



# Fargo Public School District Fargo South High School Theatrical Lighting Upgrade

Fargo, North Dakota

MBN Project No. 24-256

Bid Date: Thursday, February 6, 2025 @ 2:00 pm



MBN ENGINEERING, INC. | Mechanical | Electrical | Civil | Transmission | [www.mbnengr.com](http://www.mbnengr.com)

**FARGO OFFICE** 503 7th Street North, Suite 200 • Fargo, ND 58102 • Phone: 701-478-6336

**SIOUX FALLS OFFICE** 101 Main Avenue South, Suite 302 • Sioux Falls, SD 57104 • Phone: 701-478-6336

**BISMARCK OFFICE** 418 Rosser Avenue East, Suite 204 • Bismarck, ND 58501 • Phone: 701-478-6336

SECTION 00 01 05  
CERTIFICATIONS PAGE

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.



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MICHAEL A. BERGER, PE	01/15/25	ND#4438
	DATE	LICENSE NUMBER



END OF CERTIFICATIONS PAGE

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**ADVERTISEMENT FOR BIDS  
FARGO PUBLIC SCHOOLS  
FARGO SOUTH HIGH SCHOOL  
THEATRICAL LIGHTING UPGRADE**

Sealed bids will be received at the office of Fargo Public Schools, 700 7<sup>th</sup> St. S., Fargo, North Dakota, until 2:00 p.m., February 4th and then opened and read aloud for the **Fargo South High School Theatrical Lighting Upgrade** project.

Bids shall be based on cash payment for work performed. All work included in the contract must be completed on or before **August 15, 2025**.

Bids must be submitted on copies of the bid form in the specifications and must be accompanied by a separate envelope containing a bidder's bond in a sum equal to five percent (5%) of the full amount of the bid executed by the bidder as principal and by a surety company authorized to do business in this state, conditioned that if the bidder's bid be accepted and the contract be awarded to the bidder, the bidder, within ten (10) days after notice of award, will execute and effect a contract in accordance with the terms of the bidder's bid and a contractor's bond as required by law and the regulations and determinations of the School District. The successful bidder will be required to furnish a performance and payment Bond in the full amount of their contract.

The plans and specifications may be examined at the following locations:

MBN Engineering, Inc., 503 7<sup>th</sup> St N, Suite 200, Fargo, ND 58102  
QuestCDN.com  
Builders Exchange - Fargo, Bismarck, Minneapolis, St. Paul, St. Cloud

Bidding Documents can be downloaded for a non-refundable charge of \$22.00. Plan holders are parties that have downloaded the plans and specifications. Plan holders will be notified via email as addenda are issued. Parties that download the plans and specifications and need to have them printed elsewhere are solely responsible for those printing costs. The sales of paper copies for projects listed on this site are not available. Contact QuestCDN.com at 952-233-1632 or [info@questcdn.com](mailto:info@questcdn.com) for assistance in viewing or downloading with this digital project information. **Refer to eBidDoc #9493596.**

Bidders must hold a North Dakota Contractor's License and carry North Dakota Workers' Compensation Insurance as required by law. The required bid bond envelope shall also contain a copy of the Contractor's License or Certificate of Renewal thereof issued by the Secretary of State as required by law.

The Fargo Public School District No. 1 reserves the right to hold all bids for a period of sixty (60) days after the day fixed for the opening of the bids, and the right to reject any or all bids and to waive any informalities.

No bid will be read or considered which does not fully comply with the above provisions as to bond and licenses and any deficient bid will be resealed and returned to the bidder immediately.

**FARGO PUBLIC SCHOOLS**

**SECTION 00 21 13  
INSTRUCTIONS TO BIDDERS**

**SUMMARY**

**1.01 DOCUMENT INCLUDES**

- A. Invitation
  - 1. Bid Submission
  - 2. Intent
  - 3. Work Identified in the Contract Documents
  - 4. Contract Time
- B. Bid Documents and Contract Documents
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  - 2. Contract Documents Identification
  - 3. Availability
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- C. Site Assessment
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- D. Qualifications
  - 1. Qualifications
  - 2. Subcontractors/Suppliers/Others
- E. Bid Submission
  - 1. Bid Depository
  - 2. Bid Ineligibility
- F. Bid Enclosures/Requirements
  - 1. Security Deposit
  - 2. Consent of Surety
  - 3. Performance Assurance
  - 4. Insurance
  - 5. Bid Form Requirements
  - 6. Fees for Changes in the Work
  - 7. Bid Form Signature
- G. Offer Acceptance/Rejection
  - 1. Duration of Offer
  - 2. Acceptance of Offer

**1.02 RELATED DOCUMENTS**

- A. Document 00 41 00 - Bid Form.
- B. Document 00 73 00 - Supplementary Conditions:

**INVITATION**

**2.01 BID SUBMISSION**

- A. Bids signed and under seal, executed, and dated will be received at the office of the Owner at 701 Main Avenue; Fargo, ND 58103 before 11:30 a.m. local daylight time on the 21st day of March, 2023.
- B. Offers submitted after the above time shall be returned to the bidder unopened.
- C. Offers will be opened publicly immediately after the time for receipt of bids.

- D. Amendments to the submitted offer will be permitted if received in writing prior to bid closing and if endorsed by the same party or parties who signed and sealed the offer.

## **2.02 INTENT**

- A. The intent of this Bid request is to obtain an offer to perform work to complete the Fargo South Theater Lighting Upgrade Project for a Stipulated Sum contract, in accordance with the Contract Documents.

## **2.03 WORK IDENTIFIED IN THE CONTRACT DOCUMENTS**

- A. Work of this proposed Contract comprises demolition and a new lighting system, including electrical work.

## **2.04 CONTRACT TIME**

- A. All work included in the Contract must be completed on or before the following dates:
  1. **Final Completion of August 15th, 2025.** Final completion is defined as having the entire lighting system fully operational.
  2. **Substantial Completion of August 1st, 2025.** Substantially complete is defined as having the house lighting operational so the space can be used for meetings, etc.

## **BID DOCUMENTS AND CONTRACT DOCUMENTS**

### **3.01 DEFINITIONS**

- A. Bid Documents: Contract Documents supplemented with Invitation To Bid, Instructions to Bidders, Bid Form Bid securities identified.
- B. Contract Documents: Defined in EJCDC C-700 Article 1 including issued Addenda.
- C. Bid, Offer, or Bidding: Act of submitting an offer under seal.
- D. Bid Amount: Monetary sum identified by the Bidder in the Bid Form.

### **3.02 CONTRACT DOCUMENTS IDENTIFICATION**

- A. The Contract Documents are identified as Project Number 24-256, as prepared by MBN Engineering, Inc., who is located at 503 7th St N, Suite 200; Fargo, ND 58102, and with contents as identified in the Table of Contents.

### **3.03 AVAILABILITY**

- A. Bid Documents can be downloaded for a non-refundable charge of \$22.00. Contact QuestCDN.com at 952-233-1632 or info@questcdn.com for assistance. Refer to eBidDoc #9493596. Contractors that download the plans and specifications are required to have them printed elsewhere and are solely responsible for those printing costs.

### **3.04 EXAMINATION**

- A. Bid Documents are on display at the offices of the following construction plan rooms:
  1. Builders Exchange - Fargo, Bismarck, Minneapolis, St. Paul, St. Cloud
  2. QuestCDN.com
- B. Upon receipt of Bid Documents verify that documents are complete. Notify Engineer should the documents be incomplete.
- C. Immediately notify Engineer upon finding discrepancies or omissions in the Bid Documents.

### **3.05 INQUIRIES/ADDENDA**

- A. Direct questions to Mike Berger, telephone: 701-478-6336.
- B. Addenda may be issued during the bidding period. All Addenda become part of the Contract Documents. Include resultant costs in the Bid Amount.
- C. Verbal answers are not binding on any party.
- D. Clarifications requested by bidders must be in writing not less than 7 days before date set for receipt of bids. The reply will be in the form of an Addendum, a copy of which will be forwarded to known recipients .

### 3.06 PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS

- A. Where the Bid Documents stipulate a particular product, substitutions will be considered up to 10 days before receipt of bids.
- B. When a request to substitute a product is made, Engineer may approve the substitution and will issue an Addendum to known bidders.
- C. In submission of substitutions to products specified, bidders shall include in their bid all changes required in the Work and changes to Contract Time and Contract Sum to accommodate such substitutions. A later claim by the bidder for an addition to the Contract Time or Contract Sum because of changes in work necessitated by use of substitutions shall not be considered.
- D. The submission shall provide sufficient information to determine acceptability of such products.
- E. Provide complete information on required revisions to other work to accommodate each proposed substitution.
- F. Provide products as specified unless substitutions are submitted in this manner and accepted.
- G. See Section 01 60 00 - Product Requirements for additional requirements.

### SITE ASSESSMENT

#### 4.01 SITE EXAMINATION

- A. Examine the project site before submitting a bid.

#### 4.02 PREBID CONFERENCE

- A. A bidders conference has been scheduled for 3:30 p.m. on the 28th day of January at the location of the project, Fargo South High School Theater.
- B. Representatives of Engineer will be in attendance.
- C. Information relevant to the Bid Documents will be recorded in an Addendum, issued to Bid Document recipients.

### QUALIFICATIONS

#### 5.01 EVIDENCE OF QUALIFICATIONS

- A. To demonstrate qualification for performing the Work of this Contract, bidders may be requested to submit written evidence of financial position , license to perform work in the State of North Dakota.

#### 5.02 SUBCONTRACTORS/SUPPLIERS/OTHERS

- A. Owner reserves the right to reject a proposed subcontractor for reasonable cause.
- B. Refer to General Conditions.

### BID SUBMISSION

#### 6.01 BID DEPOSITORY

- A. The rules and regulations of this bid deposit system, in force on the day of bid submission shall apply.

#### 6.02 SUBMISSION PROCEDURE

- A. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.
- B. **Bids must be submitted on copies of the bid form in the specifications and must be accompanied by a separate envelope containing a bidder's bond in the sum equal to five percent (5%) of the full amount of the bid and a copy of the Contractor's License or Certificate of Renewal thereof issued by the Secretary of State. Bids must be in envelopes that clearly identify the bidder's name, project name, and the Owner's name on the outside.**



- C. Improperly completed information, irregularities in security deposit, may be cause not to open the Bid Form envelope and declare the bid invalid or informal.
- D. An abstract summary of submitted bids will be made available to all bidders following bid opening.

### **6.03 BID INELIGIBILITY**

- A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, will at the discretion of the Owner, be declared unacceptable.
- B. Bid Forms, Appendices, and enclosures that are improperly prepared will, at the discretion of Owner, be declared unacceptable.
- C. Failure to provide security deposit, bonding or insurance requirements will, at the discretion of Owner, be waived.

## **BID ENCLOSURES/REQUIREMENTS**

### **7.01 SECURITY DEPOSIT**

- A. Bids shall be accompanied by a security deposit as follows:
  - 1. Bid Bond of a sum no less than 5 percent of the Bid Amount on EJCDC Document C-430 Bid Bond, Penal Sum Formon AIA A310 Bid Bond Form.
- B. Endorse the Bid Bond in the name of the Owner as obligee, signed and sealed by the principal and surety.
- C. The security deposit will be returned after delivery to the Owner of the required Performance and Payment Bond(s) by the accepted bidder.
- D. After a bid has been accepted, all other securities will be returned to the respective bidders and other requested enclosures.
- E. If no contract is awarded, all security deposits will be returned.

### **7.02 PERFORMANCE ASSURANCE**

- A. Accepted Bidder: Provide a Performance Bond as described in 00 73 00 - Supplementary Conditions.
- B. Include the cost of performance assurance bonds in the Bid Amount.

### **7.03 INSURANCE**

- A. Provide an executed "Undertaking of Insurance" on a standard form provided by the insurance company stating their intention to provide insurance to the bidder in accordance with the insurance requirements of the Contract Documents.

### **7.04 BID FORM REQUIREMENTS**

- A. Complete all requested information in the Bid Form and Appendices.

### **7.05 BID FORM SIGNATURE**

- A. The Bid Form shall be signed by the bidder, as follows:
  - 1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
  - 2. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
  - 3. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so, must also be submitted with the Bid Form in the bid envelope.

4. Joint Venture: Each party of the joint venture shall execute the Bid Form under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

**OFFER ACCEPTANCE/REJECTION**

**8.01 DURATION OF OFFER**

- A. Bids shall remain open to acceptance and shall be irrevocable for a period of sixty (60) days after the bid closing date.

**8.02 ACCEPTANCE OF OFFER**

- A. Owner reserves the right to accept or reject any or all offers.
- B. After acceptance by Owner, Engineer on behalf of Owner, will issue to the successful bidder, a written Bid Acceptance.

**END OF INSTRUCTIONS TO BIDDERS**

**SECTION 00 41 00  
BID FORM**

**PART 1 THE PROJECT AND THE PARTIES**

**1.01 TO:**

- A. Fargo Public School District No. 1
- B. Attn: James Hand, Director of Facilities
- C. 700 7th Street South
- D. Fargo, ND 58103

**1.02 FOR:**

- A. Project: 24-256 Fargo South Theater Lighting Upgrade
- B. Fargo Public Schools District No. 1
- C. MBN Project No. 24-256

**1.03 ADDENDA**

- A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.

Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.

Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.

Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.

**1.04 DATE: \_\_\_\_\_ (BIDDER TO ENTER DATE)**

**1.05 SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)**

Bidder's Full Name

\_\_\_\_\_

Address

\_\_\_\_\_

City, State, Zip

\_\_\_\_\_

**1.06 BID AMOUNT**

- A. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Bid Documents prepared by MBN Engineering, Inc. for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Price.

<u>Electrical</u>	<u>Bid Amount</u>
Base Bid	\$
Unit Price Total	Total of Unit prices below: \$
Total Bid Amount	Base bid plus unit price total: \$

- B. We have included the required security deposit in the form of a five percent (5%) Bid Bond as required by the Instruction to Bidders and a copy of North Dakota Contractor's license or Certificate of Renewal.
- C. We have included the required performance assurance bonds in the Bid Amount as required by the Instructions to Bidders.

**1.07 ACCEPTANCE**

- A. This offer shall be open to acceptance and is irrevocable for sixty days from the bid closing date.
- B. If this bid is accepted by Owner within the time period stated above, we will:
  1. Execute the Agreement within ten (10) days of receipt of Notice of Award.
  2. Furnish the required bonds within ten (10) days of receipt of Notice of Award.
- C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.
- D. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.
- E. All bids will be evaluated by base bid plus unit price totals. Low bid will be the base bid plus the total of the unit prices provided. Unit prices may be adjusted after the bid prior to award of the project to the successful bidder.

**1.08 CONTRACT TIME**

- A. If this Bid is accepted:
  1. Project work will be completed and ready for final payment by the **15th day of August 2025.**

**1.09 UNIT PRICES**

- A. The following are Unit Prices for specific portions of the Work as listed. The following is the list of Unit Prices:
- B. Contractor to fill in unit prices and total value and add total value to base bid above.

Item	Quantity	Unit Price	Value
26 Degree Ellipsoidal	20	\$	\$
19 Degree Ellipsoidal	10	\$	\$
36 Degree Ellipsoidal	15	\$	\$
50 Degree Ellipsoidal	2	\$	\$
8 inch Fresnel Fixture	21	\$	\$
LED Work Lights	8	\$	\$
LED Wash Lights	5	\$	\$
Follow Spot Light	2	\$	\$
Portable Dimmer Bar	1	\$	\$
Total			\$

**1.10 CHANGES TO THE WORK**

- A. When Engineer establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, our percentage fee will be:
  - 1. **10** percent overhead and profit on the net cost of our own Work;
  - 2. **5** percent on the cost of work done by any Subcontractor.
- B. On work deleted from the Contract, our credit to Owner shall be Engineer-approved net cost plus 5 percent of the overhead and profit percentage noted above.

**1.11 BID FORM SIGNATURE(S)**

A. An Individual

- 1. By: (SEAL) \_\_\_\_\_
- 2. \_\_\_\_\_ (Individual's Name)
- 3. doing business as: \_\_\_\_\_
- 4. Business Address: \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. Phone Number: \_\_\_\_\_

B. A Partnership

- 1. By: (SEAL) \_\_\_\_\_
- 2. \_\_\_\_\_ (Firm Name)
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_ (General Partner)
- 5. Business Address: \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. Phone Number: \_\_\_\_\_

C. A Corporation

- 1. By: \_\_\_\_\_
- 2. \_\_\_\_\_ (Corporation Name)
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_ (State of Incorporation)
- 5. By: \_\_\_\_\_
- 6. \_\_\_\_\_ (Name of Person Authorized to Sign)
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_ (Title)
- 9. \_\_\_\_\_ (Corporate Seal)
- 10. Attest: \_\_\_\_\_
- 11. \_\_\_\_\_ (Secretary)
- 12. Business Address: \_\_\_\_\_
- 13. \_\_\_\_\_
- 14. Phone Number: \_\_\_\_\_

D. A Joint Venture

- 1. By: \_\_\_\_\_
- 2. \_\_\_\_\_ (Name)
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_ (Address)
- 5. By: \_\_\_\_\_
- 6. \_\_\_\_\_ (Name)
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_ (Address)

9. (Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

**END OF SECTION**

**SECTION 00 52 00  
AGREEMENT FORM**

**PART 1 GENERAL**

**1.01 FORM OF AGREEMENT**

- A. The Agreement to be executed is attached following this page.
- B. All forms are available for review in the office of the Engineer located at 503 7th St N, Suite 200; Fargo, ND 58102.
- C. See attached forms following this Specification Section

**1.02 RELATED REQUIREMENTS**

- A. Section 00 72 00 - General Conditions.
- B. Section 00 73 00 - Supplementary Conditions.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF AGREEMENT**

**AGREEMENT**  
**BETWEEN OWNER AND CONTRACTOR**  
**FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)**

THIS AGREEMENT is by and between Fargo Public School District No. 1 (“Owner”) and \_\_\_\_\_ (“Contractor”).

Owner and Contractor hereby agree as follows:

**ARTICLE 1 – WORK**

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

- A. Fargo South High School Theatrical Lighting Upgrade

**ARTICLE 2 – THE PROJECT**

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:

- A. Fargo South High School Theatrical Lighting Upgrade

**ARTICLE 3 – ENGINEER**

3.01 The part of the Project that pertains to the Work has been designed by MBN Engineering, Inc.

3.02 The Owner has retained MBN Engineering, Inc. (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

**ARTICLE 4 – CONTRACT TIMES**

4.01 *Time of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Dates*

- A. The Work will start when site conditions allow and be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the following:

Final Completion: August 15, 2025

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the



delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner \$500.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$500.00 for each day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

#### 4.04 *Special Damages*

- A. In addition to the amount provided for liquidated damages, Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.
- B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.

### **ARTICLE 5 – CONTRACT PRICE**

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

- A. For all Work, at the price stated in Contractor's Bid, attached hereto as an exhibit.

### **ARTICLE 6 – PAYMENT PROCEDURES**

#### 6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

#### 6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 1st day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the

requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
  - a. 90 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
  - b. 90 percent of the cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 97.5 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

#### 6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

### **ARTICLE 7 – INTEREST**

- 7.01 All amounts not paid when due as provided in Article 14 of the General Conditions shall bear interest at the maximum rate allowed by law at the place of the project.

### **ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS**

- 8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
  - A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
  - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. The contractor is familiar with and is satisfied with all Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent

to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

- E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.
- F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. The contractor has given the Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

## **ARTICLE 9 – CONTRACT DOCUMENTS**

### **9.01 Contents**

- A. The Contract Documents consist of the following:
  - 1. This Agreement.
  - 2. Performance bond.
  - 3. Payment bond.
  - 4. General Conditions.
  - 5. Supplementary Conditions.
  - 6. Specifications as listed in the table of contents of the Project Manual.
- B. Drawings (not attached but incorporated by reference) bearing the following general title: Fargo Park District Anderson Softball Field Lighting Upgrade.
  - 1. Exhibits to this Agreement (enumerated as follows):
    - a. Contractor's Bid.
  - 2. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    - a. Notice to Proceed.
    - b. Work Change Directives.

- c. Change Orders.
- d. Field Orders.
- C. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- D. There are no Contract Documents other than those listed above in this Article 9.
- E. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

## **ARTICLE 10 – MISCELLANEOUS**

### **10.01 Terms**

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

### **10.02 Assignment of Contract**

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

### **10.03 Successors and Assigns**

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

### **10.04 Severability**

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

### **10.05 Contractor's Certifications**

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on \_\_\_\_\_ (which is the Effective Date of the Contract).

OWNER:

CONTRACTOR:

\_\_\_\_\_

\_\_\_\_\_

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

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

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

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

*(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest: \_\_\_\_\_

Attest: \_\_\_\_\_

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

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

Address for giving notices:

Address for giving notices:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

License No.: \_\_\_\_\_  
*(where applicable)*

**SECTION 00 60 00  
BONDS AND CERTIFICATES**

**FORM OF BONDS AND CERTIFICATES**

**1.01 BID BOND:**

- A. EJCDC Document C-430, Bid Bond, Penal Sum Form (2009).
- B. All forms are available for review in the office of the Engineer located at 503 7th St N, Suite 200; Fargo, ND 58102.
- C. See attached form following this Specification Section.

**1.02 PERFORMANCE BOND:**

- A. EJCDC Document C-610, Construction Performance Bond (2009).
- B. All forms are available for review in the office of the Engineer located at 503 7th St N, Suite 200; Fargo, ND 58102.
- C. See attached form following this Specification Section.

**1.03 PAYMENT BOND:**

- A. EJCDC Document C-615, Construction Payment Bond (2009).
- B. All forms are available for review in the office of the Engineer located at 503 7th St N, Suite 200; Fargo, ND 58102.
- C. See attached form following this Specification Section.

**END OF BONDS AND CERTIFICATES**

## BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

---

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

Fargo Public School District No. 1  
700 7<sup>th</sup> St. S.  
Fargo, ND 58103

BID

Bid Due Date:

Description (*Project Name— Include Location*):

BOND

Bond Number:

Date:

Penal sum

\$

(Words)

(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

**BIDDER**

**SURETY**

(Seal)

(Seal)

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By:

Signature

By:

Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest:

Signature

Attest:

Signature

Title

Title

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
  - 3.2 All Bids are rejected by Owner, or
  - 3.3 The owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.



## PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

Fargo Public School District No. 1  
700 7<sup>th</sup> St. S.  
Fargo, ND 58103

### CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

### BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form:  None  See Paragraph 18

---

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

### SURETY

\_\_\_\_\_ *(seal)*

Contractor's Name and Corporate Seal

\_\_\_\_\_ *(seal)*

Surety's Name and Corporate Seal

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

Signature

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

Signature *(attach power of attorney)*

\_\_\_\_\_

Print Name

\_\_\_\_\_

Print Name

\_\_\_\_\_

Title

\_\_\_\_\_

Title

Attest: \_\_\_\_\_

Signature

Attest: \_\_\_\_\_

Signature

\_\_\_\_\_

Title

\_\_\_\_\_

Title

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
  - 5.1 Claimants who do not have a direct contract with the Contractor,
    - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
    - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
  - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
  - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
  - 7.2 Pay or arrange for payment of any undisputed amounts.
  - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. **Definitions**
  - 16.1 **Claim:** A written statement by the Claimant including at a minimum:
    1. The name of the Claimant;
    2. The name of the person for whom the labor was done, or materials or equipment furnished;
    3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
    4. A brief description of the labor, materials, or equipment furnished;
    5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
    6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
    7. The total amount of previous payments received by the Claimant; and
  - 16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
  - 16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
  - 16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
  - 16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
18. Modifications to this Bond are as follows:

## PERFORMANCE BOND

CONTRACTOR *(name and address):*

SURETY *(name and address of principal place of business):*

OWNER *(name and address):*

Fargo Public School District No. 1  
700 7<sup>th</sup> St. S.  
Fargo, ND 58103

### CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

### BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract):*

Amount:

Modifications to this Bond Form:  None  See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

### SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal *(seal)*

\_\_\_\_\_  
Surety's Name and Corporate Seal *(seal)*

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

By: \_\_\_\_\_  
Signature *(attach power of attorney)*

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

**Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.**

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence,

to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

#### 14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims

for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

**SECTION 00 72 00  
GENERAL CONDITIONS**

**FORM OF GENERAL CONDITIONS**

**1.01 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT IS ATTACHED FOLLOWING THIS PAGE.**

**1.02 RELATED REQUIREMENTS**

A. SECTION 00 73 00 - Supplementary Conditions.

**1.03 SUPPLEMENTARY CONDITIONS**

A. Refer Section 00 73 00 - Supplementary Conditions for amendments to the General Conditions.

**END OF DOCUMENT**

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  5. *Bidder*—An individual or entity that submits a Bid to Owner.
  6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
  7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
  8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
  9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
  10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.



48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### **2.01 *Delivery of Bonds and Evidence of Insurance***

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

### **2.03 *Before Starting Construction***

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
  1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
  2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

#### 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

### **ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

#### **3.02 *Reference Standards***

- A. Standards Specifications, Codes, Laws and Regulations
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

#### **3.03 *Reporting and Resolving Discrepancies***

- A. *Reporting Discrepancies:*
  - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
  - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
  - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
  - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

### 4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

### 4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Contractor shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

### 4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

#### 4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
  2. abnormal weather conditions;
  3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
  4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

**ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part



by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

### 5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
  - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
  - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
  2. is of such a nature as to require a change in the Drawings or Specifications; or
  3. differs materially from that shown or indicated in the Contract Documents; or
  4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
    - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
  - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
  - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
  2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
    - d. Contractor gave the notice required in Paragraph 5.05.B.
  - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
  - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings*: The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
  2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

## ARTICLE 6 – BONDS AND INSURANCE

### 6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

### 6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

### 6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
  - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).



4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
  2. claims for damages insured by reasonably available personal injury liability coverage.
  3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
    - a. Such insurance shall be maintained for three years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Broad form property damage coverage.
  4. Severability of interest.
  5. Underground, explosion, and collapse coverage.
  6. Personal injury coverage.
  7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
  8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
  - 1. include at least the specific coverages provided in this Article.
  - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
  - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
  - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
  - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

#### 6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

#### 6.05 *Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
  - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
  - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
  - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
  6. extend to cover damage or loss to insured property while in transit.
  7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
  8. allow for the waiver of the insurer's subrogation rights, as set forth below.
  9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
  10. not include a co-insurance clause.
  11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
  12. include performance/hot testing and start-up.
  13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

## 6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

## 6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

## **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

### *7.01 Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### *7.02 Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

### *7.03 Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
      - 3) it has a proven record of performance and availability of responsive service; and
      - 4) it is not objectionable to Owner.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

#### 7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
  - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
  - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
  - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
    - a. shall certify that the proposed substitute item will:
      - 1) perform adequately the functions and achieve the results called for by the general design,
      - 2) be similar in substance to that specified, and
      - 3) be suited to the same use as that specified.
    - b. will state:
      - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
      - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
      - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
    - c. will identify:
      - 1) all variations of the proposed substitute item from that specified, and



- 2) available engineering, sales, maintenance, repair, and replacement services.
  - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
  - C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
  - D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
  - E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
  - F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

#### 7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

#### 7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

#### 7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
  - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
  - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
  - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
  - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
  - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
  - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

#### 7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 7.16 *Shop Drawings, Samples, and Other Submittals*

##### A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*
    - a. Contractor shall submit the number of Samples required in the Specifications.
    - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.
  3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
  2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
  3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
  4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
  5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
  6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
  7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal;
  6. the issuance of a notice of acceptability by Engineer;
  7. any inspection, test, or approval by others; or
  8. any correction of defective Work by Owner.



- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

#### 7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, 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 Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

## **ARTICLE 8 – OTHER WORK AT THE SITE**

### **8.01 *Other Work***

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

## 8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

## 8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9 – OWNER'S RESPONSIBILITIES**

### **9.01 *Communications to Contractor***

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### **9.02 *Replacement of Engineer***

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

### **9.03 *Furnish Data***

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### **9.04 *Pay When Due***

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

### **9.05 *Lands and Easements; Reports, Tests, and Drawings***

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

### **9.06 *Insurance***

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

### **9.07 *Change Orders***

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

**ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION**

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

#### 10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

### **ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

#### 11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  1. *Change Orders:*
    - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
    - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
  2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

#### 11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

#### 11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on



the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

#### 11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

#### 11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
  2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
  3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

#### 11.07 Execution of Change Orders

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
  3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
  4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

#### 11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

### **ARTICLE 12 – CLAIMS**

#### 12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
  - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
  - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
  - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## **ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### 13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
  1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
  2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
  1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. *Cash Allowances*: Contractor agrees that:
  - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### 13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

## **ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### **14.01 Access to Work**

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### **14.02 Tests, Inspections, and Approvals**

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
  - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
  - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
  - 3. by manufacturers of equipment furnished under the Contract Documents;
  - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
  - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to



cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### 14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

#### 14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
  - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

#### 14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

## **ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

### **15.01 Progress Payments**

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
  2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
    - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
    - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
  4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
    - a. to supervise, direct, or control the Work, or
    - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
    - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
    - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
    - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
  5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
  6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
    - a. the Work is defective, requiring correction or replacement;
    - b. the Contract Price has been reduced by Change Orders;
    - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
    - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
  - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. the Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. the Contract Price has been reduced by Change Orders;
  - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
  - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

#### 15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
  - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

#### 15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 *Final Payment*

- A. *Application for Payment:*
  - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents;
  - b. consent of the surety, if any, to final payment;
  - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
  - d. a list of all disputes that Contractor believes are unsettled; and
  - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

**B. *Engineer's Review of Application and Acceptance:***

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

**C. *Completion of Work:*** The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

**D. *Payment Becomes Due:*** Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,



including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

#### 15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

#### 15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. correct the defective repairs to the Site or such other adjacent areas;
  - 2. correct such defective Work;
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## **ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION**

### **16.01 *Owner May Suspend Work***

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

### **16.02 *Owner May Terminate for Cause***

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
  - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
  - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
  - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
  - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
  - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
  - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
  - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

#### 16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## **ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

### **17.01 *Methods and Procedures***

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
  - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
  - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
  - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agree with the other party to submit the dispute to another dispute resolution process; or
  - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## **ARTICLE 18 – MISCELLANEOUS**

### **18.01 *Giving Notice***

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

### **18.02 *Computation of Times***

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### **18.03 *Cumulative Remedies***

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

**SECTION 00 73 00  
SUPPLEMENTARY CONDITIONS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 72 00 - General Conditions and other provisions of the Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

**1.02 MODIFICATIONS TO GENERAL CONDITIONS**

- A. 7.3.10: The Bid Form identifies the overhead and profit fees applicable for Changes in the Work, whether additions to or deductions from the Work on which the Contract Sum is based and identifies the fees for subcontract work for changes (both additions and deductions) in the Work. The Contractor shall apply fees as noted, to the Subcontractor's gross (net plus fee) costs.
- B. ARTICLE 11.1 - CONTRACTOR'S LIABILITY INSURANCE
  - 1. Add the following subparagraph:
    - a. 11.1.2: The Worker's Compensation are as follows:
      - 1) State: Statutory.
      - 2) Applicable Federal (e.g. Longshoreman's): Statutory.
      - 3) Employer's Liability: \$1,000,000.
    - b. Contractor's Liability limits:
      - 1) General Aggregate (Except Products - Completed Operations): \$2,000,000
      - 2) Products - Completed Operations Aggregate: \$2,000,000.
      - 3) Personal and Advertising Injury (Per Person / Organization): \$1,000,000.
      - 4) Each Occurrence (Bodily Injury and Property Damage): \$1,000,000
      - 5) Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.
      - 6) Excess Liability:
        - (a) General Aggregate: \$5,000,000.
        - (b) Each Occurrence: \$2,000,000.
    - c. The Automobile Liability are as follows:
      - 1) Bodily Injury:
        - (a) Each Person: \$500,000.
        - (b) Each Accident: \$1,000,000.
      - 2) Property Damage:
        - (a) Each Accident: \$500,000.
      - 3) Combined Single Limit (Bodily Injury and Property Damage):
        - (a) Each Accident: \$1,000,000.

**1.03 MODIFICATIONS TO EJCDC C-700**

- A. SC-1. DEFINITIONS
  - 1. The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (No. C700, 2007 ed.) have the meanings assigned to them in the General Conditions.
- B. SC-5.04.
  - 1. 5.04.1 and 5.04.2. Workers' Compensation, etc. under paragraphs 5.04.A.1 and 5.04.A.2 of the General Conditions:
    - a. State: Statutory.
    - b. Applicable Federal (e.g. Longshoreman's): Statutory.

- c. Employer's Liability: \$500,000.
  - 2. 5.04.3, 5.04.4, and 5.04.5. Contractor's Liability Insurance under Paragraphs 5.04.A.3 through 5.04.A.5 of the General Conditions which shall also include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of the Contractor.
    - a. General Aggregate (Except Products - Completed Operations): \$2,000,000.
    - b. Products - Completed Operations Aggregate: \$2,000,000.
    - c. Personal and Advertising Injury (Per Person / Organization): \$1,000,000.
    - d. Each Occurrence (Bodily Injury and Property Damage): \$1,000,000.
    - e. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.
    - f. Excess Liability:
      - 1) General Aggregate: \$5,000,000.
      - 2) Each Occurrence: \$2,000,000.
  - 3. 5.04.6 Automobile Liability:
    - a. Bodily Injury:
      - 1) Each Person: \$500,000.
      - 2) Each Accident: \$1,000,000.
    - b. Property Damage:
      - 1) Each Accident: \$500,000.
    - c. Combined Single Limit (Bodily Injury and Property Damage):
      - 1) Each Accident: \$1,000,000.
  - 4. 5.04.7 Other persons or entities to be included on policy as additional insured's: Fargo Public School District No. 1, Fargo, North Dakota, and MBN Engineering, Inc., Fargo, North Dakota.
- C. SC-5.04.B.
- 1. The Contractual Liability coverage required by Paragraph 5.04.B.1 of the General Conditions shall provide coverage for not less than the following amounts:
    - a. General Aggregate: \$2,000,000.
    - b. Each Occurrence (Bodily Injury and Property Damage): \$1,000,000.
- D. SC-5.06.
- 1. Delete Paragraph 5.06.A of the General Conditions in its entirety and insert the following in its place:
    - a. 5.06 CONTRACTOR shall purchase and maintain property insurance upon the Work at the site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in these Supplementary Conditions or required by Laws and Regulations). This insurance shall:
    - b. 5.06.A.1. include the interests of OWNER, CONTRACTOR, SUBCONTRACTORS, ENGINEER, ENGINEER's CONSULTANTS, and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;
    - c. 5.06.A.2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss and damage to the Work, temporary buildings, falsework, and Work in transit and shall insure against at least the following perils: fire, lightning, extended coverage, theft, vandalism, and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils as may be specifically required by the Supplementary Conditions;
    - d. 5.06.A.3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
    - e. 5.06.A.4. cover materials and equipment in transit for incorporation in the Work or stored at the site or at another location that was agreed to in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have

- been included in an Application for Payment recommended by ENGINEER; and
- f. 5.06.A.5. be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER, CONTRACTOR, and ENGINEER with thirty days written notice to each other additional insured to whom a certificate of insurance has been issued.
2. The policies of insurance required to be purchased and maintained by CONTRACTOR in accordance with this Paragraph 5.06 shall comply with the requirements of GC-5.06.C.
- E. SC-5.06.B.
1. Delete Paragraph 5.06.B.
- F. SC-9.03.
1. Add a new paragraph immediately after Paragraph 9.03 of the General Conditions which is to read as follows:
    - a. ENGINEER shall furnish a Resident Project Representative (RPR), assistants and other field staff to assist ENGINEER in observing performance of the work of Contractor.
    - b. Through more extensive on-site observations of the work in progress and field checks of materials and equipment by the RPR and assistants, ENGINEER shall endeavor to provide further protection for OWNER against defects and deficiencies in the work of CONTRACTOR; but, the furnishing of such services will not make ENGINEER responsible for or give ENGINEER control over construction means, methods, techniques, sequences, or procedures or for safety precautions or programs, or responsibility for CONTRACTOR's failure to perform the work in accordance with the Contract Documents and in particular the specific limitations set forth in the Agreement that are applicable.
    - c. The duties and responsibilities of the RPR are limited to those of ENGINEER in ENGINEER's agreement with the OWNER and in the construction Contract Documents, and are generally described as below:
      - 1) RPR is ENGINEER's agent at the site, will act as directed by and under the supervision of ENGINEER, and will confer with ENGINEER regarding RPR's actions. RPR's dealings in matters pertaining to the on-site work shall in general be with ENGINEER and CONTRACTOR keeping OWNER advised as necessary. RPR's dealings with subcontractors shall only be through or with the full knowledge and approval of CONTRACTOR. RPR shall generally communicate with OWNER with the knowledge of and under the direction of ENGINEER.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SUPPLEMENTARY CONDITIONS**



**SECTION 01 20 00  
PRICE AND PAYMENT PROCEDURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

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

**1.02 RELATED REQUIREMENTS**

- A. Section 00 52 00 - Agreement Form: Contract Price, retainages, payment period.
- B. Section 00 72 00 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- C. Section 00 73 00 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.
- D. Section 01 78 00 - Closeout Submittals: Project record documents.

**1.03 SCHEDULE OF VALUES**

- A. Use Schedule of Values Form: EJCDC C-620, edition stipulated in the Agreement.
- B. Forms filled out by hand will not be accepted.
- C. Submit a printed schedule on EJCDC C-620 - Contractor's Application for Payment.
- D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization and bonds and insurance.
- F. Revise schedule to list approved Change Orders, with each Application For Payment.

**1.04 APPLICATIONS FOR PROGRESS PAYMENTS**

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Forms filled out by hand will not be accepted.
- C. Present required information on electronic media printout.
- D. Form: EJCDC C-620 Contractor's Application for Payment including continuation sheets when required.
- E. For each item, provide a column for listing each of the following:
  - 1. Item Number.
  - 2. Description of work.
  - 3. Scheduled Values.
  - 4. Previous Applications.
  - 5. Work in Place and Stored Materials under this Application.
  - 6. Authorized Change Orders.
  - 7. Total Completed and Stored to Date of Application.
  - 8. Percentage of Completion.
  - 9. Balance to Finish.
  - 10. Retainage.
- F. Execute certification by signature of authorized officer.

- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- I. Submit one electronic and zero hard-copies of each Application for Payment.
- J. Include the following with the application:
  - 1. Transmittal letter as specified for submittals in Section 01 30 00.
  - 2. Construction progress schedule, revised and current as specified in Section 01 30 00.
  - 3. Partial release of liens from major subcontractors and vendors.
  - 4. Affidavits attesting to off-site stored products.
- K. When Engineer requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

### **1.05 MODIFICATION PROCEDURES**

- A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Engineer will issue instructions directly to Contractor.
- B. For other required changes, Engineer will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
  - 1. The document will describe the required changes and will designate method of determining any change in Contract Price or Contract Time.
  - 2. Promptly execute the change.
- C. Engineer may issue a document which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change. Contractor shall prepare and submit a fixed price quotation within 7 days.
- D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
  - 1. For change requested by Engineer, Owner, or Contractor for work falling under a fixed price contract, the amount will be based on Contractor's price quotation as approved by the owner.
- E. Substantiation of Costs: Provide full information required for evaluation.
  - 1. Provide the following data:
    - a. Quantities of products, labor, and equipment.
    - b. Taxes, insurance, and bonds.
    - c. Overhead and profit.
    - d. Justification for any change in Contract Time.
    - e. Credit for deletions from Contract, similarly documented.
  - 2. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- F. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- G. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- H. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- I. Promptly enter changes in Project Record Documents.

**1.06 APPLICATION FOR FINAL PAYMENT**

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Price, previous payments, and sum remaining due.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 26 00  
CONTRACT MODIFICATION PROCEDURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Contract Modification Procedures:
  - 1. Preliminary Procedures.
  - 2. Construction Change Directive.
  - 3. Lump Sum Change Order.
  - 4. Time and Material Change Order.
  - 5. Documentation of Change in Contract Price.
  - 6. Documentation of Change in Contract Time.

**1.02 RELATED REQUIREMENTS**

- A. General Conditions: Governing requirements for changes in Contract Cost and Time.
- B. Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.
- C. Section 01 20 00 - Price and Payment Procedures: Applications for payment, Schedule of Values, modifications procedures, closeout procedures.
- D. Section 01 30 00 - Administrative Requirements: Submittal procedures, project meetings, progress schedules and documentation, reports, coordination.
- E. Section 01 40 00 - Quality Requirements: Procedures for testing, inspection, mock-ups, reports, certificates; use of reference standards.
- F. Section 01 50 00 - Temporary Facilities and Controls.
- G. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.
- H. Section 01 78 00 - Closeout Submittals

**1.03 REFERENCE STANDARDS**

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. UL (DIR) - Online Certifications Directory; Current Edition.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Scheduling: Work to be scheduled to not interrupt the normal operations of Fargo South High School.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Submit name of individual authorized to accept changes and to be responsible for informing others in Contractor's employ of changes in Work.
- C. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- D. Project Record Documents: Record actual locations of all new theatrical lighting equipment.

**1.06 PRELIMINARY PROCEDURES**

- A. Engineer may submit Proposal Request which includes detailed description of change with supplementary or revised Drawings and Specifications.
- B. Contractor may initiate a change by submittal of request to Engineer describing proposed change with a statement of the reason for change, effect on Contract Price and Contract Time with full documentation and statement of effect on Work of separate Contractors.

**1.07 CONSTRUCTION CHANGE DIRECTIVE**

- A. Engineer may issue directive, signed by Owner, instructing Contractor to proceed with change in Work, for subsequent inclusion in a Change Order.
- B. Directive will describe changes in Work and will designate method of determining any change in Contract Sum or Contract Time.
- C. Promptly execute change in Work.

**1.08 LUMP SUM CHANGE ORDER:**

- A. Will be based on Proposal Request and Contractor's lump sum quotation or Contractor's request for Change Order.

**1.09 TIME AND MATERIAL CHANGE ORDER**

- A. Submit itemized account and supporting data after completion of Change, within time limits in Conditions of the Contract.

**1.10 DOCUMENTATION OF CHANGE IN CONTRACT PRICE**

- A. Maintain detailed records of Work done on time and material basis. Provide full information required for evaluation of proposed changes and to substantiate costs of changes in Work.
- B. Document each quotation for change in cost with sufficient data to allow evaluation of quotation.
- C. On request, provide additional data to support computations:
  - 1. Quantities of products, labor, and equipment.
  - 2. Taxes, insurance and bonds.
  - 3. Overhead and profit.
  - 4. Justification for any change in Contract Time.
  - 5. Credit for deletions from Contract, similarly documented.
- D. Support each claim for additional costs, and for Work done on time and material basis, with additional information:
  - 1. Origin and date of claim.
  - 2. Dates and times Work was performed, and by whom.
  - 3. Time records and wage rates paid.
  - 4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

**1.11 DOCUMENTATION OF CHAGE IN CONTRACT TIME**

- A. A change solely in the Contract Time shall only be considered under the circumstances defined in Section 00 7300 - Supplementary Conditions.

**1.12 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 30 00  
ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

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

**1.02 RELATED REQUIREMENTS**

- A. Section 00 72 00 - General Conditions: Dates for applications for payment.
- B. Section 01 60 00 - Product Requirements: General product requirements.
- C. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

**1.03 REFERENCE STANDARDS**

- A. AIA G716 - Request for Information; 2004.
- B. AIA G810 - Transmittal Letter; 2001.

**1.04 GENERAL ADMINISTRATIVE REQUIREMENTS**

- A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- B. Make the following types of submittals to Engineer:
  - 1. Requests for Interpretation (RFI).
  - 2. Shop drawings, product data, and samples.
  - 3. Test and inspection reports.
  - 4. Manufacturer's instructions and field reports.
  - 5. Applications for payment and change order requests.
  - 6. Progress schedules.
  - 7. Correction Punch List and Final Correction Punch List for Substantial Completion.
  - 8. Closeout submittals.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 PRECONSTRUCTION MEETING**

- A. Engineer will schedule a meeting after Notice of Award.
- B. Attendance Required:
  - 1. Owner.
  - 2. Engineer.
  - 3. Contractor.
- C. Agenda:
  - 1. Execution of Owner-Contractor Agreement.
  - 2. Submission of executed bonds and insurance certificates.
  - 3. Distribution of Contract Documents.
  - 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.

5. Designation of personnel representing the parties to Contract, Owner, Contractor, and Engineer.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.

### **3.02 PROGRESS MEETINGS**

- A. Engineer will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- B. Attendance Required:
  1. Owner.
  2. Engineer.
  3. Contractor's superintendent.
  4. Major subcontractors.
- C. Agenda:
  1. Review minutes of previous meetings.
  2. Review of work progress.
  3. Field observations, problems, and decisions.
  4. Identification of problems that impede, or will impede, planned progress.
  5. Review of submittals schedule and status of submittals.
  6. Review of RFIs log and status of responses.
  7. Review of off-site fabrication and delivery schedules.
  8. Maintenance of progress schedule.
  9. Corrective measures to regain projected schedules.
  10. Planned progress during succeeding work period.
  11. Maintenance of quality and work standards.
  12. Effect of proposed changes on progress schedule and coordination.
  13. Other business relating to work.

### **3.03 REQUESTS FOR INTERPRETATION (RFI)**

- A. Definition: A request seeking one of the following:
  1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
  2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
  1. Prepare a separate RFI for each specific item.
    - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
    - b. Do not forward requests which solely require internal coordination between subcontractors.
  2. Prepare in a format and with content acceptable to Owner.
    - a. Use AIA G716 - Request for Information .
  3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
  1. Unacceptable Uses for RFIs: Do not use RFIs to request the following::

- a. Approval of submittals (use procedures specified elsewhere in this section).
  - b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
  - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
- 2. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
  - 3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
    - 1. Official Project name and number, and any additional required identifiers established in Contract Documents.
    - 2. Owner's, Engineer's, and Contractor's names.
    - 3. Discrete and consecutive RFI number, and descriptive subject/title.
    - 4. Issue date, and requested reply date.
    - 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
    - 6. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
  - F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
  - G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
    - 1. Indicate current status of every RFI. Update log promptly and on a regular basis.
    - 2. Note dates of when each request is made, and when a response is received.
    - 3. Highlight items requiring priority or expedited response.
    - 4. Highlight items for which a timely response has not been received to date.
  - H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Price or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.

### **3.04 SUBMITTALS FOR REVIEW**

- A. When the following are specified in individual sections, submit them for review:
  - 1. Product data.
  - 2. Shop drawings.
  - 3. Samples for selection.
  - 4. Samples for verification.
- B. Submit to Engineer for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

### **3.05 SUBMITTALS FOR INFORMATION**

- A. When the following are specified in individual sections, submit them for information:



1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Engineer's knowledge as contract administrator or for Owner.

### **3.06 SUBMITTALS FOR PROJECT CLOSEOUT**

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
  1. Project record documents.
  2. Operation and maintenance data.
  3. Warranties.
  4. Bonds.
  5. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

### **3.07 NUMBER OF COPIES OF SUBMITTALS**

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Engineer.
  1. After review, produce duplicates.
  2. Retained samples will not be returned to Contractor unless specifically so stated.

### **3.08 SUBMITTAL PROCEDURES**

- A. General Requirements:
  1. Transmit each submittal with approved form.
  2. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
  3. Identify Project, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
  4. Deliver submittals to Mike Berger at MBN Engineering, Inc. at 503 7th St. N, Suite 200; Fargo, ND 58102 or mike.berger@mbnengr.com.
  5. Schedule submittals to expedite the Project, and coordinate submission of related items.
  6. For each submittal for review, allow 7 days excluding delivery time to and from the Engineer.
  7. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
  8. Provide space for review stamps.
  9. When revised for resubmission, identify all changes made since previous submission.
  10. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
  11. Submittals not requested will not be recognized or processed.
  12. Use a separate transmittal for each item.
  13. Transmit using approved form.
    - a. Use Form AIA G810.
    - b. Use Contractor's form, subject to prior approval by Engineer.

14. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
  15. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
  16. Schedule submittals to expedite the Project, and coordinate submission of related items.
  17. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
  18. When revised for resubmission, identify all changes made since previous submission.
  19. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
- B. Product Data Procedures:
1. Submit only information required by individual specification sections.
  2. Collect required information into a single submittal.
  3. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
  2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

### **3.09 SUBMITTAL REVIEW**

- A. Submittals for Review: Engineer will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Engineer will acknowledge receipt and review. See below for actions to be taken.
- C. Engineer's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
- D. Engineer's actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
    - a. "Approved", or language with same legal meaning.
    - b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
      - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
  2. Not Authorizing fabrication, delivery, and installation:
    - a. "Revise and Resubmit".
      - 1) Resubmit revised item, with review notations acknowledged and incorporated.
    - b. "Rejected".
      - 1) Submit item complying with requirements of Contract Documents.

**END OF SECTION**

**SECTION 01 31 00  
PROJECT MANAGEMENT AND COORDINATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Project management and coordination.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 20 00 - Price and Payment Procedures.
- B. Section 01 26 00 - Contract Modification Procedures.
- C. Section 01 30 00 - Administrative Requirements.
- D. Section 01 40 00 - Quality Requirements.
- E. Section 01 50 00 - Temporary Facilities and Controls.
- F. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.
- G. Section 01 78 00 - Closeout Submittals

**1.03 PROJECT ENGINEER:**

- A. Will schedule and administer pre-construction meeting.
- B. Schedule and administer progress meetings.
- C. Preside at meetings.
- D. Record minutes; include significant proceedings and decisions.
- E. Reproduce and distribute copies of minutes within three days after each meeting to Owner, Owner's designated representative, Prime Contractor(s), and Engineer's Consultants. Prime Contractor(s) is/ are responsible for distribution to Subcontractors, Suppliers and Manufacturers as deemed appropriate by the Prime Contractor(s).

**1.04 CONTRACTOR:**

- A. Make physical arrangements for meetings.

**1.05 ATTENDEES AT MEETINGS:**

- A. Representatives of Contractors, Subcontractors and Suppliers attending meetings shall be qualified and authorized to act on behalf of entity each represents.
- B. Owner's representative and Engineer will attend meetings to ascertain that Work is expedited consistent with Contract Documents and construction schedule.

**1.06 PRE-CONSTRUCTION MEETING:**

- A. Location: A central site, convenient for all parties, designated by Engineer.
- B. Attendance:
  - 1. Owner's representative
  - 2. Contractor(s) superintendent(s).
  - 3. Major Subcontractor's.
  - 4. Major suppliers.
  - 5. Others as appropriate.

**1.07 SUGGESTED AGENDA:**

- A. Distribution and discussion of:
  - 1. Projected construction schedule.
  - 2. Critical Work sequencing.
  - 3. Major equipment deliveries and priorities.
  - 4. Project Coordination. Designation of responsible personnel.

- B. Procedures and processing of:
  1. Field decisions.
  2. Proposal Requests.
  3. Submittals: Paper and/or electronic.
  4. Change Orders.
  5. Applications for Payment, including deadline for submittal if any.
- C. Adequacy of distribution of Contract Documents.
- D. Procedures for maintaining Record Documents.
- E. Use of premises:
  1. Owner's requirements.
  2. Construction facilities controls and construction aids.
- F. Temporary utilities.
- G. Contractor's responsibility for safety and first-aid procedures.
- H. Security procedures.
- I. Housekeeping procedures.
- J. Ordering of certain finish materials that may be discontinued.
- K. Contact information for responsible personnel.

#### **1.08 PROGRESS MEETINGS:**

- A. Schedule regular bi-weekly meetings.
- B. Location of Meetings: Project field office of Contractor or on-site.
- C. Attendance:
  1. Engineer.
  2. Contractors, Subcontractors and Suppliers as appropriate.
  3. Contractor's superintendent(s).
  4. Others.
- D. Suggested Agenda:
  1. Review, approval of minutes of previous meeting.
  2. Review of Work progress since previous meeting.
  3. Field observations, problems, conflicts.
  4. Problems which impede construction schedule.
  5. Review of off-site fabrication, delivery schedule.
  6. Corrective measures and procedures to regain projected schedule.
  7. Revisions to construction schedule.
  8. Progress during succeeding Work period.
  9. Coordination of schedules.
  10. Coordination of other Contracted Work on same site.
  11. Review submittal schedules; expedite as required.
  12. Maintenance of quality standards.
  13. Status of testing and inspections.
  14. Pending changes and substitutions.
- E. Review proposed changes for:
  1. Effect on construction schedule and on completion date.
  2. Effect on other contracts of the Project.
- F. Other business.

#### **1.09 REFERENCE STANDARDS**

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

B. UL (DIR) - Online Certifications Directory; Current Edition.

**1.10 SUBMITTALS**

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 40 00  
QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Submittals.
- B. Control of installation.
- C. Manufacturers' field services.
- D. Defect Assessment.

