior and exterior surfaces thoroughly and evenly coated with zinc using the hot-dip galvanizing process.
  4. Fittings:
    - a. Setscrew, steel construction electro-galvanized inside and out.
    - b. Components critical to performance such as set screws, split rings, and locknuts constructed of hardened steel or adequately designed to insure positive bonds.
- G. Flexible Conduit:
1. Lengths limited to minimum necessary, 6' maximum.
  2. Limit use to dry areas.
  3. For connection of lighting fixtures, motors and similar equipment.
  4. To contain an equipment grounding conductor with phase conductors.
  5. Bond grounding conductor to equipment served and nearest conduit system junction box.
  6. Manufacturer: CONTRACTOR option.
  7. Usage:
    - a. Use only in conjunction with electrical metallic tubing.
  8. Conduit:
    - a. Single strip, helically wound, galvanized steel with smooth interior surface conforming to applicable UL Standards.
    - b. Minimum size 1/2-inch may be used in lengths not to exceed 3-feet. All runs of flexible conduit shall be as short as practicable, of the same size as the conduit it extends and with enough slack to reduce the effects of expansion and vibration.

9. Fittings:
  - a. Connectors shall be malleable iron or steel with insulated throat, squeeze-type, with annular gripping rib. Particular attention shall be given to maintaining ground bond and firm support through flexible connections. Connections shall have insulated throats.
- H. Liquid Tight Flexible Conduit:
  1. Requirements same as for flexible conduit.
  2. Use in areas where environment is damp or could become damp or wet.
  3. To contain an equipment grounding conductor with phase conductors. Bond grounding conductor to equipment served and nearest conduit system junction box.
  4. Manufacturer: CONTRACTOR option.
  5. Usage:
    - a. Use in conjunction with galvanized rigid metal conduit.
    - b. Use in conjunction with PVC coated galvanized rigid metal conduit.
  6. Conduit:
    - a. Single strip, helically wound, galvanized steel core inside and outside with smooth interior surface with sunlight resistant thermoplastic jacket suitable for ambient environmental conditions conforming to applicable UL Standards.
    - b. Jacket shall be positively locked to core to prevent sleeving.
    - c. All runs of flexible conduit shall be as short as practicable, of the same size as the conduit it extends and with enough slack to reduce the effects of expansion and vibration.
  7. Fittings:
    - a. Where used in conjunction with galvanized rigid metal conduit, connectors shall be malleable iron or steel, electro zinc plated, with insulated throat and taper threaded hub.
    - b. Where used in conjunction with PVC coated galvanized rigid metal or rigid aluminum conduit connectors shall be malleable iron or steel, electro zinc plated and PVC coated, with insulated throat and taper threaded hub.
    - c. Particular attention shall be given to maintaining ground bond and firm support through flexible connections.
    - d. All fittings shall be liquid tight.
- I. Nonmetallic Conduit (PVC):
  1. Where indicated on drawings.
  2. In or under concrete slabs.
  3. PVC conduit may be used for low voltage wiring (24 volts or less), where allowed by code. PVC may not be used in plenum rated ceilings or if another type has been called out on the drawings.
  4. Where PVC conduit penetrates floor, it must be installed per conduit installation detail.
  5. PVC not allowed indoors above slab, except for single ground conductors in non-plenum areas.
  6. Manufacturer:
    - a. Carlon.
    - b. Or equal.
  7. Conduit:
    - a. Made from polyvinyl chloride compound (recognized by UL), which includes inert modifiers to improve weatherability and heat distortion.
    - b. Rated for use with 90 degree C conductors. Material shall comply with NEMA Specification TC-2.

- c. The conduit and fittings shall be homogeneous plastic material free from visible cracks, holes or foreign inclusions. The conduit bore shall be smooth and free of blisters, nicks or other imperfections, which could mar conductors or cables.
      - d. Conduit, fittings and cement shall be produced by the same manufacturer to assure system integrity.
    - 8. Conduit Bodies:
      - a. Made from polyvinyl chloride compound (recognized by UL), which includes inert modifiers to improve weatherability and heat distortion.
      - b. Rated for use with 90 degree C conductors. Material shall comply with NEMA Specification TC-2.
      - c. Stainless steel hardware.
      - d. Cover constructed of same material with solid gasket.
    - 9. Fittings:
      - a. Made from polyvinyl chloride compound (recognized by UL), which includes inert modifiers to improve weatherability and heat distortion.
      - b. Rated for use with 90 degree C conductors. Material shall comply with NEMA Specification TC-2.
  - J. MC Cable:
    - 1. Under Base Bid provide MC Cabling such that all wiring homerun from the panel to a junction box in the corridor ceiling space near the room shall be installed in conduit; from that point the EC shall route MC Cable to all room outlet(s).
    - 2. Under Alternate Bid state the added cost to install all wiring in conduit.
- 2.3 METAL CONDUIT
- A. Rigid Steel Conduit: ANSI C80.1.
    - 1. Intermediate Metal Conduit (IMC): Rigid steel.
  - B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit all steel fittings.
- 2.4 FLEXIBLE METAL CONDUIT
- A. Description: Interlocked steel construction.
  - B. Fittings: ANSI/NEMA FB 1.
- 2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT
- A. Description: Interlocked steel construction with PVC jacket.
  - B. Fittings: ANSI/NEMA FB 1 with insulated throats.
- 2.6 ELECTRICAL METALLIC TUBING (EMT)
- A. Description: ANSI C80.3; galvanized tubing.
  - B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, insulated throat connectors.
- 2.7 NONMETALLIC CONDUIT
- A. Description: NEMA TC 2; Schedule 40 PVC.
  - B. Fittings and Conduit Bodies: NEMA TC 3.
- 2.8 SINGLE CHANNEL SURFACE METAL RACEWAYS (EG. WIREMOLD)
- A. Description: Sheet metal channel with fitted covers suitable for use as surface metal raceways.
  - B. Size: As required. Maximum 40% fill.
  - C. Finish: International white.

- D. Fittings: All fittings shall have bend radius controls in accordance with TIA/EIA category 6 standards. Boxes, extension rings. Furnish manufacturer's standard accessories.

## 2.9 DUAL CHANNEL SURFACE METAL RACEWAY (WIREMOLD)

- A. Metal raceway shall be:
1. UL listed multi-outlet assembly and component raceway.
  2. Shall meet articles 386 of the NEC.
  3. Shall be ADA and UL5 compliant.
- B. Shall be TIA/EIA 569A compliant.
- C. Metal raceway base shall be 10'-0" long by 1.62" deep by 4.76" wide with dual 9/32" knockouts supplied on 18" centers.
- D. Metal raceway cover shall be tight fitting "snap in" type. Cover shall not require screws.
- E. Where raceway is used for both power and data a divider strip secured by divider strip retention clips supplied on 2.5' centers shall be provided.
- F. Metal raceway shall be provided with wire retention clips for holding conductors in place. Quantity as required for workmanlike installation.
- G. Joints in metal raceway shall be secured by manufacturer supplied coupling plates design for that purpose.
- H. Metal raceway shall be secured to walls with flat-head screws every 24". Race way to be plumb and level.
- I. Determine best mounting method and routing in the field.
- J. Offset raceway around existing wall/ceiling obstructions including lighting fixtures, other raceways, piping systems, architectural features and any other devices. Cost to offset raceways around wall obstructions shall be included.
- K. Metal raceway shall be part of a system with fittings that include but are not limited to:
1. Internal and external 90 degree corners.
  2. Internal and external 45 degree corners.
  3. TIA/EIA 569A compliant full radius fittings for both divided and undivided installations.
  4. Panel connectors for metal raceway to panel board, junction box etc. connection.
  5. Divided and undivided face plates, in multiple configurations, to provide outlets for data/communication and power per drawings.
  6. Junctions end caps and interfaces as required for full and complete system.
  7. Smaller dimensioned Metal Raceway may be used in some circumstances. Verify with drawing notes.
- L. Metal raceway and all of its components shall be ivory.
- M. All metal raceway shall have a ground wire.
- N. Provide receptacle or switch grounding per code utilizing grounding pigtail.
- O. Provide data/communications and power outlets as per drawings or special circumstances listed below. If inconsistencies in quantities are suspected assume larger quantity is required.
- P. Where receptacle spacing is listed on the drawings provide first receptacle from the end, half the center to center distance. Other spacing options are listed under special circumstances below.
- Q. Approved vendors are Hubbell Wiring Devices and Wiremold.

