

# **PROJECT MANUAL**

## **CHAMPAIGN COUNTY COURTROOM F RENOVATION**

FOR

CHAMPAIGN COUNTY, ILLINOIS  
102 E. Main Street  
URBANA, ILLINOIS 61801

## **100% CONSTRUCTION DOCUMENTS**

Architect's Project # 025151

ITB # 2026-005

August 21, 2026

**Bailey Edward Design, Inc.**  
1103 S. Mattis Avenue  
Champaign, Illinois 61821  
217.363.3375

TABLE OF CONTENTSBIDDING AND CONTRACT REQUIREMENTS

|            |                                                   |
|------------|---------------------------------------------------|
| 00 11 16   | INVITATION TO BID                                 |
| 00 21 13   | INSTRUCTIONS TO BIDDERS                           |
| 00 21 13.1 | AIA A701 INSTRUCTIONS TO BIDDERS                  |
| 00 21 13.2 | AIA A201 GENERAL CONDITIONS                       |
| 00 22 13   | SUPPLEMENTARY INSTRUCTIONS TO BIDDERS             |
| 00 22 44   | ADDITIONAL INSURANCE REQUIREMENTS                 |
| 00 25 13   | PREBID MEETING                                    |
| 00 41 06   | BID BOND FORM                                     |
| 00 41 13   | BID FORM – STIPULATED SUM (SINGLE-PRIME CONTRACT) |
| DA-1       | BIDDER'S / CONTRACTOR'S DISCLOSURE AFFIDAVIT      |
| DF-1       | DRUG FREE WORKPLACE CERTIFICATION                 |
| 00 43 43   | PREVAILING RATE OF WAGES                          |
| 00 43 43.1 | PREVAILING WAGE RATES                             |

GENERAL REQUIREMENTS

|            |                                        |
|------------|----------------------------------------|
| 01 11 00   | PROJECT SUMMARY                        |
| 01 32 00   | CONSTRUCTION SCHEDULE                  |
| 01 33 23   | SHOP DRAWINGS, PRODUCT DATA, & SAMPLES |
| 01 51 50   | USE OF EXISTING FACILITIES             |
| 01 54 00   | CONSTRUCTION AIDS                      |
| 01 56 00   | TEMPORARY BARRIERS AND ENCLOSURES      |
| 01 62 04   | SUBSTITUTION PROCEDURES                |
| 01 62 04.1 | REQUEST FOR SUBSTITUTION FORM          |
| 01 66 00   | STORAGE AND PROTECTION                 |
| 01 73 29   | CUTTING AND PATCHING                   |
| 01 74 13   | CONSTRUCTION CLEANING                  |
| 01 74 23   | FINAL CLEANING                         |
| 01 78 36   | WARRANTIES & BONDS                     |

SITE WORK

|          |                      |
|----------|----------------------|
| 02 41 19 | SELECTIVE DEMOLITION |
|----------|----------------------|

WOOD AND PLASTICS

|          |                     |
|----------|---------------------|
| 06 10 00 | ROUGH CARPENTRY     |
| 06 42 16 | FLUSH WOOD PANELING |

THERMAL AND MOISTURE PROTECTION

|          |                           |
|----------|---------------------------|
| 07 21 00 | THERMAL INSULATION        |
| 07 92 00 | JOINT SEALANTS            |
| 07 92 19 | ACOUSTICAL JOINT SEALANTS |

|          |                                                    |
|----------|----------------------------------------------------|
|          | <u>DOORS AND WINDOWS</u>                           |
| 08 11 13 | HOLLOW METAL DOORS AND FRAMES                      |
| 08 14 16 | FLUSH WOOD DOORS                                   |
| 08 71 00 | DOOR HARDWARE                                      |
| 08 80 00 | GLAZING                                            |
|          | <u>FINISHES</u>                                    |
| 09 22 16 | NON-STRUCTURAL METAL FRAMING                       |
| 09 29 00 | GYPSUM BOARD                                       |
| 09 51 23 | ACOUSTICAL TILE CEILINGS                           |
| 09 68 13 | TILE CARPETING                                     |
| 09 91 23 | INTERIOR PAINTING                                  |
| 09 93 00 | STAINING AND TRANSPARENT FINISHING                 |
|          | <u>SPECIALTIES</u>                                 |
| 10 26 41 | BALLISTIC RESISTANT PANELS                         |
|          | <u>FURNISHINGS</u>                                 |
| 12 32 13 | MANUFACTURED WOOD-VENEER-FACES CASEWORK            |
| 12 36 00 | COUNTERTOPS                                        |
|          | <u>HEATING VENTILATION AND AIR CONDITIONING</u>    |
| 23 05 93 | TESTING, ADJUSTING, AND BALANCING FOR HVAC         |
| 23 07 00 | HVAC INSULATION                                    |
| 23 21 13 | HYDRONIC PIPING AND SPECIALTIES                    |
| 23 31 13 | METAL DUCTS                                        |
| 23 33 00 | AIR DUCT ACCESSORIES                               |
|          | <u>ELECTRICAL</u>                                  |
| 26 05 00 | COMMON WORK RESULTS FOR ELECTRICAL                 |
| 26 05 19 | LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES |
| 26 05 26 | GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS       |
| 26 05 29 | HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS        |
| 26 05 33 | RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS          |
| 26 05 53 | IDENTIFICATION FOR ELECTRICAL SYSTEMS              |
| 26 09 23 | LIGHTING CONTROL DEVICES UPDATED                   |
| 26 27 26 | WIRING DEVICES                                     |
| 26 51 19 | LED INTERIOR LIGHTING                              |
| 26 52 13 | EMERGENCY AND EXIT LIGHTING                        |

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SECTION 00 11 16 – INVITATION TO BIDINVITATION TO BID:**CHAMPAIGN COUNTY PLAZA RENOVATION**

Sealed bids for the Champaign County Courtroom F Renovation Project will be received by Champaign County at the Bennett Administration Center, Shields – Carter Room (Main Level), 102 Main Street, Urbana, IL 61801. Bids will be opened publicly.

Work generally includes but is not limited to the following:

- Select removal of interior systems, finishes, and components.
- Installation of systems, finishes and components/devices.
- Removal of existing safe/vaults.
- Roof replacement
- Parking security re-striping.
- Select glazing removal and install.
- Exterior coatings

Proposals must be submitted on the forms provided and shall contain no qualifications or interlineations. In submitting a bid, it is agreed that the bid may not be withdrawn for a period of thirty (30) days after Bid Date.

The Owner reserves the right to require from any bidder, prior to contract award, a detailed statement regarding the business and technical organization of the bidder that is available for the contemplated work, and a list of his proposed subcontractors. Information pertaining to financial resources may also be required.

A Bid Security in the form of a cashier's check, certified check, or acceptable bidder's surety bond, made payable to the Owner, in an amount that is not less than ten percent (10%) of the Bid proposal submitted, including all Alternates, shall accompany each Bid as a guarantee that: (1) the Bidder will not modify, withdraw or cancel the proposal for thirty (30) days after the bid date; and (2) the bidder, if awarded the contract, will promptly enter into a contract and execute such bonds and furnish such insurance certificates as may be required. Should the Bidder fail to honor these two (2) guarantees for any reason, the Owner shall total the damages and shall deduct the amount of such damages from the Bidder's Bid Security. Should the damages total less than the amount of the Bid Security, the difference shall be returned to the Bidder. However, all damages in excess of the Bid Security shall be borne by the Owner. Damages may include, but shall not be limited to, reasonable compensation for the Owner's additional time spent, additional Architect's fees, costs to the Owner for delays in completion of the Work based upon the Bidders proposed Contract Time and the Contract Time as Awarded including, but not limited to, interest expense and lost revenue, the difference between the Bidder's proposed Contract Sum and the Contract Sum as awarded and costs to re bid the Project should such action become necessary. Such bid securities will be returned to the unsuccessful bidders after execution of the Contract.

Sealed bids for the proposed work will be received up to the hour of 4:00 P.M. Central Daylight Savings Time on Thursday, September 17, 2026 at the Shields Meeting Room, Bennett Administrative Center, 102 Main Street, Urbana, IL 61801.

A pre-bid conference will be held at Bennett Administration Center, 102 E. Main Street, Urbana IL 61801, on Friday, September 4, 2026 at 11:00 A.M. CDST.

A complete set of documents will be available from Eastern Engineering, 404 E. University Ave., Champaign, IL. 61820, [www.easternengineering.com](http://www.easternengineering.com), 217.359.3261.

Refundable Plan Deposit: \$200 for each set of bid documents. Two (2) sets maximum, Additional sets may be purchased without refund.

For Electronic sets, contact Cushing & Co at [www.cushingco.com](http://www.cushingco.com) 217.359.3261

Plan deposits will be refunded in full upon the return of the Bid Documents, in good condition, within thirty (30) days after the bid opening. The deposits of General Contractors, who do not submit a bonafide bid or do not return the Bid Documents within thirty (30) days after the bid opening, will not be refunded.

Contractor and Subcontractors shall include in bids, the cost for the current prevailing wage (Illinois Prevailing Wage Act - 820 ILCS 130/0.01 et seq.). The Contractor shall ensure that any Subcontractors shall comply with the Illinois Prevailing Wage Act.

Champaign County has a Project Labor Agreement.

The Owner reserves the right to reject any or all bids, to waive any irregularities in the bidding, or to accept the bids that in their judgment will be for their best interest.

Once awarded the contract, the Contractor will furnish a satisfactory performance bond, execute the contract and proceed with the work. The Contractor shall indicate the amount of the performance bond on the bid form.

END OF SECTION 00 11 16

SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 INSTRUCTIONS TO BIDDERS

- A. AIA Document A701, "Instructions to Bidders," is hereby incorporated into the Procurement and Contracting Requirements by reference.
  - 1. A copy of AIA Document A701-2018, "Instructions to Bidders," is bound in this Project Manual.
- B. AIA Document A201 "General Conditions" is hereby incorporated into the Procurement.
  - 1. A copy of AIA Document A201-2017 "General Conditions" is bound in this project manual.

END OF DOCUMENT 00 21 13

# **AIA**® Document A701™ – 2018

## **Instructions to Bidders**

for the following Project:  
(Name, location, and detailed description)

Champaign County Courtroom F Renovation  
ITB# 2026-

**THE OWNER:**  
(Name, legal status, address, and other information)

Champaign County, IL  
102 East Main Street  
Urbana, IL 61801

**THE ARCHITECT:**  
(Name, legal status, address, and other information)

Bailey Edward Design, Inc.  
1103 S. Mattis Avenue  
Champaign, IL 61821  
Telephone Number: 217.363.3375

### **TABLE OF ARTICLES**

- 1 DEFINITIONS**
- 2 BIDDER'S REPRESENTATIONS**
- 3 BIDDING DOCUMENTS**
- 4 BIDDING PROCEDURES**
- 5 CONSIDERATION OF BIDS**
- 6 POST-BID INFORMATION**
- 7 PERFORMANCE BOND AND PAYMENT BOND**
- 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS**

### **ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

## ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

## ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

## ARTICLE 3 BIDDING DOCUMENTS

### § 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)*



**§ 3.1.2** Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

**§ 3.1.3** Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

**§ 3.1.4** Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

**§ 3.1.5** The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

### **§ 3.2 Modification or Interpretation of Bidding Documents**

**§ 3.2.1** The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

**§ 3.2.2** Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)*

**§ 3.2.3** Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

### **§ 3.3 Substitutions**

**§ 3.3.1** The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

#### **§ 3.3.2 Substitution Process**

**§ 3.3.2.1** Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

**§ 3.3.2.2** Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

**§ 3.3.2.3** If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

**§ 3.3.3** The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

**§ 3.3.4** If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

#### § 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)*

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

### ARTICLE 4 BIDDING PROCEDURES

#### § 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

#### § 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

*(Insert the form and amount of bid security.)*

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount

of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

**§ 4.2.3** If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

**§ 4.2.4** The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning days after the opening of Bids, withdraw its Bid and request the return of its bid security.

### **§ 4.3 Submission of Bids**

**§ 4.3.1** A Bidder shall submit its Bid as indicated below:

*(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)*

**§ 4.3.2** Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

**§ 4.3.3** Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

**§ 4.3.4** The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

**§ 4.3.5** A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

### **§ 4.4 Modification or Withdrawal of Bid**

**§ 4.4.1** Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

**§ 4.4.2** Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

**§ 4.4.3** After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

*(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)*

## **ARTICLE 5 CONSIDERATION OF BIDS**

### **§ 5.1 Opening of Bids**

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

### **§ 5.2 Rejection of Bids**

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

### **§ 5.3 Acceptance of Bid (Award)**

**§ 5.3.1** It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

**§ 5.3.2** Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

## **ARTICLE 6 POST-BID INFORMATION**

### **§ 6.1 Contractor's Qualification Statement**

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

### **§ 6.2 Owner's Financial Capability**

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

### **§ 6.3 Submittals**

**§ 6.3.1** After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

**§ 6.3.2** The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

**§ 6.3.3** Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

**§ 6.3.4** Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

## ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

### § 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

*(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)*

### § 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

## ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.  
*(Insert the complete AIA Document number, including year, and Document title.)*
- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:  
*(Insert the date of the E203-2013.)*

**.5 Drawings**

| Number | Title | Date |
|--------|-------|------|
|--------|-------|------|

**.6 Specifications**

| Section | Title | Date | Pages |
|---------|-------|------|-------|
|---------|-------|------|-------|

**.7 Addenda:**

| Number | Date | Pages |
|--------|------|-------|
|--------|------|-------|

**.8 Other Exhibits:**

*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

☐ AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:  
*(Insert the date of the E204-2017.)*

☐ The Sustainability Plan:

| Title | Date | Pages |
|-------|------|-------|
|-------|------|-------|

☐ Supplementary and other Conditions of the Contract:

| Document | Title | Date | Pages |
|----------|-------|------|-------|
|----------|-------|------|-------|

**.9 Other documents listed below:**

*(List here any additional documents that are intended to form part of the Proposed Contract Documents.)*





# AIA® Document A201™ – 2017

## General Conditions of the Contract for Construction

### for the following PROJECT:

*(Name and location or address)*

Champaign County Courtroom F Renovation  
ITB# 2026-

### THE OWNER:

*(Name, legal status and address)*

Champaign County, Illinois  
102 East Main Street  
Urbana, IL 61801

### THE ARCHITECT:

*(Name, legal status and address)*

Bailey Edward Design, Inc,  
1103 S. Mattis Avenue  
Champaign, IL 61821

### TABLE OF ARTICLES

- 1 GENERAL PROVISIONS
- 2 OWNER
- 3 CONTRACTOR
- 4 ARCHITECT
- 5 SUBCONTRACTORS
- 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
- 7 CHANGES IN THE WORK
- 8 TIME
- 9 PAYMENTS AND COMPLETION
- 10 PROTECTION OF PERSONS AND PROPERTY
- 11 INSURANCE AND BONDS
- 12 UNCOVERING AND CORRECTION OF WORK
- 13 MISCELLANEOUS PROVISIONS

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Init.

## 14 TERMINATION OR SUSPENSION OF THE CONTRACT

## 15 CLAIMS AND DISPUTES

### INDEX

(Topics and numbers in bold are Section headings.)

Acceptance of Nonconforming Work  
9.6.6, 9.9.3, 12.3  
Acceptance of Work  
9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3  
Access to Work  
3.16, 6.2.1, 12.1  
Accident Prevention  
10  
Acts and Omissions  
3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5,  
10.2.8, 13.3.2, 14.1, 15.1.2, 15.2  
Addenda  
1.1.1  
Additional Costs, Claims for  
3.7.4, 3.7.5, 10.3.2, 15.1.5  
Additional Inspections and Testing  
9.4.2, 9.8.3, 12.2.1, 13.4  
Additional Time, Claims for  
3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, 15.1.6  
Administration of the Contract  
3.1.3, 4.2, 9.4, 9.5  
Advertisement or Invitation to Bid  
1.1.1  
Aesthetic Effect  
4.2.13  
Allowances  
3.8  
Applications for Payment  
4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5.1, 9.5.4, 9.6.3, 9.7, 9.10  
Approvals  
2.1.1, 2.3.1, 2.5, 3.1.3, 3.10.2, 3.12.8, 3.12.9,  
3.12.10.1, 4.2.7, 9.3.2, 13.4.1  
Arbitration  
8.3.1, 15.3.2, 15.4  
**ARCHITECT**  
4  
Architect, Definition of  
4.1.1  
Architect, Extent of Authority  
2.5, 3.12.7, 4.1.2, 4.2, 5.2, 6.3, 7.1.2, 7.3.4, 7.4, 9.2,  
9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1,  
13.4.1, 13.4.2, 14.2.2, 14.2.4, 15.1.4, 15.2.1  
Architect, Limitations of Authority and  
Responsibility  
2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2,  
4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4,  
9.4.2, 9.5.4, 9.6.4, 15.1.4, 15.2  
Architect's Additional Services and Expenses  
2.5, 12.2.1, 13.4.2, 13.4.3, 14.2.4

Architect's Administration of the Contract  
3.1.3, 3.7.4, 15.2, 9.4.1, 9.5  
Architect's Approvals  
2.5, 3.1.3, 3.5, 3.10.2, 4.2.7  
Architect's Authority to Reject Work  
3.5, 4.2.6, 12.1.2, 12.2.1  
Architect's Copyright  
1.1.7, 1.5  
Architect's Decisions  
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3,  
7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1,  
13.4.2, 15.2  
Architect's Inspections  
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.4  
Architect's Instructions  
3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.4.2  
Architect's Interpretations  
4.2.11, 4.2.12  
Architect's Project Representative  
4.2.10  
Architect's Relationship with Contractor  
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2,  
3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16,  
3.18, 4.1.2, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5,  
9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.3.2, 13.4, 15.2  
Architect's Relationship with Subcontractors  
1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3  
Architect's Representations  
9.4.2, 9.5.1, 9.10.1  
Architect's Site Visits  
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4  
Asbestos  
10.3.1  
Attorneys' Fees  
3.18.1, 9.6.8, 9.10.2, 10.3.3  
Award of Separate Contracts  
6.1.1, 6.1.2  
Award of Subcontracts and Other Contracts for  
Portions of the Work  
5.2  
Basic Definitions  
1.1  
Bidding Requirements  
1.1.1  
Binding Dispute Resolution  
8.3.1, 9.7, 11.5, 13.1, 15.1.2, 15.1.3, 15.2.1, 15.2.5,  
15.2.6.1, 15.3.1, 15.3.2, 15.3.3, 15.4.1  
Bonds, Lien  
7.3.4.4, 9.6.8, 9.10.2, 9.10.3  
Bonds, Performance, and Payment  
7.3.4.4, 9.6.7, 9.10.3, 11.1.2, 11.1.3, 11.5  
Building Information Models Use and Reliance  
1.8

Init.



Building Permit  
 3.7.1  
 Capitalization  
 1.3  
 Certificate of Substantial Completion  
 9.8.3, 9.8.4, 9.8.5  
 Certificates for Payment  
 4.2.1, 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7,  
 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.4  
 Certificates of Inspection, Testing or Approval  
 13.4.4  
 Certificates of Insurance  
 9.10.2  
 Change Orders  
 1.1.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3,  
 7.1.2, 7.1.3, 7.2, 7.3.2, 7.3.7, 7.3.9, 7.3.10, 8.3.1,  
 9.3.1.1, 9.10.3, 10.3.2, 11.2, 11.5, 12.1.2  
 Change Orders, Definition of  
 7.2.1  
 CHANGES IN THE WORK  
 2.2.2, 3.11, 4.2.8, 7, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1,  
 11.5  
 Claims, Definition of  
 15.1.1  
 Claims, Notice of  
 1.6.2, 15.1.3  
 CLAIMS AND DISPUTES  
 3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, 15, 15.4  
 Claims and Timely Assertion of Claims  
 15.4.1  
 Claims for Additional Cost  
 3.2.4, 3.3.1, 3.7.4, 7.3.9, 9.5.2, 10.2.5, 10.3.2, 15.1.5  
 Claims for Additional Time  
 3.2.4, 3.3.1, 3.7.4, 6.1.1, 8.3.2, 9.5.2, 10.3.2, 15.1.6  
 Concealed or Unknown Conditions, Claims for  
 3.7.4  
 Claims for Damages  
 3.2.4, 3.18, 8.3.3, 9.5.1, 9.6.7, 10.2.5, 10.3.3, 11.3,  
 11.3.2, 14.2.4, 15.1.7  
 Claims Subject to Arbitration  
 15.4.1  
 Cleaning Up  
 3.15, 6.3  
 Commencement of the Work, Conditions Relating to  
 2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3,  
 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.2, 15.1.5  
 Commencement of the Work, Definition of  
 8.1.2  
 Communications  
 3.9.1, 4.2.4  
 Completion, Conditions Relating to  
 3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1,  
 9.10, 12.2, 14.1.2, 15.1.2  
 COMPLETION, PAYMENTS AND  
 9  
 Completion, Substantial

3.10.1, 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1,  
 9.10.3, 12.2, 15.1.2  
 Compliance with Laws  
 2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 10.2.2,  
 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14.1.1, 14.2.1.3,  
 15.2.8, 15.4.2, 15.4.3  
 Concealed or Unknown Conditions  
 3.7.4, 4.2.8, 8.3.1, 10.3  
 Conditions of the Contract  
 1.1.1, 6.1.1, 6.1.4  
 Consent, Written  
 3.4.2, 3.14.2, 4.1.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 13.2,  
 15.4.4.2  
 Consolidation or Joinder  
 15.4.4  
 CONSTRUCTION BY OWNER OR BY  
 SEPARATE CONTRACTORS  
 1.1.4, 6  
 Construction Change Directive, Definition of  
 7.3.1  
 Construction Change Directives  
 1.1.1, 3.4.2, 3.11, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3,  
 7.3, 9.3.1.1  
 Construction Schedules, Contractor's  
 3.10, 3.11, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2  
 Contingent Assignment of Subcontracts  
 5.4, 14.2.2.2  
 Continuing Contract Performance  
 15.1.4  
 Contract, Definition of  
 1.1.2  
 CONTRACT, TERMINATION OR SUSPENSION  
 OF THE  
 5.4.1.1, 5.4.2, 11.5, 14  
 Contract Administration  
 3.1.3, 4, 9.4, 9.5  
 Contract Award and Execution, Conditions Relating  
 to  
 3.7.1, 3.10, 5.2, 6.1  
 Contract Documents, Copies Furnished and Use of  
 1.5.2, 2.3.6, 5.3  
 Contract Documents, Definition of  
 1.1.1  
 Contract Sum  
 2.2.2, 2.2.4, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.3, 7.4,  
 9.1, 9.2, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.5, 12.1.2,  
 12.3, 14.2.4, 14.3.2, 15.1.4.2, 15.1.5, 15.2.5  
 Contract Sum, Definition of  
 9.1  
 Contract Time  
 1.1.4, 2.2.1, 2.2.2, 3.7.4, 3.7.5, 3.10.2, 5.2.3, 6.1.5,  
 7.2.1.3, 7.3.1, 7.3.5, 7.3.6, 7, 7, 7.3.10, 7.4, 8.1.1,  
 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 12.1.2,  
 14.3.2, 15.1.4.2, 15.1.6.1, 15.2.5  
 Contract Time, Definition of  
 8.1.1  
 CONTRACTOR

3  
 Contractor, Definition of  
 3.1, 6.1.2  
 Contractor's Construction and Submittal Schedules  
 3.10, 3.12.1, 3.12.2, 4.2.3, 6.1.3, 15.1.6.2  
 Contractor's Employees  
 2.2.4, 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6,  
 10.2, 10.3, 11.3, 14.1, 14.2.1.1  
 Contractor's Liability Insurance  
 11.1  
 Contractor's Relationship with Separate Contractors  
 and Owner's Forces  
 3.12.5, 3.14.2, 4.2.4, 6, 11.3, 12.2.4  
 Contractor's Relationship with Subcontractors  
 1.2.2, 2.2.4, 3.3.2, 3.18.1, 3.18.2, 4.2.4, 5, 9.6.2,  
 9.6.7, 9.10.2, 11.2, 11.3, 11.4  
 Contractor's Relationship with the Architect  
 1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2,  
 3.5.1, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.2, 5.2,  
 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6,  
 10.3, 11.3, 12, 13.4, 15.1.3, 15.2.1  
 Contractor's Representations  
 3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2  
 Contractor's Responsibility for Those Performing the  
 Work  
 3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8  
 Contractor's Review of Contract Documents  
 3.2  
 Contractor's Right to Stop the Work  
 2.2.2, 9.7  
 Contractor's Right to Terminate the Contract  
 14.1  
 Contractor's Submittals  
 3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2,  
 9.8.3, 9.9.1, 9.10.2, 9.10.3  
 Contractor's Superintendent  
 3.9, 10.2.6  
 Contractor's Supervision and Construction  
 Procedures  
 1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4,  
 7.1.3, 7.3.4, 7.3.6, 8.2, 10, 12, 14, 15.1.4  
 Coordination and Correlation  
 1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1  
 Copies Furnished of Drawings and Specifications  
 1.5, 2.3.6, 3.11  
 Copyrights  
 1.5, 3.17  
 Correction of Work  
 2.5, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2, 12.3,  
 15.1.3.1, 15.1.3.2, 15.2.1  
 Correlation and Intent of the Contract Documents  
 1.2  
 Cost, Definition of  
 7.3.4  
 Costs  
 2.5, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3,  
 7.3.3.3, 7.3.4, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6,  
 11.2, 12.1.2, 12.2.1, 12.2.4, 13.4, 14  
 Cutting and Patching  
 3.14, 6.2.5  
 Damage to Construction of Owner or Separate  
 Contractors  
 3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 12.2.4  
 Damage to the Work  
 3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 12.2.4  
 Damages, Claims for  
 3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.3.2,  
 11.3, 14.2.4, 15.1.7  
 Damages for Delay  
 6.2.3, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 14.3.2  
 Date of Commencement of the Work, Definition of  
 8.1.2  
 Date of Substantial Completion, Definition of  
 8.1.3  
 Day, Definition of  
 8.1.4  
 Decisions of the Architect  
 3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 6.3, 7.3.4,  
 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.4.2,  
 14.2.2, 14.2.4, 15.1, 15.2  
 Decisions to Withhold Certification  
 9.4.1, 9.5, 9.7, 14.1.1.3  
 Defective or Nonconforming Work, Acceptance,  
 Rejection and Correction of  
 2.5, 3.5, 4.2.6, 6.2.3, 9.5.1, 9.5.3, 9.6.6, 9.8.2, 9.9.3,  
 9.10.4, 12.2.1  
 Definitions  
 1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 5.1,  
 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1  
 Delays and Extensions of Time  
 3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7,  
 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5  
 Digital Data Use and Transmission  
 1.7  
 Disputes  
 6.3, 7.3.9, 15.1, 15.2  
 Documents and Samples at the Site  
 3.11  
 Drawings, Definition of  
 1.1.5  
 Drawings and Specifications, Use and Ownership of  
 3.11  
 Effective Date of Insurance  
 8.2.2  
 Emergencies  
 10.4, 14.1.1.2, 15.1.5  
 Employees, Contractor's  
 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2,  
 10.3.3, 11.3, 14.1, 14.2.1.1  
 Equipment, Labor, or Materials  
 1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,

4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2

Execution and Progress of the Work  
1.1.3, 1.2.1, 1.2.2, 2.3.4, 2.3.6, 3.1, 3.3.1, 3.4.1, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.6, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.1, 12.2, 14.2, 14.3.1, 15.1.4

Extensions of Time  
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2, 10.4, 14.3, 15.1.6, 15.2.5

Failure of Payment  
9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2

Faulty Work  
(See Defective or Nonconforming Work)

Final Completion and Final Payment  
4.2.1, 4.2.9, 9.8.2, 9.10, 12.3, 14.2.4, 14.4.3

Financial Arrangements, Owner's  
2.2.1, 13.2.2, 14.1.1.4

GENERAL PROVISIONS

1

Governing Law  
13.1

Guarantees (See Warranty)

Hazardous Materials and Substances  
10.2.4, 10.3

Identification of Subcontractors and Suppliers  
5.2.1

Indemnification  
3.17, 3.18, 9.6.8, 9.10.2, 10.3.3, 11.3

Information and Services Required of the Owner  
2.1.2, 2.2, 2.3, 3.2.2, 3.12.10.1, 6.1.3, 6.1.4, 6.2.5, 9.6.1, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4

Initial Decision  
15.2

Initial Decision Maker, Definition of  
1.1.8

Initial Decision Maker, Decisions  
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5

Initial Decision Maker, Extent of Authority  
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5

Injury or Damage to Person or Property  
10.2.8, 10.4

Inspections  
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 12.2.1, 13.4

Instructions to Bidders  
1.1.1

Instructions to the Contractor  
3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.4.2

Instruments of Service, Definition of  
1.1.7

Insurance  
6.1.1, 7.3.4, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5, 11

Insurance, Notice of Cancellation or Expiration  
11.1.4, 11.2.3

Insurance, Contractor's Liability

11.1

Insurance, Effective Date of  
8.2.2, 14.4.2

Insurance, Owner's Liability  
11.2

Insurance, Property  
10.2.5, 11.2, 11.4, 11.5

Insurance, Stored Materials  
9.3.2

INSURANCE AND BONDS

11

Insurance Companies, Consent to Partial Occupancy  
9.9.1

Insured loss, Adjustment and Settlement of  
11.5

Intent of the Contract Documents  
1.2.1, 4.2.7, 4.2.12, 4.2.13

Interest  
13.5

Interpretation  
1.1.8, 1.2.3, 1.4, 4.1.1, 5.1, 6.1.2, 15.1.1

Interpretations, Written  
4.2.11, 4.2.12

Judgment on Final Award  
15.4.2

Labor and Materials, Equipment  
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2

Labor Disputes  
8.3.1

Laws and Regulations  
1.5, 2.3.2, 3.2.3, 3.2.4, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1, 10.2.2, 13.1, 13.3.1, 13.4.2, 13.5, 14, 15.2.8, 15.4