**1.02 RELATED REQUIREMENTS**

- A. Document 00 72 00 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- C. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

**1.03 REFERENCE STANDARDS**

- A. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2024.
- B. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.
- C. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2021.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Designer's Qualification Statement: Submit for Engineer's knowledge as contract administrator, or for Owner's information.
  - 1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
    - a. Full name.
    - b. Professional licensure information.
    - c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.
- C. Test Reports: After each test/inspection, promptly submit three (3) copies of report to Engineer.
  - 1. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of inspector.
    - d. Date and time of sampling or inspection.
    - e. Identification of product and specifications section.
    - f. Location in the Project.
    - g. Type of test/inspection.
    - h. Date of test/inspection.
    - i. Results of test/inspection.
    - j. Compliance with Contract Documents.
    - k. When requested by Engineer, provide interpretation of results.
  - 2. Test report submittals are for Engineer's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 CONTROL OF INSTALLATION**

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

**3.02 MANUFACTURERS' FIELD SERVICES**

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

**3.03 DEFECT ASSESSMENT**

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

**END OF SECTION**

**SECTION 01 50 00  
TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers.
- D. Vehicular access and parking.
- E. Waste removal facilities and services.

**1.02 TEMPORARY UTILITIES**

- A. Owner will provide the following:
  - 1. Electrical power, consisting of connection to existing facilities.
- B. Existing facilities may be used.

**1.03 TEMPORARY SANITARY FACILITIES**

- A. Use of existing facilities located at Fargo South High School is permitted.
- B. Maintain daily in clean and sanitary condition.
- C. At end of construction, return facilities to same or better condition as originally found.

**1.04 BARRIERS**

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

**1.05 VEHICULAR ACCESS AND PARKING**

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Existing parking areas located at Fargo South High School may be used for construction parking. Coordinate with the school principal as to which parking spaces may be used by contractor's personnel.

**1.06 WASTE REMOVAL**

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**



**SECTION 01 60 00  
PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

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

**1.02 RELATED REQUIREMENTS**

- A. Document 00 21 13 - Instructions to Bidders: Product options and substitution procedures prior to bid date.
- B. Section 01 3000 - Administrative Requirements.
- C. Section 01 40 00 - Quality Requirements: Product quality monitoring.

**1.03 REFERENCE STANDARDS**

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

**1.04 SUBMITTALS**

- A. Subcontractors, Suppliers and Manufacturers List: Within 14 consecutive calendar days after date of Owner-Contractor Agreement, submit complete listing of Subcontractors, Suppliers and Manufacturers of products proposed on form furnished by Architect. Submittal later than 14 days shall subject Contractor to furnishing base specified products and manufacturers, at discretion of Architect.
  - 1. Review of Subcontractors and Suppliers shall be in accordance with Article 5.2 of General Conditions.
  - 2. Product manufacturers shall be one of those listed in Specifications or Addenda.
  - 3. First Application for Payment cannot be processed until Construction Schedule, Subcontractors, Suppliers and Manufacturers List, Special Structural Testing and Inspection Program Summary Schedule, and completed Schedule of Values have been received by Engineer.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- E. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

**1.05 QUALITY ASSURANCE**

- A. Comply with Specifications and referenced standards as minimum requirements.
- B. Components required to be supplied in quantity within Specification section shall be same and shall be interchangeable.

## **PART 2 PRODUCTS**

### **2.01 EXISTING PRODUCTS**

- A. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- B. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is indicated on the drawings.

### **2.02 ALL PRODUCTS**

- A. Furnishing and installing any products which are not "asbestos-free" is strictly prohibited. "Asbestos-free" is defined under current EPA Guidelines as a material containing not more than 1% asbestos.

### **2.03 NEW PRODUCTS**

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. See Section 01 40 00 - Quality Requirements, for additional source quality control requirements.
- C. Use of products having any of the following characteristics is not permitted:
  - 1. Containing lead, cadmium, or asbestos.
- D. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- E. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

### **2.04 PRODUCT OPTIONS**

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

### **2.05 MAINTENANCE MATERIALS**

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

## **PART 3 EXECUTION**

### **3.01 SUBSTITUTION LIMITATIONS**

- A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period and the documents required.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- C. A request for substitution constitutes a representation that the submitter:
  - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
  - 2. Agrees to provide the same warranty for the substitution as for the specified product.
  - 3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.

4. Waives claims for additional costs or time extension that may subsequently become apparent.

### **3.02 TRANSPORTATION AND HANDLING**

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. Protect sensitive products and equipment against exposure to elements and moisture. Protect sensitive equipment and finishes against impact, abrasion and other damage.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Coordinate deliveries to avoid conflict with Work and conditions at site.
- E. Transport and handle products in accordance with manufacturer's instructions.
- F. Deliver products in undamaged, dry condition, in original unopened containers or packaging with identifying labels intact and legible.
- G. Immediately on delivery, inspect shipments to ensure:
  1. Product complies with requirements of Contract Documents and reviewed submittals.
    - a. Quantities are correct.
    - b. Accessories and installation hardware are correct.
    - c. Containers and packages are intact and labels legible.
    - d. Products are protected and undamaged.
- H. Clearly mark partial deliveries of component parts of equipment to identify equipment and contents to permit easy accumulation of parts and to facilitate assembly.
- I. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- J. Provide additional protection during handling to prevent marring and otherwise damaging products, packaging and surrounding surfaces.
- K. Handle product by methods to avoid bending or overstressing. Lift large and heavy components only at designated lift points.

### **3.03 STORAGE AND PROTECTION**

- A. Storage, General
  1. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
  2. Immediately on delivery, store and protect products in accordance with manufacturers' instructions. Protect until installed. Owner has no responsibility to protect products from wind, rain and the elements.
  3. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
  4. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
  5. Comply with manufacturer's warranty conditions, if any.
  6. Prevent contact with material that may cause corrosion, discoloration, or staining. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
  7. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- B. Storage - Interior
  1. Store sensitive products in weather tight, climate controlled, enclosures in an environment
  2. favorable to product.

3. Maintain temperature and humidity within ranges stated in manufacturer's instructions.
  4. Provide ventilation for sensitive products as required by manufacturer's instructions.
  5. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.
- C. Store and protect products in accordance with manufacturers' instructions.
  - D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
  - E. Provide off-site storage and protection when site does not permit on-site storage or protection.
  - F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
  - G. Comply with manufacturer's warranty conditions, if any.
  - H. Prevent contact with material that may cause corrosion, discoloration, or staining.
  - I. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
  - J. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION**

**SECTION 01 77 00  
CLOSEOUT PROCEDURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Closeout Procedures.

**1.02 RELATED REQUIREMENTS**

- A. Conditions of The Contract: Fiscal provisions, legal submittals and additional administrative requirements.
- B. Section 01 20 00 - Price and Payment Procedures: Applications for payment, Schedule of Values, modifications procedures, closeout procedures.
- C. Section 01 40 00 - Quality Requirements: Procedures for testing, inspection, mock-ups, reports, certificates; use of reference standards.
- D. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.
- E. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance (O&M) data, warranties and bonds.

**1.03 SUBSTANTIAL COMPLETION**

- A. When Work is considered Substantially Complete, submit to Engineer written or electronic notice that Work, or designated portion thereof, is Substantially Complete and list of items to be completed or corrected.
- B. Within reasonable time after receipt of such notice, Engineer will make inspection to determine
  - 1. status of completion.
- C. Should Engineer determine Work is not Substantially Complete:
  - 1. Engineer will promptly notify Contractor in writing, giving reasons therefore.
  - 2. Contractor shall remedy deficiencies in Work, and send second written or electronic notice of Substantial Completion to Engineer.
  - 3. Engineer will reinspect Work.
- D. When Engineer concurs Work is Substantially Complete, Engineer will:
  - 1. Prepare Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by Engineer. Contractor(s) shall have 30 calendar days to complete all items on Engineer's list.
  - 2. Submit Certificate to Owner and Contractor for written acceptance of responsibilities assigned to Owner in Certificate.

**1.04 FINAL INSPECTION**

- A. When Work is considered complete, submit written certification that:
  - 1. Contract Documents have been reviewed.
  - 2. Work has been inspected for compliance with Contract Documents.
  - 3. Work has been completed in accordance with Contract Documents.
  - 4. Equipment and systems have been tested in presence of Owner's representative and are operational.
  - 5. Cleaning has been completed in accordance with Section 01 74 00.
  - 7. Work is completed and ready for final inspection.
  - 8. Engineer will make inspection to verify status of completion with reasonable promptness after receipt of such certification.
  - 9. Should Engineer consider that Work is incomplete or defective:
    - a. Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.

- b. Contractor shall take immediate steps to remedy stated deficiencies, and send second written certification to Engineer that Work is complete.
  - c. Engineer will reinspect Work.
10. When Engineer finds Work is acceptable under Contract Documents, Engineer shall request Contractor to make closeout submittals.

**1.05 FINAL APPLICATION FOR PAYMENT**

- A. Submit final Application for Payment in accordance with Section 01 20 00 and the procedures and requirements stated in General Conditions of The Contract for Construction and Section 00 73 00 Supplementary Conditions. Final Payment will not be certified until all Submittals required by Section 01 78 00 have been received and approved by the Engineer.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 78 00  
CLOSEOUT SUBMITTALS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

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

**1.02 RELATED REQUIREMENTS**

- A. Section 00 72 00 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 77 00 - Closeout Procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Specific requirements for operation and maintenance data.
- F. Individual Product Sections: Warranties required for specific products or Work.

**1.03 SUBMITTALS**

- A. Project Record Documents: Submit documents to Engineer with claim for final Application for Payment.
- B. Operation and Maintenance Data:
  - 1. Submit copy of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.
  - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
  - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.
- C. Warranties and Bonds:
  - 1. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
  - 2. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other modifications to the Contract.
  - 5. Reviewed shop drawings, product data, and samples.
  - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.

- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
  - 1. Product substitutions or alternates utilized.
  - 2. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  - 3. Field changes of dimension and detail.
  - 4. Details not on original Contract drawings.

### **3.02 OPERATION AND MAINTENANCE DATA**

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

### **3.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS**

- A. For Each Item of Equipment and Each System:
  - 1. Description of unit or system, and component parts.
  - 2. Identify function, normal operating characteristics, and limiting conditions.
  - 3. Include performance curves, with engineering data and tests.
  - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- E. Provide servicing and lubrication schedule, and list of lubricants required.
- F. Include manufacturer's printed operation and maintenance instructions.
- G. Include sequence of operation by controls manufacturer.
- H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- I. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- J. Additional Requirements: As specified in individual product specification sections.

### **3.04 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS**

- A. Assemble operation and maintenance data into electronic manuals in PDF format for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification



sections.

- B. Where systems involve more than one specification section, provide separate tabbed section for each system.
- C. Contractor(s) shall submit one (1) flash drive with electronic (pdf) versions of all approved Shop Drawings and Product Data. Arrange contents of flash drive by Section numbers and names (e.g. "102110\_Toilet Compartments.pdf"), in sequence of Table of Contents of this Project Manual. All data shall be in PDF format.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Engineer, Consultants, Contractor and subcontractors, with names of responsible parties.
  - 1. Include updated Subcontractor, Supplier and Manufacturer List: Indicating any changes made after original submission at start of Project.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- G. Electronic Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Drawings: Provide paper (cut off manila envelope) or plastic pocket with holes punched for 3-ring binder. Label pocket with drawing(s) enclosed. Fold drawing(s) to fit pocket without interfering with punched holes.
- I. Arrangement of Contents: Organize each PDF in parts as follows:
  - 1. Cover.
  - 2. Project Directory.
  - 3. Table of Contents, of all volumes, and of this volume.
  - 4. Operation and Maintenance Data:
    - a. Source data.
    - b. Product data, shop drawings, and other submittals: Include only those so required by individual Sections.
    - c. Operation and maintenance data.
    - d. Include description as to type and quantity of maintenance materials turned over to Owner in accordance with individual Sections.
    - e. Operation and Maintenance Data for Equipment and Systems.
    - f. Include all field quality control data and testing laboratory reports.
- J. All warranties and bonds.

### **3.05 WARRANTIES AND BONDS**

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

**END OF SECTION**

**SECTION 26 05 00**  
**BASIC ELECTRICAL REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Basic Electrical Requirements applicable to Division 26, Division 27, and Division 1 - General Requirements.

**1.02 REFERENCES**

- A. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- B. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2016.
- C. NFPA 70 - National Electrical Code; National Fire Protection Association; 2020.

**1.03 DEFINITIONS**

- A. The meaning and intent of the word "provide" as used in these specifications is the same as the words "The Electrical Contractor (and/or Bidder) shall provide."
- B. The word "provide" shall carry the same meaning as "furnish and install."
- C. The word "Contractor" shall mean the "Electrical Contractor."

**1.04 PERFORMANCE REQUIREMENTS**

- A. Conform to all applicable Building Codes, ordinances, laws and regulations.
- B. Electrical: Conform to NFPA 70 - National Electrical Code.
- C. Furnish products listed and classified by Underwriters Laboratories Inc.®, as suitable for the purpose specified and shown.
- D. Obtain permits, and request inspections from authority having jurisdiction.
- E. If the drawings and/or specifications conflict with any regulatory requirement, the regulatory requirement shall be followed. This does not relieve the Contractor from complying with items in the drawings and/or specifications in excess of the regulatory requirements.
- F. Test Standards:
  - 1. All materials and equipment shall be listed, labeled or certified by a nationally recognized testing laboratory to meet Underwriters Laboratories, Inc.®, standards where test standards have been established. Equipment and materials which are not covered by UL® Standards will be accepted provided the equipment and material is listed, labeled, certified or otherwise determined to meet safety requirements of a nationally recognized testing laboratory acceptable to the authority having jurisdiction.
  - 2. Definitions:
    - a. Listed; equipment or device of a kind mentioned which:
      - 1) Is published by a nationally recognized laboratory which makes periodic inspection of production of such equipment.
      - 2) States that such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.
    - b. Labeled; equipment or device is when:
      - 1) It embodies a valid label, symbol, or other identifying mark of a nationally recognized testing laboratory such as Underwriters Laboratories Inc.®
      - 2) The laboratory makes periodic inspections of the production of such equipment.
      - 3) The labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner.
    - c. Certified; equipment or product is which:
      - 1) Has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner.
      - 2) Production of equipment or product is periodically inspected by a nationally recognized testing laboratory.

- 3) Bears a label, tag, or other record of certification.
- d. Nationally recognized testing laboratory; laboratory which is approved by the authority having jurisdiction.

#### **1.05 PROJECT/SITE CONDITIONS**

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Engineer before proceeding.

#### **1.06 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit product data grouped to include complete submittals of related systems, products, and accessories.
- C. Shop Drawings: Submit Shop Drawings grouped to include complete submittals of related systems, products, and accessories.
- D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- E. Mark dimensions and values in units to match those specified.

#### **1.07 DRAWINGS**

- A. The drawings indicate the general arrangement and extent of electrical work. Do not scale off the electrical drawings. All data shall be field verified with actual field conditions. Review drawings of other trades and adjust work to meet the requirements of conditions shown. Contractor shall be responsible to field measure and confirm mounting heights and location of electrical equipment with respect to existing conditions.
- B. The drawings and specifications are complementary each to the other. What is called for by one shall be as binding as if called for by both.
- C. Omissions or discrepancies between different drawings or between drawings and specifications or between contract documents and regulations and/or codes shall be brought to the attention of the Architect/Engineer for a decision in writing. Interpretation before the bid shall be by addendum only. If an interpretation is not given by addendum, bid the greater quantity or better quality.

#### **1.08 PERMITS AND LICENSES**

- A. Obtain and pay for required licenses and permits.
- B. Installation shall be performed by persons licensed and skilled in the trade, and shall be done under the supervision of a master electrician licensed by the State.

#### **1.09 PROGRESS OF WORK**

- A. Organize electrical work such that the progress of the work will conform to the progress of other trades, and complete the entire installation as soon as the conditions of the building will permit. Any cost resulting from defective or ill-timed work performed under this section shall be borne by this Contractor.
- B. Portions of work will be required to be accomplished during other than normal working hours.

#### **1.10 CORRELATION OF WORK**

- A. Organize work so that it will not interfere with the work of other trades. Consult the drawings and specifications for work of other trades to correlate information, and consult the architectural and structural drawings for details and dimensions. Verify the location of all outlets. If interference develops, bring it to the attention of the Architect/Engineer for a decision. No additional compensation will be allowed for the moving of misplaced outlets, wiring or equipment.

- B. Before roughing-in for electrical equipment furnished by others, verify the voltage and current characteristics and control connections of this equipment, and provide the proper feeders and connections as recommended by the manufacturer of the equipment.

### **1.11 CUTTING AND PATCHING**

- A. Lay out all work in advance and where removal of door frames, portions of walls, ceilings or floors are required, and cutting, channeling, chasing, or drilling of building surfaces is necessary for the proper installation of electrical equipment, carefully perform this work in a manner which does not weaken floors and walls. Damaged surfaces shall be repaired at no cost to the Owner.
- B. Concrete shall be cut only with rotary type drilling tools. Electrical equipment shall not be cut with torches, and shall be joined only by bolting (i.e., do not weld wireways to panels).
- C. Patching, when required, shall be finished to match adjoining surfaces and is subject to approval by the Engineer.

### **1.12 EXAMINATION OF SITE**

- A. Before submitting a bid, each bidder shall examine the site, check the means of installing electrical equipment within the building, making connections to services, and shall be familiar with the existing conditions and limitations. No extras will be allowed because of the Contractor's misunderstanding of the amount of work involved or lack of knowledge of any site conditions which may affect the work. Any apparent variance of the drawings or specifications from the existing conditions at the site shall be called to the attention of the Engineer before submitting a bid.

### **1.13 OPERATION AND MAINTENANCE DATA**

- A. Submit under provisions of Section 01 78 00.
- B. Format:
  - 1. Prepare data in the form of an instructional manual.
  - 2. Organize in commercial quality, 8-1/2" x 11", three-ring binders with hard black or white, cleanable, plastic covers. When multiple binders are used, correlate data into related consistent groupings.
  - 3. Identify each binder on cover with typed or printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," list title of Project and identify subject matter of contents.
  - 4. Arrange contents by section numbers and sequence of Table of Contents by this Project Manual.
  - 5. Provide tabbed flyleaf for each separate product and system, with typed description of product and major component parts of equipment.
  - 6. Text: Manufacturer's printed data or typewritten data on 20-pound paper.
  - 7. Drawings: Provide with reinforced punched binder tab. Bind in with text. Fold larger drawings to size of text pages.
- C. Contents of Each Volume:
  - 1. Table of Contents: Provide title of Project; names, addresses and telephone numbers of Engineer and Contractor and listing of products and systems indexed to tabbed flyleaves.
  - 2. Updated Subcontractor, Supplier and Manufacturer List: Indicate any changes made after original submission at start of Project.
  - 3. Include description as to type and quantity of maintenance materials turned over to Owner in accordance with individual sections.
  - 4. Warranties and Bonds: Include all.
  - 5. Shop Drawings and Product Data: Include only those so required by individual sections.
  - 6. Operation and Maintenance Data for Equipment and Systems: Where required by individual sections, provide manufacturer's recommended operation procedures and maintenance requirements including guide for troubleshooting, disassembly, repair and assembly instructions and alignment, adjusting, balancing and checking instructions.

7. Include a copy of ANSI/NFPA 70B Electrical Equipment Maintenance.
- D. Submittals:
1. Submit one copy of completed volumes in final form 15 days prior to final inspection. Copy will be returned after final inspection, with Engineer's comments. Revise contents of documents as required prior to final submittal.
  2. Submit two copies of revised volumes of data in final form to Engineer within ten days after final inspection.

**1.14 DELIVERY, STORAGE AND HANDLING**

- A. Deliver, store, protect and handle Products to site under provisions of Section 01 60 00.

**1.15 PROJECT RECORD DOCUMENTS**

- A. Submit under provisions of Section 01 78 00.
- B. Include all changes and deviations from contract documents. Clearly mark in red colored pencil. Include all addendum items and approved change orders.

**1.16 MINIMUM REQUIREMENTS**

- A. References to the National Electrical Code (NEC), Underwriters Laboratories, Inc. (UL), National Fire Protection Association (NFPA), National Electrical Installation Standards (NEIS), and any other applicable standards are minimum installation requirement standards.
- B. Drawings and other specification sections shall govern in those instances where requirements are greater than those specified in the above standards.

**END OF SECTION**

**SECTION 26 05 01  
ELECTRICAL DEMOLITION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Electrical demolition.

**PART 2 PRODUCTS**

**2.01 MATERIALS AND EQUIPMENT**

- A. Materials and equipment for patching and extending work: As specified in individual sections.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents.
- D. Report discrepancies to Engineer before disturbing existing installation.
- E. Beginning of demolition means installer accepts existing conditions.

**3.02 PREPARATION**

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- C. Existing Electrical Service and Panelboards: Disable system only to make switchovers and connections. Minimize outage duration.
  - 1. Obtain permission from Owner at least 2 weeks before partially or completely disabling system.
  - 2. Make temporary connections to maintain service in areas adjacent to work area.
  - 3. Work may need to be done outside normal working hours to avoid disruption of normal building operation. Coordinate required work hours with the Owner.

**3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK**

- A. Remove, relocate, and extend existing installations to accommodate new construction.
- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.
- E. Disconnect and remove abandoned panelboards and distribution equipment.
- F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- G. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.
- I. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- J. Install junction boxes in walls, ceilings or floors if required to continue circuiting.

- K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

### **3.04 CLEANING AND REPAIR**

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

### **3.05 MATERIAL DISPOSAL**

- A. Material and equipment deemed salvageable by the Owner shall remain the property of Owner. Contractor shall dismantle these items to manageable size and deliver to designated storage area on site. The Owner shall have first right of refusal on all material and equipment.
- B. All other materials and equipment shall become property of Contractor and must be removed from site and disposed of by approved method.
- C. Fluorescent lamps and high intensity discharge lamps shall be packed in suitable shipping cartons and broken lamps shall be put in suitable sealed shipping containers. Store lamps in an area and in a manner that will prevent breakage. Label the lamp storage area and each lamp container as hazardous waste. Provide a hazardous waste manifest and ship to an approved disposal site. Comply with all regulations of the State Pollution Control Agency.
- D. If light fixtures are to be removed from the jobsite intact, remove the light fixture from the jobsite as a unit. Do not remove lamps or ballasts on the jobsite.
- E. For disposed light fixtures, remove the lamps and ballasts from fluorescent light fixtures and high intensity discharge light fixtures. Dispose of the lamps and ballasts as indicated above.

**END OF SECTION**

**SECTION 26 05 19  
LOW VOLTAGE WIRING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Single conductor building wire.
- B. Wiring connectors.
- C. Electrical tape.
- D. Wire pulling lubricant.
- E. Cable ties.
- F. Firestop sleeves.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 84 00 - Firestopping.
- B. Section 26 05 01 - Electrical Demolition
- C. Section 26 05 26 - Grounding and Bonding: Additional requirements for grounding conductors and grounding connectors.
- D. Section 26 05 53 - Electrical Identification: Identification products and requirements.

**1.03 REFERENCE STANDARDS**

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2018).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).
- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.
- F. IEEE 1210 - IEEE Standard Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable; 2004 (Corrigendum 2014).
- G. IEEE 1210 - IEEE Standard Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable; 2004 (Corrigendum 2014).
- H. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
- K. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
- L. UL 267 - Outline of Investigation for Wire-Pulling Compounds; Current Edition, Including All Revisions.
- M. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
- N. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
- O. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.
- P. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.
- Q. ASTM B836 - Standard Specification for Compact Round Stranded Aluminum Conductors using Single Input Wire Construction (2015).



#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
  - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
  - 3. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.
- C. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

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

#### **1.08 FIELD CONDITIONS**

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Engineer and obtain direction before proceeding with work.
- B. Products: Furnish products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

### **PART 2 PRODUCTS**

#### **2.01 CONDUCTOR AND CABLE APPLICATIONS**

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Underground feeder and branch-circuit cable is not permitted.
- E. Service entrance cable is not permitted.
- F. Armored cable is not permitted.
- G. Metal-clad cable is not permitted.
- H. Manufactured wiring systems are not permitted.

#### **2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS**

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Provide conductors and cables with lead content less than 300 parts per million.
- D. Provide new conductors and cables manufactured not more than one year prior to installation.

- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- F. Comply with NEMA WC 70.
- G. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- H. Conductors for Grounding and Bonding: Also comply with Section 26 05 26.
- I. Conductors and Cables Installed Where Exposed to Direct Rays of Sun: Listed and labeled as sunlight resistant.
- J. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.
- K. Conductor Material:
  - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
  - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
  - 3. Tinned Copper Conductors: Comply with ASTM B33.
- L. Minimum Conductor Size:
  - 1. Branch Circuits: 12 AWG.
    - a. Exceptions:
      - 1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
      - 2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
      - 3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.
  - 2. Control Circuits: 14 AWG.
- M. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- N. Conductor Color Coding:
  - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
  - 2. Color Coding Method: Integrally colored insulation.
    - a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
  - 3. Color Code:
    - a. 480Y/277 V, 3 Phase, 4 Wire System:
      - 1) Phase A: Brown.
      - 2) Phase B: Orange.
      - 3) Phase C: Yellow.
      - 4) Neutral/Grounded: Gray.
    - b. 208Y/120 V, 3 Phase, 4 Wire System:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.
      - 4) Neutral/Grounded: White.
    - c. Equipment Ground, All Systems: Green.
    - d. Travelers for 3-Way and 4-Way Switching: Pink.
    - e. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.
    - f. For control circuits, comply with manufacturer's recommended color code.

### 2.03 SINGLE CONDUCTOR BUILDING WIRE

- A. Manufacturers:
  - 1. Copper Building Wire:
    - a. Cerro Wire LLC: [www.cerrowire.com/#sle](http://www.cerrowire.com/#sle).
    - b. Encore Wire Corporation: [www.encorewire.com/#sle](http://www.encorewire.com/#sle).
    - c. General Cable Technologies Corporation: [www.generalcable.com/#sle](http://www.generalcable.com/#sle).
    - d. Service Wire Co: [www.servicewire.com/#sle](http://www.servicewire.com/#sle).
    - e. Southwire Company: [www.southwire.com/#sle](http://www.southwire.com/#sle).
    - f. Or Equal.
- B. Description: Single conductor insulated wire.
- C. Conductor Stranding:
  - 1. Feeders and Branch Circuits:
    - a. Size 10 AWG and Smaller: Solid.
    - b. Size 8 AWG and Larger: Stranded.
  - 2. Control Circuits: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation:
  - 1. Copper Building Wire: Type THHN/THWN-2 or XHHW-2.