## 2.10 WIREWAYS

- A. Description: General purpose type wireway.
- B. Knockouts: Bottom only.
- C. Size: As required.
- D. Cover: Hinged.
- E. Connector: Slip-in.
- F. Fittings: Lay-in type with removable top, bottom and sides with captive screws.
- G. Finish: Rust inhibiting primer coat with gray enamel finish.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Verify routing and termination locations of conduit prior to rough in.
- B. Verify conduit routing. Routing as shown on Drawings is in approximate locations unless dimensioned. Route as required to complete wiring system.

## 3.2 FIELD MEASUREMENTS

- A. Field verify all measurements. Do not base conduit rough-in or equipment locations on dimensions obtained from the contract drawings.
- B. Identify conflicts with the work of other trades prior to installation of electrical equipment and conduit work.
- C. Adjust conduit system installation to satisfy field requirements.

## 3.3 DELIVERY, STORAGE AND HANDLING

- A. Receive, sign for and store all equipment in this section.
- B. Accept conduit on site. Inspect for damage.
- C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- D. Protect PVC conduit from sunlight.

## 3.4 INSTALLATION

- A. General:
  - 1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
  - 2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.
  - 3. All conduit shall be installed in building unless indicated otherwise.
  - 4. All conduits stubbed into ceiling shall have end bushings.
  - 5. Install conduit in accordance with NECA "Standard of Installation."
  - 6. Install nonmetallic conduit in accordance with manufacturer's instructions.
  - 7. Arrange supports to prevent misalignment during wiring installation.
  - 8. Support conduit using coated steel or malleable iron straps, lay in adjustable hangers, clevis hangers, and split hangers.
  - 9. Group related conduits: support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
  - 10. Fasten conduit supports to building structure and surface under provisions of Section 26 05 29.
  - 11. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
  - 12. Do not attach conduit to ceiling support wires.
  - 13. Arrange conduit to maintain headroom and present neat appearance.
  - 14. Route exposed conduit parallel and perpendicular to walls.
  - 15. Route conduit in and under slab from point to point.
  - 16. Do not cross conduits in slab.
  - 17. Maintain adequate clearance between conduit and piping.
  - 18. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.
  - 19. Cut conduit square using saw or pipecutter; de burr cut ends.
  - 20. Bring conduit to shoulder of fittings; fasten securely.
  - 21. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cleaner and cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
  - 22. Use conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

23. Install no more than equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Hydraulic one-shot bender may be used to fabricate factory elbows.
  24. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
  25. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.
  26. Provide suitable pull string in each empty conduit, except sleeves and nipples.
  27. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
  28. Ground and bond conduit under provisions of Section 26 05 26.
  29. Identify conduit under provisions of Section 26 05 53.
  30. Flexible metal conduit shall be used for connection to equipment subject to vibration and light fixture drops in all removable tile ceilings. Length shall not exceed 36" for equipment connections and 72" for light fixture connections. Minimum size 1/2", except 3/8" may be used for fixture drops. Install flexible conduit drops from independent junction box mounted above ceiling and accessible from below ceiling to recess ceiling mounted equipment. Allow for positioning of equipment to next tile increment.
  31. Seal conduit with oakum or duct seal where they leave heated areas and enter unheated areas.
  32. Surface raceway shall be installed to run parallel of all existing surfaces. Where raceway is used on ceiling, raceway shall be mounted at ceiling wall junction and extended from the junction box out to ceiling mounted device. Raceway shall be routed in corners and along moldings to be as least obtrusive as possible.
  33. Exterior cable and conduit installation.
    - a. Layout in trench may be started at either end unless the drawings indicate that it is to pitch for drainage. In which case the layout should be started at the lowest end. The cable and conduit shall be pitched 1" per 100 feet.
    - b. Include all excavation and backfill.
    - c. Cable and conduit shall be a minimum of 30" deep.
    - d. Cable and conduit shall be laid in a 6" sand bed and covered with another 6" of sand before backfilling with earth.
    - e. Provide Brady identotape 12" above all buried conduits and cables.
    - f. Provide #12 pull wire in all empty or spare conduits.
    - g. Restore existing surface back to its original condition.
    - h. For all excavation, maintain erosion protection per Federal, State, and municipal requirements. All work associated with erosion control for excavation shall be done as per Federal, State and municipal requirements, as well as any plans, meetings, and other special conditions.
    - i. For all trenching that is under paved surfaces, backfill with structural material. Material shall be tamped in layers up to the point of the surface paving material.
  34. For intermediate floor structural slabs, assume that conduit cannot be installed within the slab. If installing conduit within the slab, coordinate this with the Construction Manager and verify with the Architect prior to installation.
  35. For on-grade slabs, the conduit may be run in or under the slab. Verify with concrete installation prior to running conduits in slab to determine if that conduit coordinates with the slab reinforcing.
- B. Conduits Stubbed into Ceiling Space:
1. All conduits stubbed into ceiling shall have end bushings or insulated connectors.
- C. Exterior Wall Penetrations:
1. For all exterior wall penetrations, patch the wall with material to match the existing wall finish. The openings shall be as small as possible to minimize the impact on the existing wall finish. Install duct seal within the conduit to prevent air flow.

2. When conduits are rising from the ground to penetrate the walls, furnish rigid steel conduit where conduit is exposed, and deep-back LB's condulettes or NEMA 4X stainless steel junction box.

D. Interface with Other Products:

1. Install conduit to preserve fire resistance rating of partitions and other elements.
2. Route conduit through roof openings for piping and ductwork or through suitable roof jack. Coordinate location with roofing installation.

END OF SECTION 26 05 34

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SECTION 26 05 35 – ELECTRICAL BOXES

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.
- B. Conform to current National Electrical Manufacturers Association (NEMA) Standards.
- C. Conform to current Underwriters Laboratories (UL) Specifications and Standards.
- D. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”.

1.3 DESCRIPTION OF WORK

- A. Furnish and install boxes as indicated on drawings and specified herein.
- B. The intent of this section is to limit the use of sheet steel boxes to small circuit wiring in dry locations for installations of outlets, switches, exhaust fans, lights, unit heaters, small overhead door units, small power outlets, and limiting the general circuit capacity of 50 amps or less.
- C. Outlets, switches, controls and etc., installed on machinery or processes shall be served with FS and NEMA 12 type boxes.