Liens  
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8

Limitations, Statutes of  
12.2.5, 15.1.2, 15.4.1.1

Limitations of Liability  
3.2.2, 3.5, 3.12.10, 3.12.10.1, 3.17, 3.18.1, 4.2.6, 4.2.7, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 9.6.8, 10.2.5, 10.3.3, 11.3, 12.2.5, 13.3.1

Limitations of Time  
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7, 5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15, 15.1.2, 15.1.3, 15.1.5

Materials, Hazardous  
10.2.4, 10.3

Materials, Labor, Equipment and  
1.1.3, 1.1.6, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2

Means, Methods, Techniques, Sequences and Procedures of Construction  
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2

Mechanic's Lien  
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8

Mediation  
8.3.1, 15.1.3.2, 15.2.1, 15.2.5, 15.2.6, 15.3, 15.4.1, 15.4.1.1

Minor Changes in the Work  
1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1, 7.4

MISCELLANEOUS PROVISIONS  
13

Modifications, Definition of  
1.1.1

Modifications to the Contract  
1.1.1, 1.1.2, 2.5, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2

Mutual Responsibility  
6.2

Nonconforming Work, Acceptance of  
9.6.6, 9.9.3, 12.3

Nonconforming Work, Rejection and Correction of  
2.4, 2.5, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2

Notice  
1.6, 1.6.1, 1.6.2, 2.1.2, 2.2.2, 2.2.3, 2.2.4, 2.5, 3.2.4, 3.3.1, 3.7.4, 3.7.5, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 7.4, 8.2.2, 9.6.8, 9.7, 9.10.1, 10.2.8, 10.3.2, 11.5, 12.2.2.1, 13.4.1, 13.4.2, 14.1, 14.2.2, 14.4.2, 15.1.3, 15.1.5, 15.1.6, 15.4.1

Notice of Cancellation or Expiration of Insurance  
11.1.4, 11.2.3

Notice of Claims  
1.6.2, 2.1.2, 3.7.4, 9.6.8, 10.2.8, 15.1.3, 15.1.5, 15.1.6, 15.2.8, 15.3.2, 15.4.1

Notice of Testing and Inspections  
13.4.1, 13.4.2

Observations, Contractor's  
3.2, 3.7.4

Occupancy  
2.3.1, 9.6.6, 9.8

Orders, Written  
1.1.1, 2.4, 3.9.2, 7, 8.2.2, 11.5, 12.1, 12.2.2.1, 13.4.2, 14.3.1

OWNER  
2

Owner, Definition of  
2.1.1

Owner, Evidence of Financial Arrangements  
2.2, 13.2.2, 14.1.1.4

Owner, Information and Services Required of the  
2.1.2, 2.2, 2.3, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4

Owner's Authority  
1.5, 2.1.1, 2.3.32.4, 2.5, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.4, 11.5, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7

Owner's Insurance  
11.2

Owner's Relationship with Subcontractors  
1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2

Owner's Right to Carry Out the Work  
2.5, 14.2.2

Owner's Right to Clean Up  
6.3

Owner's Right to Perform Construction and to Award Separate Contracts  
6.1

Owner's Right to Stop the Work  
2.4

Owner's Right to Suspend the Work  
14.3

Owner's Right to Terminate the Contract  
14.2, 14.4

Ownership and Use of Drawings, Specifications and Other Instruments of Service  
1.1.1, 1.1.6, 1.1.7, 1.5, 2.3.6, 3.2.2, 3.11, 3.17, 4.2.12, 5.3

Partial Occupancy or Use  
9.6.6, 9.9

Patching, Cutting and  
3.14, 6.2.5

Patents  
3.17

Payment, Applications for  
4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3

Payment, Certificates for  
4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4

Payment, Failure of  
9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2

Payment, Final  
4.2.1, 4.2.9, 9.10, 12.3, 14.2.4, 14.4.3

Payment Bond, Performance Bond and  
7.3.4.4, 9.6.7, 9.10.3, 11.1.2

Payments, Progress  
9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4

PAYMENTS AND COMPLETION  
9

Payments to Subcontractors  
5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2

PCB  
10.3.1

Performance Bond and Payment Bond  
7.3.4.4, 9.6.7, 9.10.3, 11.1.2

Permits, Fees, Notices and Compliance with Laws  
2.3.1, 3.7, 3.13, 7.3.4.4, 10.2.2

PERSONS AND PROPERTY, PROTECTION OF  
10

Polychlorinated Biphenyl  
10.3.1

Product Data, Definition of  
3.12.2

Product Data and Samples, Shop Drawings  
3.11, 3.12, 4.2.7  
Progress and Completion  
4.2.2, 8.2, 9.8, 9.9.1, 14.1.4, 15.1.4  
Progress Payments  
9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4  
Project, Definition of  
1.1.4  
Project Representatives  
4.2.10  
Property Insurance  
10.2.5, 11.2  
Proposal Requirements  
1.1.1  
PROTECTION OF PERSONS AND PROPERTY  
10  
Regulations and Laws  
1.5, 2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1,  
10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14, 15.2.8,  
15.4  
Rejection of Work  
4.2.6, 12.2.1  
Releases and Waivers of Liens  
9.3.1, 9.10.2  
Representations  
3.2.1, 3.5, 3.12.6, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.10.1  
Representatives  
2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.10, 13.2.1  
Responsibility for Those Performing the Work  
3.3.2, 3.18, 4.2.2, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10  
Retainage  
9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3  
Review of Contract Documents and Field Conditions  
by Contractor  
3.2, 3.12.7, 6.1.3  
Review of Contractor's Submittals by Owner and  
Architect  
3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2  
Review of Shop Drawings, Product Data and  
Samples by Contractor  
3.12  
Rights and Remedies  
1.1.2, 2.4, 2.5, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1,  
6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.1, 12.2.2,  
12.2.4, 13.3, 14, 15.4  
Royalties, Patents and Copyrights  
3.17  
Rules and Notices for Arbitration  
15.4.1  
Safety of Persons and Property  
10.2, 10.4  
Safety Precautions and Programs  
3.3.1, 4.2.2, 4.2.7, 5.3, 10.1, 10.2, 10.4  
Samples, Definition of  
3.12.3  
Samples, Shop Drawings, Product Data and  
3.11, 3.12, 4.2.7

Samples at the Site, Documents and  
3.11  
Schedule of Values  
9.2, 9.3.1  
Schedules, Construction  
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2  
Separate Contracts and Contractors  
1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2  
Separate Contractors, Definition of  
6.1.1  
Shop Drawings, Definition of  
3.12.1  
Shop Drawings, Product Data and Samples  
3.11, 3.12, 4.2.7  
Site, Use of  
3.13, 6.1.1, 6.2.1  
Site Inspections  
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.9.2, 9.4.2, 9.10.1, 13.4  
Site Visits, Architect's  
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4  
Special Inspections and Testing  
4.2.6, 12.2.1, 13.4  
Specifications, Definition of  
1.1.6  
Specifications  
1.1.1, 1.1.6, 1.2.2, 1.5, 3.12.10, 3.17, 4.2.14  
Statute of Limitations  
15.1.2, 15.4.1.1  
Stopping the Work  
2.2.2, 2.4, 9.7, 10.3, 14.1  
Stored Materials  
6.2.1, 9.3.2, 10.2.1.2, 10.2.4  
Subcontractor, Definition of  
5.1.1  
SUBCONTRACTORS  
5  
Subcontractors, Work by  
1.2.2, 3.3.2, 3.12.1, 3.18, 4.2.3, 5.2.3, 5.3, 5.4,  
9.3.1.2, 9.6.7  
Subcontractual Relations  
5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1  
Submittals  
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.4, 9.2, 9.3,  
9.8, 9.9.1, 9.10.2, 9.10.3  
Submittal Schedule  
3.10.2, 3.12.5, 4.2.7  
Subrogation, Waivers of  
6.1.1, 11.3  
Substances, Hazardous  
10.3  
Substantial Completion  
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3,  
12.2, 15.1.2  
Substantial Completion, Definition of  
9.8.1  
Substitution of Subcontractors  
5.2.3, 5.2.4



Substitution of Architect  
 2.3.3  
 Substitutions of Materials  
 3.4.2, 3.5, 7.3.8  
 Sub-subcontractor, Definition of  
 5.1.2  
 Subsurface Conditions  
 3.7.4  
 Successors and Assigns  
 13.2  
 Superintendent  
 3.9, 10.2.6  
 Supervision and Construction Procedures  
 1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4,  
 7.1.3, 7.3.4, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.4  
 Suppliers  
 1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.5.4, 9.6,  
 9.10.5, 14.2.1  
 Surety  
 5.4.1.2, 9.6.8, 9.8.5, 9.10.2, 9.10.3, 11.1.2, 14.2.2,  
 15.2.7  
 Surety, Consent of  
 9.8.5, 9.10.2, 9.10.3  
 Surveys  
 1.1.7, 2.3.4  
 Suspension by the Owner for Convenience  
 14.3  
 Suspension of the Work  
 3.7.5, 5.4.2, 14.3  
 Suspension or Termination of the Contract  
 5.4.1.1, 14  
 Taxes  
 3.6, 3.8.2.1, 7.3.4.4  
 Termination by the Contractor  
 14.1, 15.1.7  
 Termination by the Owner for Cause  
 5.4.1.1, 14.2, 15.1.7  
 Termination by the Owner for Convenience  
 14.4  
 Termination of the Architect  
 2.3.3  
 Termination of the Contractor Employment  
 14.2.2  
  
 TERMINATION OR SUSPENSION OF THE  
 CONTRACT  
 14  
 Tests and Inspections  
 3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,  
 9.9.2, 9.10.1, 10.3.2, 12.2.1, 13.4  
 TIME  
 8

Time, Delays and Extensions of  
 3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7,  
 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5  
 Time Limits  
 2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2,  
 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,  
 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14,  
 15.1.2, 15.1.3, 15.4  
 Time Limits on Claims  
 3.7.4, 10.2.8, 15.1.2, 15.1.3  
 Title to Work  
 9.3.2, 9.3.3  
 UNCOVERING AND CORRECTION OF WORK  
 12  
 Uncovering of Work  
 12.1  
 Unforeseen Conditions, Concealed or Unknown  
 3.7.4, 8.3.1, 10.3  
 Unit Prices  
 7.3.3.2, 9.1.2  
 Use of Documents  
 1.1.1, 1.5, 2.3.6, 3.12.6, 5.3  
 Use of Site  
 3.13, 6.1.1, 6.2.1  
 Values, Schedule of  
 9.2, 9.3.1  
 Waiver of Claims by the Architect  
 13.3.2  
 Waiver of Claims by the Contractor  
 9.10.5, 13.3.2, 15.1.7  
 Waiver of Claims by the Owner  
 9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.3.2, 14.2.4, 15.1.7  
 Waiver of Consequential Damages  
 14.2.4, 15.1.7  
 Waiver of Liens  
 9.3, 9.10.2, 9.10.4  
 Waivers of Subrogation  
 6.1.1, 11.3  
 Warranty  
 3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.2, 9.10.4, 12.2.2,  
 15.1.2  
 Weather Delays  
 8.3, 15.1.6.2  
 Work, Definition of  
 1.1.3  
 Written Consent  
 1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.10.3,  
 13.2, 13.3.2, 15.4.4.2  
 Written Interpretations  
 4.2.11, 4.2.12  
 Written Orders  
 1.1.1, 2.4, 3.9, 7, 8.2.2, 12.1, 12.2, 13.4.2, 14.3.1

## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

#### § 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

#### § 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

#### § 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### § 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

#### § 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

#### § 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### § 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

#### § 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

### § 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent

consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**§ 1.2.3** Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

### **§ 1.3 Capitalization**

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

### **§ 1.4 Interpretation**

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### **§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service**

**§ 1.5.1** The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

### **§ 1.6 Notice**

**§ 1.6.1** Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

**§ 1.6.2** Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

### **§ 1.7 Digital Data Use and Transmission**

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.



## § 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

## ARTICLE 2 OWNER

### § 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

### § 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

### § 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements,

assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

**§ 2.3.2** The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

**§ 2.3.3** If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

**§ 2.3.4** The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

**§ 2.3.5** The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

**§ 2.3.6** Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

#### **§ 2.4 Owner's Right to Stop the Work**

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

#### **§ 2.5 Owner's Right to Carry Out the Work**

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

### **ARTICLE 3 CONTRACTOR**

#### **§ 3.1 General**

**§ 3.1.1** The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

**§ 3.1.2** The Contractor shall perform the Work in accordance with the Contract Documents.

**§ 3.1.3** The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

### **§ 3.2 Review of Contract Documents and Field Conditions by Contractor**

**§ 3.2.1** Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

**§ 3.2.2** Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

**§ 3.2.3** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

**§ 3.2.4** If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### **§ 3.3 Supervision and Construction Procedures**

**§ 3.3.1** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

**§ 3.3.2** The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

**§ 3.3.3** The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

### **§ 3.4 Labor and Materials**

**§ 3.4.1** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

**§ 3.4.2** Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

**§ 3.4.3** The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

### **§ 3.5 Warranty**

**§ 3.5.1** The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

**§ 3.5.2** All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

### **§ 3.6 Taxes**

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

### **§ 3.7 Permits, Fees, Notices and Compliance with Laws**

**§ 3.7.1** Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

**§ 3.7.2** The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

**§ 3.7.3** If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

### **§ 3.7.4 Concealed or Unknown Conditions**

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.



**§ 3.7.5** If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

### **§ 3.8 Allowances**

**§ 3.8.1** The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

**§ 3.8.2** Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

**§ 3.8.3** Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

### **§ 3.9 Superintendent**

**§ 3.9.1** The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

**§ 3.9.3** The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

### **§ 3.10 Contractor's Construction and Submittal Schedules**

**§ 3.10.1** The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

**§ 3.10.2** The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the

Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

**§ 3.10.3** The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

### **§ 3.11 Documents and Samples at the Site**

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

### **§ 3.12 Shop Drawings, Product Data and Samples**

**§ 3.12.1** Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

**§ 3.12.2** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

**§ 3.12.3** Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

**§ 3.12.4** Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

**§ 3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

**§ 3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

**§ 3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

**§ 3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

**§ 3.12.10.1** If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

**§ 3.12.10.2** If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

### **§ 3.13 Use of Site**

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

### **§ 3.14 Cutting and Patching**

**§ 3.14.1** The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

**§ 3.14.2** The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

### **§ 3.15 Cleaning Up**

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.



### § 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

### § 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

### § 3.18 Indemnification

**§ 3.18.1** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

**§ 3.18.2** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

## ARTICLE 4 ARCHITECT

### § 4.1 General

**§ 4.1.1** The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

**§ 4.1.2** Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

### § 4.2 Administration of the Contract

**§ 4.2.1** The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

**§ 4.2.2** The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

**§ 4.2.3** On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the

Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

#### **§ 4.2.4 Communications**

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

**§ 4.2.5** Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

**§ 4.2.6** The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

**§ 4.2.7** The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

**§ 4.2.8** The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

**§ 4.2.9** The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

**§ 4.2.10** If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

**§ 4.2.11** The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

**§ 4.2.12** Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations

and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

**§ 4.2.13** The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

**§ 4.2.14** The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

## **ARTICLE 5 SUBCONTRACTORS**

### **§ 5.1 Definitions**

**§ 5.1.1** A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

**§ 5.1.2** A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

### **§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work**

**§ 5.2.1** Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

**§ 5.2.2** The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

**§ 5.2.3** If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

**§ 5.2.4** The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

### **§ 5.3 Subcontractual Relations**

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor,

prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

#### **§ 5.4 Contingent Assignment of Subcontracts**

**§ 5.4.1** Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

**§ 5.4.2** Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

**§ 5.4.3** Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

### **ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

#### **§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts**

**§ 6.1.1** The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

**§ 6.1.2** When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

**§ 6.1.3** The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

**§ 6.1.4** Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

#### **§ 6.2 Mutual Responsibility**

**§ 6.2.1** The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

**§ 6.2.2** If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work,



promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

**§ 6.2.3** The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

**§ 6.2.4** The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

**§ 6.2.5** The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

### **§ 6.3 Owner's Right to Clean Up**

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

## **ARTICLE 7 CHANGES IN THE WORK**

### **§ 7.1 General**

**§ 7.1.1** Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

**§ 7.1.2** A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

**§ 7.1.3** Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

### **§ 7.2 Change Orders**

**§ 7.2.1** A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

### **§ 7.3 Construction Change Directives**

**§ 7.3.1** A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

**§ 7.3.2** A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

**§ 7.3.3** If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

**§ 7.3.4** If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

**§ 7.3.5** If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

**§ 7.3.6** Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

**§ 7.3.7** A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

**§ 7.3.8** The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

**§ 7.3.9** Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

**§ 7.3.10** When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

#### **§ 7.4 Minor Changes in the Work**

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will



affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

## **ARTICLE 8 TIME**

### **§ 8.1 Definitions**

**§ 8.1.1** Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

**§ 8.1.2** The date of commencement of the Work is the date established in the Agreement.

**§ 8.1.3** The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

**§ 8.1.4** The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

### **§ 8.2 Progress and Completion**

**§ 8.2.1** Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

**§ 8.2.2** The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

**§ 8.2.3** The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

### **§ 8.3 Delays and Extensions of Time**

**§ 8.3.1** If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

**§ 8.3.2** Claims relating to time shall be made in accordance with applicable provisions of Article 15.

**§ 8.3.3** This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## **ARTICLE 9 PAYMENTS AND COMPLETION**

### **§ 9.1 Contract Sum**

**§ 9.1.1** The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

**§ 9.1.2** If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

### **§ 9.2 Schedule of Values**

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and

unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

### **§ 9.3 Applications for Payment**

**§ 9.3.1** At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

**§ 9.3.1.1** As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

**§ 9.3.1.2** Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

**§ 9.3.2** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

**§ 9.3.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

### **§ 9.4 Certificates for Payment**

**§ 9.4.1** The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

**§ 9.4.2** The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

## § 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

## § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

**§ 9.6.6** A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

**§ 9.6.7** Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

**§ 9.6.8** Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

### **§ 9.7 Failure of Payment**

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

### **§ 9.8 Substantial Completion**

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

**§ 9.8.2** When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**§ 9.8.3** Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

**§ 9.8.4** When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.



### **§ 9.9 Partial Occupancy or Use**

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

**§ 9.9.2** Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

### **§ 9.10 Final Completion and Final Payment**

**§ 9.10.1** Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

**§ 9.10.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

**§ 9.10.4** The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

**§ 9.10.5** Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## **ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY**

### **§ 10.1 Safety Precautions and Programs**

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

### **§ 10.2 Safety of Persons and Property**

**§ 10.2.1** The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

**§ 10.2.2** The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

**§ 10.2.3** The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

**§ 10.2.4** When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

**§ 10.2.5** The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

**§ 10.2.6** The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

**§ 10.2.7** The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.



### **§ 10.2.8 Injury or Damage to Person or Property**

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

### **§ 10.3 Hazardous Materials and Substances**

**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

**§ 10.3.2** Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

**§ 10.3.5** The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

### **§ 10.4 Emergencies**

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

## ARTICLE 11 INSURANCE AND BONDS

### § 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

### § 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

### § 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

### § 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

### § 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

## ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

### § 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to

the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

## **§ 12.2 Correction of Work**

### **§ 12.2.1 Before Substantial Completion**

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

### **§ 12.2.2 After Substantial Completion**

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

**§ 12.2.2.2** The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

**§ 12.2.2.3** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

**§ 12.2.3** The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

**§ 12.2.4** The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

**§ 12.2.5** Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

## **§ 12.3 Acceptance of Nonconforming Work**

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## **ARTICLE 13 MISCELLANEOUS PROVISIONS**

### **§ 13.1 Governing Law**

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.



## **§ 13.2 Successors and Assigns**

**§ 13.2.1** The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

**§ 13.2.2** The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

## **§ 13.3 Rights and Remedies**

**§ 13.3.1** Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

**§ 13.3.2** No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

## **§ 13.4 Tests and Inspections**

**§ 13.4.1** Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

**§ 13.4.2** If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

**§ 13.4.3** If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

**§ 13.4.4** Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

**§ 13.4.5** If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

**§ 13.4.6** Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

## **§ 13.5 Interest**

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.



## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

### § 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or Suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance,

the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

#### **§ 14.3 Suspension by the Owner for Convenience**

**§ 14.3.1** The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

**§ 14.3.2** The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

#### **§ 14.4 Termination by the Owner for Convenience**

**§ 14.4.1** The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

**§ 14.4.2** Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

**§ 14.4.3** In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

### **ARTICLE 15 CLAIMS AND DISPUTES**

#### **§ 15.1 Claims**

##### **§ 15.1.1 Definition**

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

##### **§ 15.1.2 Time Limits on Claims**

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

##### **§ 15.1.3 Notice of Claims**

**§ 15.1.3.1** Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

**§ 15.1.3.2** Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

#### **§ 15.1.4 Continuing Contract Performance**

**§ 15.1.4.1** Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

**§ 15.1.4.2** The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

#### **§ 15.1.5 Claims for Additional Cost**

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

#### **§ 15.1.6 Claims for Additional Time**

**§ 15.1.6.1** If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

**§ 15.1.6.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

#### **§ 15.1.7 Waiver of Claims for Consequential Damages**

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

#### **§ 15.2 Initial Decision**

**§ 15.2.1** Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

**§ 15.2.2** The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the

Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

**§ 15.2.3** In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

**§ 15.2.4** If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

**§ 15.2.5** The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

**§ 15.2.6** Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

**§ 15.2.6.1** Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

**§ 15.2.7** In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

**§ 15.2.8** If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### **§ 15.3 Mediation**

**§ 15.3.1** Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

**§ 15.3.2** The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

**§ 15.3.3** Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.



§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

#### § 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

#### § 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.



SECTION 00 22 13 – SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

## 1.1 INSTRUCTIONS TO BIDDERS

## A. Instructions to Bidders for Project consist of the following:

1. AIA Document A701 - 2018, "Instructions to Bidders" a copy of which is bound in this Project Manual.
2. The following Supplementary Instructions to Bidders that modify and add to the requirements of the Instructions to Bidders.

## 1.2 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS, GENERAL

- A. The following supplements modify AIA Document A701, "Instructions to Bidders." Where a portion of the Instructions to Bidders is modified or deleted by these Supplementary Instructions to Bidders, unaltered portions of the Instructions to Bidders shall remain in effect.

## 1.3 ARTICLE 2 - BIDDER'S REPRESENTATIONS

## A. Add Section 2.1.7:

1. 2.1.7 - The Bidder has investigated all required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted bid the cost of such fees, permits, and requirements not otherwise indicated as provided by Owner.

## B. Add Section 2.1.8:

1. 2.1.8 - The Bidder is a properly licensed Contractor according to the laws and regulations of the local and state jurisdictions and meets qualifications indicated in the Procurement and Contracting Documents.

## C. Add Section 2.1.9:

1. 2.1.9 - The Bidder has incorporated into the Bid adequate sums for work performed by installers whose qualifications meet those indicated in the Procurement and Contracting Documents.

## 1.4 ARTICLE 3 - BIDDING DOCUMENTS

## A. 3.4 - Addenda:

1. Delete Section 3.4.3 and replace with the following:
  - a. 3.4.3 - Addenda may be issued at any time prior to the receipt of bids.
2. Add Section 3.4.4.1:

- a. 3.4.4.1 - Owner may elect to waive the requirement for acknowledging receipt of 3.4.4 Addenda as follows:
  - 1) 3.4.4.1.1 - Information received as part of the Bid indicates that the Bid, as submitted, reflects modifications to the Procurement and Contracting Documents included in an unacknowledged Addendum.
  - 2) 3.4.4.1.2 - Modifications to the Procurement and Contracting Documents in an unacknowledged Addendum do not, in the opinion of Owner, affect the Contract Sum or Contract Time.

## 1.5 ARTICLE 4 - BIDDING PROCEDURES

### A. 4.1 - Preparation of Bids:

#### 1. Add Section 4.1.9:

- a. 4.1.9 - Owner may elect to disqualify a bid due to failure to submit a bid in the form requested, failure to bid requested alternates or unit prices, failure to complete entries in all blanks in the Bid Form, or inclusion by the Bidder of any alternates, conditions, limitations or provisions not called for.

### B. 4.2 - Bid Security:

#### 1. Delete section 4.2.1 and replace with the following:

- a. Each Bid shall be accompanied by a bid security in the form and amount required in the bid documents and noted in 00 41 06.

### C. 4.3 - Submission of Bids:

#### 1. Delete section 4.3.1 and replace with the following:

- a. A Bidder shall submit paper copies its Bid, the bid security, and all other documents required by the bid documents.

#### 2. Add Section 4.3.2.1:

- a. 4.3.2.1 - Include Bidder's Contractor License Number applicable in Project jurisdiction on the face of the sealed bid envelope.

### D. 4.4 - Modification or Withdrawal of Bid:

#### 1. Add the following sections to 4.4.1:

- a. 4.4.1.1 - Such modifications to or withdrawal of a bid may only be made by persons authorized to act on behalf of the Bidder. Authorized persons are those so identified in the Bidder's corporate bylaws, specifically empowered by the Bidder's charter or similar legally binding document acceptable to Owner, or by a power of attorney, signed and dated, describing the scope and limitations of the power of attorney. Make such documentation available to Owner at the time of seeking modifications or withdrawal of the Bid.

- b. 4.4.1.2 - Owner will consider modifications to a bid written on the sealed bid envelope by authorized persons when such modifications comply with the following: the modification is indicated by a percent or stated amount to be added to or deducted from the Bid; the amount of the Bid itself is not made known by the modification; a signature of the authorized person, along with the time and date of the modification, accompanies the modification. Completion of an unsealed bid form, awaiting final figures from the Bidder, does not require power of attorney due to the evidenced authorization of the Bidder implied by the circumstance of the completion and delivery of the Bid.

## 1.6 ARTICLE 5 - CONSIDERATION OF BIDS

### A. 5.2 - Rejection of Bids:

#### 1. Add Section 5.2.1:

- a. 5.2.1 - Owner reserves the right to reject a bid based on Owner's and Engineer's evaluation of qualification information submitted following opening of bids. Owner's evaluation of the Bidder's qualifications will include: status of licensure and record of compliance with licensing requirements, record of quality of completed work, record of Project completion and ability to complete, record of financial management including financial resources available to complete Project and record of timely payment of obligations, record of Project site management including compliance with requirements of authorities having jurisdiction, record of and number of current claims and disputes and the status of their resolution, and qualifications of the Bidder's proposed Project staff and proposed subcontractors.

## 1.7 ARTICLE 6 – POST-BID INFORMATION

### A. 6.1 - Contractor's Qualification Statement:

#### 1. Add Section 6.1.1:

- a. 6.1.1 - Submit Contractor's Qualification Statement no later than five days after the bid submittal.

## 1.8 ARTICLE 7 - PERFORMANCE BOND AND PAYMENT BOND

### A. 7.1 - Bond Requirements:

#### 1. Add Section 7.1.1.1:

- a. 7.1.1.1 – A Performance Bond will be required, in an amount equal to 100 percent of the Contract Sum.

### B. 7.2 - Time of Delivery and Form of Bonds:

- 1. Delete the first sentence of Section 7.2.1 and insert the following:

- a. The Bidder shall deliver the required bonds to Owner no later than 10 days after the date of Notice of Intent to Award and no later than the date of execution of the Contract, whichever occurs first. Owner may deem the failure of the Bidder to deliver required bonds within the period of time allowed a default.

2. Delete Section 7.2.3 and insert the following:

- a. 7.2.3 - Bonds shall be executed and be in force on the date of the execution of the Contract.

1.9 ARTICLE 8 – ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

- A. The form of agreement between Owner and Contractor is included in specifications and is bound in this project manual.

1.10 ARTICLE 9 - EXECUTION OF THE CONTRACT

A. Add Article 9:

1. 9.1.1 - Subsequent to the Notice of Intent to Award, and within 10 days after the prescribed Form of Agreement is presented to the Awardee for signature, the Awardee shall execute and deliver the Agreement to Owner, in such number of counterparts as Owner may require.
2. 9.1.2 - Owner may deem as a default the failure of the Awardee to execute the Contract and to supply the required bonds when the Agreement is presented for signature within the period of time allowed.
3. 9.1.3 - Unless otherwise indicated in the Procurement and Contracting Documents or the executed Agreement, the date of commencement of the Work shall be the date of the executed Agreement or the date that the Bidder is obligated to deliver the executed Agreement and required bonds to Owner.
4. 9.1.4 - In the event of a default, Owner may declare the amount of the Bid security forfeited and elect to either award the Contract to the next responsible bidder or re-advertise for bids.

END OF DOCUMENT 00 22 13

SECTION 00 22 44 - ADDITIONAL INSURANCE REQUIREMENTS

## 1.1 INSURANCE

The Contractor shall purchase and maintain insurance as required in the current edition of the Standard Form of Agreement Between Owner and Contractor where the Basis of Payment is a Stipulated Sum, AIA Document A101 and the General Condition of the Contract for Construction, AIA Document A201 as modified by these specifications, AIA General Conditions and Supplements to the AIA General Conditions, Article 11

- A. All of the above documents shall be thoroughly studied prior to purchases of an insurance policy to cover the Project.
- B. While not limited to the following requirements, the requirements listed below are brought to the Contractors Specific attention.
  - 1) Champaign County, and the Architect/Engineer shall be named as additional insureds on the Commercial General Liability Policy and the Umbrella Liability Policy.
  - 2) Waivers of Subrogation are required for both Property Insurance and for Liability Insurance.