### 2.04 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 26 05 26.
- C. Wiring Connectors for Splices and Taps:
  - 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
  - 2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
- D. Wiring Connectors for Terminations:
  - 1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
  - 2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
  - 3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
  - 4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
  - 5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
  - 6. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
  - 7. Conductors for Control Circuits: Use crimped terminals for all connections.
- E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.
- F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
- G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
  - 1. Manufacturers:

- a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
  - b. Ideal Industries, Inc: [www.idealindustries.com/#sle](http://www.idealindustries.com/#sle).
  - c. NSI Industries LLC: [www.nsiindustries.com/#sle](http://www.nsiindustries.com/#sle).
  - d. Or Equal.
- H. Mechanical Connectors: Provide bolted type or set-screw type.
- 1. Manufacturers:
    - a. Burndy LLC: [www.burndy.com](http://www.burndy.com).
    - b. nVent ILSCO: [www.ilSCO.com/#sle](http://www.ilSCO.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    - d. Or Equal.
- I. Compression Connectors: Provide circumferential type or hex type crimp configuration.
- 1. Manufacturers:
    - a. Burndy LLC: [www.burndy.com](http://www.burndy.com).
    - b. nVent ILSCO: [www.ilSCO.com/#sle](http://www.ilSCO.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    - d. Or Equal.
- J. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.
- 1. Manufacturers:
    - a. Burndy LLC: [www.burndy.com](http://www.burndy.com).
    - b. IlSCO: [www.ilSCO.com/#sle](http://www.ilSCO.com/#sle).
    - c. Thomas & Betts Corporation: [www.tnb.com/#sle](http://www.tnb.com/#sle).
    - d. Or Equal.

## 2.05 ACCESSORIES

- A. Electrical Tape:
- 1. Manufacturers:
    - a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
    - b. Plymouth Rubber Europa: [www.plymouthrubber.com/#sle](http://www.plymouthrubber.com/#sle).
    - c. Or Equal.
  - 2. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
  - 3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
  - 4. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.
- B. Wire Pulling Lubricant:
- 1. Manufacturers:
    - a. 3M: [www.3m.com/#sle](http://www.3m.com/#sle).
    - b. American Polywater Corporation: [www.polywater.com/#sle](http://www.polywater.com/#sle).
    - c. Ideal Industries, Inc: [www.idealindustries.com/#sle](http://www.idealindustries.com/#sle).
    - d. Or Equal.
  - 2. Listed and labeled as complying with UL 267.
  - 3. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
  - 4. Suitable for use at installation temperature.
- C. Cable Ties: Material and tensile strength rating suitable for application.
- 1. Manufacturers:
    - a. Burndy LLC: [www.burndy.com](http://www.burndy.com).
    - b. Or Equal.

- D. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.
  - 1. Products:
    - a. HoldRite, a brand of Reliance Worldwide Corporation; HydroFlame Pro Series/HydroFlame Custom Built: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - b. Or Equal.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 PREPARATION**

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

### **3.03 INSTALLATION**

- A. Circuiting Requirements:
  - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
  - 2. When circuit destination is indicated without specific routing, determine exact routing required.
  - 3. Arrange circuiting to minimize splices.
  - 4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
  - 5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
  - 6. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
  - 7. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is permitted, under the following conditions:
    - a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
    - b. Increase size of conductors as required to account for ampacity derating.
    - c. Size raceways, boxes, etc. to accommodate conductors.
  - 8. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Installation in Raceway:
  - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
  - 2. Pull all conductors and cables together into raceway at same time.
  - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
  - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

- E. Exposed Cable Installation (only where specifically permitted):
  1. Route cables parallel or perpendicular to building structural members and surfaces.
  2. Protect cables from physical damage.
- F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
  1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
  2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits.
- H. Install conductors with a minimum of 12 inches of slack at each outlet.
- I. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.
- J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- K. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- L. Make wiring connections using specified wiring connectors.
  1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
  2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
  3. Do not remove conductor strands to facilitate insertion into connector.
  4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
  5. Connections for Aluminum Conductors: Fill connectors with oxide inhibiting compound where not pre-filled by manufacturer.
  6. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
  7. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- M. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
  1. Dry Locations: Use insulating covers specifically designed for the connectors or heat shrink tubing.
  2. Damp Locations: Use insulating covers specifically designed for the connectors or heat shrink tubing.
    - a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
  3. Wet Locations: Use heat shrink tubing.
- N. Insulate ends of spare conductors using vinyl insulating electrical tape.
- O. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.
- P. Identify conductors and cables in accordance with Section 26 05 53.

- Q. Color Code Legend: Provide identification label identifying color code for ungrounded conductors at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
- R. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
- S. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

**3.04 FIELD QUALITY CONTROL**

- A. Correct deficiencies and replace damaged or defective conductors and cables.
- B. Inspect wire for physical damage and proper connection.
- C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- D. Verify continuity of each branch circuit conductor.

**END OF SECTION**

**SECTION 26 05 26  
GROUNDING AND BONDING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.
- D. Grounding and bonding components for electrical systems.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

**1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
- B. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Notify Engineer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- B. IEEE 1100 - Recommended Practices for Powering and Grounding Electronic Equipment.

**1.05 QUALITY ASSURANCE**

- A. Conform to requirements of NFPA 70.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- C. Comply with UL 467.
- D. Comply with NECA's "Standard of Installation."

**PART 2 PRODUCTS**

**2.01 GROUNDING AND BONDING REQUIREMENTS**

- A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- D. Bonding and Equipment Grounding:
  - 1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and



other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

## **2.02 GROUNDING AND BONDING COMPONENTS**

- A. General Requirements:
  1. Provide products listed, classified, and labeled by Underwriter's Laboratories Inc. (UL) or Intertek (ETL) as suitable for the purpose indicated.
  2. Provide products listed and labeled as complying with UL 467 and IEEE 837 where applicable.
- B. Conductors for Grounding and Bonding, in addition to requirements of Section 26 05 19:
  1. Use insulated copper conductors unless otherwise indicated.
- C. Connectors for Grounding and Bonding:
  1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467 and IEEE 837.
  2. Unless otherwise indicated, use exothermic welded connections or irreversible compression connectors for underground, concealed and other inaccessible connections.
  3. Unless otherwise indicated, use mechanical connectors, exothermic welded connections, or irreversible compression connectors for accessible connections.
  4. Manufacturers - Mechanical and Compression Connectors:
    - a. Burndy LLC;: [www.burndy.com/#sle](http://www.burndy.com/#sle).
    - b. Harger Lightning & Grounding: [www.harger.com](http://www.harger.com).
    - c. Thomas & Betts , a member of the ABB Group: [www.tnb.com](http://www.tnb.com).
    - d. Or Equal.
  5. Manufacturers - Exothermic Welded Connections:
    - a. Burndy LLC;: [www.burndy.com/#sle](http://www.burndy.com/#sle).
    - b. Cadweld, a brand of Erico International Corporation: [www.erico.com](http://www.erico.com).
    - c. thermOweld, subsidiary of Continental Industries; division of Burndy LLC;: [www.thermoweld.com/#sle](http://www.thermoweld.com/#sle).
    - d. Harger Lightning & Grounding[<>]: [www.harger.com](http://www.harger.com).
    - e. Or Equal

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as shown on the drawings.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Verify existing conditions prior to beginning work.

### **3.02 INSTALLATION**

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

- B. Install grounding and bonding system components in a neat and workmanlike manner in accordance with NECA 1.
- C. Make grounding and bonding connections using specified connectors.
  - 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
  - 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
  - 3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
  - 4. Mechanical Connectors: Secure connections using silicone bronze hardware, according to manufacturer's recommended torque settings.
  - 5. Irreversible Compression Connectors: Secure connections using manufacturer's recommended tools and dies. Irreversible compression grounding connectors must be factory filled with an oxide inhibitor and installed using a 14 ton or larger hydraulic tool, matching the manufacturer's die to the connector. Connectors must be fully crimped, allowing visible inspection of the embossed index number on the crimped connector, which should match the same index number on the die.
- D. Identify grounding and bonding system components in accordance with Section 26 05 53.
- E. Comply with NEC
  - 1. Article 250 for types, sizes, and quantities of equipment grounding conductors, except where specific types, larger sizes, or more conductors than required by NEC are indicated.
- F. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing. Comply with NEC Article 250 for types, sizes, and quantities of equipment grounding conductors, except where specific types, larger sizes, or more conductors than required by NEC are indicated.
  - 1. Install equipment grounding conductor with circuit conductors for the items below in addition to those required by Code:
    - a. Feeders and branch circuits.
    - b. Lighting circuits.
    - c. Receptacle circuits.
    - d. Single-phase motor or appliance branch circuits.
    - e. Three-phase motor or appliance branch circuits.
    - f. Flexible raceway runs.
    - g. Armored and metal-clad cable runs.
- G. Connections
  - 1. General: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
  - 2. Exothermic-Welded (CADWELD) Connections: Use for connections to structural steel and for underground connections, except those at test wells. Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
  - 3. Equipment Grounding-Wire Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs, SLUH type as manufactured by Ilsco. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
  - 4. Non-contact Metal Raceway Terminations: Where metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors, except as

otherwise indicated.

5. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.
6. Irreversible Compression-Type Connections: Use hydraulic compression tools, 14 ton minimum, to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor. Compression grounding connectors shall be factory filled with oxide inhibitors.
7. Moisture Protection: Where insulated grounding conductors are connected to grounding rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

### **3.03 FIELD QUALITY CONTROL**

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

**END OF SECTION**

**SECTION 26 05 29  
HANGERS AND SUPPORTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 33.13 - Conduit: Additional support and attachment requirements for conduits.
- B. Section 26 05 33.16 - Boxes: Additional support and attachment requirements for boxes.
- C. Section 26 51 00 - Lighting: Additional support and attachment requirements for interior luminaires.

**1.03 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- D. MFMA-4 - Metal Framing Standards Publication; 2004.
- E. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2009.
- F. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2010
- G. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL 5B - Strut-Type Channel Raceways and Fittings; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate sizes and arrangement of supports and bases with actual equipment and components to be installed.
  - 2. Coordinate work to provide additional framing and materials required for installation.
  - 3. Coordinate compatibility of support and attachment components with mounting surfaces at installed locations.
  - 4. Coordinate arrangement of supports with ductwork, piping, equipment and other potential conflicts.
  - 5. Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems and non-penetrating rooftop supports.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

## 1.06 QUALITY ASSURANCE

- A. Maintain at project site one copy of each referenced document that prescribes execution requirements.
- B. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

## 1.07 DELIVERY, STORAGE, AND HANDLING

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

## PART 2 PRODUCTS

### 2.01 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
  - 1. Comply with the following. Where requirements differ, comply with most stringent.
    - a. NFPA 70.
    - b. Requirements of authorities having jurisdiction.
  - 2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
  - 3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
  - 4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 1.5. Include consideration for vibration, equipment operation, and shock loads where applicable.
  - 5. Do not use products for applications other than as permitted by NFPA 70 and product listing.
  - 6. Do not use wire, chain, perforated pipe strap, wood, or other supports not listed for the application for permanent supports unless specifically indicated or permitted.
  - 7. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
    - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
    - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
    - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
    - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.
  - 1. Manufacturers:
    - a. ABB: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Eaton Corporation: [www.eaton.com/#sle](http://www.eaton.com/#sle).
    - c. Emerson Electric Co; O-Z/Gedney: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - d. HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - e. Or equal.
- C. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
- D. Conduit Clamps: Bolted type unless otherwise indicated.
  - 1. Products:
    - a. Gripple, Inc; Universal Bracket: [www.gripple.com/#sle](http://www.gripple.com/#sle).
    - b. Gripple, Inc; Fast Trak: [www.gripple.com/#sle](http://www.gripple.com/#sle).
    - c. Gripple, Inc; Universal Clamp (Threaded): [www.gripple.com/#sle](http://www.gripple.com/#sle).
    - d. Gripple, Inc; Low Profile Bracket Kits: [www.gripple.com/#sle](http://www.gripple.com/#sle).
    - e. Or Equal.
- E. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.

1. Manufacturers:
    - a. ABB: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Eaton Corporation: [www.eaton.com/#sle](http://www.eaton.com/#sle).
    - c. Emerson Electric Co; O-Z/Gedney: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - d. HoldRite, a brand of Reliance Worldwide Corporation: [www.holdrite.com/#sle](http://www.holdrite.com/#sle).
    - e. Or equal.
- F. Metal Channel/Strut Framing Systems:
1. Manufacturers:
    - a. ABB: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Atkore International Inc; Unistrut: [www.unistrut.us/#sle](http://www.unistrut.us/#sle).
    - c. Eaton Corporation: [www.eaton.com/#sle](http://www.eaton.com/#sle).
    - d. Elgen Manufacturing Company, Inc: [www.elgenmfg.com/#sle](http://www.elgenmfg.com/#sle).
    - e. Or equal.
  2. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
  3. Comply with MFMA-4.
  4. Channel Material:
    - a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
    - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
  5. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
  6. Minimum Channel Dimensions: 1-5/8 inch wide by 13/16 inch high.
- G. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.
1. Minimum Size, Unless Otherwise Indicated or Required:
    - a. Equipment Supports: 1/2-inch diameter.
    - b. Single Conduit up to 1-inch (27 mm) Trade Size: 1/4-inch diameter.
    - c. Single Conduit Larger than 1-inch (27 mm) Trade Size: 3/8-inch diameter.
    - d. Trapeze Support for Multiple Conduits: 3/8-inch diameter.
    - e. Outlet Boxes: 1/4-inch diameter.
    - f. Luminaires: 1/4-inch diameter.
- H. Anchors and Fasteners:
1. Manufacturers - Mechanical Anchors:
    - a. Dewalt: [anchors.dewalt.com/#sle](http://anchors.dewalt.com/#sle).
    - b. Hilti, Inc: [www.hilti.com/#sle](http://www.hilti.com/#sle).
    - c. ITW Red Head, a division of Illinois Tool Works, Inc: [www.itwredhead.com/#sle](http://www.itwredhead.com/#sle).
    - d. Simpson Strong-Tie Company Inc: [www.strongtie.com/#sle](http://www.strongtie.com/#sle).
    - e. Or equal.
  2. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.
  3. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
  4. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
  5. Hollow Masonry: Use toggle bolts.
  6. Hollow Stud Walls: Use toggle bolts.
  7. Steel: Use beam clamps, machine bolts, or welded threaded studs.
  8. Sheet Metal: Use sheet metal screws.
  9. Wood: Use wood screws.
  10. Plastic and lead anchors are not permitted.
  11. Powder-actuated fasteners are not permitted.
  12. Hammer-driven anchors and fasteners are permitted only as follows:
    - a. Nails are permitted for attachment of nonmetallic boxes to wood frame construction.
    - b. Staples are permitted for attachment of nonmetallic-sheathed cable to wood frame construction.

13. Preset Concrete Inserts: Continuous metal channel/strut and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
  - a. Manufacturer: Same as manufacturer of metal channel/strut framing system.
  - b. Comply with MFMA-4.
  - c. Channel Material: Use galvanized steel.
  - d. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch minimum base metal thickness.
14. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

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

#### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install hangers and supports in accordance with NECA 1.
- C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
- D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- E. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support system or ceiling grid.
- F. Unless specifically indicated or approved by Engineer, do not provide support from roof deck.
- G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- H. Equipment Support and Attachment:
  1. Use metal, fabricated supports or supports assembled from metal channel/strut to support equipment as required.
  2. Use metal channel/strut secured to studs to support equipment surface mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
  3. Use metal channel/strut to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
  4. Unless otherwise indicated, mount floor-mounted equipment on properly sized concrete pad 3 inches in height; see Section 03 30 00.
  5. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- I. Conduit Support and Attachment: See Section 26 05 33.13 for additional requirements.
- J. Box Support and Attachment: See Section 26 05 33.16 for additional requirements.
- K. Interior Luminaire Support and Attachment: See Section 26 51 00 for additional requirements.
- L. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.
- M. Secure fasteners in accordance with manufacturer's recommended torque settings.
- N. Remove temporary supports.
- O. Identify independent electrical component support wires above accessible ceilings, where permitted, with color distinguishable from ceiling support wires in accordance with NFPA 70.

### **3.03 FIELD QUALITY CONTROL**

- A. Inspect support and attachment components for damage and defects.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective support and attachment components.
- D. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1. Size metal framing system as required for the application and structural requirements.

**END OF SECTION**



**SECTION 26 05 33.13  
CONDUIT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Flexible metal conduit (FMC).
- B. Galvanized steel electrical metallic tubing (EMT).
- C. Conduit, fittings and conduit bodies.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 19 - Low Voltage Wiring.
- B. Section 26 05 26 - Grounding and Bonding.
  - 1. Includes additional requirements for fittings for grounding and bonding.
- C. Section 26 05 29 - Hangers and Supports.
- D. Section 26 05 33.16 - Boxes.
- E. Section 26 05 53 - Electrical Identification: Identification products and requirements.

**1.03 REFERENCE STANDARDS**

- A. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.
- B. ASTM D1598 - Standard Test Methods for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure; 2021.
- C. ASTM D1599 - Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings; 2018.
- D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.
- F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.
- I. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.
- J. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.
- K. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
  - 2. Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.
  - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
  - 4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
  - 5. Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  - 1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.
- C. Project Record Documents: Record actual routing for conduits 2-inch (53 mm) trade size and larger.

### **1.06 QUALITY ASSURANCE**

- A. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for purpose specified and shown.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

### **1.08 DESIGN REQUIREMENTS**

- A. Conduit Size: ANSI/NFPA 70 or as indicated on Drawings, whichever is larger.

## **PART 2 PRODUCTS**

### **2.01 CONDUIT APPLICATIONS**

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, electrical metallic tubing.
- C. Concealed Within Hollow Stud Walls: Use electrical metallic tubing (EMT).
- D. Concealed Above Accessible Ceilings: Use electrical metallic tubing (EMT).
- E. Exposed, Interior, use electrical metallic tubing (EMT).
- F. Flexible Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit (FMC).
  - 1. Maximum Length: 6 feet.
- G. Flexible Connections to Vibrating Equipment:
  - 1. Dry Locations: Use flexible metal conduit (FMC).
  - 2. Maximum Length: 6 feet unless otherwise indicated.
  - 3. Vibrating equipment includes, but is not limited to:
    - a. Transformers.
    - b. Motors.
- H. Fished in Existing Walls, Where Necessary: Use flexible metal conduit (FMC).

### **2.02 CONDUIT - GENERAL REQUIREMENTS**

- A. Comply with NFPA 70.
- B. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling mandrel through them.
- C. Fittings for Grounding and Bonding: See Section 26 05 26 for additional requirements.
- D. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- E. Provide products listed, classified, and labeled as suitable for purpose intended.

- F. Minimum Conduit Size, Unless Otherwise Indicated:
  - 1. Branch Circuits: 1/2-inch trade size.
  - 2. Branch Circuit Homeruns: 3/4-inch trade size.
  - 3. Control Circuits: 1/2-inch trade size.
  - 4. Flexible Connections to Luminaires: 3/8-inch trade size.
- G. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

### **2.03 FLEXIBLE METAL CONDUIT (FMC)**

- A. Manufacturers:
  - 1. AFC Cable Systems, Inc: [www.afcweb.com](http://www.afcweb.com).
  - 2. Electri-Flex Company: [www.electriflex.com](http://www.electriflex.com).
  - 3. International Metal Hose: [www.metalhose.com](http://www.metalhose.com).
  - 4. Or Equal.
- B. Description: NFPA 70, Type FMC standard-wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems.
- C. Fittings:
  - 1. Manufacturers:
    - a. ABB; T&B: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Bridgeport Fittings, LLC: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - c. Emerson Electric Co; O-Z/Gedney: [www.emerson.com/#sle](http://www.emerson.com/#sle).
    - d. Or Equal.
  - 2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  - 3. Material: Use steel or malleable iron.
    - a. Do not use die cast zinc fittings.
- D. Description: Interlocked steel construction.
- E. Fittings: NEMA FB 1.

### **2.04 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)**

- A. Manufacturers:
  - 1. Allied Tube & Conduit: [www.alliedeg.com](http://www.alliedeg.com).
  - 2. Nucor Tubular Products: [www.nucortubular/#sle](http://www.nucortubular/#sle).
  - 3. Western Tube, a division of Zekelman Industries: [www.westerntube.com/#sle](http://www.westerntube.com/#sle).
  - 4. Wheatland Tube Company: [www.wheatland.com](http://www.wheatland.com).
  - 5. Or Equal.
- B. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- C. Factory-Painted, Color-Coded Galvanized Steel EMT: Apply according to indicated color code.
  - 1. See Section 26 05 53 for color code.
- D. Fittings:
  - 1. Manufacturers:
    - a. ABB; T&B: [www.electrification.us.abb.com/#sle](http://www.electrification.us.abb.com/#sle).
    - b. Allied Tube & Conduit, a division of Atkore International: [www.alliedeg.us/#sle](http://www.alliedeg.us/#sle).
    - c. Bridgeport Fittings, LLC: [www.bptfittings.com/#sle](http://www.bptfittings.com/#sle).
    - d. Emerson Electric Co; O-Z/Gedney: [www.emerson.com/#sle](http://www.emerson.com/#sle).
  - 2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  - 3. Material: Use steel or malleable iron.
    - a. Do not use die cast zinc fittings.
  - 4. Connectors and Couplings: Use compression/gland or set-screw type. Insulated Throat.

- a. Do not use indenter type connectors and couplings.
- 5. Damp or Wet Locations, Where Permitted: Use fittings listed for use in wet locations.
- 6. Embedded Within Concrete, Where Permitted: Use fittings listed as concrete-tight. Fittings that require taping to be concrete-tight are acceptable.

## **2.05 FIRESTOP**

- A. Provide a firestop system with an "F" rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
  - 1. For penetrations by non-combustible items including steel pipe, copper pipe, rigid steel conduit, and electrical metallic tubing (EMT), the following are acceptable:
    - a. Hilti FS 601 electrometric firestop sealant or Fs 605 HP firestop sealant.
    - b. b. 3M fire barrier CP25.
    - c. c. Nelson CLK firestop sealant
  - 2. For fire-rated construction joints and other gaps, the following may be used:
    - a. Hilti FS 601.
    - b. 3M fire barrier CP25.
    - c. Nelson CLK firestop sealant.
  - 3. All penetrations through fire barrier walls or floors shall consist of a conduit sleeve and shall be sealed with an industry approved fire barrier caulk or compound reamed and bushed. All vertical/horizontal sleeves shall be sized according to station count passing through each. Sized for maximum 60 percent fill.
  - 4. For penetrations by non-combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable, or cable bundles, and plastic pipe (closed piping systems), the following are acceptable:
    - a. Hilti FS 611A intumescent firestop sealant.
    - b. 3M barrier CP 25.
    - c. 3M fire barrier FS-195 wrap strip.
    - d. Nelson FSP firestop putty, PCS pipe choke system.
  - 5. For large complex penetrations made to accommodate multiple steel and copper pipes, electrical busways or raceways, the following are acceptable:
    - a. Hilti FS 635, trowelable firestop compound.
    - b. 3M fire barrier CS-195 composite sheet.
    - c. Nelson CPS composite sheet, CMP firestop compound.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Verify routing and termination locations of conduit prior to rough-in.
- E. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install conduit in accordance with NECA 1.
- C. Conduit Routing:
  - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
  - 2. When conduit destination is indicated without specific routing, determine exact routing required.
  - 3. Conceal conduits unless specifically indicated to be exposed.
  - 4. Conduits in the following areas may be exposed, unless otherwise indicated:

- a. Electrical rooms.
  - b. Mechanical equipment rooms.
  - c. Within joists in areas with no ceiling.
5. Unless otherwise approved, do not route exposed conduits:
    - a. Across floors.
    - b. Across roofs.
    - c. Across top of parapet walls.
    - d. Across building exterior surfaces.
    - e. In any finished areas.
  6. Conduits installed underground or embedded in concrete may be routed in shortest possible manner unless otherwise indicated. Route other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
  7. Arrange conduit to maintain adequate headroom, clearances, and access.
  8. Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.
  9. Arrange conduit to provide no more than 150 feet between pull points.
  10. Route conduits above water and drain piping where possible.
  11. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
  12. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:
    - a. Heaters.
    - b. Hot water piping.
    - c. Flues.
  13. Group parallel conduits in same area on common rack.
- D. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 26 05 29.
  2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
  3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
  4. Use conduit strap to support single surface-mounted conduit.
    - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
  5. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.
  6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
  7. Use trapeze hangers assembled from threaded rods and metal channel/strut with accessory conduit clamps to support multiple parallel suspended conduits.
  8. Use of spring steel conduit clips for support of conduits is not permitted.
  9. Use of wire for support of conduits is not permitted.
  10. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with most stringent requirements.
- E. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound such as Thomas & Betts Kopr-Shield on field-cut threads of galvanized steel conduits prior to making connections per NEC article 300.6.
  2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
  3. Use suitable adapters where required to transition from one type of conduit to another.
  4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.

5. Where spare conduits stub up through concrete floors and are not terminated in box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
  6. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
  7. Secure joints and connections to provide mechanical strength and electrical continuity.
- F. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
  2. Make penetrations perpendicular to surfaces unless otherwise indicated.
  3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
- G. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
  2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
  3. Where conduits are subject to earth movement by settlement or frost.
- H. Provide pull string in each empty conduit and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.
- I. Provide grounding and bonding; see Section 26 05 26.
- J. Identify conduits; see Section 26 05 53.

### **3.03 FIELD QUALITY CONTROL**

- A. Correct deficiencies and replace damaged or defective conduits.

### **3.04 CLEANING**

- A. Clean interior of conduits to remove moisture and foreign matter.

### **3.05 PROTECTION**

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.
- B. All conduit in finished areas shall be installed concealed in walls, floors or ceilings unless noted otherwise on the drawings. Unfinished areas are considered mechanical rooms, electrical rooms and utility spaces only.
- C. Route conduit parallel and perpendicular to walls.
- D. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
- E. Route conduit continuous from outlet to outlet, outlet to cabinets, outlet to pull or junction boxes. Secure conduit to all boxes with locknuts and bushings in such manner that each system is mechanically and electrically continuous throughout.
- F. Install all conduit within the building except where specifically noted or shown otherwise on the drawings.
- G. Conduit systems must be installed complete before conductors are pulled in.
- H. Repair any damage done to insulation or interior vapor barrier.
- I. Fill conduits which can admit air to or release air from air plenums through the connecting conduit system with sealing compound.
- J. Seal around all conduits passing through partitions such as walls, floor slabs and other elements. For non-rated partitions, sealant to match surrounding surface. For rated partitions, provide fireproofing sealant which preserves the fire resistant rating of the partition. Use

materials and methods as directed by the manufacturer of the fireproofing and approved by the Architect/Engineer. See Architectural drawings and existing building drawings for location of new and existing fire-rated partitions.

- K. Connect recessed lighting fixtures to conduit runs with a maximum of 6 feet of flexible metal conduit extending from a junction box to the fixture.

**END OF SECTION**

**SECTION 26 05 33.16**  
**BOXES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 84 00 - Firestopping
- B. Section 26 05 26 - Grounding and Bonding.
- C. Section 26 05 29 - Hangers and Supports.
- D. Section 26 05 33.13 - Conduit:
  - 1. Conduit bodies and other fittings.
  - 2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
- E. Section 26 05 53 - Electrical Identification: Identification products and requirements.
- F. Section 26 27 26 - Wiring Devices:
  - 1. Wall plates.
  - 2. Additional requirements for locating boxes for wiring devices.
- G. Section 27 10 05 - Telecommunications Cabling: Additional requirements for communications systems outlet boxes.