1.4 RELATED WORK ELSEWHERE

- A. Division 03: Concrete
- B. Division 04: Masonry
- C. Division 09: Finishes
- D. Division 12: Furnishing
- E. Division 23: Heating, Ventilation and Air Conditioning
- F. Division 26, 27, and 28: Electrical

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.

1.6 OPERATION & MAINTENANCE MANUALS

- A. Submit Operations & Maintenance Manuals in accordance with Section 26 05 04.

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. All materials, equipment and parts are to be new, undamaged and unused of current Manufacture.

1.8 WARRANTY

- A. Equipment shall be warranted for a period of not less than 2 years from the date of commissioning against defects in material and workmanship.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

## 2.2 BOXES

- A. Pull boxes and junction boxes: Metal construction, conforming to National Electrical Code, with screw on or hinged cover.
- B. Flush mounted pull boxes: Provide overlapping covers with flush head cover retaining screws, prime coated.
- C. Small surface type junction boxes to be used in dry locations only for general purpose lighting and outlets shall conform to the following standard sizes and spec's:
1. All boxes and covers shall be made of stamped steel. (No sectional boxes allowed).
  2. Minimum sizes:
 

a. Handy boxes	4 x 2 1/8 x 2 1/8
b. Octagon boxes	4 x 1 1/2
c. 4" sq. boxes	4 x 1 1/2 or 4 x 2 1/8
d. 4 11/16" sq. boxes	4 11/16 x 2 1/8
- D. Flush mounted outlet boxes used in dry locations shall conform to the following standards:
1. All boxes and covers shall be made of stamped steel. No sectional boxes allowed.
  2. All boxes for communications outlets and blank outlets shall be of the "deep" variety.
  3. Minimum sizes:
    - a. Masonry boxes: minimum 3 1/2" deep, gang as required. These can be used for outlets or blank outlets.
    - b. 4" square wiring device boxes: 2 1/8" deep when used for communication or blank outlets. 1 1/2" or 1 1/8" deep when used for wiring devices. All 4" square boxes shall be equipped with square cut 1" raised covers of appropriate depth.
    - c. Note special requirements for boxes that will be used in corrosive atmospheres, such as pools. In these atmospheres use corrosion resistant (PVC) outlet boxes.
    - d. Note special requirements for flush boxes for outside receptacles. These boxes shall be 4-hole type or other type to properly patch the surface weather tight covers.
- E. Junction and Splice Boxes:
1. Screw covers, galvanized after fabrication and not less than code dimensions.
  2. Entry openings in boxes shall be made with knock-out punches or hole saws.
  3. Burning of entry openings with a torch will not be acceptable.
  4. Paint exposed ferrous surfaces, 2 coats rust resisting paint.
- F. Provide outlet box divider barriers between 120/208 devices per N.E.C. and between switches for emergency and non-emergency circuits.
- G. Flush interior devices shall utilize 4" square box with raised covers or deep masonry boxes as appropriate.
- H. Raised covers to have square cut corners.
- I. Where existing boxes are reused, provide add-a-depth device rings to devices installed without proper box depth to finish surface.
- J. Box extensions will not be allowed.
- K. Through the wall type outlet boxes not allowed.
- L. Junction boxes and pull boxes shall not have knockouts. Enclosure type, material, and dimensions shall be as indicated on the drawings and as stated in these specifications. Where no type or size is indicated for junction boxes and pull boxes, they shall be one size larger than required by NEC.
- M. For exterior outlets, such as receptacles, use FS type outlet box flush mounted.
- N. Large junction boxes shall be constructed from steel in the following gauges:

Box Size	Minimum Steel Gauge
Up to 24" x 30" x 12"	14
24" x 36" x 8" to 36" x 36" x 16"	12
36" x 42" x 8" and larger	11

- O. Boxes that are shown on hollow-core, precast concrete shall be flush mounted into the spancrete unless shown otherwise on drawings. Coordinate opening to be in hollow core. Provide opening.

### 2.3 SURFACE METAL RACEWAY BOXES (EG. WIREMOLD)

- A. All outlet and junction boxes used with surface metal raceway shall be manufactured by the surface metal raceway manufacturer to be compatible with the raceway used.

### 2.4 JUNCTION BOX COLOR CODING

- A. Junction boxes shall be as follows:
1. Normal 120/208-volt: White
  2. Emergency 120/208-volt: Blue
  3. Fire Alarm: Red

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify routing and termination locations of conduit prior to rough in.

### 3.2 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings.
- B. Mounting heights:
1. As shown on drawings and details.
  2. Coordinate exact heights with specific manufacturer's recommendations.
  3. All mounting heights of keypads and pushbuttons to be ADA compliant.

### 3.3 DELIVERY, STORAGE AND HANDLING

- A. Receive, sign for and store all equipment in this section.
- B. Maintain original quality and condition of equipment while it is in storage.

### 3.4 INSTALLATION

- A. General:
1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
  2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.
- B. All fire alarm pull and junction boxes and their covers shall be painted red and have "fire alarm" written on the cover in large black non-washable ink. The lettering shall be such that it can be read from 10' away. Note that this requirement is in addition to the NEC requirements which require that the box itself be marked in red.
- C. Boxes that are being installed in rough masonry surfaces (such as split face block) shall be installed in such a manner to allow the wiring device or light fixture and the associated device plate to be seated squarely. Have the masonry opening cut to the size of the plate and then box grouted in, or the rough masonry around the box shall be chiseled away and mortar installed around the box to provide a flat finish.

- D. Coordinate with the masonry installation all details of installation on rough masonry surfaces. Without coordination assume responsibility for all costs to provide the flat surface, which will require chiseling the surface of the rough masonry away and providing mortar to obtain this smooth finish.
- E. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- F. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
- G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- I. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods compatible with NFPA.
- J. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices with each other.
- K. Use flush mounting outlet boxes in finished areas.
- L. Do not install flush mounting boxes back to back in walls; provide minimum 6 inch separation. Provide minimum 24 inches separation in acoustic rated walls.
- M. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- N. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- O. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- P. Use adjustable steel channel fasteners for hung ceiling outlet box.
- Q. Do not fasten boxes to ceiling support wires.
- R. Support boxes independently of conduit.
- S. Use gang box where more than one device is mounted together. Do not use sectional box.
- T. Use 2 gang box with plaster ring for single telecommunication outlets.
- U. Use cast outlet box in exterior locations exposed to the weather and wet locations.
- V. Large Pull Boxes: Boxes larger than 100 cubic inches in volume or 12 inches in any dimension.
  - 1. Interior Dry Locations: Use hinged enclosure.
  - 2. Other Locations: Use surface mounted cast metal box.
- W. Grounding:
  - 1. All equipment shall be grounded in accordance with NEC, these specifications and drawings, and the equipment supplier's recommendations.
- X. Interface with Other Products:
  - 1. Coordinate masonry cutting to achieve neat opening.
  - 2. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes.
  - 3. Position outlet boxes to locate luminaires as shown on reflected ceiling plan.

END OF SECTION 26 05 35

SECTION 26 05 37 – LOCATION OF OUTLETS AND EQUIPMENT

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.
- B. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”.