## 1.2 ADDITIONAL LIABILITY INSURANCE REQUIREMENTS

In addition to the liability insurance requirements noted in Paragraph 1.01 above, the following requirements also apply:

- A. The Contractor shall purchase and maintain a Commercial General Liability Policy which shall include the following coverage areas:
  - 1) Operations of the Contractor - direct liability coverage for the Contractors activities at a permanent location and the Project Site;
  - 2) Operations of Subcontractors - Liability coverage for those entities for which the Contractor has a duty to supervise and stand legally responsible for their conduct;
  - 3) Completed Operations - Liability for property damage and bodily injury and death that occurs after Substantial Completion;
  - 4) Personal Injury - Including but not limited to, libel, slander, defamation of character, wrongful eviction, right of private occupancy, false arrest and detention and other similar personal injuries;
  - 5) Employees as Additional Insured - Include employees and their acts into the coverage;
  - 6) Explosion, Collapse, Underground - Liability coverage for the property of others to include, but not limited to, unknown utilities; and
  - 7) Contractual Liability - coverage for the assumption of others by Contract.
- B. The Commercial General Liability Policy shall name Champaign County, the Architect, the Architect's Consultants, their agents and employees as additional insured.
- C. The Contractor shall purchase and maintain Workers Compensation and Employees Liability Insurance.
- D. The Contractor shall purchase and maintain commercial Automobile Liability Insurance. This policy shall cover Owned, Non-owned and Hired vehicles.
- E. The Contractor shall purchase and maintain Umbrella Liability Coverage to provide higher limits of liability above those required for General Liability, Employers Liability and Automobile Liability.
- F. The Umbrella Liability Policy shall name Champaign County, the Architect, the Architect's



Consultants, their agents and employees as additional insured.

- G. Liability limits shall be as specified herein or the maximum exposure as stated in the Government Tort Claims Acts as most recently amended, whichever is higher.
- H. The minimum amount of coverage and the limits of liability shall be as specified below:
  - 1) Claims under workers' or workman's compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed:
    - a. As required by law.
  - 2) Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees:
    - a. \$1,000,000.00
  - 3) Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees:
    - a. \$ 500,000.00
  - 4) Claims for damages insured by usual personal injury liability coverage which are sustained (1) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or (2) by another person:
    - a. \$1,000,000.00
  - 5) Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom:
    - a. \$ 500,000.00
  - 6) Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle:
    - a. \$1,000,000.00
  - 7) Claims involving contractual liability insurance applicable to the Contractor's obligations under Paragraph 3.18 of the General Conditions for the Contract for Construction as modified:
    - a. \$ 500,000.00

1.3 SUBMITTAL REQUIREMENTS

- A. Submit ACORD 25-S form along with the signed Agreement Between Owner and Contractor.
- B. Champaign County shall be listed as Certificate Holder.
- C. Include the following sentence under Special Items:  
"The Certificate Holder is Champaign County, Architect, Architect's Consultants, including their Agents and Employees are named as additional insured's in both the General and Umbrella Liability Policy. Waivers of Subrogation are in effect for both liability and property insurance policies."

1.4 LOSS OF USE INSURANCE

- A. The Owner, at the Owners option, may purchase and maintain such insurance that will protect the Owner against the loss of use of this property.

END OF SECTION 00 22 44

SECTION 00 25 13 – PREBID MEETING

## 1.1 PREBID MEETING

- A. There will be a Prebid meeting as indicated below:
  - 1. Meeting Date: Friday, August 14, 2026.
  - 2. Meeting Time: 11:00 A.M. CDST.
  - 3. Location: Champaign County Plaza, 102 East Main Street, Urbana, IL 61821
- B. Bidder Questions: Submit written questions to be addressed at Prebid meeting a minimum of two business days prior to meeting.
- C. Agenda: Prebid meeting agenda will include review of topics that may affect proper preparation and submittal of bids, including the following:
  - 1. Procurement and Contracting Requirements:
    - a. Instructions to Bidders.
    - b. Bidder Qualifications.
    - c. Bonding.
    - d. Insurance.
    - e. Bid Form and Attachments.
    - f. Bid Submittal Requirements.
    - g. Notice of Award.
  - 2. Communication during Bidding Period:
    - a. Obtaining documents.
    - b. Bidder's Requests for Information.
    - c. Bidder's Substitution Request/Prior Approval Request.
    - d. Addenda.
  - 3. Contracting Requirements:
    - a. Agreement.
    - b. The General Conditions.
    - c. The Supplementary Conditions.
    - d. Other Owner requirements.
  - 4. Construction Documents:
    - a. Scopes of Work.
    - b. Temporary Facilities.
    - c. Use of Site.
    - d. Work Restrictions.
    - e. Unit Price.
    - f. Substitutions following award.

5. Schedule:
    - a. Project Schedule.
    - b. Contract Time.
    - c. Other Bidder Questions.
  6. Site/facility visit or walkthrough.
  7. Post-Meeting Addendum.
- D. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes to attendees of prebid meeting only. Minutes of meeting are issued as Available Information and do not constitute a modification to the Procurement and Contracting Documents. Modifications to the Procurement and Contracting Documents are issued by written Addendum only.
1. Sign-in Sheet: Minutes will include list of meeting attendees.

END OF DOCUMENT 00 25 13

## RETURN WITH BID

DOCUMENT 00 41 06 – BID BOND

\_\_\_\_\_  
 as Principal, and  
 a corporation of the State of \_\_\_\_\_

as Surety, are held and firmly bound unto the Champaign County the amount of ten percent (10%) of the amount of the base bid for the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, to this agreement.

Principal has submitted to Obligee a bid to enter into a written contract, for

Project Number: \_\_\_\_\_ Division of Work: \_\_\_\_\_  
 in accordance with bidding documents for the project, which contract is by reference made a part hereof and is hereinafter referred to as "the Contract".

THE CONDITION OF THIS OBLIGATION is that if Principal, upon acceptance by Obligee of its bid within the period of time specified for acceptance, shall comply with all post award requirements as required by the terms of the bid within the time specified after date of the Notice of Award, or in the event of the failure to comply with all post award requirements, if Principal shall pay Obligee (1) for all costs of procuring the work which exceeds the amount of its bid, or (2) shall pay Obligee the amount of this bond as liquidated damages in the event Principal is a sole bidder and after an attempt to secure other bids by readvertising none can be obtained, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Surety hereby agrees that its obligation shall not be impaired by any extensions of time for Obligee's acceptance or compliance with post award requirements. Surety hereby waives notice of such extensions.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
 CONTRACTOR

\_\_\_\_\_  
 SURETY

BY \_\_\_\_\_  
 SIGNATURE

BY \_\_\_\_\_  
 OFFICER OF THE SURETY

Title \_\_\_\_\_ Title \_\_\_\_\_

ATTEST:

\_\_\_\_\_  
 CORPORATE SECRETARY (Corporations only)

\_\_\_\_\_  
 JURAT (Notary's Statement Authenticating Signature)

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I, \_\_\_\_\_, a Notary Public in and for said county, do hereby certify that

(Insert Name of Attorney-In-Fact for SURETY)

who is personally known to me to be the same person whose name is subscribed to the foregoing instrument on behalf of SURETY, appeared before me this day in person and acknowledged respectively, that he/she signed, sealed, and delivered said instrument as his/her free and voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this \_\_\_\_\_ DAY OF \_\_\_\_\_ A.D. 20 \_\_\_\_\_

My commission expires \_\_\_\_\_

Notary Signature \_\_\_\_\_



SECTION 00 41 13 – BID FORM – STIPULATED SUM (SINGE-PRIME CONTRACT)

## 1.1 BID INFORMATION

- A. Bidder: \_\_\_\_\_.
- B. Project Name: Champaign County Courtroom F Renovation
- C. Project Location: 101 E. Main Street, Urbana, Illinois 61801
- D. Owner: Champaign County

## 1.2 CERTIFICATIONS AND 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 Bailey Edward Design, Inc., 1103 S. Mattis Avenue, Champaign, IL 61821, and their 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  
( \$ \_\_\_\_\_ )

## B. Alternates

- 1. Alternate No. 1:

\_\_\_\_\_ Dollars  
( \$ \_\_\_\_\_ )

## 1.3 TIME OF COMPLETION

- A. Provided the contractor receives Notice to Proceed on or prior to September 2, 2026 the bidder agrees to be substantially complete with the Base Bid work on or before April 9, 2027.

## 1.4 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 \_\_\_\_\_.
  - 3. Addendum No. 3, dated \_\_\_\_\_.

## 1.5 SUBMISSION OF BID

A. In submitting the Bid, the undersigned agree that this Proposal will not be withdrawn for a period of thirty (30) calendar days from the date of submission. It is understood the Owner reserves the right to reject any and all Bids and to waive informalities and irregularities.

1. Respectfully submitted this \_\_\_\_ day of \_\_\_\_\_, 2026.
2. Submitted By : \_\_\_\_\_  
(Name of bidding firm or corporation).
3. Authorized Signature : \_\_\_\_\_  
(Handwritten signature).
4. Signed By : \_\_\_\_\_  
(Type or print name).
5. Title : \_\_\_\_\_  
(Owner/Partner/President/Vice President).
6. Witness By : \_\_\_\_\_  
(Handwritten signature).
7. Attest : \_\_\_\_\_  
(Handwritten signature).
8. By : \_\_\_\_\_  
(Type or print name).
9. Title : \_\_\_\_\_  
(Corporate Secretary or Assistant Secretary).
10. Street Address: \_\_\_\_\_.
11. City, State, Zip: \_\_\_\_\_.
12. Phone: \_\_\_\_\_.
13. License No.: \_\_\_\_\_.
14. Federal ID No. : \_\_\_\_\_.

(Affix Corporate Seal Here).

END OF DOCUMENT 00 41 13

**RETURN WITH BID**

## BIDDER'S / CONTRACTOR'S DISCLOSURE AFFIDAVIT

STATE OF ILLINOIS )  
 ) SS  
COUNTY OF \_\_\_\_\_ )

### BUSINESS STATUS STATEMENT

I, the undersigned, being duly sworn, do state as follows:

A. \_\_\_\_\_ (hereafter "Contractor") is a:  
Company Name

(Place a mark in front of appropriate type of business)

\_\_\_\_\_ Corporation (If a Corporation, complete B)

\_\_\_\_\_ Partnership (If a Partnership, complete C)

\_\_\_\_\_ Individual Proprietorship (If an Individual, complete D)

### B. CORPORATION

The State of Incorporation is \_\_\_\_\_

The registered agent of the Corporation in Illinois is:

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

Address: \_\_\_\_\_

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

Telephone: \_\_\_\_\_

The Corporate officers are as follows:

President: \_\_\_\_\_

Vice President: \_\_\_\_\_

Secretary: \_\_\_\_\_

Treasurer: \_\_\_\_\_

**RETURN WITH BID****C. PARTNERSHIP**

The Partners are as follows (attach additional sheets if necessary):

|               |                  |
|---------------|------------------|
| _____<br>Name | _____<br>Address |
| _____<br>Name | _____<br>Address |
| _____<br>Name | _____<br>Address |
| _____<br>Name | _____<br>Address |

The business address is: \_\_\_\_\_

**D. INDIVIDUAL PROPRIETORSHIP**

The business address is: \_\_\_\_\_

Business Telephone: \_\_\_\_\_

My home address is: \_\_\_\_\_

Home Telephone: \_\_\_\_\_

E. Under penalty of perjury \_\_\_\_\_

(Contractor's Name)

Certifies that \_\_\_\_\_ (FEIN / SSN)  
is its correct Federal Taxpayer Identification Number, or in the case of an individual or sole proprietorship, Social Security Number.

**NON-DISCRIMINATION STATEMENT**

The Contractor does not and will not engage in discriminatory practices; the Contractor does not and will not engage in discrimination because of race, sex, age, religion, national origin or sensory, mental, or physical handicap in hiring or firing; and the Contractor is, in fact, an equal opportunity employer.

**RETURN WITH BID****NON-COLLUSION STATEMENT**

- A. That the only persons or corporations interested with \_\_\_\_\_  
(Name of Bidder)  
in the delivery of the materials and/or services bid upon under the Contract other than its officers,  
directors, shareholders and employees are:

|               |                  |
|---------------|------------------|
| _____<br>Name | _____<br>Address |
| _____<br>Name | _____<br>Address |
| _____<br>Name | _____<br>Address |
| _____<br>Name | _____<br>Address |

- B. That the said Bid is made without any connection or common interest in the profits with any other persons making any Bid or Proposal for said Work except as listed above.
- C. That this Contract is in all respects fair and entered into without collusion or fraud.
- D. That no employee or any officer of the Owner has any financial interest, directly or indirectly, in the award of this Bid to Bidder except as listed above.
- E. That the Bidder is not barred from bidding on this Contract as a result of violation of either Section 33E-3 (Bid Rigging) or Section 33E-4 (Bid Rotating) of Chapter 38, Illinois Revised Statutes.
- F. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

**NO DELINQUENT ILLINOIS TAXES STATEMENT**

The undersigned certifies that the Contractor is not delinquent in payment of any tax administered by the Illinois Department of Revenue except that the taxes for which liability for the taxes or the amount of the taxes are being contested, in accordance with the procedure established by the appropriate Revenue Act; or the Contractor has entered into an agreement (2) with the Illinois Department of Revenue for the payment of all such taxes due and is in compliance with the agreement.

**RETURN WITH BID****FAMILIARITY WITH LAWS STATEMENT**

I, the undersigned, being duly sworn, do hereby state that

\_\_\_\_\_  
(Company Name)

is familiar with and will comply with all Federal, State and Local laws applicable to the Project, which include, but are not limited to, the Prevailing Wage Act and the Davis-Bacon Act.

**PENDING AND UNCOMPLETED WORK**

I, the undersigned, being duly sworn, do hereby declare that the following is a true and correct statement relating to all uncompleted contracts of the undersigned for Federal, State, County, City and private work, including all subcontract work; and all pending low BIDS not yet awarded or rejected:

Total Projects Under Contract

\_\_\_\_\_

Total Projects with Pending Low Bids

\_\_\_\_\_

Total Value of Projects Under Contract and Pending  
Low Bids

\_\_\_\_\_  
(Affiant's Signature)

\_\_\_\_\_  
(Print Name & Title)

\_\_\_\_\_  
(Company Name)

SUBSCRIBED and SWORN to before me this

\_\_\_\_\_ day of \_\_\_\_\_, 2026

Notary Public

My Commission Expires:

\_\_\_\_\_

(SEAL)

**INSTRUCTIONS:** This affidavit is to be completely filled out and executed by the chief officer of the Bidder authorized to submit the affidavit. Attach written explanation where applicable.



**RETURN WITH BID**

## DRUG FREE WORKPLACE CERTIFICATION

STATE OF \_\_\_\_\_ )  
COUNTY OF \_\_\_\_\_ ) SS

Note: The Illinois Drug Free Workplace Act, effective January 2, 1992, requires the Owner to obtain this certification from each contractor with 25 or more employees or with contracts for \$5,000 or more.)

The Contractor certifies that it will:

A. Public statement:

1. Notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance, including cannabis, is prohibited in the grantee's or contractor's workplace.
2. Specifying the actions that will be taken against employees for violations of such prohibitions.
3. Notifying the employee that, as a condition of employment on such contract or grant, the employee will:
  - a. Abide by the terms of the statement; and
  - b. Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than 5 days after such conviction.

B. Establish a drug free awareness program to inform employees about:

1. The dangers of drug abuse in the workplace.
2. The Contractor's policy of maintaining a drug free workplace.
3. Any available drug counseling, rehabilitation and employee assistance program.
4. The penalties that may be imposed upon employees for drug violations.

C. Give a copy of the published statement referred to in paragraph A above to each employee engaged in the performance of the Owner's contract and post the statement in a prominent place in the workplace.

**RETURN WITH BID**

- D. Notify the Owner within 10 days after receiving notice under paragraph A.3.b. above from an employee or otherwise receiving actual notice of such conviction.
- E. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program by any employee who is so convicted.
- F. Assist employees in selecting a course of action in the event drug counseling, treatment or rehabilitation is required and a trained referral team is in place.
- G. Make a good faith effort to continue to maintain a drug free workplace through implementation of the Drug Free Workplace Act.

If an individual, the Contractor certifies that it will not engage in the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance in the performance of the Owner's contract.

The Contractor shall, within 30 days after receiving notice from an employee of a conviction of a violation of a criminal drug statute occurring in the workplace:

- A. Take appropriate personnel action against such employee up to and including termination; and
- B. Require the employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State or local health, law enforcement or other appropriate agency.

Contractor:

By: \_\_\_\_\_

Title: \_\_\_\_\_

SIGNED and SWORN to before me this

\_\_\_\_\_ day of \_\_\_\_\_, 2026.

\_\_\_\_\_  
Notary Public

SECTION 00 43 43 – PREVAILING RATE OF WAGES

1. PREVAILING WAGE ACT

- 1.1 Pursuant to Illinois Compiled Statutes 820 ILCS 130/0.01 et seq., these specifications list on the following pages, the Illinois Department of Labor prevailing rate of wages for the county where the contract is being performed and for each craft or type of worker needed to execute the contract.
- 1.2 Contractor shall submit certified payrolls with monthly application for payment.
- 1.3 A Project Labor Agreement (PLA) is required for this project.

END OF SECTION 00 43 43

## Champaign County Prevailing Wage Rates posted on 5/21/2026

|                        |     |      |   |       |         | Overtime |     |     |     |       |         |      |      |              |                     |                     |
|------------------------|-----|------|---|-------|---------|----------|-----|-----|-----|-------|---------|------|------|--------------|---------------------|---------------------|
| Trade Title            | Rg  | Type | C | Base  | Foreman | M-F      | Sa  | Su  | Hol | H/W   | Pension | Vac  | Trng | Other<br>Ins | Add OT<br>1.5x owed | Add OT<br>2.0x owed |
| ASBESTOS ABT-GEN       | All | BLD  |   | 38.51 | 39.76   | 1.5      | 1.5 | 2.0 | 1.5 | 9.75  | 19.09   | 0.00 | 0.90 | 0.00         | 0.00                | 0.00                |
| ASBESTOS ABT-MEC       | All | BLD  |   | 29.20 | 31.20   | 1.5      | 1.5 | 2.0 | 2.0 | 10.95 | 9.50    | 0.00 | 0.50 |              | 0.00                | 0.00                |
| BOILERMAKER            | All | BLD  |   | 50.46 | 54.46   | 1.5      | 1.5 | 2.0 | 2.0 | 7.07  | 24.29   | 0.00 | 2.34 | 0.00         | 16.38               | 32.76               |
| BRICK MASON            | All | BLD  |   | 40.00 | 42.40   | 1.5      | 1.5 | 2.0 | 2.0 | 11.35 | 18.54   | 0.00 | 1.29 |              | 0.00                | 0.00                |
| CARPENTER              | All | BLD  |   | 42.97 | 45.72   | 1.5      | 1.5 | 2.0 | 2.0 | 10.45 | 20.65   | 0.00 | 0.91 | 0.00         | 15.55               | 31.10               |
| CARPENTER              | All | HWY  |   | 39.17 | 40.92   | 1.5      | 1.5 | 2.0 | 2.0 | 9.95  | 23.65   | 0.00 | 0.78 | 0.00         | 0.00                | 0.00                |
| CEMENT MASON           | All | BLD  |   | 40.59 | 43.34   | 1.5      | 1.5 | 1.5 | 2.0 | 11.00 | 12.50   | 0.00 | 0.60 |              | 0.00                | 0.00                |
| CEMENT MASON           | All | HWY  |   | 41.00 | 43.75   | 1.5      | 1.5 | 1.5 | 2.0 | 11.42 | 14.00   | 0.00 | 0.60 | 0.00         | 0.00                | 0.00                |
| CERAMIC TILE FINISHER  | All | BLD  |   | 37.34 |         | 1.5      | 1.5 | 2.0 | 2.0 | 11.35 | 13.71   | 0.00 | 0.62 |              | 0.00                | 0.00                |
| ELECTRIC PWR EQMT OP   | All | ALL  |   | 59.91 | 71.10   | 1.5      | 1.5 | 2.0 | 2.0 | 9.30  | 16.78   | 0.00 | 0.60 | 0.00         | 0.00                | 0.00                |
| ELECTRIC PWR GRNDMAN   | All | ALL  |   | 40.71 | 71.10   | 1.5      | 1.5 | 2.0 | 2.0 | 8.72  | 11.40   | 0.00 | 0.41 | 0.00         | 0.00                | 0.00                |
| ELECTRIC PWR LINEMAN   | All | ALL  |   | 66.69 | 71.10   | 1.5      | 1.5 | 2.0 | 2.0 | 9.50  | 18.67   | 0.00 | 0.67 | 0.00         | 0.00                | 0.00                |
| ELECTRIC PWR TRK DRV   | All | ALL  |   | 45.45 | 71.10   | 1.5      | 1.5 | 2.0 | 2.0 | 8.86  | 12.72   | 0.00 | 0.45 | 0.00         | 0.00                | 0.00                |
| ELECTRICIAN            | All | BLD  |   | 51.07 | 56.18   | 1.5      | 1.5 | 2.0 | 2.0 | 8.85  | 13.23   | 0.00 | 0.77 | 0.00         | 1.15                | 2.29                |
| ELECTRONIC SYSTEM TECH | All | BLD  |   | 38.34 | 41.34   | 1.5      | 1.5 | 2.0 | 2.0 | 8.85  | 13.51   | 0.00 | 0.40 |              | 0.58                | 1.15                |
| ELEVATOR CONSTRUCTOR   | All | BLD  |   | 60.52 | 68.09   | 2.0      | 2.0 | 2.0 | 2.0 | 16.37 | 21.76   | 4.84 | 0.85 |              | 0.00                | 0.00                |
| FENCE ERECTOR          | All | ALL  |   | 38.98 | 41.48   | 1.5      | 1.5 | 2.0 | 2.0 | 12.64 | 17.00   | 0.00 | 1.11 | 0.00         | 17.00               | 17.00               |
| GLAZIER                | All | BLD  |   | 42.27 | 44.27   | 1.5      | 1.5 | 2.0 | 2.0 | 8.20  | 14.00   | 0.00 | 0.68 | 0.00         | 0.00                | 0.00                |
| HEAT/FROST INSULATOR   | All | BLD  |   | 40.20 | 41.95   | 1.5      | 1.5 | 2.0 | 2.0 | 8.99  | 15.09   | 0.00 | 0.40 | 3.30         | 0.00                | 0.00                |
| IRON WORKER            | All | BLD  |   | 38.98 | 41.48   | 1.5      | 1.5 | 2.0 | 2.0 | 12.64 | 17.00   | 0.00 | 1.11 | 0.00         | 17.00               | 17.00               |
| IRON WORKER            | All | HWY  |   | 41.92 | 43.92   | 1.5      | 1.5 | 2.0 | 2.0 | 12.64 | 17.00   | 0.00 | 1.11 | 0.00         | 17.00               | 17.00               |
| LABORER                | All | BLD  |   | 35.51 | 36.76   | 1.5      | 1.5 | 2.0 | 2.0 | 9.75  | 19.09   | 0.00 | 0.80 | 0.00         | 0.00                | 0.00                |
| LABORER                | All | HWY  |   | 40.22 | 41.22   | 1.5      | 1.5 | 2.0 | 2.0 | 9.75  | 19.42   | 0.00 | 0.80 | 0.00         | 0.00                | 0.00                |
| LATHER                 | All | BLD  |   | 41.29 | 44.04   | 1.5      | 1.5 | 2.0 | 2.0 | 9.95  | 20.15   | 0.00 | 0.81 | 0.00         | 15.05               | 30.10               |
| MACHINIST              | All | BLD  |   | 60.39 | 64.39   | 1.5      | 1.5 | 2.0 | 2.0 | 11.43 | 9.95    | 1.85 | 1.47 | 0.00         | 0.00                | 0.00                |
| MARBLE FINISHER        | All | BLD  |   | 37.34 |         | 1.5      | 1.5 | 2.0 | 2.0 | 11.35 | 13.71   | 0.00 | 0.62 |              | 0.00                | 0.00                |
| MARBLE MASON           | All | BLD  |   | 38.94 | 40.89   | 1.5      | 1.5 | 2.0 | 2.0 | 11.35 | 14.05   | 0.00 | 0.62 |              | 0.00                | 0.00                |

## Champaign County Prevailing Wage Rates posted on 5/21/2026

|                    |     |     |   |       |       |     |     |     |     |       |       |      |      |      |       |       |
|--------------------|-----|-----|---|-------|-------|-----|-----|-----|-----|-------|-------|------|------|------|-------|-------|
| MILLWRIGHT         | All | BLD |   | 39.10 | 41.85 | 1.5 | 1.5 | 2.0 | 2.0 | 9.95  | 22.85 | 0.00 | 0.81 | 0.00 | 16.40 | 32.80 |
| MILLWRIGHT         | All | HWY |   | 42.00 | 43.75 | 1.5 | 1.5 | 2.0 | 2.0 | 9.95  | 24.12 | 0.00 | 0.78 | 0.00 | 0.00  | 0.00  |
| OPERATING ENGINEER | All | ALL | 1 | 47.30 | 48.30 | 1.5 | 1.5 | 2.0 | 2.0 | 12.15 | 14.50 | 0.00 | 1.50 |      | 0.00  | 0.00  |
| OPERATING ENGINEER | All | ALL | 2 | 32.20 | 48.30 | 1.5 | 1.5 | 2.0 | 2.0 | 12.15 | 14.50 | 0.00 | 1.50 |      | 0.00  | 0.00  |
| OPERATING ENGINEER | All | ALL | 3 | 49.30 | 50.30 | 1.5 | 1.5 | 2.0 | 2.0 | 12.15 | 14.50 | 0.00 | 1.50 |      | 0.00  | 0.00  |
| PAINTER            | All | ALL |   | 40.96 | 42.46 | 1.5 | 1.5 | 2.0 | 2.0 | 9.85  | 8.63  | 0.00 | 0.60 |      | 0.00  | 0.00  |
| PAINTER - SIGNS    | All | ALL |   | 40.96 | 42.46 | 1.5 | 1.5 | 2.0 | 2.0 | 9.85  | 8.63  | 0.00 | 0.60 |      | 0.00  | 0.00  |
| PILEDRIIVER        | All | BLD |   | 43.29 | 46.04 | 1.5 | 1.5 | 2.0 | 2.0 | 9.95  | 20.15 | 0.00 | 0.81 | 0.00 | 15.05 | 30.10 |
| PILEDRIIVER        | All | HWY |   | 40.17 | 41.92 | 1.5 | 1.5 | 2.0 | 2.0 | 9.95  | 23.65 | 0.00 | 0.78 | 0.00 | 0.00  | 0.00  |
| PIPEFITTER         | All | BLD |   | 54.31 | 57.68 | 1.5 | 1.5 | 2.0 | 2.0 | 9.95  | 11.39 | 0.00 | 2.81 | 0.00 | 0.00  | 0.00  |
| PLASTERER          | All | BLD |   | 39.05 | 41.05 | 1.5 | 1.5 | 1.5 | 2.0 | 10.10 | 15.20 | 0.00 | 0.50 | 0.00 | 0.00  | 0.00  |
| PLUMBER            | All | BLD |   | 54.31 | 57.68 | 1.5 | 1.5 | 2.0 | 2.0 | 9.95  | 11.39 | 0.00 | 2.81 | 0.00 | 0.00  | 0.00  |
| ROOFER             | All | BLD |   | 38.21 | 41.21 | 1.5 | 1.5 | 2.0 | 2.0 | 12.33 | 10.65 | 0.00 | 1.36 |      | 0.00  | 0.00  |
| SHEETMETAL WORKER  | All | BLD |   | 46.23 | 49.23 | 1.5 | 1.5 | 2.0 | 2.0 | 12.55 | 16.22 | 0.00 | 0.80 | 2.15 | 0.00  | 0.00  |
| SPRINKLER FITTER   | All | BLD |   | 50.51 | 53.76 | 1.5 | 1.5 | 2.0 | 2.0 | 12.40 | 17.31 | 0.00 | 0.54 | 0.00 | 0.00  | 0.00  |
| STONE MASON        | All | BLD |   | 40.00 | 42.40 | 1.5 | 1.5 | 2.0 | 2.0 | 11.35 | 18.54 | 0.00 | 1.29 |      | 0.00  | 0.00  |
| TERRAZZO FINISHER  | All | BLD |   | 37.34 |       | 1.5 | 1.5 | 2.0 | 2.0 | 11.35 | 13.71 | 0.00 | 0.62 |      | 0.00  | 0.00  |
| TERRAZZO MASON     | All | BLD |   | 38.94 | 40.89 | 1.5 | 1.5 | 2.0 | 2.0 | 11.35 | 14.05 | 0.00 | 0.62 |      | 0.00  | 0.00  |
| TILE MASON         | All | BLD |   | 38.94 | 40.89 | 1.5 | 1.5 | 2.0 | 2.0 | 11.35 | 14.05 | 0.00 | 0.62 |      | 0.00  | 0.00  |
| TRUCK DRIVER       | All | ALL | 1 | 45.29 | 49.65 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | ALL | 2 | 45.88 | 49.65 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | ALL | 3 | 46.15 | 49.65 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | ALL | 4 | 46.54 | 49.65 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | ALL | 5 | 47.64 | 49.65 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | O&C | 1 | 36.23 | 39.72 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | O&C | 2 | 36.70 | 39.72 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | O&C | 3 | 36.92 | 39.72 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | O&C | 4 | 37.23 | 39.72 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TRUCK DRIVER       | All | O&C | 5 | 38.11 | 39.72 | 1.5 | 1.5 | 2.0 | 2.0 | 17.11 | 8.06  | 0.00 | 0.25 | 0.00 | 0.00  | 0.00  |
| TUCKPOINTER        | All | BLD |   | 40.00 | 42.40 | 1.5 | 1.5 | 2.0 | 2.0 | 11.35 | 18.54 | 0.00 | 1.29 |      | 0.00  | 0.00  |

## Champaign County Prevailing Wage Rates posted on 5/21/2026

### **Legend**

**Rg** Region

**Type** Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers

**C** Class

**Base** Base Wage Rate

**OT M-F** Unless otherwise noted, OT pay is required for any hour greater than 8 worked each day, Mon through Fri. The number listed is the multiple of the base wage.

**OT Sa** Overtime pay required for every hour worked on Saturdays

**OT Su** Overtime pay required for every hour worked on Sundays

**OT Hol** Overtime pay required for every hour worked on Holidays

**H/W** Health/Welfare benefit

**Vac** Vacation

**Trng** Training

**Other Ins** Employer hourly cost for any other type(s) of insurance provided for benefit of worker.

### Explanations CHAMPAIGN COUNTY

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

Oil and chip resealing (O&C) means the application of road oils and liquid asphalt to coat an existing road surface, followed by application of aggregate chips or gravel to coated surface, and subsequent rolling of material to seal the surface.

### EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER, MARBLE FINISHER, TERRAZZO FINISHER

Assisting, helping or supporting the tile, marble and terrazzo mechanic by performing their historic and traditional work assignments required to complete the proper installation of the work covered by said crafts. The term "Ceramic" is used for



## **Champaign County Prevailing Wage Rates posted on 5/21/2026**

naming the classification only and is in no way a limitation of the product handled. Ceramic takes into consideration most hard tiles.

### **ELECTRONIC SYSTEMS TECHNICIAN**

Installation, service and maintenance of low-voltage systems which utilizes the transmission and/or transference of voice, sound, vision, or digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background/foreground music, intercom and telephone interconnect, field programming, inventory control systems, microwave transmission, multi-media, multiplex, radio page, school, intercom and sound burglar alarms and low voltage master clock systems.

Excluded from this classification are energy management systems, life safety systems, supervisory controls and data acquisition systems not intrinsic with the above listed systems, fire alarm systems, nurse call systems and raceways exceeding fifteen feet in length.

**TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION Class 1.** Drivers on 2 axle trucks hauling less than 9 ton. Air compressor and welding machines and brooms, including those pulled by separate units, truck driver helpers, warehouse employees, mechanic helpers, greasers and tiremen, pickup trucks when hauling materials, tools, or workers to and from and on-the-job site, and fork lifts up to 6,000 lb. capacity.

**Class 2.** Two or three axle trucks hauling more than 9 ton but hauling less than 16 ton. A-frame winch trucks, hydrolift trucks, vactor trucks or similar equipment when used for transportation purposes. Fork lifts over 6,000 lb. capacity, winch trucks, four axle combination units, and ticket writers.

**Class 3.** Two, three or four axle trucks hauling 16 ton or more. Drivers on water pulls, articulated dump trucks, mechanics and working forepersons, and dispatchers. Five axle or more combination units.

**Class 4.** Low Boy and Oil Distributors.

**Class 5.** Drivers who require special protective clothing while employed on hazardous waste work.

### **TRUCK DRIVER - OIL AND CHIP RESEALING ONLY.**

This shall encompass laborers, workers and mechanics who drive contractor or subcontractor owned, leased, or hired pickup, dump, service, or oil distributor trucks. The work includes transporting materials and equipment (including but not limited to, oils, aggregate supplies, parts, machinery and tools) to or from the job site; distributing oil or liquid asphalt and aggregate; stock piling material when in connection with the actual oil and chip contract. The Truck Driver (Oil & Chip Resealing) wage classification does not include supplier delivered materials.

**OPERATING ENGINEERS - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION Class 1.** Draglines, Derricks, Shovels, Gradalls, Mechanics, Tractor Highlift, Tournadozer, Concrete Mixers with Skip, Tournamixer, Two Drum Machine, One Drum Hoist with Tower or Boom, Cableways, Tower Machines, Motor Patrol, Boom Tractor, Boom or Winch Truck, Winch or Hydraulic Boom Truck, Tournapull, Tractor Operating Scoops, Bulldozer, Push Tractor, Asphalt Planer, Finishing Machine on Asphalt, Large Rollers on

## Champaign County Prevailing Wage Rates posted on 5/21/2026

Earth, Rollers on Asphalt Mix, Ross Carrier or similar Machine, Gravel Processing Machine, Asphalt Plant Engineer, Paver Operator, Dredging Equipment, or Dredge Engineer, or Dredge Operator, Central Mix Plant Engineer, CMI or similar type machine, Concrete Pump, Truck or Skid Mounted, Engineer or Rock Crusher Plant, Concrete Plant Engineer, Ditching Machine with dual attachment, Tractor Mounted Loaders, Hydro Crane, Standard or Dinkey Locomotives, Scoopmobiles, Euclid Loader, Soil Cement Machine, Back Filler, Elevating Machine, Power Blade, Drilling Machine, including Well Testing, Caissons, Shaft or any similar type drilling machines, Motor Driven Paint Machine, Pipe Cleaning Machine, Pipe Wrapping Machine, Pipe Bending Machine, Apsco Paver, Boring Machine, (Head Equipment Greaser), Barber-Greene Loaders, Formless Paver, (Well Point System), Concrete Spreader, Hydra Ax, Span Saw, Marine Scoops, Brush Mulcher, Brush Burner, Mesh Placer, Tree Mover, Helicopter Crew (3), Piledriver-Skid or Crawler, Stump Remover, Root Rake, Tug Boat Operator, Refrigerating Machine, Freezing Operator, Chair Cart- Self-Propelled, Hydra Seeder, Straw Blower, Power Sub Grader, Bull Float, Finishing Machine, Self-Propelled Pavement Breaker, Lull (or similar type Machine), Two Air Compressors, Compressors hooked in Manifold, Chip Spreader, Mud Cat, Sull-Air, Fork Lifts (except when used for landscaping work), Soil Stabilizer (Seaman Tiller, Bo Mag, Rago Gator, and similar types of equipment), Tube Float, Spray Machine, Curing Machine, Concrete or Asphalt Milling Machine, Snooper Truck-Operator, Backhoe, Farm Tractors (with attachments), 4 Point Lift System (Power Lift or similar type), Skid-Steer (Bob Cat or similar type), Wrecking Shears, Water Blaster.

Class 2. Concrete Mixers without Skips, Rock Crusher, Ditching Machine under 6', Curbing Machine, One Drum Machines without Tower or Boom, Air Tugger, Self-Propelled Concrete Saw, Machine Mounted Post Hole Digger, two to four Generators, Water Pumps or Welding Machines, within 400 feet, Air Compressor 600 cu. ft. and under, Rollers on Aggregate and Seal Coat Surfaces, Fork Lift (when used for landscaping work), Concrete and Blacktop Curb Machine, One Water Pump, Oilers, Air Valves or Steam Valves, One Welding Machine, Truck Jack, Mud Jack, Gunnite Machine, House Elevators when used for hoisting material, Engine Tenders, Fireman, Wagon Drill, Flex Plane, Conveyor, Siphons and Pulsometer, Switchman, Fireman on Paint Pots, Fireman on Asphalt Plants, Distributor Operator on Trucks, Tampers, Self-Propelled Power Broom, Striping Machine (motor driven), Form Tamper, Bulk Cement Plant, Equipment Greaser, Deck Hands, Truck Crane Oiler-Driver, Cement Blimps, Form Grader, Temporary Heat, Throttle Valve, Super Sucker (and similar type of equipment).

Class 3. Power Cranes, Truck or Crawler Crane, Rough Terrain Crane (Cherry Picker), Tower Crane, Overhead Crane.

### Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

### LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

## **Champaign County Prevailing Wage Rates posted on 5/21/2026**

SECTION 01 11 00 – PROJECT SUMMARY

## 1. GENERAL

## 1.1 WORK INCLUDED

A. Contractor shall provide all labor and materials associated with the work of this section, including:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

## 1.2 PROJECT INFORMATION

A. Project Identification:

1. Champaign County Courtroom F Renovation  
101 E. Main Street, Urbana, Illinois 61801

B. Owner's Representative: Jerry Mayberry  
Email: jmayberry@champaigncountyil.gov

## 1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Work generally includes but is not limited to:

Select removal of interior elements. Some of these elements are to be salvaged and reinstalled.  
Construction of separation to create two, small courtrooms and a secured entry.  
Removal and replacement of select finishes including carpet, paint, wall covering, and ceiling.  
New doors into the courtroom.  
New millwork and paneling at courtroom.  
Modification of HVAC, Electrical, and Lighting

B. Provided the contractor receives Notice to Proceed on or prior to September 2, 2026 the bidder agrees to be substantially complete with the Base Bid work on or before April 9, 2027.

Work in the courtroom will need to be coordinated with the court schedule. Work which creates noise should be planned to occur weekdays between 7-9 am, after 2 pm, or on weekends, unless advanced permission is given by the court.

## 2. PRODUCTS (NOT APPLICABLE)

## 3. EXECUTION (NOT APPLICABLE)

END OF SECTION 01 11 00

SECTION 01 32 00 - CONSTRUCTION SCHEDULE

## 1. GENERAL

## 1.1 REQUIREMENTS INCLUDE:

- A. The General Contractor shall prepare and maintain a detailed project schedule as described below.
- B. The project schedule shall be the Contractor's working schedule; used to execute the work and record and report actual progress. It shall show how the Contractor plans to complete the work within the contract time and meet any contractually specified intermediate milestone dates.

## 1.2 RELATED REQUIREMENTS

- A. Specified Elsewhere:
  - 1. Section 01 11 00 - Project Summary
  - 2. Section 01 33 23 - Shop Drawings, Product Data and Samples

## 1.3 FORM OF SCHEDULE

- A. The schedule shall provide sufficient detail and clarity so that the General Contractor can plan and control the work and the Owner and the A/E can readily monitor and follow the progress of all portions of the work. The critical activities must be clearly shown. The degree of detail must be satisfactory to the A/E and the Owner.
  - 1. Scope of work should be identified by floor level as applicable.
- B. The project schedule shall be in the form of a Gantt chart, and shall indicate the critical path, including durations.

## 1.4 CONTENTS OF SCHEDULE

- A. The schedule must be inclusive of all installation tasks of the work.
- B. Submittal and approval of shop drawings and material samples as well as delivery dates of major equipment shall be included in the project schedule.
- C. Activity duration shall be in whole working days.
- D. There should be at least one activity for each specification section.

## 1.5 UPDATING

- A. The project schedule shall be updated monthly.
- B. Actual activity completion dates shall be reported and recorded on the schedule.
- C. Progress on uncompleted activities shall be reported.
- D. Projected completion dates and activities shall be reviewed and revised if necessary.

1.6 REPORTS AND SUBMITTALS

- A. Within 15 days of the Authorization to Proceed, the Contractor shall submit the project schedule to the A/E and the Owner.
- B. Five (5) days prior to the pay/progress meeting, the contractor shall submit the current updated schedule to the A/E and the Owner.

1.7 REVIEWS

- A. Payment and reduction of retainage may be denied by the Owner for failure to submit a proper schedule and maintaining work progress according to the project schedule.

2. PRODUCTS

(NOT APPLICABLE)

3. EXECUTION

(NOT APPLICABLE)

END OF SECTION 01 32 00

SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA & SAMPLES

## 1. GENERAL

## 1.1 REQUIREMENTS INCLUDE

- A. The Sub-contractor shall make submittals to the General Contractor. The General Contractor shall maintain a master list of submittals.
- B. Submittals shall be complete and legible. Incomplete submittals will be returned and not reviewed.

## 1.2 GENERAL CONTRACTOR:

- A. Review Sub-contractor's submittals within 5 business days.
  - 1. Verify field dimensions.
  - 2. Verify compliance with Contract requirements.

## 1.3 RELATED REQUIREMENTS

- A. Specified elsewhere:
  - 1. Submittals specific to each section are further outlined within the technical specifications. Submittals deemed incomplete or not indication as supplied by separate sub, shall be returned without review.

## 1.4 DEFINITIONS

- A. Shop drawings: Shop drawings are original drawings prepared by Contractor, subcontractor, sub-subcontractor, supplier or distributor, which illustrated some portion of the work, showing fabrication, layout, setting or erection details.
  - 1. Prepared by qualified detailer.
  - 2. Identify details by reference to sheet and detail numbers shown on contract drawings.
  - 3. Maximum sheet size: 30" x 42"
  - 4. Submit a maximum of (3) copies. Electronic copies of submittals are preferred.
- B. Product data:
  - 1. Manufacturer's standard schematic drawings edited to fit this project.
  - 2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
    - a. Clearly mark each copy to identify pertinent materials, products or models.
    - b. Show dimensions and clearances.
    - c. Show wiring diagrams and controls.
- C. Samples: Physical samples to illustrate materials, equipment or workmanship. Approved samples establish standards by which complete work is judged. Maintain at site as directed. Protect until no longer needed.
  - 1. Office samples: Of sufficient size to clearly illustrate:
    - a. Functional characteristics of product or material.
    - b. Full range of color samples.
    - c. After review, samples may be used on construction of project.



2. Field samples and mock-ups:
  - a. Erect at project site at location approved by the Architect.
  - b. Construct each sample or mock-up complete, including work of all crafts required in finished work.
  - c. Remove as directed.

#### 1.5 SUBMITTAL SCHEDULE

- A. Submit schedule of all exhibits to Architect/Engineer within fifteen (15) business days after preconstruction meeting.
  1. Prepare schedule in gnatt chart format, Include:
    - a. Exhibit identification
    - b. Specification section and page number
    - c. Date of submittal to Architect/Engineer
    - d. Latest date for final approval
    - e. Fabrication time.
    - f. Date of Installation
  2. Architect/Engineer will review and comment on exhibit schedule and will advise the Contractor as to which submittals require longer review durations.
  3. Submit number of copies of shop drawings, product data and samples which contractor requires for distribution plus (2) copies which will be retained by Architect/Engineer.
- B. Accompany submittals with transmittal letter, in duplicate, containing:
  1. Date
  2. Project title and number
  3. Contractor's name and address.
  4. The number of shop drawings, product data and samples submitted.
  5. Notification of deviations from Contract.
  6. Other pertinent data.
- C. Submittals shall include:
  1. Date and revision
  2. Project title and number
  3. Name of:
    - a. Architect/ Engineer
    - b. Architect/ Engineer consultant
    - c. Subcontractor
    - d. Sub-subcontractor
    - e. Supplier
    - f. Manufacturer
    - g. Separate detailer when pertinent
  4. Identification of product or material.
  5. Relation to adjacent structure or material.
  6. Field dimensions clearly identified as such.
  7. Specification section and page number.
  8. Specified standards, such as ASTM number or ANSI.
  9. A blank space, (5"x5"), for Architect/Engineer's stamp.
  10. Identification of previously approved deviation(s) from contract documents.

11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract.
  12. Space for Contractor's approval stamp.
- D. Electronic Submittals: All submittals may be submitted electronically except for those specifically listing a requirement for paper submittals or physical samples. Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single file (pdf format) incorporating submittal requirements of a single Specification Section and transmittal form. Only complete submittals will be accepted.
  2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g.; PROJNAME\_061000.01). Resubmittals shall include an alphabetic suffix after the decimal point (e.g.; PROJNAME\_061000.01A)
  3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Using Agency/ Architect/ Engineer.
  4. Transmittal Cover Sheet Form for Electronic Submittals: As described by the Architect and containing all information as indicated above for paper submittals.
- 1.6 RESUBMISSION REQUIREMENTS
- A. Resubmit all shop drawings, product data, and samples as requested by the Contractor and/or A/E.
  - B. Resubmit complete package to Architect within 14 days of receiving rejected submittal.
- 1.7 RESPONSIBILITIES
- A. Review shop drawings, product data and samples prior to submission to the next level of authority. Review Subcontractor's submittals within five (5) business days. Certify review and transmit to Architect.
  - B. Verify:
    1. Field dimensions.
    2. Field construction criteria.
    3. Catalog numbers and similar data.
    4. Verify compliance with contract documents.
  - C. Coordinate each submittal with requirements of:
    1. The work.
    2. The contract documents.
    3. The work of other contractors.
    4. The existing conditions indicated to remain.
  - D. Contractor's responsibility for errors, omissions or deviation from contract documents in submittals is not relieved by the Architect/Engineer's review of submittals.
  - E. Prior to submission, notify the Architect/Engineer in writing of all proposed deviations in submittals from Contract requirements. Substitution of materials or equipment may only be approved by change order.
  - F. Do not begin any work which requires submittals without Architect/Engineer's approval.
  - G. After Architect/Engineer's review, make response required by A/E's stamp and distribute copies. Indicate by transmittal that copy of approved data has been delivered to installer.

1.8 ARCHITECT/ENGINEER'S RESPONSIBILITIES

- A. Review submittals within fourteen (14) calendar days.
- B. Review for:
  - 1. Design concept of project.
  - 2. Compliance with Contract Documents.
- C. Review all requests for proposed deviations.
- D. Affix stamp, date and initials or signature certifying review of submittal, and with instructions for the Contractor.
- E. Return submittals to sender for response or distribution.

2. PRODUCTS  
(NOT APPLICABLE)

3. EXECUTION  
(NOT APPLICABLE)

END OF SECTION 01 33 23

SECTION 01 51 50 - USE OF EXISTING FACILITIES

## 1. GENERAL

1.1 These requirements supplement and other sections of the Project Manual.

1.2 The Owner and public have vacated the building to be removed. The Owner and the public will use the ILEAS facility during construction. Portions of the south parking lot may be used by the contractor during construction. The north ILEAS parking lot should be avoided and use coordinated with the Owner. Some limited closure or barricades are expected for portions of the work. Contractor is responsible for coordinating all closures and signage with Champaign County as necessary.

1.3 REQUIREMENTS INCLUDE - Contractor provide:

- A. Scheduling
- B. Security and site regulations
- C. Entrances (if required)
- D. Construction aids
- E. Temporary enclosures and barriers
- F. Fences
- G. Temporary utilities
- H. Construction Cleaning
- I. Storage
- J. Signage
- K. Close-out

## 2. EXECUTION

## 2.1 SECURITY AND SITE REGULATIONS

- A. Confer with the Owner's representative and obtain full knowledge of all site rules and regulations affecting work.

2.2 CONSTRUCTION AIDS: Except as noted, Contractor provide and maintain construction aids and equipment for common use and to facilitate execution of the work.

## 2.3 TEMPORARY ENCLOSURES AND BARRIERS - Contractor:

- A. Provide temporary enclosures to separate work areas from existing parking and from areas occupied by Owner.
- B. Provide and maintain suitable barriers to prevent unauthorized entry, and to protect the work.

## 2.4 TEMPORARY UTILITIES

- A. Contractor shall provide and pay for extension or modification of services to perform the work, and for restoration of services at completion of work.

## 2.5 ACCESS ROADS & PARKING AREAS

- A. Limit any loading of existing paved areas to 4000 p.s.i. maximum.
- B. Use of existing parking facilities for construction personnel or for contractor's vehicles or equipment is not permitted unless otherwise noted or coordinated with the Owner.
- C. Maintain roads, walks and parking areas in a sound, clean condition. Restore areas, damaged by construction operations, not in contract to original condition upon work completion prior to Final Acceptance.
- D. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations or construction operations.
- E. Coordinate any temporary construction vehicle entrance onto the property for deliveries or access with the Owner a minimum of three (3) days prior to the necessity.
- F. Equipment with bearing pressure above 4000 psi shall not be allowed on the grounds or paving.

## 2.6 TRAFFIC REGULATION: Contractor provide traffic control and directional signs, mounted on barricades or standard posts:

- A. At each change of direction of a roadway and at parking areas.
- B. Provide qualified and suitably equipped flaggers when construction operations encroach on traffic lanes, as required for traffic regulation.
- C. Where contractor requires sidewalk closure to execute scope of work, permits and alternative access for pedestrians shall be provided in the work of this contract.

## 2.7 CONSTRUCTION CLEANING

- A. Each Contractor provide cleaning and disposal of waste materials, debris and rubbish during construction.
- B. Coordinating Contractor to supervise and coordinate cleaning operations of all Assigned Contractors.
- C. Each Contractor provide covered containers for deposit of waste materials, debris and rubbish.

## 2.8 STORAGE Make arrangements with Owner's Representative for any on-site storage of materials and equipment to be installed in project. Protection and security for stored materials and equipment is solely contractor's responsibility.

## 2.9 CLOSEOUT

- A. Upon completion of need to use existing user-provided facilities, or when directed by Architect/Engineer, restore each to original or specified condition.
- B. At completion of work in each area, provide final cleaning and return space to a condition suitable for use of Owner.

END OF SECTION 01 51 50

SECTION 01 54 00 – CONSTRUCTION AIDS

## PART 1 - GENERAL

## 1.1 REQUIREMENTS INCLUDE

- A. Contractor shall provide all labor and material to install and maintain construction aids and equipment for all personnel use and to facilitate execution of the work:
  - 1. Ladders, working platforms and Scaffolding/Fall Protection.
  - 2. Heavy Equipment.
  - 3. Temporary enclosures, electrical power & water services, etc.
  - 4. Construction Barriers, and dust/noise/fume separations.
  - 5. Platforms.
  - 6. Stairs.
  - 7. Power and hand tools.
- B. Each Contractor must comply with OSHA regulations as they relate to these construction aids and all applicable standards.
- C. See respective specification sections for particular requirements.
- D. Provide and maintain for own forces all other construction aids required to complete his work.
- E. Remove all construction aids upon completion of the work, or as directed.

## 1.2 RELATED REQUIREMENTS

- A. Specified elsewhere:
  - 1. Section 01 11 00 - Project Summary.
  - 2. Section 01 51 50 – Use of Existing Facilities.
  - 3. Section 01 74 23 - Final Cleaning.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Materials may be new or used, suitable for purpose. Comply with specified codes, standards, and regulations.

## 2.2 CONSTRUCTION AIDS

- A. Maintain facilities and equipment in first class, clean and operable condition.

## PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Consult with Architect and Owner, review site conditions and factors which affect construction procedures and construction aids, including adjacent occupied areas which may be affected by execution of the work.

- B. Coordinate with Owner for placement of barriers to maintain Owner operations, while protecting occupants from exposure to dust, noise, and fumes.

3.2 INSTALLATION

- A. Comply with respective Project Manual Specification Sections.
- B. Relocate construction aids as construction progresses to expedite storage or work and to accommodate legitimate requirements of the Owner and other contractors at the site.

3.3 REMOVAL:

- A. Completely remove temporary materials, equipment and services:
  - 1. When construction needs can be met by authorized use of permanent construction.
  - 2. At project completion.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore existing facilities used for temporary purposes to original condition.

END OF SECTION 01 54 00



SECTION 01 56 00 - TEMPORARY BARRIERS AND ENCLOSURES

## PART I - GENERAL

## 1.1 WORK INCLUDES

- A. Base Bid: Use of Barriers and Enclosures: The Contractor shall provide all labor and materials necessary to furnish, erect and maintain temporary barriers, barricades, enclosures, and temporary construction fencing as required for the following:
  - 1. To protect the health and safety of occupants and the general public from exposure to immediate physical harm as well as to noise, dust, and fumes. Note that this Section does not provide minimum requirements related to Indoor Air Quality.
  - 2. To protect new and pre-existing adjacent construction from exposure to physical damage, dust, dirt, and water.
  - 3. To provide security of valuable property.

## 1.2 RELATED SECTIONS

- A. Section 01 54 00 - Construction Aids

## PART 2 - PRODUCTS

## 2.1 GENERAL FABRICATION

- A. Substantial Construction: Barriers and enclosures shall be of adequately substantial construction to serve their purpose without failure throughout the duration of their use. Materials may be new or used, suitable for the intended purpose, but shall not violate requirements of applicable codes and standards.
- B. Dust enclosures.

## PART 3 - EXECUTION

## 3.1 BASIC REQUIREMENTS

- A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.
- B. Install barriers and enclosures so as to not create new hazards such as tripping or protrusions that might be a source of safety concern to pedestrians or passers by.
- C. Establish reasonable alternative access when necessary due to placement of barriers.
- D. Maintain barriers during entire construction period.
- E. Relocate barriers as required by progress of construction.

## 3.2 DUST ENCLOSURES

- A. Dust enclosures shall be continuous barriers with a rigid frame, made of clean materials, which will prevent dust from leaving work areas. Additionally, they may be required to resist noise and fumes as necessitated by contractors work plan.

## 3.3 REMOVAL

- A. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by the Architect.
- B. Clean and repair damage caused by installation, clean the area.

END OF SECTION 01 56 00

SECTION 01 62 04 – SUBSTITUTION PROCEDURES

## 1. GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Administrative and procedural requirements for substitutions.

## 1.2 SUBSTITUTIONS

## A. Base Bid shall be in accordance with the Contract Documents.

## B. Substitution requests prior to bidding shall be submitted to Architect, in writing, a minimum of ten (10) days prior to bid date.

## C. After the end of the bidding period, substitution requests will be considered only in case of:

1. Product unavailability
2. Other conditions beyond the control of the Contractor

## D. Substitution Requests: Submit PDF electronic file of each request submitted for consideration. Identify product or fabrication or installation method to be replaced. Submit requests for substitutions on attached form. Submit a separate request form for each substitution. Include Specification Section number, title, and Drawing numbers and titles. Support each request with the following information:

1. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents:
  - a. Product identification, including manufacturer's name and address.
  - b. Manufacturer's literature, identifying:
    - 1) Product description
    - 2) Reference standards
    - 3) Performance and test data
2. Itemized comparison of the proposed substitution with product specified, listing significant variations.
3. Data relating to changes in construction schedule.
4. Effects of substitution on separate contracts.
5. List of changes required in other work or products.
6. Accurate cost data comparing proposed substitution with product specified.
  - a. Amount of net change to Contract Sum
7. Designation of required license fees or royalties.
8. Designation of availability of maintenance services sources replacement materials.

## E. Substitutions will not be considered for acceptance when:

1. A substitution is indicated or implied on shop drawings or product data submittals without a formal request from the Contractor.
2. Acceptance will require substantial revision of Contract Documents.
3. In judgment of the Architect, the substitution request does not include adequate information necessary for a complete evaluation.
4. Requested directly by a Subcontractor or supplier.

- F. Substitutions for Convenience: Not allowed
- G. Do not order or install substitute products without recommendation of the Architect and acceptance by the Owner/Using Agency.
- H. Architect will determine acceptability of proposed substitutions.
- I. No verbal or written approvals other than by Change Order will be valid.

### 1.3 CONTRACTOR'S REPRESENTATION

- A. In making formal request for substitution the Contractor represents that:
  - 1. The proposed product has been investigated and it has been determined that it is equivalent, or superior, in all respects to the product specified.
  - 2. The same warranties or bonds will be provided for the substitute product as for the product specified.
  - 3. Coordination and installation of the accepted substitution into the Work will be accomplished and changes as may be required for the Work to be complete will be accomplished.
  - 4. Claims for additional costs caused by substitution which may subsequently become apparent will be waived by the Contractor.
  - 5. Complete cost data is attached and includes related costs under the Contract, but not:
    - a. Costs under separate contracts.
    - b. Architect's costs for redesign or revision of Contact Documents.

### 1.4 REQUEST FOR SUBSTITUTION FORM

- A. 01 62 04.1 – Substitution Request Form
- B. Substitutions will be considered only when the substitution form is completed and included with the request for substitution submittal and back-up data.

### 2. PRODUCTS

(NOT APPLICABLE)

### 3. EXECUTION

(NOT APPLICABLE)

END OF SECTION 01 62 04

SECTION 01 62 04.1 – REQUEST FOR SUBSTITUTION FORM

REQUEST FOR SUBSTITUTION FORM

Note: Use separate form for each material, product, or equipment item.

Date: \_\_\_\_\_ Request No.: \_\_\_\_\_

Project: \_\_\_\_\_

Location: \_\_\_\_\_

Name of material, product, or equipment item submitted as substitution:

\_\_\_\_\_

Name of material, product, or equipment item specified:

\_\_\_\_\_

Specification Section \_\_\_\_\_, Article \_\_\_\_\_, Paragraph \_\_\_\_\_

Qualities that differ from specified product or system: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name of Manufacturer/(Fabricator):

\_\_\_\_\_

Address

\_\_\_\_\_

City, State, and Zip

( \_\_\_\_\_ )  
Telephone

\_\_\_\_\_

Name of Vendor/Supplier

Address

City, State, and Zip

( )  
Telephone

Reason for requesting substitution:

Substitution affects other materials or systems, such as dimensional revisions, redesign of structure, or modifications to other work:

No

Yes; describe requirements:

If substitution requires modifications to dimensions indicated on drawings, are such modifications clearly indicated on attached data?

Yes

No; if no, explain:

Substitution has an effect on construction schedule:

No

Yes; describe effect on schedule:

Savings or credit to Contract Amount for accepting substitute:

\_\_\_\_\_  
Written Amount \_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
Amount in Figures

The attached data is furnished herewith for evaluation of the substitution:

Product Data \_\_\_\_\_, Drawings \_\_\_\_\_, Samples \_\_\_\_\_, Tests \_\_\_\_\_, Reports \_\_\_\_\_

Other Information \_\_\_\_\_

The undersigned hereby certifies:

1. The proposed substitution has been fully investigated and is equal or superior to specified product.
2. The same or better warranty will be furnished for proposed substitution as for specified material, product or equipment.
3. All changes in the work resulting from the use of this substitution, if approved, will be coordinated and completed in all respects and all costs, including, but not limited to, those for additional services rendered by the Architect are the responsibility of this Contractor at no additional cost to the Contract.

\_\_\_\_\_  
Contractor

\_\_\_\_\_  
Signed by

\_\_\_\_\_  
Address

\_\_\_\_\_  
City, State, and Zip

**For Use by Architect:**

☐ Recommend  
☐ Not Recommended  
☐ Insufficient Data  
☐ Recommend as Noted  
☐ Received Too Late

**For Use by Owner:**

☐ Approved  
☐ Not Approved  
☐ Approved as Noted

By: \_\_\_\_\_

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

By: \_\_\_\_\_

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

END OF FORM

SECTION 01 66 00 - STORAGE AND PROTECTION

## 1. GENERAL

## A. REQUIREMENTS INCLUDE

1. General Contractor may make arrangements with Owner for storage of materials and equipment to be installed in project. Protection and security for stored materials and equipment, on and off site, is solely the contractor's responsibility.

- B. OFF-SITE AUTHORIZATION. Payment for materials/equipment stored off-site will be permitted only on prior written authorization, proof of insurance is submitted, and the material is stored in an independent warehouse under the owner's name and paid for by the contractor.

## C. SUBMITTALS.

1. In accordance with Section 01 33 23, submit:
  - a. Request for allocation of storage space.
  - b. List of materials and equipment to be stored.
  - c. Proposed location for storage.
  - d. Special storage requirements.
  - e. Schedule of anticipated storage dates.