**1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- H. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.
- I. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
  - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
  - 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.



4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

### **1.05 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

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

## **PART 2 PRODUCTS**

### **2.01 BOXES**

- A. General Requirements:
  1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
  2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
  3. Provide products listed, classified, and labeled as suitable for the purpose intended.
  4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
  5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
  1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
  2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
  3. Use cast iron boxes or cast aluminum boxes where exposed galvanized steel rigid metal conduit is used.
  4. Use raised covers suitable for the type of wall construction and device configuration where required.
  5. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
  6. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
  7. Boxes for Supporting Luminaires: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
  8. Minimum Box Size, Unless Otherwise Indicated:
    - a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
    - b. Communications Systems Outlets: 4 inch square by 2-1/8 inch (100 by 54 mm) trade size. See section 27 1005 for further requirements.
  9. Ceiling Outlets: 4 inch octagonal or square by 1-1/2 inch deep (100 by 38 mm) trade size.
  10. Wall Plates: Comply with Section 26 27 26.
  11. Manufacturers:
    - a. Cooper Crouse-Hinds, a division of Eaton Corporation:  
www.cooperindustries.com/#sle.

- b. Hubbell Incorporated; Bell Products: [www.hubbell-rtb.com](http://www.hubbell-rtb.com).
  - c. Hubbell Incorporated; RACO Products: [www.hubbell-rtb.com](http://www.hubbell-rtb.com).
  - d. O-Z/Gedney, a brand of Emerson Electric Co: [www.emerson.com](http://www.emerson.com).
  - e. Thomas & Betts Corporations Member of the ABB Group: [www.tnb.com](http://www.tnb.com).
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
- 1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
  - 2. NEMA 250 Environment Type, Unless Otherwise Indicated:
    - a. Indoor Clean, Dry Locations: Type 1, painted steel.
  - 3. Junction and Pull Boxes Larger Than 100 cubic inches:
    - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
  - 4. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.
  - 5. Manufacturers:
    - a. Cooper B-Line, a division of Eaton Corporation: [www.cooperindustries.com/#sle](http://www.cooperindustries.com/#sle).
    - b. Hoffman, a brand of Pentair Technical Products: [www.hoffmanonline.com/#sle](http://www.hoffmanonline.com/#sle).
    - c. Hubbell Incorporated; Wiegmann Products: [www.hubbell-wiegmann.com/#sle](http://www.hubbell-wiegmann.com/#sle).

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide separate boxes for emergency power and normal power systems.
- E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
- G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- H. Box Locations:
  - 1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 31 00 as required where approved by the Architect.
  - 2. Unless dimensioned, box locations indicated are approximate.
  - 3. Locate boxes as required for devices installed under other sections or by others.
    - a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 27 26.
    - b. Communications Systems Outlets: Comply with Section 27 10 05.
  - 4. Locate boxes so that wall plates do not span different building finishes.
  - 5. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 05 33.13.
  - 6. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
    - a. Concealed above accessible suspended ceilings.
    - b. Within joists in areas with no ceiling.

- c. Electrical rooms.
  - d. Mechanical equipment rooms.
- I. Box Supports:
1. Secure and support boxes in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
  2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
  3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
  4. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.
- J. Install boxes plumb and level.
- K. Install boxes as required to preserve insulation integrity.
- L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- M. Close unused box openings.
- N. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- O. Provide grounding and bonding in accordance with Section 26 05 26.
- P. All boxes shall be installed flush in finished spaces unless noted otherwise. Unfinished spaces include mechanical, electrical and utility rooms only.
- Q. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1.
- R. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NFPA 70.
- S. Set wall mounted boxes at elevations to accommodate mounting heights indicated on the drawings or specified unless noted otherwise.
- T. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.
1. Adjust box locations up to 10 feet if required to accommodate intended purpose.
- U. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.
- V. Maintain headroom and present neat mechanical appearance.
- W. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- X. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes and mechanical radiation.
- Y. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
- Z. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.
- AA. Use surface mounted 4-inch square box with matching raised cover on exposed conduit runs.
- BB. Use 4-inch square, 1-1/2 inch deep box with round tile ring in ceiling.
- CC. Use gang box where more than one device is mounted together. Do not use sectional box. Do not use handy box.
- DD. Use gang box with plaster ring for single device outlets.
- EE. Large Pull Boxes: Boxes larger than 100 cubic inches in volume or 12 inches in any dimension. Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

- FF. Surface mounted outlets are permitted only in mechanical and electrical rooms and above removable ceilings.
- GG. Boxes protruding from the finished wall will not be accepted.
- HH. Install outlets in similar rooms in the same relative location in each room.
- II. Locate outlets to clear piping, duct work and other obstructions.
- JJ. Install switch outlets within 6 inches of latch side of door except where type of construction dictates otherwise.
- KK. Mounting heights indicated on Drawings are to center line of outlet unless indicated otherwise.
- LL. Pull boxes and junction boxes are not indicated on Drawings except for special requirements. Install as required to facilitate pulling wire. Size as required by National Electric Code. Install above removable ceilings, electrical rooms, utility rooms or storage areas in accessible locations. Installation in finished spaces not permitted without approval of the Architect/Engineer.
- MM. Do not mount junction boxes or pull boxes to duct work, ceiling system or other piping. Mount from structural system only. Mount independent of conduit system. Junction boxes supported only from conduit system will not be permitted.
- NN. Mount receptacles in the equipment rooms and in other unfinished areas at 48 inches.
- OO. Label all junction box covers with panelboard name and circuit numbers for circuits in junction box. Label all junction box covers with the type of communication system contained within; example: "Nurse Call," "Security," etc. See section 26 0553 - Electrical Identification.

### **3.03 CLEANING**

- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

### **3.04 PROTECTION**

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

**END OF SECTION**

**SECTION 26 05 53  
ELECTRICAL IDENTIFICATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Device and Junction Box Labels
- D. Wire and cable markers.
- E. Voltage markers.
- F. Warning signs and labels.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 19 - Low Voltage Wiring: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.
- B. Section 26 27 26 - Wiring Devices: Device and wallplate finishes
- C. Section 27 10 05 - Telecommunications Cabling: Identification for communications cabling and devices.

**1.03 REFERENCE STANDARDS**

- A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2023.
- B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2023.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2024.
- E. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
  - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
  - 2. Do not install identification products until final surface finishes and painting are complete.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
- C. Shop Drawings: Provide schedule of items to be identified indicating proposed designations, materials, legends, and formats.
- D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.

**1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

## 1.07 FIELD CONDITIONS

- A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for purpose specified and shown.

## PART 2 PRODUCTS

### 2.01 IDENTIFICATION REQUIREMENTS

- A. Existing Work: Unless specifically excluded, identify existing elements to remain that are not already identified in accordance with specified requirements.
- B. Identification for Equipment:
  - 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
    - a. Panelboards:
      - 1) Identify ampere rating.
      - 2) Identify voltage and phase.
      - 3) Available fault current and date calculated.
      - 4) Identify power source and circuit number. Include location.
      - 5) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
      - 6) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
      - 7) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
    - 2. Emergency System Equipment:
      - a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with NFPA 70.
    - 3. Use voltage marker to identify highest voltage present for each piece of electrical equipment.
    - 4. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.
    - 5. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
      - a. Service equipment.
      - b. Panelboards
  - 2. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.
  - 3. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
    - a. Service equipment.
    - b. Panelboards
- C. Identification for Conductors and Cables:
  - 1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19.
  - 2. Identification for Communications Conductors and Cables: Comply with Section 27 10 05.
  - 3. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
  - 4. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
    - a. Within boxes when more than one circuit is present.
  - 5. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.
- D. Identification for Boxes:
  - 1. Use voltage markers to identify highest voltage present.
  - 2. Use color coded boxes to identify specified systems.

- a. Color-Coded Boxes: Field-painted in accordance with Section 09 91 23 and 09 91 13 per the same color code used for raceways.
      - 1) Emergency Power System: Red with 'Emergency' Stencil.
    - b. For exposed boxes in public areas, do not color code.
  - 3. Use identification labels or handwritten text using indelible marker to identify circuits enclosed.
    - a. For exposed boxes in public areas, provide identification on inside face of cover.
- E. Identification for Devices:
  - 1. Identification for Communications Devices: Comply with Section 27 10 05.
  - 2. Wiring Device and Wallplate Finishes: Comply with Section 26 27 26.
  - 3. Communications Systems: Use identification label to indicate system contained within, 'Nurse Call', 'Television', etc.
  - 4. Use identification label to identify fire alarm system devices.
    - a. For devices concealed above suspended ceilings, provide additional identification on ceiling tile below device location.
  - 5. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.
    - a. For receptacles in areas as directed by Architect, provide identification on inside surface of wallplate.
  - 6. Use identification label or engraved wallplate to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.
  - 7. Use identification label to identify receptacles protected by upstream GFI protection, where permitted.

## 2.02 MANUFACTURERS

- A. Brady Corporation: [www.bradycorp.com](http://www.bradycorp.com).
- B. Seton Identification Products: [www.seton.com/aec](http://www.seton.com/aec).
- C. HellermannTyton: [www.hellermanntyton.com](http://www.hellermanntyton.com).
- D. Or Equal.

## 2.03 IDENTIFICATION NAMEPLATES AND LABELS

- A. Identification Nameplates:
  - 1. Provide on all Switchboards, Panelboards, MCC's, Disconnect Switches, Transfer Switches, Transformers, Motor Controllers, other control equipment.
  - 2. Manufacturers:
    - a. Brimar Industries, Inc: [www.brimar.com/#sle](http://www.brimar.com/#sle).
    - b. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com](http://www.kolbipipemarkers.com).
    - c. Seton Identification Products: [www.seton.com](http://www.seton.com).
    - d. Or Equal.
  - 3. Materials:
    - a. Indoor Clean, Dry Locations: Use plastic nameplates.
    - b. Outdoor Locations: Use stainless steel or aluminum nameplates suitable for exterior use.
  - 4. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
  - 5. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
  - 6. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
  - 7. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.
- B. Identification Labels:

1. Use for devices, control switches and other small controllers.
  2. Manufacturers:
    - a. Brady Corporation: [www.bradyid.com](http://www.bradyid.com).
    - b. Brother International Corporation: [www.brother-usa.com/#sle](http://www.brother-usa.com/#sle).
    - c. Panduit Corp: [www.panduit.com/#sle](http://www.panduit.com/#sle).
    - d. Or Equal.
  3. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
    - a. Use only for indoor locations.
  4. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.
- C. Format for Equipment Identification Nameplates:
1. Minimum Size: 1 inch by 2.5 inches.
  2. Legend:
    - a. System designation where applicable:
      - 1) Emergency Power System: Identify with text "EMERGENCY".
    - b. Equipment designation or other approved description.
    - c. Other information as indicated.
  3. Text: All capitalized unless otherwise indicated.
  4. Minimum Text Height:
    - a. System Designation: 1 inch.
    - b. Equipment Designation: 1/2 inch.
    - c. Other Information: 1/4 inch.
    - d. Exception: Provide minimum text height of 1 inch for equipment located more than 10 feet above floor or working platform.
  5. Color:
    - a. Normal Power System: White text on black background.
    - b. Emergency Power System: White text on red background.
- D. Format for Caution and Warning Messages Printed Labels:
1. Minimum Size: 2 inches by 4 inches.
  2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
  3. Text: All capitalized unless otherwise indicated.
  4. Minimum Text Height: 1/2 inch.
  5. Color: Black text on yellow background unless otherwise indicated.
- E. Format for Receptacle Identification Labels:
1. Minimum Size: 3/8 inch by 1.5 inches.
  2. Legend: Power source and circuit number or other designation indicated.
  3. Text: All capitalized unless otherwise indicated.
  4. Minimum Text Height: 3/16 inch.
  5. Color: Black text on clear background.
- F. Format for Control Device Identification Labels:
1. Minimum Size: 3/8 inch by 1.5 inches.
  2. Legend: Load controlled or other designation indicated.
  3. Text: All capitalized unless otherwise indicated.
  4. Minimum Text Height: 3/16 inch.
  5. Color: Black text on clear background.

## **2.04 WIRE AND CABLE MARKERS**

- A. Manufacturers:
1. Brady Corporation: [www.bradyid.com/#sle](http://www.bradyid.com/#sle).
  2. HellermannTyton: [www.hellermanntyton.com/#sle](http://www.hellermanntyton.com/#sle).



3. Panduit Corp: [www.panduit.com/#sle](http://www.panduit.com/#sle).
  4. Or Equal.
- B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.
  - C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
  - D. Legend: Power source and circuit number or other designation indicated.
  - E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
  - F. Minimum Text Height: 1/8 inch.
  - G. Color: Black text on white background unless otherwise indicated.

## 2.05 VOLTAGE MARKERS

- A. Manufacturers:
  1. Brady Corporation: [www.bradyid.com/#sle](http://www.bradyid.com/#sle).
  2. Brimar Industries, Inc: [www.brimar.com/#sle](http://www.brimar.com/#sle).
  3. Seton Identification Products: [www.seton.com/#sle](http://www.seton.com/#sle).
  4. Or Equal.
- B. Marker Bands for Conduits: Use factory pre-printed self-adhesive vinyl or vinyl snap-around type markers.
- C. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl type markers.
- D. Minimum Size:
  1. Markers for Equipment: 1 1/8 by 4 1/2 inches.
  2. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.
  3. Markers for Junction Boxes: 1/2 by 2 1/4 inches.
- E. Legend:
  1. Markers for Voltage Identification: Highest voltage present.
  2. Markers for System Identification:
    - a. Emergency Power System: Text "EMERGENCY".
- F. Color: Black text on orange background unless otherwise indicated.

## 2.06 WARNING SIGNS AND LABELS

- A. Manufacturers:
  1. Brimar Industries, Inc: [www.brimar.com/#sle](http://www.brimar.com/#sle).
  2. Clarion Safety Systems, LLC: [www.clarionsafety.com/#sle](http://www.clarionsafety.com/#sle).
  3. Insite Solutions, LLC; \_\_\_\_\_: [www.stop-painting.com/#sle](http://www.stop-painting.com/#sle).
  4. Seton Identification Products: [www.seton.com/#sle](http://www.seton.com/#sle).
  5. Or Equal.
- B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- C. Warning Signs:
  1. Materials:
    - a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
    - b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
  2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
  3. Minimum Size: 7 by 10 inches unless otherwise indicated.
- D. Warning Labels:
  1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using

materials recognized to UL 969.

- a. Do not use labels designed to be completed using handwritten text.
2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
3. Minimum Size: 2 by 4 inches unless otherwise indicated.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

- A. Clean surfaces to receive adhesive products according to manufacturer's instructions.
- B. Degrease and clean surfaces to receive nameplates and labels.

#### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
  1. Surface-Mounted Equipment: Enclosure front.
  2. Flush-Mounted Equipment: Inside of equipment door.
  3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
  4. Elevated Equipment: Legible from the floor or working platform.
  5. Branch Devices: Adjacent to device.
  6. Interior Components: Legible from the point of access.
  7. Boxes: Outside face of cover.
  8. Conductors and Cables: Legible from the point of access.
  9. Devices: Outside face of cover.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
- E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- F. Secure rigid signs using stainless steel screws.
- G. Mark all handwritten text, where permitted, to be neat and legible.

#### **3.03 FIELD QUALITY CONTROL**

- A. Install identification nameplates on all switchboards, panelboards, mcc's, disconnect switches, motor controllers and other equipment control panels.
- B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.
- C. Provide self-adhesive labels on all receptacles by identifying the panel name and circuit number, example: H1-24.
- D. Provide self-adhesive labels on all junction box covers to identify the circuits contained within for all power circuits or the system contained within for all communications systems. Example: 'Panel L1, Ckt 11' or 'Paging System'.

**END OF SECTION**

## **SECTION 26 27 26 WIRING DEVICES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Wall switches.
- B. Receptacles.
- C. Wall plates.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 26 05 26 - Grounding and Bonding.
- B. Section 26 05 37 - Boxes.
- C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- D. Section 27 10 05 - Telecommunications Cabling: Voice and data jacks.

#### **1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
- B. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2005).
- C. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R2008).
- D. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.
- F. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.
- G. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.
- H. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc.
  - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
  - 3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
  - 4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
  - 5. Notify Engineer of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
- C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

- D. Operation and Maintenance Data:
  - 1. GFI Receptacles: Include information on status indicators and testing procedures and intervals.
- E. Project Record Documents: Record actual installed locations of wiring devices.

#### **1.06 QUALITY ASSURANCE**

- A. Conform to requirements of NFPA 70.

#### **1.07 DELIVERY, STORAGE, AND PROTECTION**

- A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Hubbell Incorporated: [www.hubbell-wiring.com](http://www.hubbell-wiring.com).
- B. Lutron Electronics Company, Inc: [www.lutron.com](http://www.lutron.com).
- C. Pass & Seymour, a brand of Legrand North America, Inc: [www.legrand.us](http://www.legrand.us)
- D. Cooper Wiring Devices: [www.cooperwiringdevices.com](http://www.cooperwiringdevices.com).
- E. Approved equal.
- F. Source Limitations: Where possible, for each type of wiring device furnish products produced by a single manufacturer and obtained from a single supplier.

#### **2.02 APPLICATIONS**

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
- C. Provide tamper resistant receptacles for all receptacles installed in childcare areas. Provide tamper resistant receptacles in all educational facilities and other occupancies as required by the latest edition of the NEC.
- D. Provide GFI protection for all receptacles installed within 6 feet of sinks.
- E. Provide GFI protection for all receptacles serving electric drinking fountains.
- F. Provide GFCI protection for all circuits as required by the latest edition of the NEC, NFPA 70.
- G. Unless noted otherwise, do not use combination switch/receptacle devices.

#### **2.03 ALL WIRING DEVICES**

- A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- B. Finishes:
  - 1. Wiring Devices Installed in Finished Spaces: Gray with stainless steel wall plate unless otherwise indicated.
  - 2. Wiring Devices Installed in Unfinished Spaces: Gray with galvanized steel wall plate unless otherwise indicated.
  - 3. Wiring Devices Installed in Wet or Damp Locations: Gray with specified weatherproof cover unless otherwise indicated.

#### **2.04 WALL SWITCHES**

- A. All Wall Switches: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20; types as indicated on the drawings.
  - 1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

- B. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings. Rated 1 horsepower at 120 volts, 2 horsepower at 277 volts

## **2.05 RECEPTACLES**

- A. All Receptacles: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498; types as indicated on the drawings.
  - 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
  - 2. NEMA configurations specified are according to NEMA WD 6.
- B. Convenience Receptacles:
  - 1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
  - 2. Tamper Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, , listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.
- C. GFI Receptacles:
  - 1. All GFI Receptacles: Provide with feed-through protection, light to indicate ground fault tripped condition and loss of protection, and list as complying with UL 943, class A.
    - a. Provide test and reset buttons of same color as device.
  - 2. Standard GFI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
  - 3. Tamper Resistant GFI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type.
- D. Locking Receptacles: Industrial specification grade, configuration as indicated on the drawings.

## **2.06 WALL PLATES**

- A. All Wall Plates: Comply with UL 514D.
  - 1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
  - 2. Size: Standard.
  - 3. Screws: Metal with slotted heads finished to match wall plate finish.
- B. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.
- C. Galvanized Steel Wall Plates: Rounded corners and edges, with corrosion resistant screws.
- D. Provide labeling of plate with panelboard and circuit number.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as shown on the drawings.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that floor boxes are adjusted properly.
- F. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- G. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 PREPARATION**

- A. Provide extension rings to bring outlet boxes flush with finished surface.

- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

### 3.03 INSTALLATION

- A. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 05 37 as required for installation of wiring devices provided under this section.
  - 1. Mounting Heights: Unless otherwise indicated, as follows:
    - a. Wall Switches: 48 inches above finished floor.
    - b. Receptacles: 18 inches above finished floor or 6 inches above counter.
  - 2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
  - 3. Provide minimum of 24 inches horizontal separation between flush mounted outlet boxes installed on opposite sides of fire rated walls.
  - 4. Where multiple receptacles or wall switches are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
  - 5. Provide separate outlet boxes for wiring devices connected to emergency power and normal power systems.
  - 6. Unless otherwise indicated, provide separate outlet boxes for line voltage and low voltage devices.
  - 7. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Engineer to obtain direction prior to proceeding with work.
  - 8. Locate outlet boxes so that wall plate does not span different building finishes.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Provide GFI receptacles with integral GFI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
- I. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- J. Install wall switches with OFF position down.
- K. Install vertically mounted receptacles with grounding pole on bottom and horizontally mounted receptacles with grounding pole on left.
- L. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- M. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
- N. Install identification label for wall switches in accordance with Section 26 05 26 indicating load served when controlling loads that are not visible from the control location or multiple wall switches are installed at one location.

- O. Install identification label for all receptacles in accordance with Section 26 05 26 indicating serving branch circuit.
- P. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.
- Q. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- R. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

#### **3.04 INTERFACE WITH OTHER PRODUCTS**

- A. Coordinate locations of outlet boxes provided under Section 26 05 37 to obtain mounting heights specified and indicated on drawings.

#### **3.05 FIELD QUALITY CONTROL**

- A. Inspect each wiring device for damage and defects.
- B. Operate each wall switch with circuit energized to verify proper operation.
- C. Verify that each receptacle device is energized.
- D. Test each receptacle to verify operation and proper polarity.
- E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.
- F. Correct wiring deficiencies and replace damaged or defective wiring devices.

#### **3.06 ADJUSTING**

- A. Adjust devices and wall plates to be flush and level.
- B. Adjust the time delays, sensitivity and other settings on occupancy sensors as directed.

#### **3.07 CLEANING**

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

**END OF SECTION**

**SECTION 26 43 00  
SURGE PROTECTIVE DEVICES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Surge protective devices for branch panelboard locations.
- B. Surge protective devices for life safety (NEC Article 700 and 517) panelboard locations.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 26 - Grounding and Bonding.
- B. Section 26 24 16 - Panelboards.

**1.03 ABBREVIATIONS AND ACRONYMS**

- A. EMI/RFI: Electromagnetic Interference/Radio Frequency Interference.
- B. SPD: Surge Protective Device.mA

**1.04 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL 1283 - Standard for Electromagnetic Interference Filters; Current Edition, Including All Revisions.
- E. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.
- F. ANSI/IEEE C62.41.1-2002, C62.41.2-2002, C62.45-2002
- G. National Electrical Code: Article 285

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate size and location of overcurrent device compatible with the actual surge protective device and location to be installed. Notify Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to ordering equipment.

**1.06 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include detailed component information, voltage, surge current ratings, repetitive surge current capacity, voltage protection rating (VPR) for all protection modes, maximum continuous operating voltage (MCOV), nominal discharge current (I-n), short circuit current rating (SCCR), connection means including any required external overcurrent protection, enclosure ratings, outline and support point dimensions, weight, service condition requirements, and installed features.
  - 1. I-nominal rating (I-n) of 20kA.
  - 2. Type 1 Device Listing
  - 3. VPR, MCOV, I-n, and Type 1, 20kA information is posted at [www.UL.com](http://www.UL.com), under Certifications, searching using UL Category Code: VZCA. SCCR's are posted in manufacturer's UL docs.
- C. Shop Drawings: Include wiring diagrams showing all factory and field connections with wire and circuit breaker/fuse sizes.
- D. Certificates: Manufacturer's documentation of listing for compliance with the following standards:
  - 1. UL 1449.
  - 2. UL 1283 (for Type 2 SPDs).



- 3. SPD and performance parameters shall be posted at [www.UL.com](http://www.UL.com) <<http://www.UL.com>> under Category Code: VZCA. Products or parameters without posting at UL.com shall not be approved.
- E. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- F. Operation and Maintenance Data: Include information on status indicators and recommended maintenance procedures and intervals.
- G. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.
- H. Project Record Documents: Record actual connections and locations of surge protective devices.

**1.07 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

**1.08 DELIVERY, STORAGE, AND PROTECTION**

- A. Store in a clean, dry space in accordance with manufacturer's written instructions.

**1.09 FIELD CONDITIONS**

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

**1.10 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturer's Warranty: Provide minimum ten year warranty covering repair or replacement of surge protective devices showing evidence of failure due to defective materials or workmanship.
- C. Exclude surge protective devices from any clause limiting warranty responsibility for acts of nature, including lightning, stated elsewhere.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design: Schneider Electric; Square D Brand Surgellogic Products; [www.surgellogic.com](http://www.surgellogic.com). IMA Series.
- B. Factory-installed, Internally Mounted Surge Protective Devices:
  - 1. Same as manufacturer of equipment containing surge protective device, to provide a complete listed assembly including SPD.
- C. Products other than basis of design are subject to compliance with specified requirements and prior approval of Engineer. By using products other than basis of design, Contractor accepts responsibility for costs associated with any necessary modifications to related work, including any design fees.
- D. Source Limitations: Furnish surge protective devices produced by a single manufacturer and obtained from a single supplier.

**2.02 SURGE PROTECTIVE DEVICES - GENERAL REQUIREMENTS**

- A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service; listed, classified, and labeled as suitable for the purpose intended; system voltage as indicated on the drawings.
- B. Unless otherwise indicated, provide factory-installed, internally-mounted SPDs.

- C. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.
- D. SPD shall be UL labeled with 200kA Short Circuit Current Rating (SCCR). Fuse ratings shall not be considered in lieu of demonstrated withstand testing of SPD, per NEC 285.6.
- E. SPD shall be UL labeled as Type 1, 20kA Inominal (verifiable at UL.com), intended for use without need for external or supplemental overcurrent controls. Every component (MOV) of every mode, shall be protected by individual fusing, and matched to within + or - 1 volt. SPDs relying upon external or supplementary installed safety disconnectors do not meet the intent of this specification.
- F. SPD shall be UL labeled with 20kA Inominal (I-n) (verifiable at UL.com) for compliance to UL 96A Lightning Protection Master Label and NFPA 780.
- G. Protected Modes:
  - 1. Wye Systems: L-N, L-G, N-G, L-L.
- H. UL 1449 Voltage Protection Ratings (VPRs):
  - 1. 208Y/120V System Voltage: Not more than 800 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.
- I. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.
- J. Enclosure Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
  - 1. Indoor clean, dry locations: Type 1.
  - 2. Outdoor locations: Type 3R.
- K. Equipment Containing Factory-installed, Internally Mounted SPDs: Listed and labeled as a complete assembly including SPD.
  - 1. Panelboards: See Section 26 24 16.