1.3 DESCRIPTION OF WORK

- A. Furnish and install a complete installation as indicated on the drawings and as specified herein.
- B. This specification lays out the general requirements for heights of devices. Heights of devices may be required to be changed depending on interferences in the walls or interferences with mechanical or other architectural equipment. Assume responsibility for verifying the existing conditions in the room by reviewing mechanical and architectural drawings so as not to interfere with that equipment.
- C. Verification of door swings: Assume responsibility to verify door swings with the architectural plans prior to outlet box installation. Review if the switch location is such that it can be easily accessed upon opening the door.

1.4 RELATED WORK ELSEWHERE

- A. Division 03: Concrete
- B. Division 04: Masonry
- C. Division 09: Finishes
- D. Division 12: Furnishing
- E. Division 23: Heating, Ventilation and Air Conditioning
- F. Division 26, 27, and 28: Electrical

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.

1.6 OPERATION & MAINTENANCE MANUALS (NONE)

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. All materials, equipment and parts are to be new, undamaged and unused of current manufacture.
- C. All boxes to be plumb and level.

1.8 WARRANTY

- A. Equipment shall be warranted for a period of not less than 2 years from the date of commissioning against defects in material and workmanship.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

## 2.2 EQUIPMENT

- A. Specifications for equipment being installed under conditions set forth in this section shall be found in related work elsewhere.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify installation locations suitability and adjust as directed.

### 3.2 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings.
- B. Mounting heights:
  - 1. As shown on drawings and details.
  - 2. Coordinate exact heights with specific manufacturer's recommendations.
  - 3. All mounting heights of keypads and pushbuttons to be ADA compliant.

### 3.3 DELIVERY, STORAGE AND HANDLING

- A. Receive, sign for and store all equipment in this section prior to installation.

### 3.4 INSTALLATION

- A. General:
  - 1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
  - 2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.
- B. Grounding:
  - 1. All equipment shall be grounded in accordance with NEC, these specifications and drawings, and the equipment supplier's recommendations.
- C. Location:
  - 1. Location of outlets and equipment as shown on plans is approximate. Verify exact location determined by:
    - a. Construction or code requirements.
    - b. Conflict with equipment of other trades.
    - c. Equipment manufacturer's drawings.
  - 2. Minor modification to the location of outlets and equipment is considered a part of this specification and shall be made with no additional compensation.
  - 3. Mounting heights for all devices and equipment to be measured from finished floor to center of device and unless otherwise noted on plans shall be as follows:

Switches	42"	
Receptacles	22"	
Above Counter receptacles	-	Mount just above backsplash for above counter outlets. See floor plan general notes.
Fire Alarm Horn/Strobe Signal	82"	above the floor (shall be to the highest point in the space i.e. above highest riser level) or 6" below ceiling (whichever is lower)
Fire Alarm Pull Station	42"	
FA Xenon Strobe	82"	above the floor (shall be to the highest point in the space i.e. above highest riser level) or 6" below ceiling (whichever is lower)
Blank Outlets	-	Match receptacle height located adjacent to it unless stated otherwise on plans
D.	Check Heating and Ventilating Plans for location of baseboard heating elements or wall radiators and mount equipment accordingly.	
E.	Receptacles below counter: Verify the actual mounting height with architect. Determine if device is to fit into knee space and rough-in accordingly.	

END OF SECTION 26 05 37

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SECTION 26 27 26 – WIRING DEVICES

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. Conform to requirements of ANSI/NFPA 70 - National Electric Code.
- B. Conform to current Underwriters Laboratories (UL) Specifications and Standards.
- C. Device specific standards and requirements are included in device specifications.

1.3 DESCRIPTION OF WORK

- A. Provide and install wiring devices as required on the drawings and as specified herein.

1.4 RELATED WORK ELSEWHERE

- A. Division 09: Finishes.
- B. Division 11: Equipment
- C. Division 26, 27, and 28: Electrical

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.
- B. The following information shall be submitted in addition to items listed above:
  - 1. One sample of each switch will be supplied to Electrical Engineer, for review prior to installation.
  - 2. One sample of each receptacle will be supplied to Electrical Engineer for review prior to installation.

1.6 OPERATION & MAINTENANCE MANUALS

- A. Submit Operations & Maintenance Manuals in accordance with Section 26 05 04.

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. All materials, equipment and parts shall be new and unused of current manufacture.
- C. Provide all necessary accessories required for a complete and operable system.
- D. Store wiring devices and accessories in original cartons and in clean dry space; protect from weather and construction traffic.

1.8 WARRANTY

- A. Equipment shall be warranted for a period of not less than 2 years from the date of commissioning against defects in material and workmanship.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

## 2.2 WALL SWITCHES

- A. Switches shall be:
1. UL listed for current and voltages indicated.
  2. Shall comply with NEMA standard publication WD-1, "Heavy Duty Wiring Devices".
  3. Federal Specifications Test WS-896 E.
  4. UL standard 20, 943 class A (GFCI) and 498.
- B. Switches shall be 20 ampere heavy duty specification grade unless noted.
- C. Switches shall have provisions for back and side wiring, screw clamp type suitable for solid or stranded wire with separate green ground screw.
- D. Switches shall be white unless noted as different by architect.
- E. Switches shall be made of nylon or high impact resistant material.
- F. Modular switches with pigtailed terminals are allowed.
- G. Supply the following:
1. Wall switch with:
    - a. 20 ampere, 120/277 volt rating.
    - b. Toggle handle.
    - c. Single-pole, double-pole, 3-way and 4-way switches shall be available.
    - d. Approved vendors are: Cooper, Hubbell Wiring, Leviton, and Pass & Seymour.

## 2.3 RECEPTACLES

- A. Receptacles shall be:
1. UL listed for current, uses and voltages indicated.
  2. Shall comply with NEMA standard publication WD-1 and WD-6 standards.
- B. Colors selected by architect. Multiple colors in areas may be required
- C. Receptacles shall be specification grade unless noted.
- D. Receptacles (with the exception of GFCI) shall have one piece brass strap.
- E. Receptacles shall have provisions for back and side wiring, screw clamp type suitable for solid or stranded wire with separate green ground screw.
- F. Receptacles shall be white unless noted as different by architect.
- G. Provide red colored receptacles when connected to the generator.
- H. Modular receptacles with pigtailed terminals are allowed.
- I. Receptacles shall be made of nylon or high impact resistant material.
- J. Receptacles installed in wet or damp locations shall be weather resistant.
- K. Receptacles shall be supplied with face plate.
- L. Supply the following:
1. Duplex NEMA 5-20R heavy duty straight blade (Tamper Resistant) receptacles with:
    - a. 20 ampere, 120 volt rating.
    - b. Standard face shape.
    - c. 2-pole, 3-wire grounding
    - d. Approved vendors are: Cooper, Hubbell Wiring, Leviton, and Pass & Seymour.
  2. GFCI Duplex NEMA 5-20R (Tamper Resistant) receptacles with:
    - a. 20 ampere, 125 volt rating.
    - b. Standard GFCI face.
    - c. GFCI compatible face plate.
    - d. 2-pole, 3-wire grounding.
    - e. Approved vendors are: Cooper, Hubbell Wiring, Leviton, Pass & Seymour.