## 2. PRODUCTS

## A. PROTECTIVE MATERIALS

1. For duration of storage period, provide materials which will provide proper protection against the elements or other harmful environmental conditions.

## 3. EXECUTION

## A. LOCATION

1. Where authorized by Owner.
2. Contractor will resolve conflicts in storage requirements of all subcontractors.

## B. PROTECTION

1. Appropriate protection is required as necessary to maintain quality and intent of stored materials.

END OF SECTION 01 66 00



SECTION 01 73 29 - CUTTING AND PATCHING

## 1. GENERAL

## 1.1 REQUIREMENTS INCLUDE

- A. Unless noted otherwise, each contractor shall:
  - 1. Execute cutting (including excavating), filling or patching of work to:
    - a. Install specified work.
    - b. Remove samples of installed work specified for testing.
    - c. Remove and replace defective work.
  - 2. In addition, upon written instructions of Architect/Engineer:
    - a. Uncover work to provide for observation of covered work.
    - b. Remove samples of installed materials for testing.
    - c. Remove work to provide for alteration of existing work.
  - 3. Do not cut or alter work of another contractor without written consent of Architect/Engineer.

## 1.2 SUBMITTALS

- A. Prior to cutting which affects structural members or work of another contractor, submit written notice to Architect/Engineer requesting consent to proceed with cutting, including:
  - 1. Project identification.
  - 2. Description of affected work.
  - 3. Necessity for cutting.
  - 4. Effect on other work, on structural integrity of project.
  - 5. Description of proposed work. Designate:
    - a. Scope of cutting and patching.
    - b. Contractor and Crafts to execute the work.
    - c. Products proposed to be used.
    - d. Extent of refinishing.
  - 6. Alternatives to cutting and patching.
  - 7. Designation of party responsible for cost of cutting and patching.
- B. Prior to cutting and patching done on instruction of Architect/ Engineer, submit cost estimate.
- C. When conditions of work, or schedule, indicate change of materials or methods, submit recommendation to Architect/Engineer, including:
  - 1. Condition indicating change.
  - 2. Recommendation for alternative materials or methods.
  - 3. Submittals specified for substitutions.
- D. Submit written notice to Architect/Engineer, designating time work will be uncovered, to provide for observation.

## 1.3 PAYMENT FOR COSTS

- A. Costs caused by ill-timed or defective work, or work not conforming to contract documents, including costs for additional services of Architect/Engineer: Party responsible for ill-timed, rejected or non-conforming work.
- B. Work done on instructions of Architect/Engineer (by change order only), other than defective or non-conforming work: Owner

## 2. PRODUCTS

- 2.1 MATERIALS. For replacement of work removed: Comply with specifications for type of work to be performed.

## 3. EXECUTION

### 3.1 INSPECTION

- A. Inspect existing conditions of work, including elements subject to movement or damage during:
  - 1. Cutting and patching.
  - 2. Excavating and backfilling.
- B. After uncovering work, inspect conditions affecting installation of new products.

### 3.2 PREPARATION

- A. Prior to cutting:
  - 1. Provide shoring, bracing and support to maintain structural integrity of project.
  - 2. Provide protection for other portions of the project.
  - 3. Provide protection from elements.

### 3.3 PERFORMANCE

- A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, finishes.
- B. Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs and new work.
- C. Restore work which has been cut or removed; install new products to provide completed work in accord with contract documents.
- D. Refinish entire surfaces to provide an even finish.
- E. Continuous surfaces: To nearest intersection(s).
- F. Assembly: Entire refinishing.

END OF SECTION 01 73 29

SECTION - 01 74 13 - CONSTRUCTION CLEANING

1. GENERAL

1.1 REQUIREMENTS INCLUDE

A. General Contractor: Supervise and coordinate cleaning operations.

1.2 RELATED REQUIREMENTS

A. Specified elsewhere:

1. Individual Specification Sections: specific cleaning for product or work.
2. Section 01 35 16 – Remodeling Project Procedures

2. PRODUCTS

2.1 EQUIPMENT

A. As designated in individual specification sections.

3. EXECUTION

3.1 CLEANING

A. As designated in individual specification sections.

3.2 DISPOSAL

- A. Maintain individual disposal units for sorting of debris for recycling and general disposal.
- B. Properly dispose of all contents of dumpsters off site in an environmentally friendly manner and in compliance with local, state and federal regulations.
- C. No burning of debris or materials is acceptable on site.
- D. All hazardous materials shall be disposed of off-site in an EPA approved facility.

END OF SECTION 01 74 13

SECTION - 01 74 23 - FINAL CLEANING

## 1. GENERAL

## 1.1 REQUIREMENTS INCLUDE

## A. General Contractor: Provide final cleaning:

1. At completion of work, or at such other times as directed by the Contractor, remove all waste, debris, rubbish, tools, equipment, machinery and surplus materials. Clean all sight exposed surfaces; leave work clean and ready for occupancy.

## 1.1 RELATED REQUIREMENTS

## A. Specified elsewhere:

1. Section 01 74 13 - Construction Cleaning.

## 2. PRODUCTS

- 2.1 All products shall be environmentally friendly "Green" cleaning products.

## 3. EXECUTION

## 3.1 FINAL CLEANING

## A. Employ experienced workmen for final cleaning.

## B. Remove grease, dust, dirt, stains, labels, fingerprints, protection and other foreign materials from sight-exposed finished surfaces; polish surfaces so designated to specified finish.

1. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed surfaces, and of concealed spaces to ensure performance.

## C. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.

## D. Contractor soft broom clean all exposed concrete surfaces clean; other paved areas with soft or stiff broom as directed. Rake clean other surfaces on grounds.

## E. Contractor to replace air handling filters at completion of cleaning and just prior to Owner occupancy.

## F. Contractor to maintain finally cleaned areas until project, or designated portion thereof, is accepted by A/E.

END OF SECTION 01 74 23

SECTION 01 78 36 - WARRANTIES & BONDS

1. GENERAL

1.1 REQUIREMENTS INCLUDE

- A. Each Contractor shall warrant their work in accordance with the Standard Documents for Construction. In addition, the following Warranties and Bonds shall be provided as specified.
- B. Champaign County will be the designated agent during the warranty period.

2. PRODUCTS

- A. Warranties and Bonds. Include the following:
  - 1. Warranty and/or bond.
  - 2. List of circumstances and conditions that would affect validity of warranty or bond.

3. EXECUTION (NOT APPLICABLE)

END OF SECTION 01 78 36

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Mechanical Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the mechanical drawings:

- 1) Testing, Adjusting, and Balancing of Air Systems:

- a) Variable-air-volume systems.

- 2) Testing, Adjusting, and Balancing of Hydronic Piping Systems:

- a) Variable-flow hydronic systems.

- 3) Testing, adjusting, and balancing of existing HVAC systems and equipment.

- 4) Duct leakage tests verification.

- 5) Pipe leakage tests verification.

- 6) HVAC-control system tests and verification.

- 7) Reports.

- 8) Commissioning: Testing organization will provide assistance to the commissioning authority as described in Specification Section 01 91 13 General Commissioning Requirements.

## 1.2 RELATED WORK

## A. Specified elsewhere:

- 1. Section 23 07 00 – HVAC Insulation
- 2. Section 23 31 13 – Metal Ducts
- 3. Section 23 33 00 – Air Duct Accessories

## 1.3 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An independent entity meeting qualifications to perform TAB work.

F. TDH: Total dynamic head.

G. UFAD: Underfloor air distribution.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB specialist and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
- B. Contract Documents Examination Report: Within 30 days of Contractor's Notice to Proceed, submit the Contract Documents review report, as specified in Part 3.
- C. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures, as specified in "Preparation" Article.
- D. System Readiness Checklists: Within 30 days of Contractor's Notice to Proceed, submit system readiness checklists, as specified in "Preparation" Article.
- E. Examination Report: Submit a summary report of the examination review required in "Examination" Article.
- F. Sample report forms.
- G. Instrument calibration reports, to include the following:
  - 1. Instrument type and make.
  - 2. Serial number.
  - 3. Application.
  - 4. Dates of use.
  - 5. Dates of calibration.
- H. Testing Instruments and Equipment:
  - 1. Submit data sheets on each item of testing equipment for Engineer review.
  - 2. Include name of device, manufacturer's name, model number, latest date of calibration and correction factors.
- I. Certified Balance Reports:
  - 1. Submit a report containing all test data and other related information recorded during testing and balancing, placed on appropriate forms for Architect / Engineer review.
  - 2. Reports shall certify that the methods used and results achieved are as specified.
  - 3. All readings taken throughout the balancing procedure shall be recorded on approved forms and upon completion of balancing and testing shall be "certified" as being correct and submitted for review.
- J. Certified Point-To-Point Testing Report:
  - 1. Coordinate with Temperature Controls Contractor to submit a list of all fans, control valves, and motor-operated dampers
  - 2. Test each item listed above for proper actuation under the building automation system.
  - 3. The Temperature Control Contractor shall set and adjust automatically operated devices to achieve specified sequence of operation.
  - 4. Testing organization shall verify all controls for proper calibration and list those controls requiring adjustment by temperature control system installer.

K. System Performance Report

1. After the conclusion of balancing operations, make temporary installation of portable recorders and simultaneously record temperatures and humidity during summer and winter conditions at representative locations in each system.
2. Make recordings during summer and winter for a seven-day period, continuous over a weekend, and including at least one period of operation at outside conditions within 5°F wet bulb temperature of maximum summer design condition and within 10°F dry bulb temperature of minimum winter design condition.
3. Report of test results shall include original recording and two reproductions.

L. Closeout Submittals:

1. Copy of all reports
2. Warranty Certificate of 1 year for test and balance services.

1.5 REVERIFICATION

- A. During Substantial Completion Inspection and upon receipt of "certified" balancing forms and letter of certification that all balancing, testing and adjusting is completed in accordance with plans and specifications and that all systems are operating properly, a percentage (not more than 5%) of the recorded data will be subject to reverification by the Engineer or Engineer's representative.
- B. Furnish personnel, instruments and equipment as required to assist the Engineer during this "balance inspection".
- C. Take instrument readings as directed. Test points will be in normally accessible locations and randomly selected by Engineer.
- D. If during the above balance inspection any portion of any system is found in improper balance, that entire system shall be rebalanced and a new report submitted.
- E. The rebalance shall be checked and if again found in improper balance, this Contractor shall again rebalance and submit report.
- F. This procedure shall be repeated until the systems are properly balanced to the satisfaction of the Engineer.

1.6 QUALITY ASSURANCE

- A. TAB Specialists Qualifications, Certified by AABC:
  1. TAB Field Supervisor: Employee of the TAB specialist and certified by AABC.
  2. TAB Technician: Employee of the TAB specialist and certified by AABC.
- B. TAB Specialists Qualifications, Certified by NEBB or TABB:
  1. TAB Field Supervisor: Employee of the TAB specialist and certified by NEBB or TABB.
  2. TAB Technician: Employee of the TAB specialist and certified by NEBB or TABB.
- C. Certify TAB field data reports and perform the following:
  1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.



2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.
- D. TAB Report Forms: Use standard TAB contractor's forms approved by Engineer and/or Commissioning Authority.
- E. Instrumentation Type, Quantity, Accuracy, and Calibration: Comply with requirements in ASHRAE 111, Section 4, "Instrumentation."
  1. ASHRAE 62.1 Compliance: Applicable requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."
- F. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6.7.2.3 - "System Balancing."
- G. Code and AHJ Compliance: TAB is required to comply with governing codes and requirements of authorities having jurisdiction.

## 1.7 FIELD CONDITIONS

- A. Heating, ventilating, air conditioning equipment shall be completely installed and in continuous operation to accomplish the testing, adjusting and balancing work specified. Complete air balancing prior to piping systems balancing.
- B. Perform testing, adjusting and balancing when outside conditions approximate design conditions for heating and cooling functions (or when the system is operating at design capacity).
- C. The Architect / Engineer may be present during testing and balancing to verify that specified procedures are followed.
- D. Full Owner Occupancy: Owner will occupy the site and existing building during entire TAB period. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.
- E. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

## 2. PRODUCTS

### 2.1 AIR SYSTEMS INSTRUMENTS

- A. Velometer with probes and Pitot tube.
- B. Rotating vane anemometer.
- C. ASHRAE standard Pitot tubes stainless steel 5/16 outside diameter, lengths 18" and 36".
- D. Magnehelic differential air pressure gauges, 0 to 0.5", 0 to 1.0" and 0 to 5.0" water pressure ranges, each arranged as a portable unit for use with a standard Pitot tube.
- E. Combination inclined-vertical portable manometer, range 0 to 5.0" water.
- F. Portable-type hook gauge, range 0 to 12" water.

- G. Portable flexible U-tube manometer, magnetic mounting clips, range 0 to 18" water.
- H. Conical or pyramidal shaped hood.

## 2.2 WATER SYSTEMS INSTRUMENTS

- A. 30" Mercury U-Tube Manometer, 200 psig wwp, with three valve bypass assembly and return wells or mercury check valves.
- B. Inspector's Gauge Testing Set.
- C. Water Differential Pressure Gauge, 4.50" dial.
- D. Pressure gauge measurements points, quick-connect couplings, 1/4" ips.

## 2.3 SYSTEM PERFORMANCE MEASURING INSTRUMENTS

- A. Insertion thermometers, with graduations at 0.1EF or contact pyrometer.
- B. Sling psychrometer.
- C. Tachometer, centrifugal type.
- D. Revolution counter.
- E. Clamp-on volt-ammeter.
- F. Recorders, portable type for temperature and humidity.

## 3. EXECUTION

### 3.1 TAB SPECIALISTS

- A. Testing and balancing shall be performed by (an) independent firm(s) specializing in such work.
  - 1. Test and balance work for heating and cooling systems shall be performed as a subcontract to the Heating (HVAC) Contractor. The Test and Balance Subcontractor shall not be related to the Plumbing or Heating (HVAC) Contractor in any business enterprise.
  - 2. Test and balance work for plumbing system shall be performed as a subcontract to the Plumbing Contractor.
  - 3. Test and balance work for heating, cooling and plumbing systems shall be performed as a reimbursable expense to the Architect / Engineer.
- B. Acceptable Vendors
  - 1. Miller Certified Air - 314-352-8981.
  - 2. Total Balance, Inc. - 317-955-7825.
  - 3. Airdronics - 815-561-0339.
  - 4. Illinois Certified, LLC - 217-632-3479.
  - 5. BPI - 309-663-1500.
  - 6. Air Tech Test & Balance, Inc. - 217-874-2324.
  - 7. G Squared Solutions - 618-926-4614.

- C. Only qualified personnel shall perform testing and balancing work.
- D. Submit evidence that the personnel who will perform the testing and balancing of the project systems are qualified personnel for review by the Architect / Engineer prior to performing the work.
- E. Submit a list of completed projects successfully tested and balanced by the submitted qualified personnel for review by the Architect / Engineer, prior to performing the work.
- F. Perform all corrective measures caused by faulty installation. Retest, readjust and rebalance system(s) until satisfactory results are achieved.

### 3.2 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems designs that may preclude proper TAB of systems and equipment.
- B. Examine installed systems for balancing devices, such as test ports, gauge cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are applicable for intended purpose and are accessible.
- C. Examine the approved submittals for HVAC systems and equipment.
- D. Examine design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- F. Examine test reports specified in individual system and equipment Sections.
- G. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.
- H. Examine 2-way and 3-way control valves for proper installation for their intended function of isolating, throttling, diverting, or mixing fluid flows.
- I. Examine heat-transfer coils for correct piping connections and for clean and straight fins.
- J. Examine operating safety interlocks and controls on HVAC equipment.
- K. Examine control dampers for proper installation for their intended function of isolating, throttling, diverting, or mixing air flows.
- L. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

### 3.3 PREPARATION

- A. Prepare a TAB plan that includes the following:
  - 1. Equipment and systems to be tested.
  - 2. Strategies and step-by-step procedures for balancing the systems.

3. Instrumentation to be used.
  4. Sample forms with specific identification for all equipment.
- B. Perform system-readiness checks of HVAC systems and equipment to verify system readiness for TAB work. Include, at a minimum, the following:
1. Airside:
    - a. Verify that leakage and pressure tests on air distribution systems have been satisfactorily completed.
    - b. Duct systems are complete with terminals installed.
    - c. Volume dampers are open and functional.
    - d. Clean filters are installed.
    - e. Automatic temperature-control systems are operational.
    - f. Ceilings are installed.
    - g. Windows and doors are installed.
      - 1) Windows and doors can be closed so indicated conditions for system operations can be met.
    - h. Suitable access to balancing devices and equipment is provided.
  2. Hydronics:
    - a. Verify leakage and pressure tests on water distribution systems have been satisfactorily completed.
    - b. Piping is complete with terminals installed.
    - c. Systems are flushed, filled, and air purged.
    - d. Shutoff and balance valves have been verified to be 100 percent open.
    - e. Pumps are started and proper rotation is verified.
    - f. Pump gauge connections are installed directly at pump inlet and outlet flanges or in discharge and suction pipe prior to valves or strainers.
    - g. Variable-frequency controllers' startup is complete and safeties are verified.
    - h. Suitable access to balancing devices and equipment is provided.

### 3.4 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system in accordance with the procedures contained in AABC's "National Standards for Total System Balance," ASHRAE 111, NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.
1. Comply with requirements in ASHRAE 62.1-2022, Section 7.2.2, "Air Balancing."
- B. Cut insulation, ducts, pipes, and equipment casings for installation of test probes to the minimum extent necessary for TAB procedures.
1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
  2. After testing and balancing, install test ports and duct access doors that comply with requirements in Section 23 33 00 "Air Duct Accessories."

3. Where holes for probes are required in piping or hydronic equipment, install pressure and temperature test plugs to seal systems.
  4. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish in accordance with Section 23 07 00 "HVAC Insulation."
- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

### 3.5 TESTING, ADJUSTING, AND BALANCING OF HVAC EQUIPMENT

- A. Test, adjust, and balance HVAC equipment indicated on Drawings, including, but not limited to, the following:
1. Terminal units.
  2. Coils.

### 3.6 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' Record drawings duct layouts.
- C. For variable-air-volume systems, develop a plan to simulate diversity.
- D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.
- E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.
- F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- G. Verify that motor starters are equipped with properly sized thermal protection.
- H. Check dampers for proper position to achieve desired airflow path.
- I. Check for airflow blockages.
- J. Check condensate drains for proper connections and functioning.
- K. Check for proper sealing of air-handling-unit components.
- L. Verify life safety dampers are accessible and fully open.

### 3.7 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

- A. Adjust the variable-air-volume systems as follows:
1. Verify that the system static pressure sensor is located two-thirds of the distance down the duct from the fan discharge.

2. Verify that the system is under static pressure control.
3. Select the terminal unit that is most critical to the supply-fan airflow. Measure inlet static pressure, and adjust system static pressure control set point so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
4. Calibrate and balance each terminal unit for maximum and minimum design airflow as follows:
  - a. Adjust controls so that terminal is calling for maximum airflow. Some controllers require starting with minimum airflow. Verify calibration procedure for specific project.
  - b. Measure airflow and adjust calibration factor as required for design maximum airflow. Record calibration factor.
  - c. When maximum airflow is correct, balance the air outlets downstream from terminal units.
  - d. Adjust controls so that terminal is calling for minimum airflow.
  - e. Measure airflow and adjust calibration factor as required for design minimum airflow. Record calibration factor. If no minimum calibration is available, note any deviation from design airflow.
  - f. On constant volume terminals, in critical areas where room pressure is to be maintained, verify that the airflow remains constant over the full range of full cooling to full heating. Note any deviation from design airflow or room pressure.
5. After terminals have been calibrated and balanced, test and adjust system for total airflow. Adjust fans to deliver total design airflows within the maximum allowable fan speed listed by fan manufacturer.
  - a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.
  - b. Set terminals for maximum airflow. If system design includes diversity, adjust terminals for maximum and minimum airflow, so that connected total matches fan selection and simulates actual load in the building.
  - c. Where duct conditions allow, measure airflow by main Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses close to the fan and prior to any outlets, to obtain total airflow.
  - d. Where duct conditions are unsuitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
6. Measure fan static pressures as follows to determine actual static pressure:
  - a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
  - b. Measure static pressure directly at the fan outlet or through the flexible connection.
  - c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
  - d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
7. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.
  - a. Report the cleanliness status of filters and the time static pressures are measured.

8. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
9. Set final return and outside airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.
  - a. Balance the return-air ducts and inlets.
  - b. Verify that terminal units are meeting design airflow under system maximum flow.
10. Re-measure the inlet static pressure at the most critical terminal unit, and adjust the system static pressure set point to the most energy-efficient set point to maintain the optimum system static pressure. Record set point and give to controls Contractor.
11. Verify final system conditions as follows:
  - a. Re-measure and confirm that minimum outdoor, return, and relief airflows are within design. Readjust to match design if necessary.
  - b. Re-measure and confirm that total airflow is within design.
  - c. Re-measure final fan operating data, speed, volts, amps, and static profile.
  - d. Mark final settings.
  - e. Test system in economizer mode. Verify proper operation and adjust if necessary. Measure and record all operating data.
  - f. Verify tracking between supply and return fans.

### 3.8 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

- A. Prepare test reports with pertinent design data, and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against the approved pump flow rate. Correct variations that exceed plus or minus 5 percent.
- B. List all mechanical specifications of tested equipment and verify against contract documents. Inspect all system components for proper installation and operation. Clean all screens.
- C. Prepare schematic diagrams of systems' "as-built" piping layouts.
- D. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:
  1. Open all manual valves for maximum flow. Close coil bypass stop valves, then set mixing control valve to full coil flow.
  2. Check liquid level in expansion tank. Verify that system is entirely full of fluid. Vent all air vents.
  3. Check makeup water-station pressure gage for adequate pressure for highest vent.
  4. Check flow-control valves for specified sequence of operation, and set at indicated flow.
  5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type unless several terminal valves are kept open.
  6. Set system controls so automatic valves are wide open to heat exchangers.
  7. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
  8. Verify that air vents in high points of water systems are installed and operating freely. Check air vents for a forceful liquid flow exiting from vents when manually operated.
  9. For each pump, verify rotation, test, and record pump shut-off head, and test and record pump wide-open head.
  10. Verify that all instruments are accurately calibrated and maintained.

- E. Measure and record upstream and downstream pressure of each piece of equipment.
- F. Measure and record upstream and downstream pressure of pressure-reducing valves.
- G. Check settings and operation of automatic temperature-control valves, self-contained control valves, and pressure-reducing valves. Record final settings.
  - 1. Check settings and operation of each safety valve. Record settings.

### 3.9 PROCEDURES FOR VARIABLE-FLOW HYDRONIC SYSTEMS

- A. Balance systems with automatic two- and three-way control valves by setting systems at maximum flow through heat-exchange terminals, and proceed as specified above for hydronic systems.
- B. Adjust the variable-flow hydronic system as follows:
  - 1. Verify that the pressure-differential sensor(s) is located as indicated.
  - 2. Determine whether there is diversity in the system.
- C. For systems with no flow diversity:
  - 1. Adjust pumps to deliver total design flow.
    - a. Measure total water flow.
      - 1) Position valves for full flow through coils.
      - 2) Measure flow by main flow meter, if installed.
      - 3) If main flow meter is not installed, determine flow by pump TDH or known equipment pressure drop.
    - b. Measure pump TDH as follows:
      - 1) Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.
      - 2) Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
      - 3) Convert pressure to head and correct for differences in gauge heights.
      - 4) Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow, and verify that the pump has the intended impeller size.
      - 5) With valves open, read pump TDH. Adjust pump discharge valve or speed until design water flow is achieved. If excessive throttling is required to achieve desired flow, recommend pump impellers be trimmed to reduce excess throttling.
    - c. Monitor motor performance during procedures, and do not operate motor in an overloaded condition.
  - 2. Adjust flow-measuring devices installed in mains and branches to design water flows.
    - a. Measure flow in main and branch pipes.
    - b. Adjust main and branch balance valves for design flow.
    - c. Re-measure each main and branch after all have been adjusted.



3. Adjust flow-measuring devices installed at terminals for each space to design water flows.
    - a. Measure flow at terminals.
    - b. Adjust each terminal to design flow.
    - c. Re-measure each terminal after it is adjusted.
    - d. Position control valves to bypass the coil, and adjust the bypass valve to maintain design flow.
    - e. Perform temperature tests after flows have been balanced.
  4. For systems with pressure-independent valves at terminals:
    - a. Measure differential pressure and verify that it is within manufacturer's specified range.
    - b. Perform temperature tests after flows have been verified.
  5. For systems without pressure-independent valves or flow-measuring devices at terminals:
    - a. Measure and balance coils by either coil pressure drop or temperature method.
    - b. If balanced by coil pressure drop, perform temperature tests after flows have been verified.
  6. Prior to verifying final system conditions, determine the system pressure-differential set point(s).
  7. If the pump discharge valve was used to set total system flow with variable-frequency controller at 60 Hz, at completion, open discharge valve 100 percent, and allow variable-frequency controller to control system differential-pressure set point. Record pump data under both conditions.
  8. Mark final settings and verify that all memory stops have been set.
  9. Verify final system conditions as follows:
    - a. Re-measure and confirm that total flow is within design.
    - b. Re-measure final pumps' operating data, TDH, volts, amps, speed, and static profile.
    - c. Mark final settings.
- D. For systems with flow diversity:
1. Determine diversity factor.
  2. Simulate system diversity by closing required number of control valves, as approved by Architect.
  3. Adjust pumps to deliver total design flow.
    - a. Measure total water flow.
      - 1) Position valves for full flow through coils.
      - 2) Measure flow by main flow meter, if installed.
      - 3) If main flow meter is not installed, determine flow by pump TDH or known equipment pressure drop.
    - b. Measure pump TDH as follows:
      - 1) Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.
      - 2) Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
      - 3) Convert pressure to head and correct for differences in gauge heights.
      - 4) Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow, and verify that the pump has the intended impeller size.

- 5) With valves open, read pump TDH. Adjust pump discharge valve or speed until design water flow is achieved. If excessive throttling is required to achieve desired flow, recommend pump impellers be trimmed to reduce excess throttling.
- c. Monitor motor performance during procedures, and do not operate motor in an overloaded condition.
4. Adjust flow-measuring devices installed in mains and branches to design water flows.
  - a. Measure flow in main and branch pipes.
  - b. Adjust main and branch balance valves for design flow.
  - c. Re-measure each main and branch after all have been adjusted.
5. Adjust flow-measuring devices installed at terminals for each space to design water flows.
  - a. Measure flow at terminals.
  - b. Adjust each terminal to design flow.
  - c. Re-measure each terminal after it is adjusted.
  - d. Position control valves to bypass the coil, and adjust the bypass valve to maintain design flow.
  - e. Perform temperature tests after flows have been balanced.
6. For systems with pressure-independent valves at terminals:
  - a. Measure differential pressure, and verify that it is within manufacturer's specified range.
  - b. Perform temperature tests after flows have been verified.
7. For systems without pressure-independent valves or flow-measuring devices at terminals:
  - a. Measure and balance coils by either coil pressure drop or temperature method.
  - b. If balanced by coil pressure drop, perform temperature tests after flows have been verified.
8. Open control valves that were shut. Close a sufficient number of control valves that were previously open to maintain diversity, and balance terminals that were just opened.
9. Prior to verifying final system conditions, determine system pressure-differential set point(s).
10. If the pump discharge valve was used to set total system flow with variable-frequency controller at 60 Hz, at completion, open discharge valve 100 percent, and allow variable-frequency controller to control system differential-pressure set point. Record pump data under both conditions.
11. Mark final settings and verify that memory stops have been set.
12. Verify final system conditions as follows:
  - a. Re-measure and confirm that total water flow is within design.
  - b. Re-measure final pumps' operating data, TDH, volts, amps, speed, and static profile.
  - c. Mark final settings.

### 3.10 DUCT LEAKAGE TESTS

- A. Witness the duct leakage testing performed by Installer.
- B. Verify that proper test methods are used and that leakage rates are within specified limits.
- C. Report deficiencies observed.

### 3.11 PIPE LEAKAGE TESTS

- A. Witness the pipe pressure testing performed by Installer.
- B. Verify that proper test methods are used and that leakage rates are within specified limits.
- C. Report deficiencies observed.

### 3.12 HVAC CONTROLS VERIFICATION

- A. In conjunction with system balancing, perform the following:
  - 1. Verify HVAC control system is operating within the design limitations.
  - 2. Confirm that the sequences of operation are in compliance with Contract Documents.
  - 3. Verify that controllers are calibrated and function as intended.
  - 4. Verify that controller set points are as indicated.
  - 5. Verify the operation of lockout or interlock systems.
  - 6. Verify the operation of valve and damper actuators.
  - 7. Verify that controlled devices are properly installed and connected to correct controller.
  - 8. Verify that controlled devices travel freely and are in position indicated by controller: open, closed, or modulating.
  - 9. Verify location and installation of sensors to ensure that they sense only intended temperature, humidity, or pressure.
- B. Reporting: Include a summary of verifications performed, remaining deficiencies, and variations from indicated conditions.

### 3.13 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

- A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.
  - 1. Measure and record the operating speed, airflow, and static pressure of each fan and equipment with fan(s).
  - 2. Measure and record flows, temperatures, and pressures of each piece of equipment in each hydronic system. Compare the values to design or nameplate information, where information is available.
  - 3. Measure motor voltage and amperage. Compare the values to motor nameplate information.
  - 4. Check the refrigerant charge.
  - 5. Check the condition of filters.
  - 6. Check the condition of coils.
  - 7. Check the operation of the drain pan and condensate-drain trap.
  - 8. Check bearings and other lubricated parts for proper lubrication.
  - 9. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.
- B. TAB After Construction: Before performing testing and balancing of renovated existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished in accordance with renovation scope indicated by Contract Documents. Verify the following:
  - 1. New filters are installed.
  - 2. Coils are clean and fins combed.