## **2.03 SURGE PROTECTIVE DEVICES FOR EMERGENCY SYSTEM AND BRANCH PANELBOARD LOCATIONS**

- A. Surge Protective Device:
  - 1. Protection Circuits: Field-replaceable modular or non-modular.
  - 2. Surge Current Rating: Not less than 60 kA per mode/120 kA per phase.
  - 3. Repetitive Surge Current Capacity: Not less than 2,000 impulses.
  - 4. UL 1449 Nominal Discharge Current (I-n): 20 kA.
  - 5. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
  - 6. EMI/RFI Filtering: Provide EMI/RFI filter to attenuate electrical noise; listed as complying with UL 1283 for Type 2 SPDs (UL 1283 listing not available for Type 1 SPDs).
  - 7. Diagnostics:
    - a. Protection Status Monitoring: Provide indicator lights to report the protection status for each phase.
    - b. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.
  - 8. Emergency systems are as defined in articles 517, 700 and 701 of NFPA 70.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.

- C. Verify system grounding and bonding is in accordance with Section 26 05 26, including bonding of neutral and ground for service entrance and separately derived systems where applicable. Do not energize SPD until deficiencies have been corrected.
- D. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Unless indicated otherwise, connect service entrance surge protective device on load side of service disconnect main overcurrent device.
- E. Do not energize SPD until bonding of neutral and ground for service entrance and separately derived systems is complete in accordance with Section 26 05 26 where applicable. Replace SPDs damaged by improper or missing neutral-ground bond.

### **3.03 CLEANING**

- A. Repair scratched or marred exterior surfaces to match original factory finish.

**END OF SECTION**

**SECTION 26 51 00  
LIGHTING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Luminaires.
- B. Emergency lighting units.
- C. LED Drivers
- D. Luminaire accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 37 - Boxes.
- B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- C. Section 26 27 26 - Wiring Devices: Manual wall switches and wall dimmers.
- D. Section 26 55 00 - Theatrical Lighting: Stage and House lighting units and associated controls.

**1.03 REFERENCE STANDARDS**

- A. 47 CFR 15 - Radio Frequency Devices, Current Edition.
- B. IEEE C62.41.2 - Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (R2008).
- C. IESNA LM-63 - ANSI Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).
- D. IES LM-63 - IESNA Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).
- E. IES LM-79 - Approved Method: Electrical and Photometric Measurement of Solid-State Lighting Products; 2008.
- F. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules, 2015.
- G. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
- H. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; National Electrical Contractors Association; 2006.
- I. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; National Electrical Contractors Association; 2006.
- J. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; National Electrical Manufacturers Association; 2012.
- K. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- L. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures; National Fire Protection Association; 2012.
- M. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.
- N. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- O. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.
- P. UL 1598C - Light Emitting Diode (LED) Retrofit Luminaire Conversion Kits, Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
  - 2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
  - 3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
  - 4. Notify Engineer of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

#### **1.05 SYSTEM DESCRIPTION**

- A. Catalog numbers indicated in the Luminaire Schedule are a design series reference and do not necessarily represent the exact catalog number, size, voltage, wattage, type of light bar, driver, finish trim, ceiling type, mounting hardware or special requirements as specified or as required by the particular installations. Provide complete luminaire to correspond with the features, accessories, number of LEDs, wattage and/or size specified in the text description of each luminaire type. Additional features, accessories and options specified shall be included.
- B. Provide all frames, supplementary support structures, hangers, spacers, stems, aligner canopies, auxiliary junction boxes and other hardware as required for a complete and proper installation. Recessed luminaires shall have frames that are compatible with the ceiling systems.
- C. Luminaire voltage shall match the voltage of the circuit serving same.

#### **1.06 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
- C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- E. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

#### **1.07 QUALITY ASSURANCE**

- A. Conform to requirements of NFPA 70.
- B. LED fixtures shall comply with the following:
  - 1. UL Standard 8750 "Light Emitting Diode Equipment for Use in Lighting Products", IES Standard LM-79 "Electrical and Photometric Measurements of Solid-State Lighting Products", IES Standard LM-80 "Measuring Lumen Maintenance of LED Light Sources", and IES Standard TM-21 "Projecting Long Term Lumen Maintenance of LED Light Sources".

- C. Conform to requirements of NFPA 70 and the International Building Code (IBC), locally adopted version.

### **1.08 DELIVERY, STORAGE, AND PROTECTION**

- A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.
- C. Store product in a clean, dry space, protected from weather.

### **1.09 FIELD CONDITIONS**

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

### **1.10 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year pro-rata warranty for batteries for emergency lighting units.
- C. Provide a five year full warranty on all LED light fixtures including the driver.
- D. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

## **PART 2 PRODUCTS**

### **2.01 LUMINAIRE TYPES**

- A. Furnish products as indicated in luminaire schedule included on the drawings.
- B. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.02 LUMINAIRES**

- A. Provide products that are listed and labeled as complying with UL 1598.
- B. Provide products that comply with requirements of NFPA 70 and NFPA 101.
- C. Luminaires provided shall have means of disconnection from power source during service, as required in NEC Article 410.
- D. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- E. Unless otherwise indicated, provide complete luminaires including LEDs and all drivers reflectors, lenses, housings and other components required to position, energize and protect the LEDs and distribute the light.
- F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
- G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
- H. Lenses, Covers, and Diffusers:
  - 1. Acrylic Lighting Diffusers: UV stabilized high resistance to yellowing and other changes due to aging, exposure to heat and UV radiation.
    - a. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
    - b. Lenses shall have uniform brightness throughout the entire visible area without LED pixelation.
- I. Recessed Luminaires:
  - 1. Ceiling Compatibility: Comply with NEMA LE 4.
  - 2. Fixtures installed in "hard" ceilings shall have all connections accessible through the luminaire.

- J. LED Luminaires: Listed and labeled as complying with UL 8750.
1. Luminaires:
    - a. Photometric measurements indicated on the product data shall be provided in accordance with IESNA LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting products and shall meet the requirements specified and/or indicated on the drawings.
    - b. Lumen data indicated on the product data sheets shall be generated in accordance with IESNA LM-80-08 Approved Method for Measuring Lumen Maintenance of LED Light Sources and shall meet the requirements specified and/or indicated on the drawings.
    - c. Lumen depreciation shall be identified in terms of IES TM-21-11. Unless noted otherwise, luminaires shall provide a minimum L70 rating at the drive current provided product data shall indicate such.
    - d. Correlated color temperature (CCT) indicated on the product data sheets shall be provided in accordance with ANSI C78.377-2008 American National Standard for Electric Lamps requirements specified and/or indicated on the drawings.
      - 1) LED color temperatures: CRI> 85, 2700K as noted +/- 145K.
      - 2) LED color temperatures: CRI> 85, 4000K as noted +/- 275K.
      - 3) LED color temperatures: CRI> 85, 5000K as noted +/- 283K.
    - e. Lumen output specified shall be lumens delivered from the luminaire at the color temperature specified. LED luminaires shall deliver a minimum of 60 lumens per watt. LED's shall be "Bin No. 1" quality.
    - f. Luminaires efficacy shall meet that specified and scheduled at the CCT specified.
    - g. The LED light source shall be fully dimmable with use of compatible dimmers switch designated for low voltage loads.
    - h. Drivers shall be solid state and accept 120 through 277 VAC at 60 Hz input.
    - i. Luminaires shall have internal thermal protection.
    - j. LED arrays shall be sealed, high performance, long life type; minimum 70% rated output at 50,000 hours.
    - k. Color spatial uniformity shall be within .004 of CIE 1976 diagram.
    - l. Color maintenance over rated life shall be within .007 of CIE 1976.
    - m. Indoor luminaires shall have a minimum CRI of 85.
    - n. Luminaires shall not draw power in the off state. Luminaires with integral occupancy, motion, photo-controls, or individually addressable luminaires with external control and intelligence are exempt from this requirement. The power draw for such luminaires shall not exceed 0.5 watts when in the off state.
    - o. Luminaire manufacturers shall adhere to device manufacturer guidelines, certification programs, and test procedures for thermal management
    - p. LED package(s)/module(s)/array(s) used in qualified luminaires shall deliver a minimum 70% of initial lumens, when installed in-situ, for a minimum of 50,000 hours.
    - q. Luminaires shall be fully accessible from below ceiling plane for changing drivers, power supplies and arrays.
    - r. The fixture shall have an integral thermal management system with extruded aluminum radiation fins and lateral airways for passive cooling, no devices using moving part are permitted.
- K. Drivers and Power Supplies:
1. Power Factor: 0.90 or higher
  2. Maximum driver case temperature not to exceed driver manufacturer recommended in-situ operation.
  3. Output operating frequency: 60Hz.
  4. LED drivers shall be electronic-type, labeled as compliant with radio frequency interference (RFI) requirements of FCC Title 47 Part 15, and comply with NEMA SSL 1 "Electronic Drivers for LED Devices, Arrays, or Systems". LED drivers shall have a sound

5. rating of "A", have a minimum efficiency of 85%, and be rated for a THD of less than 20 percent at all input voltages.
  6. Dimmable LED drivers shall be 0-10V type unless otherwise indicated. Dimmable LED drivers shall be capable of dimming without LED strobing or flicker across their full dimming range.
  7. Interference: EMI and RFI compliant with FCC 47 CFR Part 15.
  8. Total Harmonic Distortion Rating: 20% Maximum.
  9. Meet electrical and thermal conditions as described in LM-80 Section 5.0.
  10. Secondary Current: Confirm secondary current specified by individual luminaire manufacturers.
  11. Compatibility: Certified by manufacturer for use with individually specified luminaire and individually specified control components.
  12. Solid-state control components to be integral or external per each specified luminaire. Remote control gear to be enclosed in Class 1, Class 2, or NEMA 3R enclosures as required.
  13. Drivers shall be universal voltage (120-277 volt) or shall be 208 volt, 240 volt, or 480 volt to meet project conditions.
  14. Drivers shall be provided with protection against transients line surge.
  15. Drivers shall be equipped with a quick disconnect.
  16. Ambient temperature range shall be -30 degrees F to 104 degrees F.
  17. All drivers shall be UL listed.
- L. Controller and Control:
1. System electronics driver / controller to use coordinated communication protocols: DMX512, 0-10V, DALI, or proprietary as required
  2. The Contractor to ensure that external control equipment is compatible with LED control requirements.
  3. Provide connector types and wiring as appropriate for un-interrupted communication between devices, considering distance maximums, field obstructions, and accessibility. Ensure that connection points are optically isolated for system noise reduction.
  4. For control components that are part of overall area control system see Lighting Controls Specifications.
  5. Compatibility: Certified by manufacturer for use with individually specified luminaire and individually specified power supplies and/or drivers.
- M. Luminaires Mounted in Continuous Rows: Provide quantity of units required for length indicated, with all accessories required for joining and aligning.

### **2.03 EMERGENCY LIGHTING UNITS**

- A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
- B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
- C. Battery:
  1. Sealed maintenance-free nickel cadmium unless otherwise indicated.
  2. Size battery to supply all connected lamps, including emergency remote heads where indicated.
- D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
- E. Provide low-voltage disconnect to prevent battery damage from deep discharge.
- F. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101; provide indicator light(s) to report test and diagnostic status.



- G. Accessories:
  - 1. Provide compatible accessory mounting brackets where indicated or required to complete installation.
  - 2. Provide compatible accessory high impact polycarbonate vandal shields where indicated.
  - 3. Provide compatible accessory wire guards where indicated.
  - 4. Where indicated, provide emergency remote heads that are compatible with the emergency lighting unit they are connected to and suitable for the installed location.

#### **2.04 EMERGENCY LIGHTING RELAY**

- A. Manufacturer: Nine 24, Inc. Model BLTC-R or equal by Bodine or Wattstopper.
- B. Description: Self-contained power supply and low voltage relay in a thermoplastic housing designed to override switches in case of normal utility power failure. UL924 listed.
- C. Rating: 277 volts, 10 amperes.
- D. Local test switch with LED indicators for normal and emergency power. Mounts to a standard junction box. Mount test switch and LED indicator flush in ceiling near relay.

#### **2.05 ACCESSORIES**

- A. Stems for Suspended Luminaires: Steel tubing, minimum 1/2" size, factory finished to match luminaire or field-painted as directed.
- B. Threaded Rods for Suspended Luminaires: Zinc-plated steel, minimum 1/4" size, field-painted as directed.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field measurements are as shown on the drawings.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

#### **3.02 PREPARATION**

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

#### **3.03 INSTALLATION**

- A. Coordinate locations of outlet boxes provided under Section 26 05 37 as required for installation of luminaires provided under this section.
- B. Install products according to manufacturer's instructions.
- C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 1 (general workmanship), NECA 500 (commercial lighting), and NECA 502 (industrial lighting).
- D. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- E. Suspended Ceiling Mounted Luminaires:
  - 1. Do not use ceiling tiles to bear weight of luminaires.
  - 2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
  - 3. Secure pendant-mounted luminaires to building structure.
  - 4. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.

5. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
- F. Recessed Luminaires:
    1. Install trims tight to mounting surface with no visible light leakage.
    2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
  - G. Suspended Luminaires:
    1. Unless otherwise indicated, specified mounting heights are to bottom of luminaire.
    2. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
    3. Provide minimum of two supports for each luminaire equal to or exceeding 4 feet in length, with no more than 4 feet between supports. Utilize 1/2 inch rigid conduit stems unless noted as chain or cable suspended on the drawings.
    4. Install canopies tight to mounting surface.
    5. Unless otherwise indicated, support pendants from swivel hangers.
  - H. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
  - I. Install fixtures securely, in a neat and workmanlike manner, as specified in NECA 500 and 502.
  - J. Install suspended luminaires and exit signs using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.
  - K. Support luminaires larger than 2 x 4 foot size independent of ceiling framing.
  - L. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.
  - M. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.
  - N. Exposed Grid Ceilings: Fasten surface mounted luminaires to ceiling grid members using bolts, screws, rivets, or suitable clips.
  - O. Install recessed luminaires to permit removal from below.
  - P. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating. Provide all necessary components to maintain ceiling system fire rating, coordinate with ceiling installer.
  - Q. Install clips to secure recessed grid-supported luminaires in place.
  - R. Install wall mounted luminaires, emergency lighting units, and exit signs at height as indicated on Drawings. Coordinate exact mounting heights with Architectural Drawings.
  - S. Install accessories furnished with each luminaire.
  - T. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within fixture; use flexible conduit.
  - U. Connect luminaires and exit signs to branch circuit outlets provided under Section 26 05 37 using flexible conduit.
  - V. Bond products and metal accessories to branch circuit equipment grounding conductor.
  - W. Attach all surface mounted fixtures to ceiling or wall surface with a minimum of two attachment points besides the outlet box.
  - X. Install recessed plaster frames, or other special frames where required for construction type. Install frames securely to provide adequate light fixture support.
  - Y. Insure that luminaires requiring access to ballasts or junction boxes have adequate openings and clearances.
  - Z. Maintain required clearances between insulation and light fixtures where light fixtures are installed in an insulated ceiling. Provide barriers as needed to prevent insulation from

contacting light fixture.

- AA. Pendant mounted luminaires shall utilize factory stems with suitable canopy unless noted as "chain suspended" or "cable suspended." For sloped ceilings, provide a swivel type canopy. Install individually mounted pendant fixtures with one stem at each end of fixture.
- BB. For chain suspended and cable suspended light fixtures, use flexible metal conduit and attach to light fixture support chain or cable.
- CC. Provide adequate backing and support from the structural system for all pendant supported fixtures.
- DD. Coordinate light fixture installation in unfinished areas with piping, duct work and other obstructions. Exact light fixture location to be determined by field conditions. Suspend light fixture with chains or stems if necessary to avoid mounting light fixtures above ceiling mounted equipment, duct work and piping. Use trapeze style hangers to mount light fixtures under duct work piping or other equipment.
- EE. All circuiting for emergency egress lights and exit lighting will be in separate conduits from all other circuiting.
- FF. Emergency Lighting Units:
  - 1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.

### **3.04 FIELD QUALITY CONTROL**

- A. Inspect each product for damage and defects.
- B. Operate each luminaire after installation and connection to verify proper operation.
- C. Test self-powered exit signs and emergency lighting units to verify proper operation upon loss of normal power supply.
- D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Engineer.
- E. Examine drawings and site conditions for ceiling construction, structural depths, piping and ductwork locations, door heights, upper cabinet heights and location, and other building elements. Coordinate to avoid conflict with luminaire installation.
- F. A visual inspection shall be performed to verify cleanliness and alignment of the fixtures. Misalignment and light leaks shall be corrected, and rattles due to ventilation system vibration shall be eliminated.
- G. Perform an operational test to verify that all fixtures illuminate properly, dimming systems dim properly (i.e. no flicker), and lighting zones are switched according to the drawings.

### **3.05 ADJUSTING**

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Engineer. Secure locking fittings in place.
- B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Engineer or authority having jurisdiction.
- C. Aim and adjust fixtures as directed.

### **3.06 CLEANING**

- A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.
- B. Clean electrical parts to remove conductive and deleterious materials.
- C. Remove dirt and debris from enclosures.
- D. Clean photometric control surfaces as recommended by manufacturer.

E. Clean finishes and touch up damage.

**3.07 CLOSEOUT ACTIVITIES**

A. Demonstration: Demonstrate proper operation of luminaires to Engineer, and correct deficiencies or make adjustments as directed.

**3.08 PROTECTION**

A. Protect installed luminaires from subsequent construction operations.

**3.09 SCHEDULE - SEE DRAWINGS**

**END OF SECTION**

**SECTION 26 55 00**  
**THEATRICAL LIGHTING CONTROL AND EQUIPMENT**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 RELATED SECTIONS**

- A. Section 26 05 26 - Grounding and Bonding.
- B. Section 26 05 33.13 - Conduit.
- C. Section 26 05 37 - Boxes.
- D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 27 26 - Wiring Devices
- F. Section 27 10 05 - Telecommunications Cabling.

**1.03 REFERENCE STANDARDS**

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

**1.04 SCOPE**

- A. All materials, components, and services necessary to provide a complete system indicated in this Section, as specified herein and shown on related drawings, including:
  - 1. Verification of dimensions and conditions at the job site.
  - 2. Preparation and submission of complete shop drawings and samples for approval prior to fabrication.
  - 3. Shipment of equipment to the job site and the secured storage of all non-fixed equipment.
  - 4. Installation and completion in accordance with these specifications, related drawings, the Theatrical Lighting Equipment Manufacturer's recommendations, established trade criteria, and all applicable code requirements.
  - 5. The inspection, demonstration, and necessary adjustment of the completed installation by the Theatrical Lighting Equipment Manufacturer's engineering personnel.
  - 6. Preparation and submission of complete record drawings and operation and maintenance data and certificates.

**1.05 WORK INCLUDED**

- A. The following is for reference only and is not intended to define the limits of the work for a complete installation:
  - 1. DMX-controlled intelligent electrical panels.
  - 2. Control racks and devices.
  - 3. Emergency lighting interface devices.
  - 4. Network data system.
  - 5. Control receptacle panels.
  - 6. Entry stations.
  - 7. Work light control panels.
  - 8. Wiring devices.
  - 9. Theatrical lighting fixtures and accessories.
  - 10. Theatrical lighting control console and accessories.
- B. The following work shall be completed by the contractor but not by the Theatrical Lighting Manufacturer or Theatrical Lighting Equipment Dealer.
  - 1. Electrical feeds, conduit, wire, control cable, and connections except as indicated herein.

2. Testing and certification of network cable and terminations as specified in section 27 10 05.

#### **1.06 QUALITY ASSURANCE**

- A. The Theatrical Lighting dimming and control system equipment shall be the responsibility of a single Theatrical Lighting Equipment Manufacturer or Theatrical Lighting Equipment Dealer.
- B. The Theatrical Lighting Equipment Manufacturer shall have at least then (10) years of experience in the fabrication of similar equipment and systems. If requested, the manufacturer shall submit a representative list of installations during the above period.
- C. Subject to the above requirements, the equipment specified herein shall be provided by one of the following Theatrical Lighting Equipment Manufacturers.
  1. Control console and dimming system:
    - a. Electronic Theatre Controls (ETC), Middleton, WI.
  2. Wiring devices:
    - a. Altman Stage Lighting, Yonkers, NY.
    - b. Electronic Theatre Controls (ETC), Middleton, WI.
    - c. Lex Products, Stamford, CT.
    - d. Performance Electric, Inc., Greenville, SC.
    - e. SECOA, Champlin, MN.
    - f. Stagecraft Industries, Portland, OR.
    - g. Union Connector, Roosevelt, NY.
  3. Other Theatrical Lighting Equipment Manufacturers may be considered with the prior review and approval of the Engineer. Manufacturers seeking approval to bid must contact the Engineer and provide the following information not less than ten (10) days prior to the bid date:
    - a. List of projects of similar scale and complexity completed in the last five (5) years. Provide project name, location, completion date, and description of equipment installed.
    - b. Samples of shop drawing submittals for projects of similar scale and complexity completed in the last five (5) years.
    - c. Technical data sheets for any product proposed for use on this project.
    - d. Samples of any products requested by the Engineer.
  4. The Theatrical Lighting dimming and control system shall be provided by a qualified Theatrical Lighting Equipment Dealer who shall have at least five (5) years' experience in the sales and installation of similar systems and who shall be factory certified to provide warranty service for all of the equipment in this Section. Dealer shall meet the requirements for full Membership in the Professional Lighting and Sound Association (PLASA).
  5. The dealer shall be responsible for the integration, operation, and performance of all elements of the system described in this Section. The dealer shall provide all warranty work and equipment upgrades as called for in this Section.
  6. The dealer shall be available for onsite product service within (24) hours of a call for service.
  7. Subject to the above requirements, the equipment specified herein shall be provided by one of the following Theatrical Lighting Equipment Dealers:
    - a. Gopher Stage Lighting, Minneapolis, MN; (612) 871-0138.
    - b. Lighthouse Productions, Green Bay, WI: (920) 338-3442
    - c. Norcostco, Golden Valley, MN; (763) 544-0601.
    - d. Heartland Scenic Studio, Omaha, NE; (402) 341-9121.
    - e. Barbizon Lighting, Chicago, IL; (773) 276-8500.
  8. Other Theatrical Lighting Equipment Dealers may be considered with the prior review and approval of the Engineer. Dealers seeking approval to bid must contact the Engineer and provide the following information not less than ten (10) days prior to the bid date:

- a. List of projects of similar scale and complexity completed in the last five (5) years. Provide project name, location, completion date, and description of equipment installed or services provided. Provide contact name, title, and phone number for references familiar with Dealer's work on east project listed.
- b. Samples of shop drawing submittals for projects of similar scale and complexity completed in the last five (5) years. Sample drawings shall be provided in PDF format only.
- c. Name, resume, and number of years of employment for Dealer's project manager assigned to this project.

## 1.07 SUBMITTALS

- A. Shop drawings:
  - 1. Within thirty (30) days of receipt of order, the manufacturer shall submit one (1) complete set of computer-generated drawings in PDF format to the Engineer for approval prior to fabrication:
    - a. Dimensions, components, and finishes of all equipment and accessories.
    - b. All system assemblies and major sub-assemblies, cabinets, and enclosures, including notation of type and manufacture of switches, relays, locks, hardware, and electrical and electronic connectors.
    - c. Quantities of each component and sub-assembly.
    - d. Block schematics of system internal wiring and system element interconnection.
    - e. Indication by boxed caption of any and all deviations or exceptions from the contract drawings and specifications, whether or not those variations have been formally or informally accepted by the Engineer.
    - f. Indication by boxed caption of any and all additional wire or conduit runs that are not shown on the drawings that will be required to install manufacturer's system.
- B. Final Submittal:
  - 1. Within thirty (30) days of final tests, and as a condition for final approval, the contractor shall submit three (3) bound sets to the owner and one (1) bound set to the Engineer:
    - a. Receipts for delivery of all non-installed items, i.e., all items designated, "deliver to owner".
    - b. As built and approved" CAD/PDF drawings and wiring diagrams showing all systems and components as installed, including all field modifications.
    - c. Operation and service manuals, schematics, and parts lists for each unit of equipment installed or provided. A printed, bound manual is required for each control console.
    - d. DVD copies of video-recorded instructions as described below.
    - e. Certificates of warranty, as set forth below.

## 1.08 TESTING AND INSTRUCTION

- A. Upon completion of all installation work, the contractor shall certify in writing to the Engineer that the work is complete and ready for final inspection. Final inspection shall be scheduled by the Engineer within fourteen (14) days following contractor's notice of completion.
- B. After system commissioning and adjustment, a knowledgeable representative of the manufacturer shall operate the system for the approval of Owner and Engineer.
- C. Necessary adjustments or modifications shall be made as required.
- D. Manufacturer's representative shall instruct the owner's designed staff or representatives in the operation and maintenance of all equipment as follows:
  - 1. The first instruction session shall encompass a complete and detailed orientation to the system, including all controllers, control accessories, dimmers, receptacle panels, and theatrical lighting fixtures. This instruction session shall be scheduled to last a minimum of eight (8) hours where a minimum of four (4) hours is dedicated to the lighting control console(s).

2. The manufacturer shall provide to the owner video-recorded instructions on the operation and maintenance of the system. Information contained in the video will cover all points of operation and maintenance covered in the first instruction session with the owner's staff. A recording of the actual instruction session is acceptable. Provide two (2) DVDs each contained full copies of the video instruction.

#### **1.09 WARRANTY**

- A. For a period of two (2) years following final acceptance, the Theatrical Lighting Equipment Manufacturer shall unconditionally warrant all dimmer modules and dimmer rack control modules provided under this Section to be free from defects in materials and workmanship.
- B. For a period of one (1) year following final acceptance, the Theatrical Lighting Equipment Manufacturer shall unconditionally warrant all other equipment and systems provided under this Section to be free from defects in materials and workmanship. Lamps and normal wear and tear are exempted.
- C. For a period of two (2) years following final acceptance, the Theatrical Lighting Equipment Dealer shall provide and install, at no cost to the owner, software upgrades to all components of all control systems including consoles and architectural lighting controllers. Thereafter the dealer shall notify the owner of all software upgrades for the life of the control system(s). The dealer shall keep the owners name and address in a database for this purpose. All upgrades shall include a full written description of operational modifications. Software upgrades shall be designed so as to allow all existing data, configurations and show files to be maintained, accessed and edited in the future.
- D. Appropriate additional equipment to replace equipment removed for service shall be provided at the job site at no expense to the owner. Replacement control console(s) must be of the same model as those removed for service.
- E. Warranty service shall be performed by personnel in the employ of the Theatrical Lighting Equipment Manufacturer and shall not be sub-contracted or assigned to another company, service, or individual unless the owner has approved such assignment in writing, in which event the Theatrical Lighting Equipment Manufacturer shall nevertheless be responsible to the owner for such work.