## 2.4 PLATE COVERS

- A. All plate covers shall be stainless steel.
- B. Provide red colored plates for receptacles connected to the generator.
- C. Cast metal plates: Die cast profile, ribbed for strength, flash removed, primed with gray enamel, furnished complete with four mounting screws.
- D. Steel plates: Hot dip galvanized 1.25 oz /sq. ft. minimum.
- E. Weatherproof receptacle plate shall be heavy duty type, cast aluminum with a deep cover hood to provide weatherproof protection while an attachment plug cap is inserted. Plate shall be code approved as "suitable for wet locations while in use". Weatherproof cover shall be provided with 1/4" padlock hole. Plate must meet OSHA lockout/tagout requirements. Provide a padlock for each weatherproof receptacle cover installed on the project. All padlocks shall be keyed alike. Provide twenty spare keys for Owner's use.
- F. Surface box plates: Beveled, steel, pressure formed for smooth edge to fit box.
- G. Where two-gang boxes are required for single gang devices, provide special plates with device opening in one gang and second gang blank.
- H. Approved vendors are: Cooper, Hubbell Wiring, Leviton, and Pass & Seymour.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify outlet boxes are installed at proper height.
- B. Verify wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- D. Inspect each wiring device for defects.
- E. Operate each wall switch with circuit energized and verify proper operation.
- F. Verify that each receptacle device is energized.
- G. Test each receptacle device for proper polarity.
- H. Test each GFCI receptacle device for proper operation.
- I. Test that each receptacle is properly grounded.
- J. Adjust devices and wall plates to be flush and level.

### 3.2 FIELD MEASUREMENTS

- A. Field verify proper location of all wiring devices with field conditions and adjust accordingly.

### 3.3 DELIVERY, STORAGE AND HANDLING

- A. Receive, sign for and store all equipment in this section.
- B. Maintain original quality and condition of equipment while it is in storage.

### 3.4 INSTALLATION

- A. General:
  - 1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
  - 2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.
  - 3. Start of installation shall not begin until areas are broom clean, properly lighted, exterior enclosing walls in place, exterior windows glazed, roof completely installed to prevent weather damage to equipment.
- B. Install products in accordance with manufacturer's instructions.
- C. Install devices plumb and level.
- D. Install switches with OFF position down.

- E. Install vertical receptacles with grounding pole on top and horizontal receptacles with grounding pole to left.
- F. Connect wiring device grounding terminal to outlet box with bonding jumper.
- G. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- H. Connect wiring devices by wrapping solid conductor around screw terminal or inserting into wire clamp. Wrapping conductor not allowed for stranded wire.
- I. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- J. Mount switches at heights shown in specification 26 05 37 unless otherwise noted. Coordinate location with architectural detail.
- K. In areas where ceiling mounted receptacles and outlets are shown, the face of the receptacle or outlet is to be flush with the ceiling finish. For grid ceilings, provide proper support framing such that receptacles and outlets can be used from the ceiling below without damaging the ceiling tile.
- L. Preparation:
  - 1. Provide extension rings to bring outlet boxes flush with finished surface.
  - 2. Clean debris from outlet boxes.

3.5 OWNER TRAINING (NONE)

3.6 SPARE EQUIPMENT (NONE)

END OF SECTION 26 27 26

SECTION 26 51 13 – INTERIOR LIGHTING FIXTURES

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.
- B. Conform to current Underwriters Laboratories (UL) Specifications and Standards.
- C. Conform to Wisconsin Administrative Code, Comm. 63.
- D. Conform to National Fire Protection Association NFPA 101.
- E. Conform to American National Standards Institute ANSI C 82.11-1993
- F. Conform to current National Electrical Manufacturers Association Standards.

1.3 DESCRIPTION OF WORK

- A. Furnish and install a complete interior lighting system as required on the drawings and as specified herein.

1.4 RELATED WORK ELSEWHERE

- A. Division 09: Finishes
- B. Division 23: Heating, Ventilation and Air Conditioning
- C. Division 26: Electrical

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.

1.6 OPERATION & MAINTENANCE MANUALS

- A. Submit Operations & Maintenance Manuals in accordance with Section 26 05 04.

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. All materials, equipment and parts shall be new and unused of current manufacture.
- C. Provide all necessary accessories required for a complete and operable system.
- D. Test fixtures for proper operation and make all ready for use by Owner.

1.8 WARRANTY

- A. Lighting fixtures shall be warranted for a period of not less than 2 years from the date of commissioning against defects in material and workmanship.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, and repair parts cost.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

## 2.2 FIXTURES AND COMPONENTS

- A. Each bidder shall make his own count of all fixtures of the types indicated on the fixture schedule and they shall be furnished as outlined hereunder.
- B. Basic catalog number only is given herein for fixtures; plaster rings, fixture ends or caps, suspension units, furnish mounting brackets and/or all other auxiliary parts necessary for a complete installation. Fixture shall be furnished as required, for a full and complete installation, even though not specifically called out on plans.
- C. Should any parts of the fixtures be found to be bent or not in accord with their designed position, adjust, repair or replace at once the affected items required.

## 2.3 FIXTURE LED MODULES

- A. All fixtures that are LED will have the LED modules included with the fixture.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine each luminaire to determine suitability for LED modules specified.

### 3.2 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on drawings.

### 3.3 DELIVERY, STORAGE AND HANDLING

- A. Receive, sign for, and store all equipment in this section.
- B. Maintain original quality and condition of equipment while it is in storage.

### 3.4 INSTALLATION

- A. General:
  - 1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
  - 2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.
  - 3. Start of installation shall not begin until areas are broom clean, properly lighted, exterior enclosing walls in place, exterior windows glazed, roof completely installed to prevent weather damage to equipment.
  - 4. Check and confirm ceiling material, recessing space and suspension system with Construction Manager before releasing the order for any recessed fixtures.
  - 5. Type of ceiling material and suspension system must be submitted with fixture order to ensure delivery of proper fixtures.
  - 6. Approval of fixture drawings by the Electrical Engineer shall not relieve this section from responsibility of ceiling confirmation.
  - 7. Clean electrical parts to remove conductive and deleterious materials.
  - 8. Remove dirt and debris from enclosure.
  - 9. Clean photometric control surfaces as recommended by manufacturer.
  - 10. Clean finishes and replace damaged equipment.
  - 11. All fixtures to be supported from structural system, not from ceiling material.
    - a. All fixtures to be supported at minimum of 4 feet-0 inches on center.
    - b. All tees supporting fixtures to be secured directly to the structural system.
    - c. Intermediate tees shall not be used for mounting fixtures.
    - d. If fixtures occur between structural tees, fixture supports shall be installed by spanning structural tees from above, or by suspending a channel support above ceiling from building structure.