3. Drain pans are clean.
  4. Fans are clean.
  5. Bearings and other parts are properly lubricated.
  6. Deficiencies noted in the preconstruction report are corrected.
- C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.
1. Compare the indicated airflow of the renovated work to the measured fan airflows, and determine the new fan speed and the face velocity of filters and coils.
  2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
  3. If calculations increase or decrease the airflow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
  4. Balance each air outlet.

### 3.14 TOLERANCES

- A. Set HVAC system's airflow rates and water flow rates within the following tolerances:
1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent. If design value is less than 100 cfm, within 10 cfm.
  2. Air Outlets and Inlets: Plus or minus 10 percent. If design value is less than 100 cfm, within 10 cfm.
  3. Heating-Water Flow Rate: Plus or minus 10 percent. If design value is less than 10 gpm, within 10 percent.
  4. Chilled-Water Flow Rate: Plus or minus 10 percent. If design value is less than 10 gpm, within 10 percent.
  5. Condenser-Water Flow Rate: Plus or minus 10 percent.
- B. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

### 3.15 PROGRESS REPORTING

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for system-balancing devices. Recommend changes and additions to system-balancing devices, to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance-measuring and -balancing devices.
- B. Status Reports: Prepare weekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

### 3.16 FINAL REPORT

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
  2. Include a list of instruments used for procedures, along with proof of calibration.
  3. Certify validity and accuracy of field data.
- B. Final Report Contents: In addition to certified field-report data, include the following:
1. Manufacturers' test data.
  2. Field test reports prepared by system and equipment installers.
  3. Other information relative to equipment performance; do not include Shop Drawings and Product Data.
- C. General Report Data: In addition to form titles and entries, include the following data:
1. Title page.
  2. Name and address of the TAB specialist.
  3. Project name.
  4. Project location.
  5. Architect's name and address.
  6. Engineer's name and address.
  7. Contractor's name and address.
  8. Report date.
  9. Signature of TAB supervisor who certifies the report.
  10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
  11. Summary of contents, including the following:
    - a. Indicated versus final performance.
    - b. Notable characteristics of systems.
    - c. Description of system operation sequence if it varies from the Contract Documents.
  12. Nomenclature sheets for each item of equipment.
  13. Data for terminal units, including manufacturer's name, type, size, and fittings.
  14. Notes to explain why certain final data in the body of reports vary from indicated values.
  15. Test conditions for fans performance forms, including the following:
    - a. Settings for outdoor-, return-, and exhaust-air dampers.
    - b. Conditions of filters.
    - c. Cooling coil, wet- and dry-bulb conditions.
    - d. Heating coil, dry-bulb conditions.
    - e. Face and bypass damper settings at coils.
    - f. Fan drive settings, including settings and percentage of maximum pitch diameter.
    - g. Variable-frequency controller settings for variable-air-volume systems.
    - h. Settings for pressure controller(s).
    - i. Other system operating conditions that affect performance.
  16. Test conditions for pump performance forms, including the following:
    - a. Variable-frequency controller settings for variable-flow hydronic systems.
    - b. Settings for pressure controller(s).
    - c. Other system operating conditions that affect performance.

- D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
1. Quantities of outdoor, supply, return, and exhaust airflows.
  2. Water and steam flow rates.
  3. Duct, outlet, and inlet sizes.
  4. Pipe and valve sizes and locations.
  5. Terminal units.
  6. Balancing stations.
  7. Position of balancing devices.
- E. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:
1. Report Data:
    - a. System fan and air-handling-unit number.
    - b. Location and zone.
    - c. Traverse air temperature in deg F.
    - d. Duct static pressure in inches wg.
    - e. Duct size in inches.
    - f. Duct area in sq. ft..
    - g. Indicated airflow rate in cfm.
    - h. Indicated velocity in fpm.
    - i. Actual airflow rate in cfm.
    - j. Actual average velocity in fpm.
    - k. Barometric pressure in psig.
- F. Air-Terminal-Device Reports:
1. Unit Data:
    - a. System and air-handling unit identification.
    - b. Location and zone.
    - c. Apparatus used for test.
    - d. Area served.
    - e. Make.
    - f. Number from system diagram.
    - g. Type and model number.
    - h. Size.
    - i. Effective area in sq. ft..
  2. Test Data (Indicated and Actual Values):
    - a. Airflow rate in cfm.
    - b. Air velocity in fpm.
    - c. Preliminary airflow rate as needed in cfm.
    - d. Preliminary velocity as needed in fpm.
    - e. Final airflow rate in cfm.
    - f. Final velocity in fpm.
    - g. Space temperature in deg F.

G. System-Coil Reports: For reheat coils and water coils of terminal units, include the following:

1. Unit Data:
  - a. System and air-handling-unit identification.
  - b. Location and zone.
  - c. Room or riser served.
  - d. Coil make and size.
  - e. Flowmeter type.
2. Test Data (Indicated and Actual Values):
  - a. Airflow rate in cfm.
  - b. Entering-water temperature in deg F.
  - c. Leaving-water temperature in deg F.
  - d. Water pressure drop in feet of head or psig.
  - e. Entering-air temperature in deg F.
  - f. Leaving-air temperature in deg F.

H. Instrument Calibration Reports:

1. Report Data:
  - a. Instrument type and make.
  - b. Serial number.
  - c. Application.
  - d. Dates of use.
  - e. Dates of calibration.

### 3.17 VERIFICATION OF TAB REPORT

- A. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of Engineer.
- B. Engineer shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to the lesser of either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.
- C. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
- D. If recheck measurements find the number of failed measurements noncompliant with requirements indicated, proceed as follows:
  1. TAB specialists shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection. All changes shall be tracked to show changes made to previous report.
  2. If the second final inspection also fails, Owner may pursue others Contract options to complete TAB work.
- E. Prepare test and inspection reports.

### 3.18 ADDITIONAL TESTS

- A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 23 05 93



SECTION 23 07 00 - HVAC INSULATION

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Mechanical Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the mechanical drawings.
- b. Provide Insulation for all piping, equipment, etc. installed under their work. Work shall include, but not be limited, to the following:

## 1) Insulation Materials:

- a) Mineral fiber.
- b) Adhesives.
- c) Sealants.
- d) Tapes.

- c. Provide insulation for all ductwork, equipment, etc. installed under their work. Work shall include, but not be limited, to the following:

## 1) Insulation Materials:

- a) Mineral fiber.
  - i. Adhesives.
  - ii. Sealants.
  - iii. Factory-applied jackets.
  - iv. Field applied jackets.
  - v. Tapes.

## 1.2 RELATED WORK

## A. Specified elsewhere:

- 1. Section 23 31 13 – Metal Ducts for duct liners.

## 1.3 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
  - 2. Detail insulation application at elbows, fittings, dampers, specialties and flanges for each type of insulation.
  - 3. Detail attachment and covering of heat tracing inside insulation.
  - 4. Detail insulation application at pipe expansion joints for each type of insulation.
  - 5. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
  - 6. Detail removable insulation at piping specialties. Detail application of field-applied jackets.
  - 7. Detail application at linkages of control devices.
  - 8. Detail field application of each equipment type.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.
  - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
  - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or craft training program, certified by the Department of Labor, Bureau of Apprenticeship and Training.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers are to be marked with the manufacturer's name, appropriate ASTM standard designation, type and grade, and maximum use temperature.

## 1.8 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 23 05 29 "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application, duct Installer for duct insulation application, and equipment Installer for equipment insulation application. Before preparing piping and ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate clearance requirements with equipment installer for equipment installation application.
- D. Coordinate installation and testing of heat tracing.

## 1.9 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

## 2. PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products in accordance with ASTM E84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation, jacket materials, adhesive, mastic, tapes, and cement material containers with appropriate markings of applicable testing agency.
  - 1. All Insulation Installed Indoors and Outdoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

### 2.2 INSULATION MATERIALS

- A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.
- B. Products do not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel have a leachable chloride content of less than 50 ppm when tested in accordance with ASTM C871.
- D. Insulation materials for use on austenitic stainless steel are qualified as acceptable in accordance with ASTM C795.
- E. Foam insulation materials do not use CFC or HCFC blowing agents in the manufacturing process.
- F. Glass-Fiber Blanket: Glass fibers bonded with a thermosetting resin; suitable for maximum use temperature up to 450 deg F in accordance with ASTM C411. Comply with ASTM C553, Type II, and ASTM C1290, Type III with factory-applied FRK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. CertainTeed; SAINT-GOBAIN.
  - b. Johns Manville; a Berkshire Hathaway company.
  - c. Knauf Insulation.
  - d. Owens Corning.
  
- G. Glass-Fiber Board Insulation: Glass fibers bonded with a thermosetting resin; suitable for maximum use temperature between 35 deg F and 250 deg F for jacketed and between 35 deg F and 450 deg F for unfaced in accordance with ASTM C411. Comply with ASTM C612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied FRK. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed; SAINT-GOBAIN.
    - b. Johns Manville; a Berkshire Hathaway company.
    - c. Knauf Insulation.
    - d. Owens Corning.
  
- H. Mineral-Fiber, Preformed Pipe Insulation:
  1. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
  2. Type II, 1200 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type II, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
  
- I. Mineral-fiber, Pipe and Tank Insulation: Mineral or glass fibers bonded with a thermosetting resin. Semirigid board material with factory-applied ASJ complying with ASTM C 1393, Type II or Type IIIA Category 2, or with properties similar to ASTM C 612, Type IB. Nominal density is 2.5 lb/cu. ft. or more. Thermal conductivity (k-value) at 100 deg F is 0.29 Btu x in./h x sq. ft. x deg F or less. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

## 2.3 ADHESIVES

- A. Materials are compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Glass-Fiber and Mineral Wool Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
  1. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## 2.4 SEALANTS

- A. Materials are as recommended by the insulation manufacturer and are compatible with insulation materials, jackets and substrates.

B. Joint Sealants:

1. Joint Sealants for Cellular-Glass, Phenolic, and Polyisocyanurate Products: Subject to compliance with requirements, provide one of the following:
  - a. Childers Products, Division of ITW; CP-76.
  - b. Foster Products Corporation, H. B. Fuller Company; 30-45.
  - c. Mon-Eco Industries, Inc.; 44-05.
  - d. Pittsburgh Corning Corporation; Pittseal 444.
  - e. Vimasco Corporation; 750.
2. Joint Sealants for Polystyrene Products: Subject to compliance with requirements, provide one of the following:
  - a. Childers Products, Division of ITW; CP-70.
  - b. Foster Products Corporation, H. B. Fuller Company; 30-45/30-46.
  - c. Mon-Eco Industries, Inc.; 44-05.
  - d. Vimasco Corporation; 750.
3. Materials shall be compatible with insulation materials, jackets, and substrates.
  - a. Permanently flexible, elastomeric sealant.
  - b. Service Temperature Range: Minus 100 to plus 300 deg F (Minus 73 to plus 149 deg C).
  - c. Color: White or gray.
  - d. For indoor applications, 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).

3. EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
  1. Verify that systems to be insulated have been tested and are free of defects.
  2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
  1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
- C. Coordinate insulation installation with the tradesman installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use de-mineralized water.

### 3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.
- B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, compress, or otherwise damage insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips or other attachment devices to piping, fittings and specialties.
- G. Keep insulation materials dry during application and finishing. Replace insulation materials that get wet during storage or in the installation process before being properly covered and sealed in accordance with Contract Documents.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
  1. Install insulation continuously through hangers and around anchor attachments.
  2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
  3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
  4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Cut insulation in a manner to avoid compressing insulation.

- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- O. For above ambient services, do not install insulation to the following:
  - 1. Vibration-control devices.
  - 2. Testing agency labels and stamps.
  - 3. Nameplates and data plates.
  - 4. Manholes.
  - 5. Handholes.
  - 6. Cleanouts

### 3.4 PENETRATIONS

- A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

### 3.5 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
  - 1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
  - 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
  - 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
  - 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
  - 5. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
  - 6. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
  - 7. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions.

Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.

8. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.
- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
  1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
  2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
  3. Construct removable valve insulation covers in same manner as for flanges except divide the two-part section on the vertical center line of valve body.
  4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
  5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

### 3.6 INSTALLATION OF GLASS-FIBER AND MINERAL-WOOL INSULATION ON DUCTS AND PLENUMS

- A. Secure with adhesive and insulation pins.
- B. Comply with manufacturer's written installation instructions.
  1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
  2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
  3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    - a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    - b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    - d. Do not overcompress insulation during installation.
    - e. Impale insulation over pins and attach speed washers.
    - f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.



4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
    - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
  5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
  6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
  7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.
- C. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
  2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
  3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    - a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    - b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    - c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    - d. Do not overcompress insulation during installation.
    - e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
  4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
    - a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    - b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.

5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

### 3.7 INSTALLATION OF GLASS-FIBER AND MINERAL-WOOL INSULATION ON STRAIGHT PIPES AND TUBES

#### A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

#### B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

#### C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

#### D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

### 3.8 FINISHES

- A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."
  - 1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
    - a. Finish Coat Material: Interior, flat, latex-emulsion size.
- B. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.
- C. Do not field paint aluminum or stainless steel jackets.

### 3.9 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
- C. Tests and Inspections: Inspect ductwork and pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation.
  - 1. Extent of inspection is limited to three locations of:
    - a. Straight pipe
    - b. Threaded and welded fittings
    - c. Threaded and flanged valves
  - 2. Extent of inspection is limited to one for each of the duct systems defined in the "Duct Insulation Schedule".
- D. All insulation applications will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

### 3.10 DUCT INSULATION SCHEDULE, GENERAL

- A. Plenums and Ducts Requiring Insulation:
  - 1. Indoor, concealed supply and outdoor air.
  - 2. Indoor, concealed return located in unconditioned space.
- B. Items Not Insulated:
  - 1. Factory-insulated flexible ducts.

### 3.11 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Concealed, rectangular, round and flat-oval, supply air and outside air duct insulation is the following:

1. Glass-Fiber Blanket: 1-1/2 inches thick and 1.0 lb/cu. ft. nominal density.

#### 3.12 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
  1. Drainage piping located in crawl spaces.
  2. Underground piping.
  3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

#### 3.13 PIPING INSULATION SCHEDULE

- A. Heating-Hot-Water Supply and Return:
  1. NPS 3 and Smaller: Insulation shall be the following:
    - a. Mineral-Fiber, Preformed Pipe, Type I: 1 inch thick.

#### 3.14 INSULATION OF EXISTING SYSTEMS

- A. Insulate existing systems that were previously uninsulated as listed below:
  1. Hot water piping.
  2. Supply ductwork.

END OF SECTION 23 07 00

SECTION 23 21 13 - HYDRONIC PIPING AND SPECIALTIES

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Mechanical Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the mechanical drawings:

- 1) This Section includes pipe and fitting materials, joining methods for the following:

- a) Copper tube and fittings.
- b) Piping joining materials.
- c) Transition fittings.
- d) Piping system applications.

## 1.2 ACTION SUBMITTALS

## A. Product Data: For each type of the following:

- 1. Pipe and tube.
- 2. Fittings.
- 3. Joining materials.
- 4. Transition fittings.
- 5. Include construction details and material descriptions for hydronic piping specialties.
- 6. Include rated capacities, operating characteristics, and furnished specialties and accessories.
- 7. Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.

## 1.3 CLOSEOUT SUBMITTALS

## A. Operation and Maintenance Data: For hydronic piping specialties to include in emergency, operation, and maintenance manuals.

## B. Meter fluid when filling hydronic systems, document system volume in as-built drawings.

## 1.4 MAINTENANCE MATERIAL SUBMITTALS

## A. Differential Pressure Meter: For each type of balancing valve and automatic flow control valve, include flowmeter, probes, hoses, flow charts, and carrying case.

## 1.5 INFORMATIONAL SUBMITTALS

## A. Coordination Drawings: Piping layout, or BIM model, drawn to scale, indicating the items described in this Section, and coordinated with all building trades.

## B. Qualification Data: For Installer.

## C. Welding certificates.

D. Water Analysis: Submit a copy of the water analysis to illustrate water quality available at Project site.

## 1.6 QUALITY ASSURANCE

### A. Installer Qualifications:

1. Installers of Pressure-Sealed Joints: Installers are to be certified by pressure-seal joint manufacturer as having been trained and qualified to join piping with pressure-seal pipe couplings and fittings.

B. Steel Support Welding: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

C. Pipe Welding: Qualify procedures and operators in accordance with ASME Boiler and Pressure Vessel Code: Section IX.

1. Comply with ASME B31.9 for materials, products, and installation.
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

D. Pipe Welding: Qualify procedures and operators in accordance with ASME BPVC, Section IX.

E. Pressure-relief and safety-relief valves and pressure vessels bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME BPVC, Section VIII, Division 1.

## 2. PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation are to be capable of withstanding the following minimum working pressures and temperatures unless otherwise indicated:

1. Hot-Water Heating Piping: 100 psig at 200 deg F.

### 2.2 COPPER TUBE AND FITTINGS

A. Drawn-Temper Copper Tube: ASTM B88, Type L.

B. Annealed-Temper Copper Tube: ASTM B88, Type K.

C. DWV Copper Tube: ASTM B306, Type DWV.

D. Wrought-Copper, Solder-Joint Fittings: ASME B16.22 pressure fittings. Do not use solder joints on pipe sizes greater than NPS 4.

E. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends. Do not use solder joints on pipe sizes greater than NPS 4.

F. Wrought-Copper Unions: ASME B16.22. Do not use solder joints on pipe sizes greater than NPS 4.

G. Copper-Tube, Mechanically Formed Tee Fitting: For forming T-branch on copper water tube.

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

- a. Apollo Valves; a part of Aalberts Integrated Piping Systems.
  - b. T-DRILL Industries Inc.
- 2. Description: Tee formed in copper tube in accordance with ASTM F2014.
- H. Copper-Tube, Pressure-Seal-Joint Fittings - Copper or Bronze:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Apollo Valves; a part of Aalberts Integrated Piping Systems.
    - b. Copper Press Brand; Merit Brass Company.
    - c. Elkhart Products Corporation; a part of Aalberts Integrated Piping Systems.
    - d. FNW; Ferguson Enterprises, Inc.
    - e. Mueller Streamline Co.; a company of Mueller Industries.
    - f. NIBCO INC.
    - g. Victaulic Company.
    - h. Viega LLC.
  - 2. Source Limitations: Obtain copper-tube pressure-seal-joint fittings from single manufacturer.
  - 3. Housing: Copper or bronze.
  - 4. O-Rings and Pipe Stops: EPDM.
  - 5. Tools: Manufacturer's special tools.
  - 6. Minimum 200 psig working pressure rating at 250 deg F.

## 2.3 HYDRONIC SPECIALTY VALVES

- A. Gate, Globe, Check, Ball, and Butterfly Valves: Comply with requirements specified in Section 23 05 23 "General-Duty Valves for HVAC Piping".
- B. Automatic Temperature-Control Valves, Actuators, and Sensors: Comply with requirements specified in Section 23 09 00 "Instrumentation and Controls for HVAC".
- C. Manufacturers
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Armstrong Pumps, Inc.
    - b. Bell & Gossett Domestic Pump; a division of ITT Industries.
    - c. Flow Design, Inc.
    - d. Gerand Engineering Co.
    - e. Griswold Controls.
    - f. Taco.
    - g. Tour and Anderson.
- D. Bronze, Calibrated-Orifice, Balancing Valves (NPS ½ to NPS 2):
  - 1. Body: Bronze, ball or plug type with calibrated orifice or venturi.
  - 2. Ball: Brass or stainless steel.
  - 3. Plug: Resin.
  - 4. Seat: PTFE.
  - 5. End Connections: Threaded or socket.
  - 6. Pressure Gauge Connections: Integral seals for portable differential pressure meter.

7. Handle Style: Lever, with memory stop to retain set position.
8. CWP Rating: Minimum 125 psig.
9. Maximum Operating Temperature: 250 deg F.

## 2.4 AIR VENTS

### A. Manual Air Vents:

1. Body: Bronze.
2. Internal Parts: Nonferrous.
3. Operator: Screwdriver or thumbscrew.
4. Inlet Connection: NPS 1/2.
5. Discharge Connection: NPS 1/8.
6. CWP Rating: 150 psig.
7. Maximum Operating Temperature: 225 deg F.

### B. Automatic Air Vents:

1. Body: Bronze or cast iron.
2. Internal Parts: Nonferrous.
3. Operator: Noncorrosive metal float.
4. Inlet Connection: NPS 1/2.
5. Discharge Connection: NPS 1/4.
6. CWP Rating: 150 psig.
7. Maximum Operating Temperature: 240 deg F.

## 2.5 PIPING JOINING MATERIALS

### A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness unless otherwise indicated.
  - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
  - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

### B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

### C. Solder Filler Metals: ASTM B32, lead-free alloys.

### D. Flux: ASTM B813, water flushable.

### E. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BAg-1, silver alloy for joining copper with bronze or steel.

### F. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

## 2.6 TRANSITION FITTINGS

### A. General Requirements:

1. Same size as pipes to be joined.



2. Pressure rating at least equal to pipes to be joined.
    3. End connections compatible with pipes to be joined.
  - B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
3. EXECUTION
- 3.1 EXAMINATION
- A. Examine all piping specialties for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
  - B. Examine threads on all devices for form and cleanliness.
  - C. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
  - D. Do not attempt to repair defective piping specialties; replace with new devices. Remove defective piping specialties from site.
- 3.2 PIPING APPLICATIONS
- A. Viega ProPress pipe system will be an acceptable method of HVAC pipe installation and joining for piping 2" and less.
  - B. Install all vents for all of the safety valves, pressure reducing valves and all equipment in this contract requiring such vents. Connect safety valves to vent lines with an open connection made by sliding a larger pipe over the stub from exhaust valve. Unless otherwise shown on the drawings, extend vents through roof and where possible pitch all vent piping to drain into a condensate receiver. Flash all vents through roof with a 12" high roof jack fabricated of 6 lb sheet lead and extend 12" from side of vent in all directions on roof. Provide counter-flashing rain skirt clamped around pipe over top of roof jack.
  - C. Hot-Water Heating Piping, Aboveground, NPS 2 (DN 50) and Smaller, to Be Either of the Following:
    1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or pressure-seal joints.
- 3.3 INSTALLATION OF VALVES
- A. Install shutoff-duty valves at each branch connection to supply mains, and at supply connection to each piece of equipment.
  - B. Install calibrated-orifice, balancing valves at each branch connection to return main.
  - C. Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal.
  - D. Install check valves at each pump discharge and elsewhere as required to control flow direction.
  - E. Install safety valves at hot-water generators and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install drip-pan elbow on safety-valve outlet and pipe without valves to the outdoors; and

pipe drain to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 01, for installation requirements.

- F. Install pressure-reducing valves at makeup-water connection to regulate system fill pressure.

### 3.4 INSTALLATION OF PIPING

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Select system components with pressure rating equal to or greater than system operating pressure.
- K. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- L. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
- M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- N. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
- O. Install branch connections to mains using mechanically formed tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
- P. Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
- Q. Install flanges in piping, NPS 2-1/2 and larger, at final connections of equipment and elsewhere as indicated.
- R. Install shutoff valve immediately upstream of each dielectric fitting.

- S. Comply with requirements in Section 23 05 00 "Common Work Results for HVAC" for installation of expansion loops, expansion joints, anchors, and pipe alignment guides.
- T. Comply with requirements in Section 23 05 53 "Identification for HVAC Piping and Equipment" for identifying piping.
- U. Install expansion loops, expansion joints, anchors, and pipe alignment guides as specified in Section 23 05 16 "Expansion Fittings and Loops for HVAC Piping."
- V. Identify piping as specified in Section 23 05 53 "Identification for HVAC Piping and Equipment."
- W. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 23 05 00 "Common Work Results for HVAC."
- X. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 23 05 00 "Common Work Results for HVAC."

### 3.5 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Soldered Joints: Apply ASTM B813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints in accordance with ASTM B828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B32.
- D. Brazed Joints: Construct joints in accordance with AWS's "Brazing Handbook," "Pipe and Tube" chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8/A5.8M.
- E. Threaded Joints: Thread pipe with tapered pipe threads in accordance with ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- F. Welded Joints: Construct joints in accordance with AWS D10.12M/D10.12, using qualified processes and welding operators in accordance with "Quality Assurance" Article.
- G. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- H. Mechanically Formed Tee Fittings: Use manufacturer-recommended tools, procedure, and brazed joints.
- I. Pressure-Seal Joints: Use manufacturer-recommended tools and procedure. Leave insertion marks on pipe after assembly.

### 3.6 INSTALLATION OF HANGERS AND SUPPORTS

- A. Comply with requirements for seismic-restraint devices specified in Section 23 05 48 "Vibration and Seismic Controls for HVAC."
- B. Comply with requirements in Section 23 05 29 "Hangers and Supports for HVAC Piping and Equipment" for hangers, supports, and anchor devices.
- C. Install the following pipe attachments:
  - 1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
  - 2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
  - 3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
  - 4. Spring hangers to support vertical runs.
  - 5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
- D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:
  - 1. NPS 3/4: Maximum span, 7 feet; minimum rod size, 1/4 inch.
  - 2. NPS 1: Maximum span, 7 feet; minimum rod size, 1/4 inch.
  - 3. NPS 1-1/2: Maximum span, 9 feet; minimum rod size, 3/8 inch.
  - 4. NPS 6: Maximum span, 17 feet; minimum rod size, 1/2 inch.
- E. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:
  - 1. NPS 3/4: Maximum span, 5 feet; minimum rod size, 1/4 inch.
  - 2. NPS 1: Maximum span, 6 feet; minimum rod size, 1/4 inch.
  - 3. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
- F. Support horizontal piping within 12 inches of each fitting and coupling.
- G. Support vertical runs of copper tubing and steel piping to comply with MSS SP-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

### 3.7 HYDRONIC SPECIALTIES INSTALLATION

- A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.
- B. Install automatic air vents at high points of system piping in mechanical equipment rooms only.
  - 1. Provide air outlet drain line full size of air outlet to floor drain or to other point indicated on Drawings.
- C. Install manual vents at heat-transfer coils and elsewhere as required for air venting.
- D. Install in-line air separators in pump suction. Install drain valve on air separators NPS 2 and larger.
- E. Install tangential air separator in pump suction. Install blowdown piping with gate or full-port ball valve full size of separator outlet; extend full size to nearest floor drain.

- F. Install expansion tanks having direct air/water interface above the air separator or air purger. Install tank fitting in tank bottom and charge tank. Use manual vent for initial fill to establish proper water level in tank.
  - 1. Install tank fittings that are shipped loose.
  - 2. Support tank from floor or structure above with sufficient strength to carry weight of tank, piping connections, and fittings, plus tank full of water. Do not overload building components and structural members.
  - 3. Install piping from air separator or air purger to expansion tank with a 2 percent upward slope toward tank to avoid air entrapment.
- G. Install diaphragm- or bladder-type expansion tanks on the floor.
- H. Vent and purge air from hydronic system, and ensure that tank is properly charged with air to suit system Project requirements.

### 3.8 TERMINAL EQUIPMENT CONNECTIONS

- A. Sizes for supply and return piping connections are to be the same as or larger than equipment connections.
- B. Install control valves in accessible locations close to connected equipment.
- C. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.
- D. Install ports for pressure gauges and thermometers at coil inlet and outlet connections. Comply with requirements in Section 23 05 00 "Common Work Results for HVAC."

### 3.9 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification materials and installation in Section 23 05 53 "Identification for HVAC Piping and Equipment."

### 3.10 SYSTEM STARTUP

- A. Perform the following before operating the system:
  - 1. Open manual valves fully.
  - 2. Inspect pumps for proper rotation.
  - 3. Set makeup pressure-reducing valves for required system pressure.
  - 4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
  - 5. Set temperature controls so all coils are calling for full flow.
  - 6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
  - 7. Verify lubrication of motors and bearings.
  - 8. Meter fluid when filling hydronic systems. Stencil system volume and date of metering on associated expansion tank.

### 3.11 FIELD QUALITY CONTROL

- A. Prepare hydronic piping in accordance with ASME B31.9 and as follows:

1. Leave joints, including welds, uninsulated and exposed for examination during test.
  2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
  3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
  4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure is to be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
  5. Install pressure-relief valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.
- B. Perform the following tests on hydronic piping:
1. Use ambient-temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
  2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
  3. Isolate expansion tanks and determine that hydronic system is full of water.
  4. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure is not to exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the "SE" value in Appendix A in ASME B31.9.
  5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
  6. Prepare written report of testing.

END OF SECTION 23 21 13

SECTION 23 31 13 - METAL DUCTS

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Mechanical Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the mechanical drawings:

- 1) Single-wall rectangular ducts and fittings.
- 2) Double-wall round and flat-oval ducts and fittings.
- 3) Sheet metal materials.
- 4) Sealants and gaskets.
- 5) Hangers and supports.

## 1.2 RELATED WORK

## A. Specified elsewhere:

1. Section 23 05 93 – Testing, Adjusting, and Balancing for HVAC for testing, adjusting, and balancing requirements for metal ducts.
2. Section 23 33 00 – Air Duct Accessories for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

## 1.3 DEFINITIONS

- A. OSHPD: Office of Statewide Health Planning and Development (State of California).

## 1.4 ACTION SUBMITTALS

## A. Product Data: For each type of the following products:

1. Liners and adhesives.
2. Sealants and gaskets.
3. Seismic-restraint devices.

## B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
4. Elevation of top and bottom of ducts.
5. Dimensions of main duct runs from building grid lines.
6. Fittings.
7. Reinforcement and spacing.
8. Seam and joint construction.
9. Equipment installation based on equipment being used on Project.
10. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.

11. Hangers and supports, including methods for duct and building attachment and vibration isolation.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: A single set of plans or BIM model, drawn to scale, showing the items described in this Section, and coordinated with all building trades.
- B. Welding certificates.
- C. Field quality-control reports.

## 1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
  - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum supports.
  - 3. AWS D9.1/D9.1M, "Sheet Metal Welding Code," for duct joint and seam welding.