#### **1.10 GENERAL REQUIREMENTS**

- A. General conditions of the project contract, work schedules, and site regulations apply to this work.
- B. This work shall comply with all applicable national and local labor regulations.
- C. All parts shall be new, of first quality, and under warranty.
- D. All work and products shall conform to all applicable national and local code requirements. It is the Contractor's responsibility to verify and comply with all national and local codes.
- E. All electrical work and products shall conform to all applicable current edition of NFPA 70 National Electric Code (NEC) standards.
- F. All components shall be UL listed and carry pertinent UL labels.
- G. All components shall bear labels identifying the manufacturer, model number, and serial number. All such labels and certificates shall be permanently attached in a conspicuous location.
- H. Identification:
  1. All control and receptacle faceplates shall be identified and legends with permanent markings.
  2. All control and receptacle faceplates not described elsewhere in this specification shall be black anodized aluminum or black painted steel, and all labels and legends shall be permanently engraved directly into the faceplate. Minimum text height if not specified elsewhere: ¼ inch. Engravings shall be filled with white paint. Lamacoid labels shall be acceptable if mechanically fastened to the panel.



3. Dry transfers, decals, plastic “dymo”, or other types of adhesive labels shall not be used. Silk-screened labels or legends shall not be used.
4. All control and receptacle faceplates shall have beveled edges and rounded corners.
5. Control signal protocol and connectors shall comply with applicable standards established and published by the U.S. Institute of Theatre Technology. The control signal protocol shall be equal to ANSI E1.11-2008 DMX512-A.
6. All multi-conductor connectors shall be wired in accordance with the recommended practice RP-1 as published by the U.S. Institute for Theatre Technology.
7. All control, signal, and video connectors shall be of substantial construction and shall be of the locking or latching type. All plate-mounted connectors shall be bolted to faceplates, rivets shall not be acceptable.
8. All components requiring external electrical connections of more than seven (7) conductors shall include barrier-type terminal strips properly sized and permanently labeled.
9. Where specification allows for “approved equal”, substitutions shall be proposed to the Engineer no less than ten (10) days prior to bid date.
10. All equipment shall be fully insured against loss or damage during shipment, job site storage, installation, and testing. The contractor shall have and assume full responsibility for the safety of every unit of equipment, components, wiring, and plans during delivery, installation, and testing. Certification of such coverage shall be furnished to the Engineer within thirty (30) days of award of contract.
11. For a period of three (3) years following acceptance, the manufacturer shall provide and install, at no cost to the owner, all control console operating system upgrades. Thereafter the manufacturer shall notify the owner of all operating system upgrades for the life of the console. All upgrades shall include a full written description of operational modifications. Operating system upgrades shall be designed so as to allow existing data to be accessed and upgraded.
12. For a period of five (5) years following acceptance, the manufacturer shall maintain service capability by guaranteeing a factory-authorized representative available for on-site service calls within twenty-four (24) hours of notification by owner of a need for service.
13. All control signal terminations shall be made by the Theatrical Lighting Equipment Manufacturers’ installation technician.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Equipment and hardware are specified on the basis of performance and minimum acceptable quality. Materials manufactured by any of the following companies that equals or surpasses the performance and quality specified will be acceptable:
  1. Electronic Theatre Controls (ETC), Middleton, WI.
  2. Other manufacturers as listed for specific components below.

### **2.02 INTELLIGENT ELECTRICAL PANELBOARD**

- A. Product: Sensor IQ Intelligent Breaker System by ETC Inc. Provides 120/208 V, 120/240 V, or 277/480 V mains-fed power distribution for up to 48 branch circuits. Combines high inrush rated overcurrent protection, switched power control, and power usage/breaker status reporting in a single device. Integrated DMX and Ethernet connectivity. Optional 0-10 V dimming, DALI output, contact inputs, and isolated ground bar for audio loads.
- B. IQ48 Enclosure: 48 branch breaker slots, 3-phase 120/208 V mains feed.
- C. Mechanical:
  1. Construction: 16-gauge steel.
  2. Finish: black, fine-textured, scratch-resistant powder coat paint.
  3. Removable outer panel includes integral locking door to limit access to electronics, breakers, and local relay overrides.
  4. Full front access with no side clearance required.

5. Removable covers for access to Class 1 and Class 2 wiring.
  6. Complies with California building code - seismic zone four.
- D. Electrical:
1. Mains feed power input to support 120 / 208 V three-phase four-wire or 120 / 240 V bi-phase three-wire plus ground.
  2. Max current input: 100 A at 12 circuits, 200 A at 24 circuits and 400 A at 48 circuits.
  3. Quiescent draw: < 10 W with relays at steady state.
  4. Optional isolation between chassis and equipment grounding.
  5. Short-circuit current rating: 22,000 A or 65,000 A symmetrical.
  6. Overloads occurs at 50 operations of 600 percent of rated current.
  7. Feeder entry supported at top or top side.
  8. Bottom or bottom side entry supported by rotating enclosure during installation.
  9. Load wire entry supported on top, sides, or bottom.
- E. Thermals:
1. Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
  2. Humidity: 5 to 95 percent non-condensing.
- F. Smart Breakers:
1. Integral mechanically held air gap relay.
  2. Integrated hall-effect sensors detect contact positions.
  3. Integrated solenoid for remote operation.
  4. Supports manual reset using breaker handle without power.
- G. Breaker Operational Ratings:
1. No load-remote switching (Smart Breakers): 1,000,000 cycles.
  2. Resistive Load: 16 A (20 A branch breaker): 100,000 cycles.
  3. Electronic load: 15 A, 100,000 cycles.
  4. Handle operations: 10,000 cycles.
  5. Duty cycle of 6 full cycles (12 operations) per minute.
  6. Supports voltage isolation of 4000 V RMS.
  7. Utilizes latching state, mechanically held relays (Smart Breakers only).
- H. Breaker Models:
1. Breakers: 120 V Smart.
    - a. 1-pole: 15 A, 20 A, or 30 A.
  2. Control:
    - a. User interface:
      - 1) Graphical display with LED backlight.
      - 2) Button Interface With: 0 to 9 number buttons.
      - 3) Navigation Buttons: Up, down, back and enter.
      - 4) "Light bulb" test button for local preset activation, sequence and set level overrides.
      - 5) USB interface: For upload of setup and software updates.
    - b. Control Wiring Terminations:
      - 1) Control Terminals: Accept 12 AWG wire.
      - 2) Control Wiring Exiting Panel: Class 2.
      - 3) Control Terminations: Utilize removable connectors.
    - c. Relay Modes: Normal (priority/HTP), latch-lock or last-action.
    - d. Configurable DMX on/off threshold.
    - e. Status feedback for breaker state, relay state, current drawer circuit, phase voltage and energy usage per circuit.
    - f. Presets and sequences:
      - 1) Sixteen spaces with 64 presets per space configurable via local UI.
      - 2) One 16 step sequence per space.

- g. UL924 Listed emergency control bypass.
- h. Configurable Data-Loss Behavior: Play preset; Hold last look; Wait and fade.
- 3. Accessories:
  - a. 0-10 V Dimming: 24 outputs of 0-10 V sink dimming control rated for 100 mA per output.
  - b. Contact Input: 24 Dry Contact Inputs:
    - 1) Trigger presets and sequences, which play at priority configured for architectural sources.
    - 2) Directly control one or more outputs. Priority of outputs is configurable. If nothing is configured, the last action takes precedence.
  - c. RideThru Option: Short-term power backup of control electronics.
    - 1) Automatically engages when power is lost.
    - 2) Recharges during normal power operation.
- 4. Standards Compliance:
  - a. Breakers: Listed to UL 489.
  - b. Enclosures: Listed to UL 67, UL 508, UL 924.
  - c. Complies with ANSI DMX512-A and ANSI E1.31 streaming ACN standard.
  - d. Complies with ESD immunity to IEC standard 1000-4-2.
- 5. Quantities and configurations of Sensor IQ enclosures, branch circuit breakers, and accessories to be supplied as shown on project drawings.

### **2.03 PORTABLE DIMMER STRIPS**

- A. Lightronics DB612 are self-contained dimming systems packaged as linear strips cooled by natural convection and operate without cooling fans or filters.
  - 1. Lightronics DB612
    - a. Six 1200-watt dimmers
    - b. Measure 5 x 3 x 72 inches
    - c. Weigh no more than 26 pounds
    - d. DMX512 Control Protocol
    - e. UL and CSA listed.
    - f. Stage Pin Output Panel for each circuit.
  - 2. Six independently control circuits with a load capacity of 1200 watts per circuit. Each circuit protected by a 10 amp fast acting magnetic circuit breaker.
  - 3. Dimmers shall have a rise time of not less than 450 microseconds.
  - 4. Power Output shall be displayed via LED indicators for each circuit.
  - 5. Each dimmer shall have rotary decade switches and dipswitches for setting the DMX start address and non-dim function.
  - 6. Panel controls for dimmer set up, dimmer attributes, circuit test, and unit address.
  - 7. Power requirements shall be 120/208 volt three phase (20 amperes) or 120/240 volt single phase (30 amperes). Provide a twistlock plug (NEMA L5-20) and cord for the dimmer bar preterminated on the terminal strip with strain relief.
  - 8. Provide each bar with 3 mounting brackets and associated hardware for pipe/truss mounting.

### **2.04 EMERGENCY TRANSFER PANEL**

- A. Electronic Theatre Controls (ETC) ELTS2.
- B. Provide a panel with required number of 20 ampere transfer circuits as indicated on the drawings.
- C. Emergency Transfer Panel shall operate as follows:
  - 1. The transfer panel shall employ integral break-before-make relays to switch power between the north theatrical panel feed and the emergency feed when normal power is interrupted.
  - 2. The transfer panel shall have a power sensing circuit to determine when power to the relay panel or system electrical panel has been interrupted. In the event of a power

- interruption, the transfer panel shall automatically restore power to the emergency circuits and bring them to full intensity.
3. The transfer shall comply with UL 1008 and NFPA 70 articles 700 and 701.
- D. The transfer panel shall be designed to operate at 120/208 volts or 120 volts, normally fed from the normal power system.
  - E. Electrical contractor shall provide a circuit from the emergency power source to the transfer panel. Loss of power to any phase shall activate emergency operation. See riser diagram on the drawings.

## **2.05 EMERGENCY LIGHTING INTERFACE DEVICES**

- A. Emergency Bypass Detection:
  1. The system described below is based upon general performance criteria common to the products listed below. No other system shall be considered unless specifically approved by the Engineer at least ten (10) days prior to the bid date:
    - a. Electronic Theatre Controls “Emergency Bypass Detection Kit (EBDK)” or approved equal
    - b. Provide emergency bypass detection kit to sense loss of normal power for each DMX-controlled relay panel, intelligent electrical panel or other device that activates emergency lighting.
    - c. Electrical Contractor shall provide 20A 3-pole circuit breaker or 1-pole feed from normal power source for each emergency bypass detection kit. Loss of any phase shall activate emergency operation. Refer to riser diagram on drawings.
    - d. Provide quantity of emergency bypass detection kits and 3-pole or 1-pole circuit breakers as required to serve multiple panels. Provide all components required for a complete and operable system.
- B. Emergency Bypass Controller:
  1. The system described below is based upon general performance criteria common to the products listed below. No other system shall be considered unless specifically approved by the Engineer at least then (10) days prior to the bid date:
    - a. Electronic Theatre Controls “Emergency Bypass Controller DEBC.” or approved equal. Provide quantity of DMX outputs required per the drawings.
    - b. Provide emergency bypass controller to force DMX data to emergency lighting fixtures into a bypass state. DMX bypass state may bring each DMX control channel to a designated level.
    - c. Emergency bypass controller shall control a single universe of 512 DMX channels to six optically isolated lines..
    - d. Electrical contractor shall provide emergency power to the emergency bypass controller as well as to all emergency lighting fixtures.
    - e. Electrical contractor shall connect each emergency bypass controller to an emergency bypass detection kit or equal device to activate emergency operation.
    - f. Provide quantity of emergency bypass controllers as required to serve multiple fixture locations or multiple universes of DMX. Provide all components required for a complete and operable system.
    - g. Manufacturer’s commissioning technician shall configure each emergency bypass controller to activate all designated emergency lighting fixtures and confirm emergency operation with the electrical contractor.

## **2.06 CONTROL INTERFACE RACK**

- A. Control interface rack(s) shall be 19-inch industry standard equipment rack. Design and configuration of the control interface rack(s) shall contain equipment as listed below and any other devices necessary for a complete system.
- B. Physical Requirements:
  1. Equipment rack(s) shall be fully welded construction using minimum 16 gauge steel and finished in black powder coat.

2. Equipment rack(s) shall be wall-mounted at location(s) shown on the drawings.
  3. Equipment rack(s) shall include a front access door with integral lock. Door may be inverted on site for opposite swing. Provide six (6) keys to owner. Label door: "Theatrical Lighting Control Interface".
  4. The depth of the rack, including front access door shall not exceed 23 inches.
  5. The height of the rack shall be sized to accommodate required components as detailed below and shall not exceed 70 inches.
- C. Equipment Rack(s) shall contain the following components:
1. Architectural lighting processor(s).
  2. Network switch(s) and patch bay(s).
  3. Distributed DMX driver(s).
  4. Centralized DMX Distribution devices(s) as specified herein.
  5. Power conditioner or surge protection as specified herein.
  6. Cable management.
  7. Minimum 2U blank rack space for future use.
  8. Blank panels as required.
  9. Additional devices, as required, for a complete and operable system.
- D. Provide DMX output(s) to LED architectural lighting fixtures in the theater and other spaces. Coordinate DMX control with fixture manufacturer and electrical contractor for a complete and operable system.
- E. Provide 0-10 volt controller(s) for LED architectural lighting fixtures requiring 0-10 volt control. Coordinate control wiring with fixture manufacturer and electrical contractor for a complete and operable system.
- F. All devices installed at the control interface rack shall operate silently if installed within the auditorium, stagehouse or control room. Fan noise, transformer hum, or other acoustic interference shall not be acceptable.
- G. Installation shall include appropriate cable management, terminal blocks and labels.
- H. All devices, stations, and blank panels contained within rack(s) shall be "black."
- I. Manufacturer: Middle Atlantic Products, Lowell, or approved equal.
- J. Install as indicated on the drawings.

## **2.07 POWER CONDITIONER WITH BATTERY BACKUP**

- A. Rack mounted power conditioners with battery backup shall be provided to protect all lighting control devices from electrical irregularities such as surges, "spikes" and emergency transfer. Battery backup shall be sized to maintain power to all connected devices for a minimum of 15 minutes.
- B. Provide one (1) power conditioner for each of the following equipment rack locations:
1. Control interface rack and for all external network devices requiring a power source.
  2. Stage manger's rack.
  3. Booth rack.
- C. Manufacturers:
1. Furman Sound F1000-UPS
  2. Furman Sound F1500-UPS
  3. APC
  4. Best Power Technology
  5. Approved equal.
- D. All devices installed at the stage manager's rack shall operate silently, fan noise, transformer hum, or other acoustic interference shall not be acceptable.
- E. Install as indicated on the drawings.

## 2.08 NETWORK DATA SYSTEM

- A. The network data system shall provide for the interconnection of devices used solely for theatrical lighting and special effects.
- B. A dedicated network is required for the lighting control system. The network shall consist of receptacle panels, connecting wiring, patch bays, patch cables, routers, switches, and portable node devices.
- C. All materials, components, and services necessary to provide a complete network data system indicated in this Section. Manufacturer shall be responsible for performance of the complete system.
- D. All lighting control devices shall operate as part of the network. If the manufacturer's system requires devices that are not network compatible, manufacturer shall provide all required hardware to accommodate those devices to meet the intent of this specification. Division 26 shall provide and install conduits, boxes, and conductors to accommodate these devices, as part of the work of this Section.
- E. The network shall provide for the connection of the following devices:
  - 1. Control consoles
    - a. DMX outputs.
    - b. Remote video displays.
    - c. Designer's remote control consoles.
    - d. Dedicated lines to console locations if required.
    - e. Automated lighting fixtures.
    - f. Moving yoke devices.
    - g. Color changers.
    - h. LED lighting fixtures.
    - i. DMX-controlled special effects.
    - j. Architectural lighting control system.
- F. Network capacity shall be determined by the following simultaneous usage criteria. System shall allow all the data below to be sent simultaneously, within the traffic and collision maximums noted below:
  - 1. Control consoles – quantity one (1) in each auditorium.
  - 2. Remote video displays – quantity (2) in use, in two separate locations.
  - 3. Designer's remote control consoles
  - 4. Distributed DMX signal – eight (8) 512-dimmer universes for automated lighting, color changers, and special effects. System shall be designed for the quantity of DMX nodes specified herein and a 50% future expansion of DMX node devices.
  - 5. Architectural lighting control system – as specified herein.
- G. The system shall utilize unshielded twisted pair (UTP) wiring. UTP wiring shall be 4 pair, 24 AWG, unshielded twisted pair wiring. Fiber optic wiring is permissible for "backbone" wiring runs. Fiber optic wiring shall be 62.5/125/900 Micron Fiber Optic wiring. All category 6 connectors shall be RJ45. All fiber optic connectors shall be LC style connectors.
- H. All elements of the system shall meet the following requirement:
  - 1. Institute of Electrical and Electronic Engineers Standard 802.3: ANSI/IEEE Standard 802.3, 2012 Edition.
  - 2. Electronic Industries Association/Telecommunications Industries Association Standard 568-2015.
  - 3. TIA/EIA Bulletin TSB67 for field testing of unshielded twisted-pair cabling systems.
  - 4. ESTA CP/96-1057r1 Recommended Practice for Ethernet Cabling Systems in Entertainment Lighting Applications and CP/98-1005r3, Supplement to the Recommended Practice.
- I. See Section 27 10 05 - Telecommunication Cabling for cable, jack, patch panel, and other system requirements.

- J. Network switches:
  1. The system shall utilize network switches for data distribution. The switches shall be rack-mounted in the control interface rack(s) and completely wired internally.
  2. The switches shall include sufficient ports for patching all network devices, plus six (6) spare receptacles per control interface rack.
  3. The switches shall accommodate 100Mbps transmission rate.
  4. All switch ports shall be labeled with designation of wire destination.
- K. Network Patch Panels - See Section 27 10 05.
- L. Network Cables and Patch Cables - See Section 27 10 05.
  1. Provide one (1) patch cable of appropriate length for patching each switch port to the designated network receptacle. Provide one (1) spare patch cable for each spare switch port.
  2. Deliver to owner.
- M. Wiring Methods:
  1. All permanent network wiring shall terminate in receptacles in panels. All equipment shall be connected to receptacles via "patch cables" with RJ45 plugs. No installed wire shall terminate directly to network equipment. The use of male RJ45 pigtailed shall not be permitted.
  2. Cable shall be pulled in conduits, meeting the minimum bending radius permitted by the cable manufacturer. All cable shall be pulled with no more than the maximum pulling tension permitted by the cable manufacturer.
  3. Plenum rated cable shall be used.
- N. Electrical Requirements:
  1. All UTP wiring segments shall be continuous runs of not more than 250 feet. If a wiring run exceeds the noted maximum footage, manufacturer shall provide required repeaters and system elements to bring the wiring segment to the stated maximum run. Contractor shall provide and install such elements as part of the work of this section.
  2. All cable shall meet the standard for EIA/TIA 568 TSB-36 Category 6. The contractor shall use a current generation 100Mhz or higher, network/cable analyzer to perform testing on the cable plan and shall test all data pairs. All cable shall be tested for continuity, attenuation, near end cross talk, mutual capacitance, cable impedance, cable resistance, cable length, structural return loss and pair mapping. All testing will be performed by certified cable technicians. As part of the final submittal, provide cable analyzer printouts of all test performed, labeled by cable number.
  3. All wiring shall meet the EIA/TIA T586B wiring standard.
  4. All cable and installation shall accommodate 100Mbps transmission rate. "Thin Net" systems shall not be used.
  5. The system shall be designed for maximum 40% traffic utilization and maximum 10% collisions within the same collision domain. The use of switches is acceptable to manage network traffic.
  6. All layer 2 switches shall provide for IGMP Layer 3 snooping to accommodate IP multicast events.

## 2.09 NETWORK NODES

- A. Rack Mounted Node Devices:
  1. The device described below is based upon general performance criteria common to the products listed below. No other system shall be considered unless specifically approved by the Engineer at least ten (10) days prior to the bid date:
    - a.
    - b. Pathway Connectivity "Pathport Quattro Node."
    - c. Pathway Connectivity "Pathport Octo Node."
  2. Node devices shall be rack mounted for connection of equipment at the lighting control interfac

3. Nodes shall have receptacles for network cables.
4. Nodes shall have a minimum of four (4) DMX output receptacles.
5. Provide four (4) male to male DMX turn arounds for each node.
6. Quantities per the drawings.

## **2.10 CENTRALIZED DMX DISTRIBUTION**

- A. The system described below is based upon general performance criteria common to the products listed below. No other system shall be considered unless specifically approved by the Engineer at least ten (10) days prior to the bid date:
  1. Electronic Theatre Controls "Net3 Four Port Gateway."
  2. Pathway Connectivity "Pathport Quattro Node."
  3. Pathway Connectivity "Pathport Octo Node."
- B. The Centralized DMX Distribution system shall be located at the control interface rack and employ the above noted device(s). The system shall provide for the translation of network control data into discrete DMX512 data streams to the indicated receptacles on the control receptacle panels, per the drawings and schedules. The system shall be designed with the following functionality:
  1. The device(s) shall be capable of accepting the following lighting control network data: ACN; sACN; RDM; ETC Net3; ShowNet.
  2. The device(s) shall use a dedicated multiplexed signal conforming to the ANSI E1.11-2004 DMX512-A standard.
  3. DMX512 data streams shall be optically isolated.
  4. Each discrete DMX data stream shall be programmable to provide data within the specified DMX Universe(s).
- C. Wiring between the centralized DMX distribution system devices and indicated receptacles on the control (dataO panels per the drawings shall
  1. Utilize Category 6 cable for transmission of DMX512 data.
  2. Cable length shall be limited to 250 feet.
  3. Follow all recommended practices of ANSI E1.27-2-2009.
- D. All wires shall be identified at the jacket with separate numbers.
- E. The device(s) shall provide one discrete input or output for each DMX receptacle in the system plus four (4) spare inputs/outputs. Provide rear-mounted terminals for the connection of all DMX wiring.
- F. Multiple DMX receptacles on a single input or output cable is not acceptable.
- G. Install in the control interface rack.

## **2.11 CONTROL STATION PANEL (DATA)**

- A. The control receptacle panels shall be deadfront, and completely wired internally, with terminal strips of the proper rating for all external connections. Appropriate back boxes shall be provided for all panels.
- B. The face of each panel shall contain flush mounted locking type receptacles for connection to the devices indicated. DMX connectors shall be equal to XLR series by Switchcraft. Ethernet connectors shall be RJ45. Smaller or less substantial connectors shall not be acceptable. Provide surface mount back box or C-clam hardware to mount boxes in the appropriate locations.
- C. DMX A shall be 1-512 and control house dimmers unless noted otherwise. DMX B shall be 513-1024.
- D. Initial programming of DMX receptacles shall be as follows:
  1. If one (1) DMX INPUT then: DMX INPUT shall be 1-512 and control house dimmers unless noted otherwise. DMX INPUT shall be provided in the control booth, see plans and schedules.



2. If two (2) DMX INPUT then: first DMX INPUT shall be 1-512 and control house dimmers unless noted otherwise; second DMX INPUT shall be 513-1024.
  3. If one (1) DMX INPUT then: DMX OUTPUT shall be 513-1024.
  4. If two (2) DMX INPUT then: first DMX OUTPUT shall be 1-512 and control house dimmers unless noted otherwise; second DMX OUTPUT shall be 513-1024.
  5. If three (3) or more DMX INPUT or OUTPUT then DMX receptacle shall be initially programmed for the next sequential DMX Universe.
- E. All control panel faceplates shall have a factory-applied paint or anodized finish as indicated in the finish schedule on the drawings.
  - F. All faceplates shall be engraved at each connector and backfilled with contrasting epoxy paint. Connector labels as indicated on the drawings.
  - G. All control panels shall be mounted as indicated on the drawings and in the schedules. Provide appropriate back boxes for all control panels. Verify all mounting conditions.
  - H. Install as indicated on the drawings.

## **2.12 HOUSE LIGHT PANEL – LCD**

- A. The system described below is based upon general performance criteria common to the products listed below. No other system shall be considered unless specifically approved by the Engineer at least ten (10) days prior to the bid date:
  1. Electronic Theatre Controls “Unison Paradigm Touchscreen.”
- B. Provide two (2) - one at the existing stage manager panel and one at the existing booth control panel.
- C. Physical Requirements:
  1. The lighting control panel shall be deadfront and completely wired internally, with terminals of the proper rating for all external wiring.
  2. The face of the panel shall have a touch-screen capable of selection, programming, and control of the lighting presets.
  3. All control wiring shall be low-voltage Class II.
- D. Operational Requirements:
  1. Each panel shall have the capability to access a minimum of ninety nine (99) presets, plus OFF.
  2. Each panel shall have the capability to access a minimum of (1024) dimmers.
  3. The presets shall be programmed by adjusting and recording the levels of the house light control channels. Presets shall be capable of user-defined sequences.
  4. All presets shall have an adjustable fade rate control.
  5. They system shall include Macro capability of channels, presets, playback and custom conditional statements.
  6. The record function shall be capable of being locked by a passcode to prevent unauthorized use.
  7. The system set-up shall be protected by a separate passcode.
  8. The system shall provide printable reporting information on the status of all presets, macros, processors, and stations.
  9. The system shall accept graphical inputs to allow custom LCD screen configuration.
- E. The system shall provide for storing of all program, preset and system set-up configuration to removable media. Provide three (3) units of media.
- F. All House Light Panels shall be mounted as indicated on the drawings and in the schedules. Provide appropriate back boxes for all panels. Verify all mounting conditions.
- G. Faceplate color and labels shall be as indicated in the schedules. Manufacturer shall confirm all faceplate colors and labels in shop drawings.
- H. All faceplates shall be labeled: House Lights.”

- I. Install as indicated on the drawings and in the schedules. House light panels are identified as "HLP" on the drawings.

### **2.13 ENTRY STATION**

- A. The system described below is based upon general performance criteria common to the products listed below. No other system shall be considered unless specifically approved by the Engineer at least ten (10) days prior to the bid date:
  1. Electronic Theatre Controls "Unison Heritage Series Button Station."
- B. Physical Requirements:
  1. The panels shall be deadfront and completely wired internally, with terminals of the proper rating for all external wiring.
  2. The face of each panel shall contain momentary contact switches for accessing lighting presets and non-dims as indicated. All buttons shall have integral LED's, illuminated when activated.
  3. All faceplates shall contain an LED indicator lamp for ease of identifying in a darkened room.
  4. All control wiring shall be low-voltage Class II.
- C. Operational Requirements:
  1. Each panel shall contain momentary contact switches for accessing lighting presets as indicated in the schedules.
- D. All entry station panels shall be mounted as indicated in the schedule. Provide appropriate back boxes for all panels. Verify all mounting conditions.
- E. Faceplate color and labels shall be as indicated in the schedules. Manufacturer shall confirm all faceplate colors and labels in shop drawings.
- F. Provide a clear, lockable cover plate and two (2) keys for each station as indicated in the schedule. Locking cover assembly shall be painted to match station faceplate. Deliver keys to owner.
- G. Install as indicated on the drawings and in the schedules. Entry stations are identified as "ES" throughout the documents.