12. Recessed lay-in and non-recessed grid mounted lighting fixtures:
  - a. Where lay-in light fixtures are provided, the fixture shall be securely fastened to the ceiling framing members by mechanical means; such as bolts, screws, or rivet clips identified for use with the type of ceiling framing members and fixtures being used.
  - b. Grid mounted fixtures shall be mounted in the grid and attached to the grid system per NEC.
  - c. Separate mounting shall be provided to the ceiling structure above.
  - d. Provide a minimum of two supports per fixture per NEC.
13. Recessed luminaires:
  - a. Locate recessed ceiling luminaires as indicated on ceiling plan.
  - b. Relocate light fixtures as necessary and coordinate with other mechanical trades.
  - c. Coordinate installation in the field, where necessary.
  - d. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
  - e. Install clips to secure recessed grid-supported luminaires in place and separate support wires for each fixture.
  - f. Where recessed fixtures occur in tile ceiling, notify the ceiling contractor so fixture and tile arrangements can be coordinated.
  - g. Install recessed luminaires to permit removal from below.
14. Surface mounted luminaires:
  - a. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prohibit movement.
15. Lighting fixtures installed in areas where there are not suspended ceilings:
  - a. In areas where lighting fixtures are installed where there are not suspended ceilings furnish all mounting hardware.
  - b. Continuous fixtures:
    - 1) In areas where lighting fixtures are mounted end-to-end in ceiling joist area, furnish support strut to solidly support the fixtures.
    - 2) Support strut may be B-line, Kindorf or equal.
    - 3) Strut shall be supported 8' on center using pendant hangers with swivels mounted on 4" square boxes.
16. Mounting hardware painting:
  - a. Mounting hardware to be installed prior to the ceiling being painted.
  - b. If it is not installed prior to that time, paint the support hardware.
17. Special color requirements:
  - a. Refer to fixture schedule to determine if there are special color requirements for the mounting hardware and lighting fixtures other than the ceiling finish.
18. Clearance heights:
  - a. Lighting fixtures shall be mounted to maintain maximum head clearance height and that the bottom of the fixtures shall be even with the bottom of the ceiling joists.
19. Mounting locations:
  - a. The fixtures shall be mounted between the joists unless otherwise shown on the floor plans.
  - b. If fixtures are mounted perpendicular to joist, attach fixtures to the bottom of the joist and furnish steel support struts to the bottom of the joists for fixture support.

20. Individual fixtures:
    - a. In the ceiling joist area, individual fixtures shall be supported using pendant hangers with swivels mounted on 4" square boxes.
    - b. Fixtures shall be fed through one pendant end.
  21. Flat ceiling spaces:
    - a. The fixtures shall be mounted tight to the ceiling unless it is required to adjust the fixture height because of mechanical equipment interference.
    - b. If required to adjust the fixture height because of mechanical equipment interference, support the fixtures using pendant hangers.
  22. Wire Guards:
    - a. Furnish wire guards for all open strip or industrial fixtures.
  23. Mechanical Rooms:
    - a. The light fixtures in the mechanical rooms are shown to indicate number of fixtures only.
    - b. Locate the lighting fixtures to coordinate with the mechanical equipment installation.
    - c. If required, these fixtures may be supported using chain with a cord connection.
    - d. If fixture cannot be mounted on the ceiling, lighting fixture shall be mounted on the wall using an adjustable wall bracket.
  - B. LED modules and drivers shall be factory installed.
  - C. Install accessories furnished with each luminaire.
  - D. Connect luminaires using flexible conduit.
  - E. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
  - F. Bond products and metal accessories to branch circuit equipment grounding conductor
  - G. Fixtures not to be used as a raceway. A fixture may only feed another fixture if it is in master/slave configuration.
  - H. Cleaning:
    1. Prior to turning the system over to the Owner, the system shall be physically cleaned.
    2. All appearance defects shall be carefully and professionally touched up so that the equipment is in "factory new" condition.
    3. At the completion of the work, remove from the building and the premises all rubbish and debris resulting from the work.
  - I. Final Testing:
    1. Operate each luminaire after installation.
    2. Confirm light controls properly operate intended fixtures.
- 3.5 OWNER TRAINING
- A. Provide minimum of one hour training on luminaire operation and LED module and driver replacement.

END OF SECTION 26 51 13



SECTION 28 24 00 – ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.2 APPLICABLE PUBLICATIONS

- A. Conform to requirements of current ANSI/NFPA 70 – National Electric Code.
- B. Conform to current Underwriters Laboratories (UL) Specifications and Standards.
- C. Conform to current Telecommunication Industry Association (TIA/EIA).
- D. Conform to current National Electrical Manufacturers Associates (NEMA) Standards.

1.3 DESCRIPTION OF WORK

- A. Division 26 contractor to include all work in Div 28 as part of Div 26 bid.
- B. Expand the existing keyless entry system as shown on the drawings. The District's keyless entry provide is:
  - 1. Johnson Controls  
ATTN: James L. Veach  
1351 60<sup>th</sup> Street N.E.,  
Cedar Rapids, Iowa 52402  
Mobile: 563-529-2399  
Email: James.l.veach@jci.com
- C. No other vendor will be allowed to preform work on this system. This system is to remain in place and extended to the new doors and new devise shown on plans.

1.4 RELATED WORK ELSEWHERE

- A. Division 26 Electrical.

1.5 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 26 05 04.

1.6 OPERATION & MAINTENANCE MANUALS

- A. Submit Operations & Maintenance Manuals in accordance with Section 26 05 04.

1.7 QUALITY ASSURANCE

- A. Provide quality assurance in accordance with Section 26 05 04.
- B. The following shall be provided in addition to items listed above.
  - 1. Arrange pre-installation meeting.
  - 2. 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.
  - 3. 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.
  - 4. Manufacturer must carry replacement parts.
  - 5. All components must be UL Listed and be UL Listed as an assembled system.

1.8 WARRANTY

- A. The supporting devices and labor for installation shall be warranted for a period of not less than 1 year from the date of commissioning against defects in materials and workmanship.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, and repair parts cost.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).
- B. Cable to be furnished and installed by keyless entry contractor and included in bid

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify surfaces and areas are ready to receive work.
- B. Verify field measurements are accurate and shown on drawings.
- C. Verify proper power connections are installed.
- D. Proceed with installation only after unsatisfactory conditions are corrected.
- E. All wiring shall test free from grounds and shorts.

### 3.2 FIELD MEASUREMENTS

- A. Verify on site all wire lengths and exact location of devices.
- B. Mounting heights:
  - 1. As shown on drawings and details.
  - 2. Coordinate exact heights with specific manufacturer's recommendations.
  - 3. All mounting heights of keypads and pushbuttons to be ADA compliant.

### 3.3 DELIVERY, STORAGE & HANDLING

- A. Receive, sign for, and store all equipment in this section.
- B. Maintain original quality and condition of equipment while it is in storage.

### 3.4 INSTALLATION

- A. General:
  - 1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
  - 2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.
  - 3. Start of installation shall not begin until detention areas are broom clean, properly lighted, exterior enclosing walls in place, exterior windows glazed, roof completely installed to prevent weather damage to equipment.
- B. Cleaning:
  - 1. Prior to turning the system over to the Owner, the system shall be physically cleaned.
  - 2. All appearance defects shall be carefully and professionally touched up so that the equipment is in "factory new" condition.
  - 3. At the completion of the work, remove from the building and the premises all rubbish and debris resulting from the work.