## 2. PRODUCTS

### 2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
  - 1. Construct ducts of galvanized sheet steel unless otherwise indicated.
- B. Transverse Joints: Fabricate joints in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Ch. 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

### 2.2 DOUBLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Linx Industries; a DMI company (formerly Lindab).
  - 2. McGill AirFlow LLC.
  - 3. SEMCO, LLC; part of FlaktGroup.
  - 4. Sheet Metal Connectors, Inc.



- B. Source Limitations: Obtain double-wall round and flat oval ducts and fittings from single manufacturer.
- C. Flat-Oval Ducts: Indicated dimensions are the duct width (major dimension) and diameter of the round sides connecting the flat portions of the duct (minor dimension) of the inner duct.
- D. Outer Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Ch. 3, "Round, Oval, and Flexible Duct," based on static-pressure class unless otherwise indicated.
  - 1. Construct ducts of galvanized sheet steel unless otherwise indicated.
  - 2. Transverse Joints: Select joint types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 3. Longitudinal Seams: Select seam types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 4. Tees and Laterals: Select types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Inner Duct: Minimum 24-gauge perforated galvanized sheet steel having 3/32-inch-diameter perforations, with overall open area of 23 percent.
- F. Interstitial Insulation, Fibrous Glass: Duct liner complying with ASTM C1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."
  - 1. Install spacers that position the inner duct at uniform distance from outer duct without compressing insulation.
  - 2. Cover insulation with polyester film complying with UL 181, Class 1.

## 2.3 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials are to be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A653/A653M.
  - 1. Galvanized Coating Designation: G60.
  - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Carbon-Steel Sheets: Comply with ASTM A1008/A1008M, with oiled, matte finish for exposed ducts.
- D. Stainless Steel Sheets: Comply with ASTM A480/A480M, Type 304 or 316, as indicated in "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish is to be No. 2B, No. 2D, No. 3, or No. 4 as indicated in "Duct Schedule" Article.

- E. Aluminum Sheets: Comply with ASTM B209 Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.
- F. Reinforcement Shapes and Plates: ASTM A36/A36M, steel plates, shapes, and bars; black and galvanized.
  - 1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.
- G. Tie Rods: Galvanized steel, 1/4-inch-minimum diameter for lengths 36 inches or less; 3/8-inch-minimum diameter for lengths longer than 36 inches.

## 2.4 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets are to be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested in accordance with UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:
  - 1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
  - 2. Tape Width: 4 inches.
  - 3. Sealant: Modified styrene acrylic.
  - 4. Water resistant.
  - 5. Mold and mildew resistant.
  - 6. Maximum Static-Pressure Class: 10 inch wg, positive and negative.
  - 7. Service: Indoor and outdoor.
  - 8. Service Temperature: Minus 40 to plus 200 deg F.
  - 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
- C. Water-Based Joint and Seam Sealant:
  - 1. Application Method: Brush on.
  - 2. Solids Content: Minimum 65 percent.
  - 3. Shore A Hardness: Minimum 20.
  - 4. Water resistant.
  - 5. Mold and mildew resistant.
  - 6. VOC: Maximum 75 g/L (less water).
  - 7. Maximum Static-Pressure Class: 10 inch wg, positive and negative.
  - 8. Service: Indoor or outdoor.
  - 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.
- D. Flanged Joint Sealant: Comply with ASTM C920.
  - 1. General: Single-component, acid-curing, silicone, elastomeric.
  - 2. Type: S.
  - 3. Grade: NS.
  - 4. Class: 25.
  - 5. Use: O.

- E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

## 2.5 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Galvanized-steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A603.
- E. Steel Cables for Stainless Steel Ducts: Stainless steel complying with ASTM A492.
- F. Steel Cable End Connections: Galvanized-steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- H. Trapeze and Riser Supports:
  - 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
  - 2. Supports for Stainless Steel Ducts: Stainless steel shapes and plates.
  - 3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

## 2.6 RECTANGULAR DUCT FABRICATION

- A. Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" and complying with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.
  - 1. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure class.
  - 2. Deflection: Duct systems shall not exceed deflection limits according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
- B. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches and larger and 0.0359 inch thick or less, with more than 10 sq. ft. of nonbraced panel area unless ducts are lined.

## 3. EXECUTION

### 3.1 DUCT INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and coordination drawings.

- B. All ducts shall be of size indicated on the drawings. In no case shall the indicated duct size be changed without written approval of the Architect / Engineer.
- C. Duct sizes shown on drawings are met inside area. Where duct lining is specified, increase duct sizes to allow for lining.
- D. Install ducts in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- E. Install ducts in maximum practical lengths with fewest possible joints.
- F. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- G. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- H. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- I. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- J. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- K. Where ducts pass through non-fire rated interior partitions, seal around duct with non-combustible material.
- L. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions.
- M. Coordinate layout with suspended ceiling, fire- and smoke-control dampers, lighting layouts, and similar finished work.
- N. Seal all joints and seams. Apply sealant to male end connectors before insertion, and afterward to cover entire joint and sheet metal screws.
- O. Non-Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls and are exposed to view, conceal spaces between construction openings and ducts or duct insulation with sheet metal flanges of same metal thickness as ducts. Overlap openings on 4 sides by at least 1-1/2 inches.
- P. Protect duct interiors from the elements and foreign materials until building is enclosed. Follow SMACNA's "Duct Cleanliness for New Construction."
- Q. Paint visible interiors of metal ducts located behind grilles and registers. Apply one coat of flat, black, latex finish coat over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Division 9 painting Sections.
  - 1. Paint not required for ductwork with fiberglass liner.
- R. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

- S. Install heating coils, cooling coils, air filters, dampers, and all other duct-mounted accessories in air ducts where indicated on Drawings.
- T. Protect duct interiors from moisture, construction debris and dust, and other foreign materials both before and after installation.
- U. Elbows: Use long-radius elbows wherever they fit.
  - 1. Fabricate 90-degree rectangular mitered elbows to include turning vanes.
  - 2. Fabricate 90-degree round elbows with a minimum of three segments for 12 inches and smaller and a minimum of five segments for 14 inches and larger.
- V. Branch Connections: Use lateral or conical branch connections.

### 3.2 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal ducts at a minimum to the following seal classes in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
  - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 2. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
  - 3. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
  - 4. Conditioned Space, Exhaust Ducts: Seal Class B.
  - 5. Conditioned Space, Return-Air Ducts: Seal Class C.
- C. Seal ducts before external insulation is applied.

### 3.3 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
  - 1. Where practical, install concrete inserts before placing concrete.
  - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
  - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
  - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
  - 5. Do not use powder-actuated concrete fasteners for seismic restraints. Coordinate with Section 23 05 48 "Vibration and Seismic Controls for HVAC."
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.

- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

#### 3.4 DUCTWORK CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Section 23 33 00 "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

#### 3.5 PAINTING

- A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Division 9 Sections "Exterior Painting" and "Interior Painting."

#### 3.6 DUCT CLEANING

- A. Clean new duct system(s) before testing, adjusting, and balancing.
- B. For cleaning of existing ductwork, see Section 23 01 30.52 "Existing HVAC Air Distribution System Cleaning."
- C. Use duct cleaning methodology as indicated in NADCA ACR.

#### 3.7 STARTUP

- A. Air Balance: Comply with requirements in Section 23 05 93 "Testing, Adjusting, and Balancing for HVAC."

#### 3.8 DUCT SCHEDULE

- A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:
  - 1. Fabricate all ducts to achieve SMACNA pressure class, seal class, and leakage class as indicated below.
- B. Supply Ducts:
  - 1. Ducts Connected to Terminal Units:
    - a. Pressure Class: Positive 2-inch wg.
    - b. Minimum SMACNA Seal Class: B.
    - c. SMACNA Leakage Class for Rectangular: 12.
    - d. SMACNA Leakage Class for Round and Flat Oval: 12.
  - 2. Ducts Connected to Variable-Air-Volume Air-Handling Units:
    - a. Pressure Class: Positive 4-inch wg.

- b. Minimum SMACNA Seal Class: A.
- c. SMACNA Leakage Class for Rectangular: 6.
- d. SMACNA Leakage Class for Round and Flat Oval: 6.

C. Return Ducts:

1. Ducts Connected to Air-Handling Units:

- a. Pressure Class: Positive or negative 2-inch wg.
- b. Minimum SMACNA Seal Class: B.
- c. SMACNA Leakage Class for Rectangular: 6.
- d. SMACNA Leakage Class for Round and Flat Oval: 6.

END OF SECTION 23 31 13

SECTION 23 33 00 - AIR DUCT ACCESSORIES

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Mechanical Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the mechanical drawings:

- 1) Manual volume dampers.
- 2) Flange connectors.
- 3) Flexible ducts.
- 4) Flexible duct connectors.
- 5) Duct accessory hardware.

## 1.2 ACTION SUBMITTALS

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

1. For duct silencers, include pressure drop, dynamic insertion loss, and self-generated noise data. Include breakout noise calculations for high-transmission-loss casings.

## B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details, and attachments to other work.

1. Detail duct accessories' fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
  - a. Special fittings.
  - b. Manual volume damper installations.
  - c. Motorized-control-damper installations.
  - d. Fire-damper, smoke-damper, combination fire- and smoke-damper, ceiling, and corridor-damper installations, including sleeves; and duct-mounted access doors and remote damper operators.
  - e. Duct security bars.
  - f. Include diagrams for power, signal, and control wiring.

## 1.3 CLOSEOUT SUBMITTALS

## A. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

## B. Product Data: For each type of product indicated.

1. For duct silencers, include pressure drop and dynamic insertion loss data. Include breakout noise calculations for high transmission loss casings.



#### 1.4 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. Fusible Links: Furnish quantity equal to 10 percent of amount installed.

#### 2. PRODUCTS

##### 2.1 PERFORMANCE REQUIREMENTS

- A. Comply with NFPA 90A and NFPA 90B.
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

##### 2.2 MANUAL VOLUME DAMPERS

- A. Standard, Steel, Manual Volume Dampers:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Air Balance; MESTEK, Inc.
    - b. Aire Technologies, Inc.; DMI Companies.
    - c. Arrow United Industries; Mestek, Inc.
    - d. Cesco Products; MESTEK, Inc.
    - e. Greenheck Fan Corporation.
    - f. McGill AirFlow LLC.
    - g. Nailor Industries Inc.
    - h. Ruskin; Air Distribution Technologies, Inc.; Johnson Controls, Inc.
  - 2. Performance:
    - a. Leakage Rating Class III: Leakage not exceeding 40 cfm/sq. ft. against 1-inch wg differential static pressure.
  - 3. Construction:
    - a. Linkage out of airstream.
    - b. Suitable for horizontal or vertical airflow applications.
  - 4. Frames:
    - a. Hat-shaped, 16-gauge-thick, galvanized sheet steel.
    - b. Mitered and welded corners.
    - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
  - 5. Blades:
    - a. Multiple or single blade.
    - b. Parallel- or opposed-blade design.

- c. Stiffen damper blades for stability.
  - d. Galvanized steel; 16 gauge thick.
- 6. Blade Axles: Galvanized steel.
  - 7. Bearings:
    - a. Oil-impregnated bronze or molded synthetic.
    - b. Dampers mounted with vertical blades to have thrust bearing at each end of every blade.
  - 8. Tie Bars and Brackets: Galvanized steel.
  - 9. Locking device to hold damper blades in a fixed position without vibration.

### 2.3 FLANGE CONNECTORS

- A. Description: Add-on or roll-formed, factory fabricated, slide-on transverse flange connectors, gaskets, and components.
- B. Material: Galvanized steel.
- C. Gauge and Shape: Match connecting ductwork.

### 2.4 FLEXIBLE DUCTS

- A. Insulated, Flexible Duct: UL 181, Class 1, 2-ply vinyl film supported by helically wound, spring-steel wire; fibrous-glass insulation; aluminized vapor-barrier film.
  - 1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
  - 2. Maximum Air Velocity: 4000 fpm.
  - 3. Temperature Range: Minus 10 to plus 160 deg F.
  - 4. Insulation R-Value: Comply with ASHRAE/IES 90.1.
- B. Flexible Duct Connectors:
  - 1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.
  - 2. Provide manual balancing dampers at each flex connections to the branch duct. Provide 200% duct area take-off fittings at all flex connections to branch ducts.
- C. Flexible duct for connections between return air duct and return air registers shall be similar to supply duct.
- D. Maximum length of installed flex shall be 4 feet. Do not install flex above inaccessible ceilings.
- E. Flex duct sizes shall be as follows (use larger duct if shown on drawings).

| Flex Duct Size | Cfm<br>(at .10"/100ft) |
|----------------|------------------------|
| 5"             | 55                     |
| 6"             | 90                     |
| 7"             | 140                    |
| 8"             | 200                    |
| 10"            | 380                    |
| 12"            | 600                    |

| Flex Duct Size | Cfm<br>(at .10"/100ft) |
|----------------|------------------------|
| 14"            | 860                    |
| 16"            | 1300                   |

## 2.5 FLEXIBLE DUCT CONNECTORS

- A. Clamps: Stainless steel band with stainless steel or zinc-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.

## 2.6 DUCT ACCESSORY HARDWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. CL WARD & Family Inc.
  2. Ductmate Industries, Inc; a DMI company.
  3. Duro Dyne Inc.
  4. DynAir; a Carlisle Company.
  5. Elgen Manufacturing.
  6. Hardcast; Carlisle Construction Materials.
  7. United Enertech Corp.
  8. Ventfabrics, Inc.
  9. Ward Industries; a brand of Hart & Cooley, LLC.
- B. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- C. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

## 2.7 MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A653/A653M.
  1. Galvanized Coating Designation: G60.
  2. Exposed-Surface Finish: Mill phosphatized.
- C. Stainless Steel Sheets: Comply with ASTM A480/A480M, Type 304, and having a No. 2 finish for concealed ducts and No. 4 finish for exposed ducts.
- D. Aluminum Sheets: Comply with ASTM B209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, one-side bright finish for exposed ducts.
- E. Extruded Aluminum: Comply with ASTM B221, Alloy 6063, Temper T6.
- F. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless steel ducts.

- G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

### 3. EXECUTION

#### 3.1 INSTALLATION

- A. Install duct accessories in accordance with applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116 for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless steel accessories in stainless steel ducts, and aluminum accessories in aluminum ducts.
- C. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
  - 1. Install steel volume dampers in steel ducts.
  - 2. Install aluminum volume dampers in aluminum ducts.
- D. Set dampers to fully open position before testing, adjusting, and balancing.
- E. Install test holes at fan inlets and outlets and elsewhere as indicated and as needed for testing and balancing.
- F. Install duct test holes where required for testing and balancing purposes.
- G. Installation of Flexible Ducts
  - 1. Install flexible ducts in accordance with applicable details in the following publications:
    - a. ADC's "Flexible Duct Performance & Installation Standards" for flexible ducts.
    - b. NAIMA AH116.
    - c. SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts.
    - d. SMACNA's "Fibrous Glass Duct Construction Standards" for fibrous-glass ducts.
  - 2. Install in indoor applications only. Do not install flexible duct in locations where it will be exposed to UV lighting.
  - 3. Connect terminal units to supply ducts directly or with maximum 12-inch lengths of flexible duct. Do not use flexible ducts to change directions. Do not install flexible duct above inaccessible ceilings.
  - 4. Connect diffusers and light troffer boots to ducts directly or with maximum 48-inch lengths of flexible duct clamped or strapped in place. Do not install flexible duct above inaccessible ceilings.
  - 5. Connect flexible ducts to metal ducts with draw bands.
  - 6. Installation:
    - a. Install ducts fully extended.
    - b. Do not bend ducts across sharp corners.
    - c. Bends of flexible ducting must not exceed a minimum of one-duct diameter.
    - d. Avoid contact with metal fixtures, water lines, pipes, or conduits.
    - e. Install flexible ducts in a direct line, without sags, twists, or turns.
    - f. Install in accordance with ADC instructions.

7. Supporting Flexible Ducts:

- a. Support flexible duct at manufacturer's recommended intervals, but at no greater distance than 4 ft. Provide sufficient support so that maximum centerline sag is 1/2 in. per ft. between supports. A connection to rigid duct or equipment may be considered a support joint.
  - b. Install extra supports at bends placed approximately one-duct diameter from center line of the bend.
  - c. Ducts may rest on ceiling joists or truss supports. Spacing between supports must not exceed the maximum spacing in accordance with manufacturer's written installation instructions.
  - d. Vertically installed ducts must be stabilized by support straps at a maximum of 72 inches o.c.
- H. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop of fans.
- I. Provide airtight and grease tight cleanout doors in kitchen hood exhaust ductwork. Provide at each connection in horizontal ducts, at each elbow, every 20' in straight duct and above every floor in vertical risers.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

- 1. Operate dampers to verify full range of movement.

END OF SECTION 23 33 00

SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Electrical equipment coordination and installation.
  - 2) Common electrical installation requirements.

## 2. PRODUCTS – DOES NOT APPLY

## 3. EXECUTION

## 3.1 INSPECTION OF BID DOCUMENTS AND PREMISES

- A. Visit the premises, take measurements and verify all elevations shown on the drawings, inspect existing conditions and limitations, obtain first hand information necessary to submit a complete bid.
- B. Thoroughly examine the complete set of contract documents including work required by other trades. Bidders are cautioned to acquaint themselves with requirements necessitating installation work of material or equipment furnished by other contractors or the Owner.
- C. In the event of any conflict, discrepancy or inconsistency among the Contract Documents, interpretation shall be based on the following descending order or priority:
  - 1. Specifications.
  - 2. Drawings, and among the drawings, the following:
    - a. as between figures given on drawings and scaled measurements, the figures shall govern;
    - b. as between large scale drawings and small-scale drawings, the large-scale drawings shall govern.
  - 3. In the event that Work is called for by the drawings but not by the specifications, or by the specifications but not by the drawings, the Contractor shall be responsible for such Work.

## 3.2 PERMITS AND FEES

- A. Obtain and pay for all permits and make all deposits necessary for the installation of the work under his contract.
- B. Where inspections of the work are required by State or local authorities, obtain certificates of inspection of the work by such authorities, and these certificates (in triplicate) shall be submitted to the Architect / Engineer.

### 3.3 COORDINATION

- A. Coordinate arrangement, mounting, and support of electrical equipment:
  - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
  - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
  - 3. To allow right of way for piping and conduit installed at required slope.
  - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

### 3.4 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Space Preference:
  - 1. Carefully verify and coordinate the location and level of all lines. Run preliminary levels and check with all other contractors so that conflict in location may be avoided.
  - 2. If conflicts occur, the following preference schedule shall be followed:
    - a. Recessed electric fixtures.
    - b. Low pressure ductwork.
    - c. Domestic water storm and vent lines.
    - d. Electric conduits.
  - 3. No other work shall have preference over plumbing lines below fixtures.
  - 4. No other work shall have preference over conduit above or below electric switchgear and above or below panels.
  - 5. No piping conveying fluids shall be provided directly over electrical or elevator equipment.
- F. Lines and Levels: Determine all grades, maintain necessary lines and levels throughout the progress of the work and assume full responsibility for their correctness. Where levels are indicated on the drawings, work shall be installed at those levels unless prior written approval to change is obtained from the Architect / Engineer.
- G. Location of Equipment: The approximate location of all equipment is shown on the drawings. The Architect / Engineer reserves the right to change the location of all equipment 5' in any direction without

these changes being made the subject of an extra charge provided such changes are made before final installation.

### 3.5 CUTTING AND PATCHING

- A. Examine architectural and structural drawings to determine the general nature of the types of construction to be encountered during performance of electrical work.
- B. All cutting and patching of masonry, carpentry, steel, iron work, concrete structural work, and finished surfaces belonging to the building shall be done in order that work may be properly installed. Replace or repair all disturbed constructions or finishes to its original condition and under no condition cut structural work except upon approval of the Architect / Engineer.
- C. Cut through ceilings, floors, walls and partitions in a careful manner and fill the openings around the pipes and sleeves.
- D. Carefully coordinate locations of openings and sleeves to avoid conflict with other trades. Furnish complete information concerning locations and sizes of openings to other trades in sufficient time for inclusion on their shop drawings.
- E. Employ craftsmen and mechanics who are skilled and experienced in their respective trades to perform all cutting, fitting, matching, patch repairing, and finishing work required for installation of electrical work.
- F. Perform cutting to neat line, in a manner that will not weaken the wall, partition, or floor being cut. Cut holes in floors to neat line. Perform drilling in a manner that will not cause breaking of floor around the drilled hole.

### 3.6 FIELD CORRECTIONS AND CHANGES

- A. Carefully and accurately record on field set of drawings, any deviations or changes in locations of conduit, wiring and/or equipment made in the field and shall keep the Architect / Engineer informed on all deviations and changes.
- B. At the completion of the job, furnish the Architect / Engineer three (3) complete sets (not the field set) of drawings indicating these deviations or changes. Extra sets of drawings will be provided to the contractor for this purpose. Any changes in the exterior work shall be recorded by dimension.

### 3.7 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. Before final acceptance of the electrical installation, provide to the Architect / Engineer digital copies of a complete set of operating and maintenance instructions and procedures for all electrical systems and equipment furnished under this contract.
- B. Prepare a complete file of maintenance and operating instructions which covers all electrical systems and equipment listed in the section entitled "Submittals".
- C. Data shall be placed in a portable USB drive. Label USB drive as follows:

ELECTRICAL SYSTEMS  
MAINTENANCE AND OPERATING INSTRUCTIONS  
CHAMPAIGN COUNTY COURTROOM F RENOVATION



- D. Data shall include a complete table of contents, tabs, final approved shop drawings, wiring diagrams, manufacturer's operating and maintenance instructions, catalog brochure information, replacement parts lists, name, address and telephone number of nearest stocking supply house in pdf format.
- E. All material relative to the equipment for one system (i.e.; lighting fixtures, panelboards, motor starting equipment, etc.) shall be organized in folders. The following information shall be included as a cover: Item, Manufacturer, Contractor's Order Number, Supplier's Order Number, Manufacturer's Order Number.
- F. The completed files shall be submitted for review prior to job completion. Final payments will not be certified until the maintenance manuals have been received and reviewed.
- G. Authorized manufacturer's personnel shall instruct (to the Owner's satisfaction) all personnel designated by the Owner in the use of equipment and systems as listed in the section entitled "Submittals".
- H. Provide a minimum of two man days in two trips to the job before the job is accepted for the instruction and training of the Owner's representative in the operation and maintenance of the complete electrical system.
- I. The above does not relieve the contractor of his responsibility of making service calls due to any defect which may develop with systems or equipment during the guarantee period nor shall these service calls be included as part of instruction time. Specific requirements in specifications for factor service representatives is also in addition to above requirements.

### 3.8 CLEANING UP

- A. Before work can be considered complete, clean all surfaces of all paint, plaster, mortar, labels and other stains and remove all lumps of cement. Take care not to scratch, mar, or damaged surfaces in cleaning.
- B. In case of dispute, the Owner / User may remove the rubbish and charge the cost to the one or more contractors as the Architect / Engineer may determine to be just.

### 3.9 TOUCH-UP PAINTING

- A. Comply with requirements in Division 09 Painting Sections for cleaning and touch-up painting.
- B. All factory applied paint finishes on all electrical items, equipment, panelboards, switchboards, fire alarm devices, etc., that is scratched or damaged shall be touched up with rust inhibitive paint to match factory applied paint.

END OF SECTION 26 05 00

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Building wires and cables rated 600 V and less.
- 2) Connectors, splices, and terminations rated 600 V and less.

## 1.2 ACTION SUBMITTALS

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

## 1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

## 2. PRODUCTS

## 2.1 CONDUCTORS AND CABLES

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

- 1. General Cable; General Cable Corporation.
- 2. Senator Wire & Cable Company.
- 3. Southwire Company.
- 4. Nexans.
- 5. Republic Wire, Inc.

- B. Copper Conductors: Comply with ASTM B3 for bare concealed copper and with ASTM B8 for stranded conductors.

- C. Conductor Insulation: Comply with UL 83 for Type THHN/THWN-2.

- D. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC and with ground wire.

## 2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- 1. 3M.
- 2. Hubbell Power Systems, Inc.
- 3. ILSCO.
- 4. Tyco Electronics Corp.

- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
  - 1. Expandable steel spring and polypropylene body type connectors and wire nuts for wire sizes up to and including No. 10 AWG.
  - 2. Bolt type connectors or mechanical compression crimp type for wire sizes No. 8 AWG and larger. Cover connectors with three layers of 600 volt tape or heat shrinkable insulation equivalent to 150% conductor insulation.

## 2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

## 3. EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper.
- B. Branch Circuits: Copper. Stranded for all sizes.

### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings: Type THHN/THWN-2 single conductors in raceway.
- G. Branch Circuits Concealed in Walls and Partitions: Metal-clad cable, Type MC.
- H. Branch Circuits concealed below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- I. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- J. Minimum wire size shall be No. 12 except for internal fixture wire which shall be minimum size of No. 14 type SF, SFF, PF, PFF or TFN, 600 volt.

- K. All branch circuit wiring and feeder cables for circuits over 20 amps shall be sized as noted on the drawings. If size is not specifically noted, size all branch circuit wiring and feeder cables in accordance with the National Electrical Code.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

### 3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Splices and taps in conductors shall be as few in number as practicable.
- D. Splices and taps shall be so made that they have an electrical resistance not in excess of that of 2' of the conductor.
- E. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.
- F. Neutral conductors in outlet boxes at receptacles shall be jointed and pigtailed to the outlet. The removal of a receptacle from the circuit shall not affect the continuity of the neutral conductor.

### 3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 26 05 53 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

### 3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

### 3.7 FIELD QUALITY CONTROL

#### A. Perform the following tests and inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

#### B. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Section includes grounding and bonding systems and equipment.
- 2) Section includes grounding and bonding systems and equipment plus the following special applications:
  - a) Foundation steel electrodes.

## 1.2 INFORMATIONAL SUBMITTALS

- A. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:

- 1. Ground rods.
- 2. Grounding arrangements and connections for separately derived systems.

## 1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

## 2. PRODUCTS

## 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Burndy; Part of Hubbell Electrical Systems.
  - 2. Dossert; AFL Telecommunications LLC.
  - 3. ERICO International Corporation.
  - 4. Fushi Copperweld Inc.
  - 5. Galvan Industries, Inc.; Electrical Products Division, LLC.
  - 6. Harger Lightning & Grounding.
  - 7. ILSCO.
  - 8. O-Z/Gedney; a brand of Emerson Industrial Automation.
  - 9. Robbins Lightning, Inc.
  - 10. Siemens Power Transmission & Distribution, Inc.

## 2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

## 2.3 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Stranded Conductors: ASTM B 8.
  - 3. Tinned Conductors: ASTM B 33.
  - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
  - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  - 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
  - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

## 2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connections for Conductors and Pipes: Copper or copper alloy, pressure-type with at least two bolts.
  - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

## 2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet.

## 3. EXECUTION

### 3.1 APPLICATIONS

- A. Conductors: Install stranded for all sizes unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 1/0 AWG minimum.
  - 1. Bury at least 24 inches below grade.
- C. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors.

### 3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits. Separate grounding conductors are not shown on the drawings but shall be included in all raceways as set forth on the drawings.
- B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

### 3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
  1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
  2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
  1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
  3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding and Bonding for Piping:
  1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
  2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.



3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- E. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- F. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
  1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
  2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

### 3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
  1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
  3. Test completed grounding system at service disconnect enclosure grounding terminal at individual ground rods. Make tests at ground rods before any conductors are connected.
    - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81.
  4. Prepare dimensioned Drawings locating each ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports. Report measured ground resistances.
- E. Report measured ground resistances that exceed the following values:
  1. Service Disconnect: 10 ohms.
  2. Ground Rod: 25 ohms.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Hangers and supports for electrical equipment and systems.
- 2) Construction requirements for concrete bases.

## 1.2 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For hangers and supports for electrical equipment and systems listed in Section 26 05 48 "Vibration and Seismic Controls for Electrical Systems."

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

## 2. PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Hangers and supports listed in Section 26 05 48 "Vibration and Seismic Controls for Electrical Systems" shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified."

## 2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.

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

- a. Cooper B-Line, Inc.; a division of Cooper Industries.
- b. Flex-Strut Inc.
- c. Unistrut; an Atkore International company.

2. Material: Galvanized steel.
3. Channel Width: 1-5/8 inches.
4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
5. Channel Dimensions: Selected for applicable load criteria.

- B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  - 1. Powder-Actuated Fasteners: Anchors using explosive charges to drive inserts into concrete shall not be used.
  - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
      - 2) Empire Tool and Manufacturing Co., Inc.
      - 3) Hilti, Inc.
      - 4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
  - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
  - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
  - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  - 6. Toggle Bolts: All-steel springhead type.
  - 7. Hanger Rods: Threaded steel.

### 3. EXECUTION

#### 3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.
- B. Comply with requirements for raceways and boxes specified in Section 26 05 33 "Raceways and Boxes for Electrical Systems."
- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as scheduled in NECA 1, where its Table 1 lists maximum spacings that are less than those stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
  - 1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.

### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.
  - 2. To New Concrete: Bolt to concrete inserts.
  - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - 4. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69 or metal framing channel welded to structure.
  - 5. To Light Steel: Sheet metal screws.
  - 6. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.
- E. Repair fireproofing damaged as a result of installing clamps or supports to structural steel.

### 3.3 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Division 09 Sections 09 91 13 "Exterior Painting" and 09 91 23 "Interior Painting" for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.
- D. Prime paint all structural steel installed for pipe or equipment supports or burned by welding with one coat of rust inhibitive black paint at the time of installation.

END OF SECTION 26 05 29

SECTION 26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Metal conduits, tubing and fittings.
- 2) Nonmetal conduits, tubing and fittings.
- 3) Boxes, enclosures and cabinets.

## 1.2 DEFINITIONS

- A. EMT: Electric metallic tubing.
- B. FMC: Flexible metallic conduit.
- C. GRC: Galvanized rigid steel conduit.
- D. LFMC: Liquid tight flexible metallic conduit.

## 2. PRODUCTS

## 2.1 METAL CONDUITS, TUBING, AND FITTINGS

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

- 1. Allied Tube & Conduit; a part of Atkore International.
- 2. Republic Conduit.
- 3. Western Tube and Conduit Corporation.

- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- C. GRC: Comply with ANSI C80.1 and UL 6.

- D. EMT: Comply with ANSI C80.3 and UL 797.

- E. FMC: Comply with UL 1; zinc-coated steel.

- F. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

- G. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

- 1. Fittings for EMT:

- a. Material: Steel.
- b. Type: Setscrew.

- H. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Allied Tube and Conduit: A Part of Atkore International
  - 2. CANTEX INC.
  - 3. Electri-Flex Company.
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- D. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

## 2.3 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cooper Technologies Company.
  - 2. Hubbell Incorporated.
  - 3. MonoSystems, Inc.
  - 4. RACO; Hubbell.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- F. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- G. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- H. Gangable boxes are prohibited.

## 3. EXECUTION

### 3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
  - 1. Exposed, Not Subject to Physical Damage: EMT
  - 2. Underground Conduit: RNC, Type EPC-40-PVC.

3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LPMC.
  4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
  2. Concealed in Ceilings and Interior Walls and Partitions: EMT.
  3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LPMC.
  4. Damp or Wet Locations: EMT.
  5. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
    - a. All boxes installed in poured concrete, block, brick or tile shall be masonry type.
    - b. All multiple gang switch boxes shall be solid gang box.
    - c. All surface-mounted boxes shall be cast FS or FD type.
    - d. The minimum size of boxes shall be 4" x 4" x 2-1/8" minimum depth. For single device installation, install square cut single device cover.
    - e. Install all device boxes with square cut device covers for number of devices required.
    - f. For multiple gang boxes installed for more than one 277 volt switch, a barrier shall be installed between each box gang.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
  2. EMT: Use setscrew, steel fittings. Comply with NEMA FB 2.10.
  3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

### 3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Conduits and raceways shall not be supported from plumbing lines, ductwork or supports for equipment provided by other trades.
- F. Arrange stub-ups so curved portions of bends are not visible above finished slab.

- G. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- H. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines. In mechanical equipment rooms conduit and EMT may be exposed at the ceiling or on the walls. No surface-mounted conduit shall be permitted in finished spaces unless noted otherwise on drawings. Surface-mounted raceway shall be used in finished spaces when concealing conduit within wall construction is not possible.
- I. Support conduit within 12 inches of enclosures to which attached.
- J. Raceways Embedded in Slabs:
  - 1. There shall not be any raceways installed horizontally in concrete slabs throughout the building, except where specifically noted and detailed on the drawings.
- K. Stub-ups to Above Recessed Ceilings:
  - 1. Use EMT, IMC, or RMC for raceways.
  - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- L. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- M. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- N. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- O. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- P. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- Q. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- R. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- S. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- T. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover



plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

- U. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where an underground service raceway enters a building or structure.
  - 3. Where otherwise required by NFPA 70.
- V. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- W. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit (FMC) for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
  - 1. Use LFMC in damp or wet locations subject to severe physical damage.
- X. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- Y. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- Z. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- AA. Locate boxes so that cover or plate will not span different building finishes.
- BB. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- CC. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- DD. Set metal floor boxes level and flush with finished floor surface.
- EE. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

### 3.3 EXCAVATION AND BACKFILLING

- A. The Contractor is to call JULIE (Joint Utility Location Information for Excavators) at 800-892-0123 at least two business days prior to any digging, excavation, boring, or other such work. The contractor shall recognize that the JULIE locating service locates only those utilities that participate in the JULIE program and that non-participating utilities, privately-owned utilities, and the Owner's own services will not be located by JULIE. The contractor shall also recognize that the contract documents do not claim to show all utilities existing on the site. In addition to JULIE, the contractor shall provide, at their expense, the services of a private locating service to identify and locate all utilities, public and private, that could be affected by the contractor's work. The contractor shall repair all damage caused by the Contractor's activities promptly to the satisfaction of the owner of the damaged utility. All such repairs shall be conducted at the sole expense of the Contractor that damaged the utility.

- B. Conduct all excavations so that no personnel shall be endangered and no building walls or footings shall be disturbed or injured.
- C. Excavate to dimensions and elevations required for work.
- D. Remove any old foundations, building construction, and other materials concealed beneath present grade, where required to execute work, and as indicated.
- E. If undesirable material is encountered during excavation, remove and replace material as directed by Architect / Engineer.
- F. Properly level off bottoms of all excavations.
- G. Remove all rocks, lumps, frozen ground, soft or wet material, vegetation, and other foreign material upon which fill is to be placed.
- H. Scarify top 12" (300 mm) of earth and compact to 95% of maximum dry density.
- I. Place fill material in 9" lifts and compact each lift to 90%.
- J. Maintain between 0% below and 3% above optimum moisture content during compaction.
- K. Compact fill and backfill using suitable mechanical tamping equipment to obtain specified density.
  - 1. Use mechanical hand tampers for filling and backfilling next to walls.
  - 2. Compact granular fill using vibratory methods.
- L. Do not permit water to accumulate or remain in trench or other excavation that is a part of this contract. Dispose of water withdrawn from excavations in a manner that will not cause injury to public health, public or private property, or to the work already completed or in progress.
- M. All backfill material under buildings, sidewalks, streets, curbs and within 5' of footings shall be sand and gravel, free from cinders, ashes, refuse, vegetable or organic material, boulders, large rocks or stones. Where a utility passes under a building footing, backfill material shall be concrete up to footing bearing surface.
- N. Load excavated materials which are to be replaced with sand and gravel backfill, directly from the trench into trucks, remove from the construction area and properly dispose of if where directed.
- O. Extreme caution must be used in excavating for new underground services to avoid all damage to existing underground utilities in the working area. Confirm where possible, the exact location of all existing utilities. In the event of a break in an existing utility main or service, immediately notify an official from the utility interrupted and lend all possible assistance in restoring services cut. Also, assume costs or claims connected with the interruption and repair of such service.
- P. Excavate the trenches to the depth required so as to provide a uniform and continuous bearing and support for the pipe on solid undisturbed ground or compacted fill.
- Q. Wherever excavations are made through streets, sidewalks, parking areas, curbs or other finished surfaces, replace such surfaces with material to match existing surfaces. Where reinforcing steel in concrete is required, install it in a manner similar to that used in existing surfaces.

- R. If it is necessary to drive trucks or equipment over sidewalks, pavement, streets, and curbs, take care to protect same from damage. If such surfaces are damaged, replace same with new materials, same type and thickness and in the manner as the original.
- S. Reuse original surface materials if, in the opinion of the Architect / Engineer, they are suitable for use in restoration.
- T. Excavated material which is to be reused in backfilling or restoring the surface shall be piled in a manner that will not endanger the work and will avoid obstructing sidewalks, driveways or traffic lanes which are to be maintained during construction.
- U. Keep all excavated top soil separated from excavation soil. Stock pile sufficient top soil to provide 6" top soil at all graded areas. Provide any additional soil from off-site source if required.

### 3.4 INSTALLATION OF UNDERGROUND CONDUIT

#### A. Direct-Buried Conduit:

- 1. Excavate trench bottom to provide firm and uniform support for conduit.
- 2. Install backfill as specified in Section above.
- 3. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
  - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
  - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
  - c. Absolutely no plastic conduit shall be above grade unless explicitly noted otherwise.
- 4. Underground Warning Tape: Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."

### 3.5 PROTECTION

#### A. Protect coatings, finishes, and cabinets from damage and deterioration.

- 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
- 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

- #### B. Protect work from injury by keeping all conduit and boxes capped and plugged or otherwise protected. This includes damage by freezing and / or stoppage from building materials, sand, dirt or concrete.

END OF SECTION 26 05 33

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Identification for raceways.
- 2) Underground-line warning tape.
- 3) Equipment identification labels, including arc-flash warning labels.
- 4) Miscellaneous identification products.

## 1.2 ACTION SUBMITTALS

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

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

## 2. PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

## A. Comply with NFPA 70.

- B. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

## 2.2 LABELS

## A. Self-Adhesive Labels:

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

- a. A'n D Cable Products.
- b. Brady Corporation.
- c. Brother International Corporation.
- d. emedco.
- e. Grafoplast Wire Markers.
- f. Ideal Industries, Inc.
- g. LEM Products Inc.
- h. Marking Services, Inc.
- i. Panduit Corp.

2. Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
  - a. Nominal Size: 3.5-by-5-inch.

## 2.3 TAPES AND STENCILS:

- A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Brady Corporation.
  - b. Carlton Industries, LP.
  - c. emedco.

- B. Underground-Line Warning Tape

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Brady Corporation.
  - b. Ideal Industries, Inc.
  - c. LEM Products Inc.
  - d. Marking Services, Inc.
  - e. Reef Industries, Inc.
2. Tape:
  - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
  - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
  - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
3. Color and Printing:
  - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
  - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
  - c. Inscriptions for Orange-Colored Tapes: "COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".
4. Tape Construction:
  - a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
  - b. Width: 3 inches.
  - c. Overall Thickness: 5 mils.
  - d. Foil Core Thickness: 0.35 mil.
  - e. Tensile according to ASTM D 882: 70 lbf and 4600 psi.

## 2.4 SIGNS

### A. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:
  - a. For signs up to 20 sq. inches, minimum 1/16-inch.
  - b. For signs larger than 20 sq. inches, 1/8 inch thick.
  - c. Engraved legend with black letters on white face.
  - d. Punched or drilled for mechanical fasteners.
  - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Brady Corporation.
  - b. Carlton Industries, LP.
  - c. emedco.

## 2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## 3. EXECUTION

### 3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

### 3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

- G. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

### 3.3 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with indelible marker containing the wiring system legend, system voltage and circuit. System legends shall be as follows:
  - 1. "POWER."
  - 2. "DATA."
- B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
  - 1. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
    - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
    - b. Colors for 208/120-V Circuits:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.
      - 4) Neutral: White.
      - 5) Ground: Green.
    - c. Colors for 480/277-V Circuits:
      - 1) Phase A: Brown.
      - 2) Phase B: Orange.
      - 3) Phase C: Yellow.
      - 4) Neutral: White.
      - 5) Ground: Green with yellow stripe.
    - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- C. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
  - 1. Install underground-line warning tape for direct-buried cables and cables in raceways.
- D. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm unless equipment is provided with its own identification.

1. Labeling Instructions:

- a. Indoor Equipment: Engraved, laminated acrylic or melamine plastic label, punched or drilled for mechanical fasteners. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
- b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
- c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
- d. Fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
- e. Attach labels with screws and not adhesives.

2. Equipment To Be Labeled:

- a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a engraved, laminated acrylic or melamine label.
- b. Enclosures and electrical cabinets.
- c. Access doors and panels for concealed electrical items.
- d. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- e. Emergency system boxes and enclosures.
- f. Enclosed switches.
- g. Enclosed circuit breakers.
- h. Enclosed controllers.
- i. Variable-speed controllers.
- j. Push-button stations.
- k. Remote-controlled switches, dimmer modules, and control devices.
- l. Monitoring and control equipment.

END OF SECTION 26 05 53



SECTION 26 09 23 - LIGHTING CONTROL DEVICES

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Indoor occupancy and vacancy sensors.
- 2) Low-voltage wall stations.
- 3) Switchbox-mounted occupancy sensors.

## 1.2 RELATED WORK

## A. Specified elsewhere:

- 1. Section 26 27 26 "Wiring Devices" for wall-box dimmers, non-networkable wall-switch occupancy sensors, and manual light switches.

## 1.3 ACTION SUBMITTALS

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

## B. Shop Drawings:

- 1. Show installation details for the following:
  - a. Occupancy sensors.
  - b. Vacancy sensors.
  - c. Power packs.
  - d. Low-voltage switches.
- 2. Interconnection diagrams showing field-installed wiring.
- 3. Include diagrams for power, signal, and control wiring.

## 1.4 INFORMATIONAL SUBMITTALS

## A. Sample Warranty: For manufacturer's warranties.

## 1.5 CLOSEOUT SUBMITTALS

## A. Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.

## 1.6 WARRANTY

## A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
    - a. Faulty operation of lighting control software.
    - b. Faulty operation of lighting control devices.
  2. Warranty Period: Two years from date of Substantial Completion.
2. PRODUCTS
- 2.1 INDOOR OCCUPANCY AND VACANCY SENSORS
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Sensor Switch, Inc.
  2. Hubbell Control Solutions.
  3. Wattstopper.
  4. Steinel.
- B. General Requirements for Sensors:
1. Wall or Ceiling-mounted as shown on drawings, solid-state indoor occupancy or vacancy sensors.
  2. Dual technology.
  3. Integrated or separate power pack as needed to meet lighting control sequence.
  4. Hardwired connection to switch.
  5. Configured for one or two-pole operation as shown on drawings.
  6. Operation:
    - a. Combination Sensor: Unless otherwise indicated, sensor shall be programmed to turn lights on when coverage area is occupied and turn them off when unoccupied, or to turn off lights that have been manually turned on; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
  7. Furnish with auxiliary dry contact closure via an SPDT, 1 amp, 40 volt relay.
  8. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A or sensor is powered from the power pack whichever best meets lighting control sequences.
  9. Power: Line voltage.
  10. Power Pack: Dry contacts rated for 20-A load at 120- and 277-V ac, and for 1 hp at 120-V ac.
  11. Mounting:
    - a. Sensor: Suitable for mounting in any position on a standard outlet box.
    - b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
    - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
  12. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
  13. Bypass Switch: Override the "on" function in case of sensor failure.
  14. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; turn lights off when selected lighting level is present.
- C. Dual-Technology Type: Wall or ceiling mounted; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.

1. Sensitivity Adjustment: Separate for each sensing technology.
2. Detector Sensitivity: Detect occurrences of 6-inch-minimum movement of any portion of a human body that presents a target of not less than 36 sq. in., and detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
3. Standard Range Detection Coverage: Detect occupancy anywhere within a circular area of 500 sq. ft. when mounted on a 96-inch-high ceiling.
4. Extended Range Detection Coverage: Detect occupancy anywhere within a circular area of 2000 sq. ft. when mounted on a 96-inch high ceiling.
5. Wall Mount Sensor Detection Coverage: Detect occupancy anywhere within a 90-degree pattern centered on the sensor over an area of 1000 square feet when mounted 96 inches above finished floor.

## 2.2 LOW-VOLTAGE WALL STATIONS

### A. Manufacturers

1. Sensor Switch, Inc.
2. Hubbell Control Solutions.
3. Wattstopper.
4. Steinel.

### B. General Requirements for low-voltage wall stations: Push-Button type low-voltage wall stations shall interface with standard occupancy sensor systems and power packs in order to implement a wide range of single, bi-level and dimmable switching applications.

1. Enables occupancy sensors system to be used for manual on operation.
2. Alternative usage as override switch for auto-on applications.
3. Soft-click push-buttons with engraved identification
4. Programmable on site
5. Hard wired
6. Color: White
7. Faceplate Color: Color to match switch.
8. Available with one or more of the following options (see schedule on plans for individual switch requirements)
  - a. Two-pole, dual manual on operation
  - b. Three-way operation
  - c. 0-10 VDC dimming control

## 2.3 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

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

1. Sensor Switch, Inc.
2. Hubbell Control Solutions.
3. Wattstopper.
4. Steinel.

### B. General Requirements for Sensors: Automatic-wall-switch sensor with manual on-off switch, suitable for mounting in a single gang switchbox using hardwired connection.

1. Auto-On Sensor Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn lights off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
2. Manual-On Sensor Operation: Unless otherwise indicated, requires manual action to turn lights on, but no action to turn lights off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
3. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F.
4. Switch Rating: Not less than 800-VA load at 120 V, 1200-VA load at 277 V.
5. Configured for one or two-pole operation as shown on drawings.
6. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage area of 500 sq. ft.
7. Sensing Technology: Dual technology - PIR and ultrasonic.
8. Capable of controlling load in three-way application.
9. Voltage: Dual voltage - 120 and 277 V.
10. Concealed, field-adjustable, "off" time-delay selector at up to 30 minutes.
11. Color: White.
12. Faceplate: Color matched to switch.

## 2.4 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
- C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

## 3. EXECUTION

### 3.1 EXAMINATION

- A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.
- B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 SENSOR INSTALLATION

- A. Comply with NECA 1.
- B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- C. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

### 3.3 WIRING INSTALLATION

- A. Comply with NECA 1.
- B. Wiring Method: Comply with Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch.
- C. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- D. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

### 3.4 IDENTIFICATION

- A. Identify components and power and control wiring according to Section 26 05 53 "Identification for Electrical Systems."
  - 1. Identify controlled circuits in lighting contactors.
  - 2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.

### 3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
  - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

### 3.6 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
  - 1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
  - 2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.
  - 3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

END OF SECTION 26 09 23

SECTION 26 27 26 - WIRING DEVICES

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Straight-blade convenience, tamper-resistant and controlled receptacles.
- 2) GFCI receptacles.
- 3) Twist-locking receptacles.
- 4) Wall plates.

## 1.2 DEFINITIONS

## A. Abbreviations of Manufacturers' Names:

- 1. Cooper: Cooper Wiring Devices; Division of Cooper Industries, Inc.
- 2. Hubbell: Hubbell Incorporated: Wiring Devices-Kellems.
- 3. Leviton: Leviton Mfg. Company, Inc.
- 4. Pass & Seymour: Pass& Seymour/Legrand.

B. BAS: Building automation system.

C. EMI: Electromagnetic interference.

D. GFCI: Ground-fault circuit interrupter.

E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

F. RFI: Radio-frequency interference.

G. SPD: Surge protective device.

H. UTP: Unshielded twisted pair.

## 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

## 1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

## 2. PRODUCTS

### 2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
  - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
  - 2. Devices shall comply with the requirements in this Section.
- D. Devices for Owner-Furnished Equipment:
  - 1. Receptacles: Match plug configurations.
- E. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

### 2.2 STRAIGHT-BLADE RECEPTACLES

- A. Duplex Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Eaton (Arrow Hart).
    - b. Hubbell Incorporated; Wiring Device-Kellems.
    - c. Leviton Manufacturing Co., Inc.
    - d. Pass & Seymour/Legrand (Pass & Seymour).

### 2.3 GFCI RECEPTACLES

- A. General Description:
  - 1. 125 V, 20 A, straight blade, feed-through type.
  - 2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.
  - 3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
- B. Duplex GFCI Convenience Receptacles:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Eaton (Arrow Hart).
    - b. Hubbell Incorporated; Wiring Device-Kellems.
    - c. Leviton Manufacturing Co., Inc.
    - d. Pass & Seymour/Legrand (Pass & Seymour).

## 2.4 TOGGLE SWITCHES

- A. Comply with NEMA WD 1, UL 20, and FS W-S-896.
- B. Switches, 120/277 V, 20 A:
  - 1. Single Pole:
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Eaton (Arrow Hart).
      - 2) Hubbell Incorporated; Wiring Device-Kellems.
      - 3) Leviton Manufacturing Co., Inc.
      - 4) Pass & Seymour/Legrand (Pass & Seymour).

## 2.5 WALL PLATES

- A. Single, multi gang and combination types shall match corresponding wiring devices.
  - 1. Plate-Securing Screws: Metal with head color to match plate finish.
  - 2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
  - 3. Material for Unfinished Spaces: Galvanized steel.
  - 4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

## 2.6 FINISHES

- A. Device Color:
  - 1. Wiring Devices Connected to Normal Power System: White unless otherwise indicated or required by NFPA 70 or device listing.
- B. Coverplate Color:
  - 1. Coverplates for devices connected to normal power system: When thermoplastic or nylon coverplates are specified, their color shall match device color.
- C. The Architect / Engineer reserves the right to change the color at time of shop drawing review.

## 3. EXECUTION

### 3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Mounting Heights
  - 1. Examine architectural details and elevations for heights indicated there. Coordinate mounting heights with wall treatment and finish.



2. Examine electrical drawings for heights indicated there.
  3. Unless otherwise indicated:
    - a. Wall Switches: 48" above finished floor, except where special wall treatment requires a higher or lower setting.
    - b. Dimmer and Lighting Controls: 48" AFF, except where special wall treatment requires higher or lower setting.
    - c. Receptacles - General: 18" AFF.
    - d. Receptacles in Patient Care Areas: 22" AFF.
    - e. Receptacles in Mechanical and Electrical Equipment Rooms: 40" AFF.
    - f. Receptacles - Exterior: 24" above finished grade.
    - g. Clock Outlets: 96" AFF where possible or 12" below ceiling.
  4. Mounting heights given above shall be to the center line of the device.
  5. In block walls, locate device in either bottom or top of the block course nearest to the height indicated.
  6. In brick walls, mount receptacles in the horizontal position in the brick course nearest to the height indicated.
  7. Where receptacles are indicated to be installed above counters, mount in the horizontal position 4" from top of back splash to bottom of box.
- C. Coordination with Other Trades:
1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
  2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
  3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
  4. Install wiring devices after all wall preparation, including painting, is complete.
- D. Conductors:
1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
  2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
  3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
- E. Device Installation:
1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
  2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
  3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
  4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
  5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
  6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
  7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.

8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

F. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.
- G. Device Plates: Device plates shall fit tight against the finished walls and shall completely cover the openings in the walls for the boxes. Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening. Device plates shall be attached and adjusted so they finish straight and level.
- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 GROUND FAULT INTERRUPTING RECEPTACLES

- A. Where drawing or specifications call for 15 amp or 20 amp, 120 volt receptacles in the following locations, provide ground fault interrupting type receptacles.
1. Bathrooms, Restrooms and Toilet Rooms (except where toilet is located in Critical Care Patient Room of Health Care Facility).
  2. Wet locations (except where served by isolated power system).
  3. Outdoors.

3.4 IDENTIFICATION

- A. Comply with Section 26 05 53 "Identification for Electrical Systems."
1. Receptacles and Switches: Provide all outlet and switch coverplates with identification labels showing panelboard designation and circuit breaker number connected to device.
    - a. Normal Circuits: Black letters indicating panel and circuit number on clear background applied to front of coverplate. Minimum letter height 3/16".
  2. Labels shall be attached to coverplates with pressure-sensitive adhesive. Devices installed in multi-outlet, surface raceways shall be provided with labels.

END OF SECTION 26 27 26

SECTION 26 51 19 - LED INTERIOR LIGHTING

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Section includes the following:

- a) General luminaire requirements.
- b) Luminaire materials.
- c) Luminaire finishes.
- d) Luminaire support.

## 1.2 RELATED WORK

## A. Specified elsewhere:

1. Section 26 09 23 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.

## 1.3 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

## 1.4 ACTION SUBMITTALS

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

1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaires.
4. Include emergency lighting units, including batteries and chargers.
5. Include life, output (lumens, CCT, and CRI), and energy-efficiency data.
6. Photometric data and adjustment factors based on laboratory tests IES LM-79 and IES LM-80.

- a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Shop Drawings: For nonstandard or custom luminaires.
  - 1. Include plans, elevations, sections, and mounting and attachment details.
  - 2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 3. Include diagrams for power, signal, and control wiring.
- 1.5 CLOSEOUT SUBMITTALS
  - A. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.
- 1.6 QUALITY ASSURANCE
  - A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer's laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.
  - B. Provide luminaires from a single manufacturer for each luminaire type.
  - C. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.
- 1.7 DELIVERY, STORAGE, AND HANDLING
  - A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.
- 1.8 WARRANTY
  - A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
  - B. Warranty Period: Five years from date of Substantial Completion.
- 2. PRODUCTS
  - 2.1 PERFORMANCE REQUIREMENTS
    - A. Ambient Temperature: 41 to 104 deg F.
      - 1. Relative Humidity: Zero to 95 percent.
    - B. Altitude: Sea level to 1000 feet.
  - 2.2 LUMINAIRE REQUIREMENTS
    - A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
    - B. Recessed luminaires shall comply with NEMA LE 4.

- C. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
- D. Provide luminaires from a single manufacturer for each luminaire type.

## 2.3 MATERIALS

### A. Metal Parts:

- 1. Free of burrs and sharp corners and edges.
- 2. Sheet metal components shall be steel unless otherwise indicated.
- 3. Form and support to prevent warping and sagging.

### B. Steel:

- 1. ASTM A 36/A 36M for carbon structural steel.
- 2. ASTM A 568/A 568M for sheet steel.

### C. Stainless Steel:

- 1. 1. Manufacturer's standard grade.
- 2. 2. Manufacturer's standard type, ASTM A 240/240 M.

### D. Galvanized Steel: ASTM A 653/A 653M.

### E. Aluminum: ASTM B 209.

## 2.4 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

## 2.5 LUMINAIRE SUPPORT

- A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage.

## 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 luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 TEMPORARY LIGHTING

- A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

### 3.3 INSTALLATION

- A. Comply with NECA 1.
- B. Lighting Fixtures: Set level, plumb and square with ceilings and walls. Install lamps in each fixture.
- C. Support all fixtures from the building structure and not from the ceiling suspension system.
- D. Support the fixtures from the bar joists, floor structure or roof structure above.
- E. When a fixture occurs under ducts, the widths of duct shall be spanned with metal framing channel suspended and supported at both ends and the fixture attached to the metal framing channel.
- F. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- G. Supports:
  - 1. Sized and rated for luminaire weight.
  - 2. Able to maintain luminaire position after cleaning and relamping.
  - 3. Provide support for luminaire without causing deflection of ceiling or wall.
  - 4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
- H. Wall-Mounted Luminaires:
  - 1. Attached to structural members in walls.
  - 2. Do not attach luminaires directly to gypsum board.
- I. Comply with requirements in Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

### 3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

### 3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
  - 1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.

### 3.6 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to

two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION 26 51 19

SECTION 26 52 13 - EMERGENCY AND EXIT LIGHTING

## 1. GENERAL

## 1.1 WORK INCLUDES

## A. Base Bid:

## 1. Contractor

- a. All work related to the furnishing, installing, and testing of the following material described within this specification as outlined on the electrical drawings:

- 1) Emergency lighting units.
- 2) Exit signs.
- 3) Luminaire supports.

## 1.2 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color Rendering Index.

C. Emergency Lighting Unit: A lighting unit with internal or external emergency battery powered supply and the means for controlling and charging the battery and unit operation.

D. Fixture: See "Luminaire" Paragraph.

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

## 1.3 ACTION SUBMITTALS

## A. Product Data: For each type of emergency lighting unit, exit sign, and emergency lighting support.

- 1. Include data on features, accessories, and finishes.
- 2. Include physical description of the unit and dimensions.
- 3. Battery and charger for light units.
- 4. Include life, output of luminaire (lumens, CCT, and CRI), and energy-efficiency data.
- 5. Include photometric data and adjustment factors based on laboratory tests, complying with IES LM-45, for each luminaire type.

- a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

## B. Product Schedule:

- 1. For emergency lighting units. Use same designations indicated on Drawings.
- 2. For exit signs. Use same designations indicated on Drawings.



#### 1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For luminaires and lighting systems to include in emergency, operation, and maintenance manuals.

1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

#### 1.5 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer's laboratory that is accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

#### 1.7 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

### 2. PRODUCTS

#### 2.1 GENERAL REQUIREMENTS FOR EMERGENCY LIGHTING

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Fabricate and label emergency lighting units, exit signs, and batteries to comply with UL 924.
- C. Comply with NFPA 70 and NFPA 101.
- D. Comply with NEMA LE 4 for recessed luminaires.
- E. Provide luminaires from a single manufacturer for each luminaire type.
- F. Internal Type Emergency Power Unit: Self-contained, modular, battery-inverter unit, factory mounted within luminaire body and compatible with driver.
  1. Emergency Connection: Operate fixture continuously at 20% of full output upon loss of normal power. Connect unswitched circuit to battery-inverter unit and switched circuit to luminaire driver.
  2. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
  3. Test Push-Button and Indicator Light: Visible and accessible without opening luminaire or entering ceiling space.

- a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
- b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
- 4. Battery: Sealed, maintenance-free, nickel-cadmium type.
- 5. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.

## 2.2 MATERIALS

### A. Metal Parts:

- 1. Free of burrs and sharp corners and edges.
- 2. Sheet metal components shall be steel unless otherwise indicated.
- 3. Form and support to prevent warping and sagging.

### B. Doors, Frames, and Other Internal Access:

- 1. Smooth operating, free of light leakage under operating conditions.
- 2. Designed to permit relamping without use of tools.
- 3. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- 4. Acrylic: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- 5. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

### C. Conduit: Electrical metallic tubing, minimum 3/4 inch in diameter.

## 2.3 METAL FINISHES

- A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.4 LUMINAIRE SUPPORT COMPONENTS

- A. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Support Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.

## 3. EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for conditions affecting performance of luminaires.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.
- C. Examine walls, floors, roofs, and ceilings for suitable conditions where emergency lighting luminaires will be installed.

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

### 3.2 INSTALLATION

A. Comply with NECA 1.

B. Lighting Fixtures: Set level, plumb and square with ceilings and walls. Install lamps in each fixture.

C. Support all fixtures from the building structure and not from the ceiling suspension system.

D. Support the fixtures from the bar joists, floor structure or roof structure above.

E. When a fixture occurs under ducts, the widths of duct shall be spanned with metal framing channel suspended and supported at both ends and the fixture attached to the metal framing channel.

F. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

G. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position when testing emergency power unit.
3. Provide support for luminaire and emergency power unit without causing deflection of ceiling or wall.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire and emergency power unit weight and vertical force of 400 percent of luminaire weight.

H. Wall-Mounted Luminaire Support:

1. Attached to structural members in walls.
2. Do not attach luminaires directly to gypsum board.

I. Ceiling Grid Mounted Luminaires:

1. Secure to any required outlet box.
2. Secure emergency power unit using approved fasteners in a minimum of four locations, spaced near corners of emergency power unit.
3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.

### 3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

### 3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

### 3.5 ADJUSTING

- A. Adjustments: Within 12 months of date of Substantial Completion, provide on-site visit to do the following:
  - 1. Inspect all luminaires. Replace lamps, emergency power units, batteries, signs, or luminaires that are defective.
    - a. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
  - 2. Conduct short-duration tests on all emergency lighting.

END OF SECTION 26 52 13