### **2.14 WIRING DEVICES**

- A. General:
  1. Wiring devices shall be constructed of minimum 18 gauge steel. Exterior finish shall be baked enamel, color as indicated in the schedules.
  2. Terminal strips of the proper rating shall be provided for external connections on all components requiring more than seven (7) conductors. Terminal strips shall be clearly labeled and located as indicated on the drawings.
  3. Flush mounted standard receptacles shall be as specified in this section.
  4. Panel mounted multi-conductor connectors shall be as specified in this section. All multi-conductor electrical connections shall be soldered and insulated with heat shrink tubing.
  5. Circuit numbers shall be engraved Lamacoid labels, minimum 1 inch high white letters on a black background. Labels shall be applied with adhesive and mechanically fastened to the wiring device.
  6. Unit shall be UL listed and carry a UL label.

### **2.15 THEATRICAL LIGHTING CABLES**

- A. Ethernet or DMX Cable:
  1. See Section 27 10 05.
- B. Portable Ethernet Cable:
  1. Portable ethernet cable shall be used for all control (data) boxes.
  2. Cable shall be 4-pair, 23 AWG, shielded Category 6 wiring, cable jacket to be UV resistant polyurethane, black in color.
  3. Cables shall be LEX Products Powerflex or TMB Proplex or approved equal.

- C. Portable DMX Cable:
  1. Portable DMX cable shall be used for all control (data) boxes.
  2. Cable shall be 2-pair, 22 AWG, shielded twisted pair, cable jacket to be UV resistant polyurethane, black in color.
  3. Cables shall be LEX Products Powerflex or TMB Proplex or approved equal.
- D. Quantities per wiring device and accessory specifications, drawings, and schedules.

## **2.16 THEATRICAL LIGHTING CONNECTORS**

- A. Ethernet Connectors:
  1. Ethernet connectors shall be RJ45, Neutrik 'etherCON' with integral strain relief. All connectors shall be black.
  2. Cable connectors shall be Neutrik NE8MC-B.
  3. Panel mount receptacles shall be Neutrik NE8FDV-8
  4. Ethernet extension cables for fixtures or consoles that do NOT utilize 'etherCON' panel mount receptacles shall be heavy duty RJ45, Lex Products or approved equal.
- B. DMX Connectors:
  1. DMX connectors shall be 5-pin XLR, with integral strain relief. All connectors shall be black.
  2. Male connectors shall be Neutrik NC5MXX-B.
  3. Female connectors shall be Neutrik NC5FXX-B.
  4. Panel mounted male connectors shall be Neutrik NC5MD-L-B-1.
  5. Panel mounted female connectors shall be Neutrik NC5FD-L-B-1.
- C. Quantities per lighting fixture specifications, accessory specifications, drawings, and schedules.

## **2.17 THEATRICAL LIGHTING FIXTURES AND ACCESSORIES:**

- A. Ellipsoidal Spotlights:
  1. Ellipsoidal spotlights, each with 20-AMP stage pin connector installed. Connector type as specified in this section.
  2. Provide 10' 5-Pin DMX cable per specifications for each fixture.
  3. Provide c-clamp, safety cable and color frame.
  4. The fixtures shall be of the manufacturers, styles and quantities indicated below, unless otherwise shown,
    - a. Electronic Theatre Controls ColorSource Spot V or approved equal, 19 degree, 26 degree, 36 degree and 50 degree lens version. Provide quantity of fixtures listed on the bid form, install in the locations as directed by the Owner.
- B. 8" Fresnel Spotlights:
  1. 8" Fresnel LED spotlights, each with: C-clamp, safety cable, color frame and 20-AMP stag connector installed. Connector type as specified in this section.
  2. Provide 10' RJ45 DMX cable per specifications for each fixture.
  3. Provide c-clamp, safety cable and color frame.
  4. The fixtures shall be of the manufacturers, styles, and quantities as indicated below:
    - a. Altman Stage Lighting Pegasus or approved equal.
    - b. Provide quantity of fixtures listed on the bid form, install in the locations as directed by the Owner.
- C. Color changing LED Wash Lights
  1. Color changing LED wash lights, each with: C-clamp, safety cable, (1) 10' Neutrik PowerCon to Neutrik PowerCon power-thru cable and (1) 5' Neutrik PowerCon to stage pin connector.
  2. Fixtures must be controllable via DMX.
  3. Provide 10' 5-pin DMX cable per specifications for each fixture.
  4. The fixtures shall be of the manufacturers, styles, and quantities as indicated below, unless otherwise shown:

- a. ETC ColorSource Fresnel V.
  - b. Provide quantity of fixtures listed on the bid form, install in the locations as directed by the Owner.
- D. LED Work Lights:
- 1. White LED work lights, each with C-clamp, safety cable and 20 amp switched stage pin connector installed.
  - 2. The fixtures shall be of the manufacturers, styles, and quantities as indicated below, unless otherwise shown:
    - a. Altman LED Worklight II or approved equal
    - b. Provide quantity of fixtures listed on the bid form, install in the locations as directed by the Owner.
- E. LED Follow Spotlight:
- 1. Provide Canto Astro 600 Series follow spotlight or approved equal
  - 2. White LED light engine, 6000K
  - 3. 5-color wheel button control, 8 to 22 degree zone, manual focus, mechanical iris with fader control, rear mounted controls, 600 watts. DMX in/out, power in/out.
  - 4. Include tripod base, 12'-0" electrical cord, NEMA 5-15P connector installed.
- F. Theatrical Lighting and Hardware Accessories:
- 1. Provide (10) 25 foot TMB Procable DMX extension cord or equal by Lex Products.
  - 2. Provide (8) 50 foot TMB Procable DMX extension cord or equal by Lex Products.
- G. Installation:
- 1. Installation shall be provided as described in article 3.03 below.

## **2.18 CONTROL CONSOLE**

- A. The system described below is based upon general performance criteria common to the products listed below. No other system shall be considered unless specifically approved by the Engineer at least ten (10) days prior to the bid date:
- 1. Electronic Theatre Controls "Ion Xe20" or approved equal.
- B. Physical Requirements:
- 1. The console shall be deadfront, modular in construction, with plug-in control components, completely wired internally, and shall contain, but not be limited to, the following components:
    - a. Console shall allow for a minimum of two (2) full-size LCD touch screens for display and direct selection of console functions
    - b. Minimum four (4) encoder wheels for automated lighting control.
    - c. Keypad for patching, level setting, and cue recording.
    - d. Playback controls, including split crossfader.
    - e. Minimum ten (10) potentiometers for configurable fader, submaster, and master control.
    - f. Hard drive for recording of all patch, submaster, and cue information.
    - g. USB ports to access external storage media for recording all patch, submaster, and cue information.
    - h. USB ports to connect to peripherals (keyboard, mouse, etc.).
- C. Operational Requirements:
- 1. The console shall control a minimum of 2048 DMX outputs.
  - 2. A minimum of 10,000 cues shall be recorded, along with fade times, by means of a keypad.
  - 3. Console shall be able to record part cues or have the ability to provide individual fade times for each channel.
  - 4. A minimum of 99 cue lists.
  - 5. The console shall have a minimum of 1000 group, 1000 macros, and 600 effects.
  - 6. It shall be possible to record and modify cues "blind."

7. Control and programming features for automated fixtures shall include:
  - a. A standard library of fixture profiles.
  - b. The ability to copy and edit existing profiles and create new profiles.
  - c. Patch displays including channel and output addressing.
  - d. 16-bit fade resolution.
  - e. Color characterization allowing color mixing.
  - f. Simple selection of fixtures and attributes.
  - g. The use of encoders or wheels for quick adjustments of pan and tilt.
  - h. In the event of a loss of power, an internal battery backup power supply shall hold all memory information for up to 24 hours.

## **2.19 CONTROL ACCESSORIES:**

- A. Flat Screen Monitors.
  1. Provide (2) 24-inch minimum color LCD monitors for use with main console to display patch, submaster, channel levels, and cue sheet.
- B. Dust Covers.
  1. Provide vinyl dust covers for all consoles and all monitors.
- C. Storage Media.
  1. Provide appropriate spare storage media for control console. Removable flash media shall be a minimum of 2GB.
- D. Task Lighting.
  1. Provide 18-inch high-intensity task lighting fixtures with dimmers and weighted bases. Littlite L-18E-LED or per-approved equal.
- E. Keyboard.
  1. Provide standard keyboard for any console that supports an external keyboard for test labels. Keyboard color: black.
- F. Mouse.
  1. Provide standard mouse for any console that support a mouse for selection of menu items. Mouse color: black.
- G. Uninterruptible Power Supply (UPS):
  1. Separate external power conditioner with battery back-up shall be provided to protect lighting control console from electrical irregularities such as surges, "spikes", and emergency transfer. Battery back-up shall be sized to maintain power to all connected devices for a minimum of 15 minutes.
  2. Manufacturer: American Power Conversion (APC) or Best Power Technology, Inc. or approved equal.

## **PART 3 – EXECUTION**

### **3.01 FABRICATION**

- A. Control racks, and cabinets shall be welded assemblies of sheet steel or aluminum or bar size angles, channels, and tees or aluminum extrusions forming rigid enclosures to support internal components.
- B. Operating elements shall be mechanically safe and electrically "dead."
- C. All steel parts and panels shall be cleaned and primed with rust inhibiting primer. Exterior finishes shall be epoxy resin or baked enamel in matte black, or in manufacturer's standard color where not specified.
- D. Control element working face panels shall be steel or substantial aluminum. Legends and control and protective device designations shall be engraved in panels, or in permanently attached plates, and located for ready identification/
- E. All internal wiring shall be factory completed. All wiring shall be in harnesses and bound. No loose or randomly routed wires shall be permitted.

- F. All wire sized and insulations shall comply with NFPA 70 National Electric Code (NEC), UL, and local codes and meet or exceed electronics industry standards.

### **3.02 PACKING AND SHIPPING**

- A. Equipment shall be wrapped and sealed in polyethylene and substantially crated for shipment. Crates shall clearly indicate equipment contained, nature of components, and site designation.
- B. The equipment manufacturer shall provide notice prior to shipping of shipping method and equipment contained.

### **3.03 INSTALLATION**

- A. All electrical feeds, conduit, and wire shall be provided and installed by Division 26.
- B. All theatrical distribution, and control devices specified in this section shall be provided by the dealer and installed by Divisions 26.
- C. All receptacles at all distribution devices shall be tested by the dealer to verify that every circuit has been terminated at the correct panelboard. Circuit corrections, if required, shall be completed by Division 26 prior to owner training.
- D. All control wire types and topography shall be detailed by the Theatrical Lighting Equipment Manufacturer in the shop drawings. Control wire shall be provided and installed by Division 26. Control wire testing and termination shall be completed by Division 26 and coordinated with the dealer.
- E. After all painting and dust-creating work is complete and the theatre has been thoroughly cleaned, the dealer shall unpack, assemble, install and test all portable equipment; including consoles, fixtures, and accessories specified in this section.
- F. All lighting fixtures shall be hung by the dealer at locations indicated by the owner prior to owner training. Fixtures shall be lamped, shutters pulled to "open" position, aimed toward stage, safety cables installed, and plugged to the nearest dimmed circuit. Installation of color, accessories, or extension cables is the responsibility of the owner. Patch and final aiming of all fixtures provided by this section is the responsibility of the owner.

### **3.04 SYSTEMS INTEGRATION AND PROGRAMMING**

- A. Dealer shall provide addressing for all LED fixtures and any other DMX controlled fixture. Dealer to provide Division 26 contractor a list of DMX address numbers prior to installation of fixtures. At time of commissioning dealer to patch all DMX controlled fixtures and test to ensure proper functionality.
- B. Dealer shall install the most current LED fixture profiles at each control console and trained the owner to add and update fixture profiles during the owner training required herein.
- C. Dealer, at the direction of enand/or owner's representative, will adjust all programmable components of the lighting and control system to meet the design intent of the project. Programmable devices include lighting controls (including the layout and design of all touchscreen control panels), addressable lighting fixtures, and user interfaces.

### **3.05 PROTECTION AND CLEANING**

- A. Provide protection for any theatrical lighting equipment, panels, and faceplates installed prior to the completion of construction and painting. Remove any debris or paint from equipment that was not adequately protected. Panels and faceplates not appearing "like new" shall be replaced.
- B. No control consoles, fixtures or accessories shall be installed until construction and painting are complete and the building has been cleaned. Any console, fixtures or accessories delivered to the job site prior to their installation shall be stored in a mean area in dustproof bags.
- C. Upon the completion of the work of this section, dispose of all packing materials, debris and remnants which result from the work of this section.

**END OF SECTION**

**SECTION 27 10 05  
TELECOMMUNICATIONS CABLING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Communications system design requirements.
- B. Copper cable and terminations.
- C. Communications identification.
- D. Cabling and pathways inside building(s).
- E. Distribution frames, cross-connection equipment, enclosures, and outlets.

**1.02 RELATED REQUIREMENTS**

- A. Section 26 05 33.13 - Conduit.
- B. Section 26 05 33.16 - Boxes.
- C. Section 26 05 53 - Electrical Identification: Identification products.
- D. Section 26 55 00 - Theatrical Lighting Control and Equipment

**1.03 REFERENCE STANDARDS**

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. EIA/ECA-310 - Cabinets, Racks, Panels, and Associated Equipment; Electronic Industries Alliance/Electrical Components Association; Revision E, 2005.
- C. CEA-310 - Cabinets, Racks, Panels, and Associated Equipment; Consumer Electronics Association; Revision E, 2005.
- D. NECA/BICSI 568 - Standard for Installing Building Telecommunications Cabling; National Electrical Contractors Association; 2006. (ANSI/NECA/BICSI 568)
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. TIA-568 (SET) - Commercial Building Telecommunications Cabling Standard Set; 2015
- G. TIA-568-C.2 - Commercial Building Telecommunications Cabling Standard - Part 2: Balanced Twisted Pair Cabling Components; Telecommunications Industry Association; Rev C, 2009.
- H. TIA/EIA-568-B.3 - Commercial Building Telecommunications Cabling Standard - Part 3: Optical Fiber Cabling Components Standard, and Addendum 1 - Additional Transmission Performance Specifications for 50/125 um Optical Fiber Cables; Rev B, 2000; Addendum 1.
- I. TIA-569-C - Telecommunications Pathways and Spaces; Telecommunications Industry Association; Rev C, 2012 (with Addenda; 2013).
- J. TIA-606-B - Administration Standard for the Telecommunications Infrastructure; Telecommunications Industry Association; Rev B, 2012.
- K. UL 497 - Standard for Protectors for Paired-Conductor Communications Circuits; Current Edition, Including All Revisions.
- L. UL 1863 - Communications-Circuit Accessories; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate arrangement of communications equipment with the dimensions and clearance requirements of the actual equipment to be installed.
  - 2. Notify Engineer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
  - 1. Storage and handling requirements and recommendations.
  - 2. Installation methods.
- C. Manufacturer Qualifications.
- D. Field Test Reports.
- E. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of project record documents.

### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: At least 3 years experience manufacturing products of the type specified.
- B. Installer Qualifications: A company having at least 3 years experience in the installation and testing of the type of system specified, and:
  - 1. Supervisors and installers factory certified by manufacturers of products to be installed.
  - 2. Employing experienced technicians for all work; show at least 3 years experience in the installation of the type of system specified, with evidence from at least 2 projects that have been in use for at least 18 months; submit project name, address, and written certification by user.
- C. Products: Listed, classified, and labeled as suitable for the purpose intended.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep stored products clean and dry.

### **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a 1 year period after Date of Substantial Completion.
- C. Manufacturer shall warranty and provide maintenance service for 15 years minimum on the network system and a lifetime for products used in the system.

## **PART 2 PRODUCTS**

### **2.01 SYSTEM DESIGN**

- A. Provide a complete permanent system of cabling and pathways for voice and data communications, including cables, conduits and wireways, pull wires, support structures, enclosures and cabinets, and outlets.
  - 1. Comply with TIA-568 (cabling) and TIA-569 (pathways), latest editions (commercial standards).
  - 2. Provide fixed cables and pathways that comply with NFPA 70 and TIA-607 and are UL listed or third party independent testing laboratory certified.
  - 3. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F at relative humidity of 0 to 95 percent, noncondensing.
  - 4. In this project, the term plenum is defined as return air spaces above ceilings, inside ducts, under raised floors, and other air-handling spaces.
- B. System Description:
  - 1. Horizontal Cabling: Copper.
- C. Cabling to Outlets: Specified horizontal cabling, wired in star topology to distribution frame located at center hub of star; also referred to as "links".



## **2.02 PATHWAYS**

- A. Conduit: As specified in Section 26 05 33.13; provide pull cords in all conduit.
- B. Outlets
  - 1. As specified in Section 26 05 37 - Boxes.

## **2.03 COPPER CABLE AND TERMINATIONS**

- A. Copper Horizontal Cable: TIA/EIA-568 Category 6 solid conductor unshielded twisted pair (UTP), 24 AWG, 100 ohm; 250 Mhz, 4 individually twisted pairs; covered with blue jacket and complying with all relevant parts of and addenda to latest edition of TIA/EIA-568 and UL 444.
  - 1. Manufacturer:
    - a. Panduit NUL6 Series.
    - b. General Genspeed GS6 Series.
    - c. Berk Tek LANmark-6 Series.
    - d. Hitachi ECO Series
    - e. Approved Equal.
  - 2. Plenum rated cable, NFPA 70 type CMP.
- B. Copper Cable Terminations: Insulation displacement connection (IDC) type using appropriate tool.
- C. Jacks and Connectors: Category 6, 8 position, 8 wire, Modular RJ-45, non-keyed, terminated with 110-style insulation displacement connectors (IDC); high impact thermoplastic housing; suitable for and complying with same standard as specified horizontal cable; UL 1863 listed.
  - 1. Performance: 500 mating cycles.
  - 2. Voice and Data Jacks: 4-pair, pre-wired to T568B configuration.
  - 3. Connector modules shall be Panduit Netkey NK688 Series.
  - 4. Jack Colors:
    - a. All Applications: Provide blue colored jack.
- D. Faceplates:
  - 1. Modular faceplates shall be Panduit Netkey NK Series faceplates.
  - 2. Plastic plates with label ID windows.
  - 3. See Drawings for quantity of connector modules and modular faceplates.
  - 4. Provide with color coordinated screw cover and clear station and port label covers.
  - 5. Provide blank inserts for unused ports.

## **2.04 GROUNDING AND BONDING COMPONENTS**

- A. Comply with TIA-607.
- B. Comply with Section 26 05 26.

## **2.05 IDENTIFICATION PRODUCTS**

- A. Comply with TIA-606.
- B. Comply with Section 26 05 53.

## **2.06 SOURCE QUALITY CONTROL**

- A. Factory test cables according to TIA-568.

## **2.07 CROSS-CONNECTION EQUIPMENT**

- A. Patch Panels for Copper Cabling: Sized to fit EIA standard 19 inch wide equipment racks; 16 gauge steel with black powdercoat finish; cabling terminated on modular connectors.
  - 1. 48 port, all metal construction, modular patch panel frames, populated with Category 6 jack connectors, by approved equipment manufacturer.
  - 2. Jacks: Non-keyed RJ-45, suitable for and complying with same standard as cable to be terminated and with same manufacturer as used at the data outlet; maximum 48 ports per standard width panel.
  - 3. Capacity: Provide ports sufficient for cables to be terminated plus 25 percent spare.

4. Labels: Factory installed laminated plastic nameplates above each port, numbered consecutively; comply with TIA/EIA-606 using encoded identifiers.
5. Provide incoming cable strain relief and routing guides on back of panel.
6. Hoffman DCHS2 horizontal wire management panels shall be provided between pairs of CP48BL patch panel frames for front and rear patch cable management and as necessary above and/or below network electronics.
7. Manufacturers:
  - a. Panduit NKFP Series.

## 2.08 ENCLOSURES

- A. Equipment Racks and Cabinets: CEA-310 standard 19 inch wide component racks.
  1. Wall Mounted Cabinets: Swing out cabinet body, adjustable 19" EIA threaded equipment rails, vented cabinet body, steel locking front door, 200 lb load rating, steel construction.
    - a. Manufacturer: Equal to Chatsworth 13265 Series.
    - b. Usable depth: 18".
    - c. Height: 60".
    - d. Provide UL listed horizontal power strip, single input, 120V single phase, 20 amp rated, (8) NEMA 5-20R outlets and an integral circuit breaker and 10 foot cord with NEMA 5-20P plug equal to Chatsworth 12816 Series in all data racks.
    - e. Door: ventilated front door with key lock.
- B. Outlet Boxes: For flush mounting in walls; depth as required to accommodate cable manufacturer's recommended minimum conductor bend radius. See section 26 05 37 for additional information and installation requirements.
  1. Size, Unless Otherwise Indicated: 4-11/16 inches square by 2-1/8 inches deep.
  2. Faceplates: High impact thermoplastic, complying with system design standards and UL 514C.
  3. Labels: Comply with TIA/EIA-606 using encoded identifiers; label each jack on the face plate as to its function with a unique numerical identifier.

## PART 3 EXECUTION

### 3.01 INSTALLATION - GENERAL

- A. Comply with latest editions and addenda of TIA-568 (cabling), TIA-569 (pathways), TIA-607 (grounding and bonding), NECA/BICSI 568, NFPA 70, and SYSTEM DESIGN as specified in PART 2.
- B. See Section 26 0534 Conduit for Telecommunications raceway installation requirements.
- C. See Section 26 0526 Grounding and Bonding for Electrical Systems for Telecommunications systems grounding and bonding requirements.
- D. Grounding and Bonding: Perform in accordance with TIA-607 and NFPA 70.

### 3.02 INSTALLATION OF PATHWAYS

- A. Install pathways with the following minimum clearances:
  1. 48 inches from motors, generators, frequency converters, transformers, x-ray equipment, and uninterruptible power systems.
  2. 12 inches from power conduits and cables and panelboards.
  3. 5 inches from fluorescent and high frequency lighting fixtures.
  4. 6 inches from flues, hot water pipes, and steam pipes.
- B. Conduit, in Addition to Requirements of Section 26 05 33.13:
  1. Arrange conduit to provide no more than the equivalent of two 90 degree bend(s) between pull points.
  2. Conduit Bends: Inside radius not less than 10 times conduit internal diameter.
  3. Arrange conduit to provide no more than 100 feet between pull points.
  4. Do not use conduit bodies.
- C. Conduit:

1. All penetrations through fire barrier walls or floors shall be sealed with an industry approved fire barrier caulk or compound reamed and bushed. All conduit shall be sized for maximum 60 percent fill.
2. Install conduit from outlet to rack. Terminate conduit using an insulated bushing.

### **3.03 INSTALLATION OF EQUIPMENT AND CABLING**

- A. Cabling:
  1. Do not bend cable at radius less than manufacturer's recommended bend radius; for unshielded twisted pair use bend radius of not less than 4 times cable diameter.
  2. Do not over-cinch or crush cables.
  3. Do not exceed manufacturer's recommended cable pull tension.
  4. When installing in conduit, use only lubricants approved by cable manufacturer and do not chafe or damage outer jacket.
- B. Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly:
  1. At Distribution Frames: 120 inches.
  2. At Outlets - Copper: 12 inches.
- C. Copper Cabling:
  1. Category 6 and Above: Maintain cable geometry; do not untwist more than 1/2 inch from point of termination.
  2. For 4-pair cables in conduit, do not exceed 25 pounds pull tension.
  3. Bridged taps/splices are not allowed as part of the horizontal wiring system.
  4. Avoid routing cables near EMI sources.
  5. All cabling shall consist of 4 pairs and 1 cable per jack.
  6. Install modular outlets at all locations shown on the Drawings. Terminate wiring at workstation jacks and rack.
  7. Install cable from all outlets to rack.
  8. Each jack shall be provided with its own UTP cable continuous (without splice) from jack to rack.
  9. Telecommunications wiring shall be used for data wiring.
  10. Where indicated, workstation jacks may be ganged under a common wall plate.
- D. Identification:
  1. Use wire and cable markers to identify cables at each end.
- E. Field-Installed Labels: Comply with TIA/EIA-606 using encoded identifiers.
  1. Cables: Install color coded labels on both ends.
  2. Outlets: Label each jack on its face plate as to its type and function, with a unique numerical identifier.
  3. All horizontal cabling shall be labeled with permanent tag indication from which jack the cable originated.
  4. Machine labels shall be installed on each workstation jack faceplate.
  5. All labels shall be a machine label in conformance with ANSI/EIA/TIA 606.
  6. Numbering of workstation jacks shall be consistent.
  7. Labeling to be verified with Engineer and Owner.

### **3.04 FIELD QUALITY CONTROL**

- A. Comply with inspection and testing requirements of specified installation standards.
- B. Visual Inspection:
  1. Inspect cable jackets for certification markings.
  2. Inspect cable terminations for color coded labels of proper type.
  3. Inspect outlet plates and patch panels for complete labels.
- C. Testing - Copper Cabling and Associated Equipment:
  1. Test operation of shorting bars in connection blocks.

2. Category 6 Links: Perform tests for wire map, length, insertion loss, NEXT, PSNEXT, ELFNEXT, PSELFEXT, return loss, delay skew and propagation delay.
  - a. Utilize a Level III/Level IV rated tester compatible with the following test standards:
    - 1) TIA-1152 Level IIIe and ISO/IEC 61935-1 Level IV accuracy.
    - 2) TIA-58-C.2, TIA1152 Category 5, 5e, 6, 6A, and ISO/IEC 11801.
  - b. The cabling tester shall be approved for use with the selected connectivity solution for both Channel and Permanent Link tests, and for the associated warranty provided by the connectivity Manufacturers.
  - c. The company/individual testing the cable shall be manufacturer certified for products provided.
  - d. Contractor shall perform and document all conductor tests per TIA-568-B and ANSI/TIA-606. Return one copy of testing report to the Engineer and one copy to the Owner. All copper station runs must be tested after final installation and termination. All cable runs shall be documented with a hard copy printout of the test results. This printout shall be bound and delivered to the Owner prior to final payment
- D. Final Testing: After all work is complete, including installation of telecommunications outlets, and telephone dial tone service is active, test each voice jack for dial tone.

**END OF SECTION**