- C. Raceways:
1. All screws used for anchoring conduit and J-boxes parts in public or resident areas shall have tamperproof screws.
  2. All screws used on signal devices, including speakers, shall be of the tamperproof type.
  3. There shall be no sharp edges with installed materials.
- D. Cable:
1. All wire runs shall be continuous lengths, without splices.
  2. All wiring systems shall be color coded as shown on the drawings. Green conductors shall be used only for grounding conductors, white only for neutral conductors.
  3. All control wiring systems shall use stranded copper conductors terminated with crimp connectors or lugs, correctly sized for the termination, and applied to the conductor with a crimping tool intended for use with the lug used, or to terminal strips providing 360 degree capture of the wire.
  4. All field terminal blocks shall be 300 volts minimum NEMA rated, or as required by the NEC for the specific application, and be able to accommodate no less than two (2) #14 AWG wires.
  5. Marker strips shall be attached to the field wiring. These markers shall not change when devices are replaced during repair or maintenance.
  6. Within equipment cabinets, all wires and cables shall be contained in wire management channels such as Panduit or equal, and dressed and labeled in such a manner that all wires may be easily traced, and such that they do not obstruct access to components which may need to be replaced or serviced.
  7. All low voltage cabling to be routed in J hooks above lay-in ceilings.
  8. Plenum Rated
- E. Grounding:
1. All equipment shall be grounded in accordance with NEC, these specifications and drawings, and the equipment supplier's recommendations.
    - a. Each cabinet frame shall be grounded. Equipment cabinets shall be bonded directly to the building electrode grounding.
    - b. All exterior panels of cabinets shall be bonded to the cabinet frame.
    - c. All equipment installed in a cabinet shall be bonded to the cabinet frame.
- F. Cable Support & Raceways:
1. In areas where cable trays are provided, cables shall be installed within the trays.
  2. Above accessible ceilings, a "J-hook" support system shall be used throughout the ceiling space, other areas where cables are run. The "J" shall have flat bottom to eliminate single point stress on cables supported. Min size is cat 21. Allow for 50% spare capacity in all runs of J hooks. Provide additional runs where required to meet this requirement. Cables shall not be installed in a hap-hazard manner across the ceiling grid system. J-hooks to be separate from the data or fire alarm J hooks. J hook spacing to be a maximum of 5' on center. J hooks to be run parallel to the data and fire alarm J hooks. The following method shall be used:
    - a. Conduits that are stubbed into the accessible ceiling space that are acting as cable raceways shall be extended into the nearest corridor space, or, as an option, the contractor shall install a sleeve through any wall separating the room from the corridor area.
    - b. Cables shall be routed at 90 degrees from the room to the J-hook support system in the corridor. The corridor area shall generally be defined as the area where the J-hook support system shall be installed. However, in the event that there is not adequate corridor space, the J-hook system may be moved into the adjacent rooms.

- c. J-hook system shall be installed in straight lines perpendicular, right angle to the building walls. Groups of J-hooks shall be used where the single J-hook system is not adequate to support the cabling to allow for 50% spare capacity.
  - d. Mark the "record drawings" to indicate the approximate path of the J-hook system.
  - e. Maximum spacing between J-hooks to be 5'.
3. Provide and install all wall sleeves and penetrations. Any place that a wall is penetrated to route cable through the wall, the contractor shall provide a through-the-wall sleeve. It shall be steel conduit with insulated connectors on ends in those areas where plenum ceilings are used. For each door entering each room, include providing and installing one sleeve above all doors entering rooms. These sleeves shall be installed above the ceiling grid.
4. All system cables shall be routed through conduit, through the non-ceiling area, into an area where there is ceiling cavity. There shall be no open cables routed through ceiling areas, unless it is indicated otherwise on the drawings.

END OF SECTION 28 24 00

SECTION 28 30 00 – FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. Drawings and general provisions of contract, including general and supplemental conditions and Division 1 specification sections, apply to work of this section.

1.2 SECTION INCLUDES

- A. Manual fire alarm stations.

1.3 DESCRIPTION

- A. The existing fire alarm systems are as follow:
  - 1. North Hill: Notifier NFS2-640 24 Vdc, addressable panel.
  - 2. Sunnyside ES: Notifier NFS2-640 24 Vdc, addressable panel.
  - 3. Grimes ES: Notifier NFS2-640 24 Vdc, addressable panel.
- B. Contact:
  - 1. Johnson Controls  
ATTN: James L. Veach  
1351 60<sup>th</sup> Street N.E.,  
Cedar Rapids, Iowa 52402  
Mobile: 563-529-2399  
Email: James.l.veach@jci.com
- C. Expand the existing fire alarm system at North Hill, Sunnyside, and Grimes Elementary to accommodate the new fire alarm devices shown on the drawings.
- D. Since there are less than 19 devices at each school these drawings will not be required to be submitted to the State for review.
- E. All fire alarm equipment shall be installed in metal conduit or metal raceway in exposed areas and in J-hooks above lay-in or Z-tile ceilings. See raceway portion of the specifications.
- F. All fire alarm equipment and installation shall comply with the American Disabilities Act (ADA) requirements.
- G. Provide a complete, power limited, fire detection and evacuation system to be connected, tested and left in first-class operating condition.
- H. Mounting heights shall be as follows:
  - 1. Fire alarm station - 44" above the floor to top.
  - 2. Fire alarm signals and strobes- 80" above the floor to bottom or 6" below the ceiling, whichever is lower.
- I. The fire alarm system shall monitor the integrity of all alarm initiating and indicating appliance circuits, and shall be provided with automatically charged standby batteries to maintain system operation for 24 hours in the normal supervisory mode plus have sufficient capacity to operate in the alarm mode for 5 minutes at the conclusion of this supervisory time period. Batteries shall be supervised for connection to the system and for low voltage threshold. The automatic battery charger shall be capable of charging fully discharged system batteries to 100% in 8 hours.
- J. Location of the control panel, alarm initiating devices, alarm indicating devices shall be as shown on the plans.

1.4 WARRANTY

- A. Equipment shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

#### 1.5 RELATED SECTIONS

- A. Section 26 05 04 - Documentation.
- B. Section 26 05 53 - Electrical Identification. Marking of the fire alarm boxes and cables.

#### 1.6 QUALITY ASSURANCE

- A. Provide fire alarm system factory trained technician's certificate of proper operation.

#### 1.7 REFERENCES

- A. NFPA 70 - National Electrical Code.
- B. NFPA 72 - National Fire Alarm Code.
- C. NFPA 101 - Life Safety Code.

#### 1.8 SYSTEM OPERATION

- A. Alarm initiating devices shall be grouped in zones identified by Zone Light Emitting Diodes (LED's) on the control panel.
- B. Actuation of an alarm initiating device shall:
  - 1. Cause the respective red zone alarm LED on the control panel to flash, until the reset switch is actuated at the control panel. Once acknowledged, the zone LED will be constantly illuminated until the actuating device is restored to normal and the system is reset.
  - 2. The audible/visual alarm indicating appliance shall annunciate throughout the entire facility until the system alarm acknowledge/silence switch is operated.
  - 3. The audible/visual indicating appliance units shall sound and flash until the alarm acknowledge/silence switch is operated.
- C. After the silence or reset switch is operated, activation of a subsequent initiating device on another zone shall cause the audible indicating appliances to resound and the visual indicating appliances to flash.
- D. Each alarm initiating circuit and indicating appliance circuit shall be electrically supervised. Any disarrangement of system wiring such as opens or grounds, shall activate the audible and visual trouble indicators at the control panel. Actuation of the trouble silence switch shall silence the audible trouble indicator, but the trouble LED will remain lit. The trouble LED shall be non-canceling, except by an actual clearing of the trouble condition and restoring the trouble silence switch to normal.
- E. Power for operating UL listed compatible 2-Wire, 24 Volt DC smoke detectors will be obtained from the control panel. 0.5 Amps of auxiliary, 24 VDC power shall be available from the control panel for external use. (i.e. door holders, remote control relays, 4-wire smoke detectors, etc.)
- F. The control shall be provided with two Form C alarm relays with dry contacts rated at 2 Amps 24 volt DC and one Form C alarm relay with dry contacts rated at 10 Amps 120 volt AC.
- G. The control panel shall obtain its primary operating power from a 120 VAC single-phase 60 Hz supply provided with a dedicated and secured disconnect switch.

### PART 2 - PRODUCTS

#### 2.1 EXTERNAL DEVICES

- A. Description:
  - 1. The system shall utilize UL listed fire alarm initiating devices (i.e. pull stations, smoke detectors, heat detectors, etc.) and UL listed fire alarm indicating devices (i.e. horns, bells, visual lights, etc.) as shown on the project drawings.
  - 2. To insure compatibility, these devices shall be supplied by the manufacturer of the fire alarm control panel.
  - 3. Equipment:

- a. Manual Fire Alarm Stations: Stations shall be non-coded, Break Rod Type. Stations shall be single-action and when operated shall remain mechanically "locked" until reset. Construction shall be of LEXAN with raised white lettering. Manual stations and system control panel shall be keyed alike using tumbler cylinder type locks.
  - 1) EST
  - 2) Simplex
  - 3) Notifier

## 2.2 SPARE PARTS (NONE)

## PART 3 - EXECUTION

### 3.1 SYSTEM WIRING

- A. The system wiring and installation shall be in compliance with applicable codes, project drawings and as required by the manufacturer. All wiring shall be color coded, tagged and checked to assure that it is free from shorts and grounds. Provide record drawings of installation.
- B. Miscellaneous: NOTE: ELECTRICAL CONTRACTOR SHALL PROVIDE DUXSEAL AT EACH SMOKE DETECTOR TO SEAL THE CONDUIT.
- C. Cable Support & Raceways:
  1. In areas where cable trays are provided, cables shall be installed within the trays.
  2. Above accessible ceilings, a "J-hook" support system shall be used throughout the ceiling space, other areas where cables are run. The "J" shall have flat bottom to eliminate single point stress on cables supported. Min size is cat 21. Allow for 50% spare capacity in all runs of J hooks. Provide additional runs where required to meet this requirement. Cables shall not be installed in a hap-hazard manner across the ceiling grid system. J-hooks to be separate from the data or fire alarm J hooks. J hook spacing to be a maximum of 5' on center. J hooks to be run parallel to the data and fire alarm J hooks. The following method shall be used:
    - a. Conduits that are stubbed into the accessible ceiling space that are acting as cable raceways shall be extended into the nearest corridor space, or, as an option, the contractor shall install a sleeve through any wall separating the room from the corridor area.
    - b. Cables shall be routed at 90 degrees from the room to the J-hook support system in the corridor. The corridor area shall generally be defined as the area where the J-hook support system shall be installed. However, in the event that there is not adequate corridor space, the J-hook system may be moved into the adjacent rooms.
    - c. J-hook system shall be installed in straight lines perpendicular, right angle to the building walls. Groups of J-hooks shall be used where the single J-hook system is not adequate to support the cabling to allow for 50% spare capacity.
    - d. Mark the "record drawings" to indicate the approximate path of the J-hook system.
    - e. Maximum spacing between J-hooks to be 5'.
  3. Provide and install all wall sleeves and penetrations. Any place that a wall is penetrated to route cable through the wall, the contractor shall provide a through-the-wall sleeve. It shall be steel conduit with insulated connectors on ends in those areas where plenum ceilings are used. For each door entering each room, include providing and installing one sleeve above all doors entering rooms. These sleeves shall be installed above the ceiling grid.
  4. All system cables shall be routed through conduit, through the non-ceiling area, into an area where there is ceiling cavity. There shall be no open cables routed through ceiling areas, unless it is indicated otherwise on the drawings.

### 3.2 SYSTEM TESTING

- A. The completed system shall be tested in accordance with NFPA Standard 72H. Provide a certified test report from the manufacturer's representative that the system complies with NFPA and State codes.
- B. Contractor shall fill out the fire alarm system checklist included as a part of this specification. This checklist shall be included with the final O&M operation manual and will be required prior to final payment being made on this equipment.

3.3 OWNER'S INSTRUCTION

- A. Provide a minimum of 1(one) hour of owners instruction. Have owner sign certificate stating that he has received instruction on the fire alarm equipment see spec section 16013.

3.4 SYSTEM SERVICE SUPPORT

- A. The system's vendor must employ factory trained technicians and maintain a service organization within 100 miles of the job site. This organization must have a minimum of 10 years experience servicing fire alarm systems and provide 24 hour emergency service.

3.5 WARRANTY

- A. The equipment and wiring shall be warranted to be free from electrical and mechanical defects for a period of one (1) year commencing with start-up and beneficial use of any portion of the system.

3.6 MOUNTING OF SMOKE DETECTORS

- A. Smoke detectors shall not be installed until final room finishes and carpeting have been laid. As an option to this, the contractor may install the smoke detector, but it must be protected by a plastic bag to prevent dust entering the smoke detector. It shall be this contractor's responsibility to install the smoke detectors in this manner to prevent erroneous alarms. If smoke detectors are installed prior to final room finishes being completed and floor finishes being installed, this contractor shall bear the expense of returning the smoke detectors to the factory for cleaning and recalibration.

3.7 SUBMITTAL DRAWINGS

- A. Provide documentation per Specification Section 26 05 04.

3.8 MOUNTING HEIGHTS

- A. Fire alarm station - 44" above the floor to top.
- B. Fire alarm signals and strobes - 80" above the floor to bottom or 6" below the ceiling, whichever is lower.
- C. Fire alarm control panel - mount such that the top of the fire alarm control panel is not higher than 6'.

3.9 FIRE ALARM ZONES SCHEDULE

- A. The following separate alarm zones shall be provided:
  - 1. Pull station.

3.10 PROGRAMMING

- A. All programming that is required for installation shall be done by this contractor. The contractor shall assume that his vendor is to meet with the owner to determine if there are any extraordinary programming circumstances. The supplier shall go over the entire sequence of operation of the fire alarm panel and explain what the various programming sequences are.

END OF SECTION 28 30 00



Fire Alarm System Startup Checklist

Date \_\_\_\_\_

Building Name \_\_\_\_\_

Facility Owner \_\_\_\_\_

Installing Contractor \_\_\_\_\_

Equipment Supplier \_\_\_\_\_

Equipment Manufacturer \_\_\_\_\_

Factory Authorized Technician \_\_\_\_\_

Each fire alarm pull station must be individually tested for system activation and proper zone annunciation. This was done and tested and is in compliance. Yes \_\_\_\_\_ No \_\_\_\_\_ NA \_\_\_\_\_

Each heat detector was individually tested for system activation and proper zone annunciation. This was done and tested and is in compliance. Yes \_\_\_\_\_ No \_\_\_\_\_ NA \_\_\_\_\_

Each smoke detector was individually tested for system activation and proper zone annunciation. This was done and tested and is in compliance. Yes \_\_\_\_\_ No \_\_\_\_\_ NA \_\_\_\_\_

Each fire door with magnetic hold opens and ceiling mounted detectors was tested for fire alarm activation, door closure and proper zone annunciation. Note that this shall be tested so that only those doors that are connected with the local smoke detectors are to close; no other doors are to close. This was done and tested and is in compliance. Yes \_\_\_\_\_ No \_\_\_\_\_ NA \_\_\_\_\_

I hereby certify that the fire alarm system was tested as indicated above. It was found to be operating and complies with State and NFPA codes.

Signed \_\_\_\_\_ Printed Name \_\_\_\_\_

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