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# INVITATION TO BID ITB #2026002

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*for construction of the*

## **COLUMBIA HEIGHTS SUBSTATION**



for any information regarding these documents contact:

**Cole Isaacson**  
**Purchasing Specialist III**  
Northern Wasco County PUD  
Phone: 541-298-3323  
Email: [cole-isaacson@nwascopud.org](mailto:cole-isaacson@nwascopud.org)

Bid Issue Date: Tuesday, September 8, 2026  
Bids Due Date: Tuesday, October 20, 2026 @ 2:00 PM PDT or as amended

ITB #2026002

for the construction of

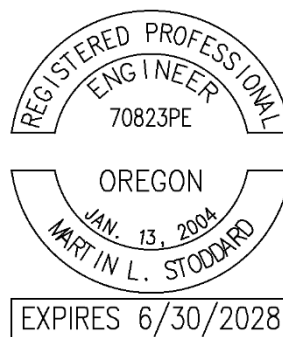
COLUMBIA HEIGHTS SUBSTATION

NORTHERN WASCO COUNTY  
PEOPLE'S UTILITY DISTRICT

consisting of:

**VOLUME 1**  
BID REQUIREMENTS  
CONTRACT FORMS  
CONDITIONS OF THE CONTRACT  
TECHNICAL SPECIFICATIONS  
GEOTECHNICAL INVESTIGATION REPORT

**VOLUME 2**  
SUBSTATION CONSTRUCTION DRAWINGS



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## **PART 1**

# **PROPOSING REQUIREMENTS**

**SECTION 00 11 16**  
**INVITATION TO BID**

NORTHERN WASCO COUNTY PEOPLE'S UTILITY DISTRICT, hereinafter called the OWNER, is soliciting bids to perform construction work for the COLUMBIA HEIGHTS SUBSTATION CONSTRUCTION project. The OWNER's Columbia Heights Substation is located at 1100 East 16<sup>th</sup> Place, The Dalles, Oregon 97058. More location information can be found in Section 00 30 00.

Sealed Bids must be addressed to Purchasing Attn: Cole Isaacson and either hand-delivered or mailed to 2345 River Road, The Dalles, OR 97058. Sealed bids must be received no later than 2:00 p.m. PDT, on Tuesday, October 13, 2026. Bids must be submitted in sealed envelopes in accordance with the Instructions to Bidders and identified as "**BID #2026002- COLUMBIA HEIGHTS SUBSTATION**". Sealed Bids must include one flash drive with all electronic documents.

Sealed Bids will be opened at 2:00 p.m. PDT on Tuesday, October 13, 2026, in the PUD's Board Room located at 2345 River Road, The Dalles, OR 97058.

A bid that is conditioned upon the Contracting Agency's acceptance of Terms and Conditions different from those contained in this solicitation may be rejected as non-responsive.

Copies of this Invitation to Bid may be obtained from the OWNER by contacting:

Cole Isaacson, Purchasing Specialist III  
Email: cole-isaacson@nwascopud.org  
Phone: 541-298-3323

The work for the project includes:

**Phase 1 (The existing substation will remain in service until Phase I construction is complete, energized, and placed in service):**

1. Site development includes an access driveway, clearing, excavation, grading, backfill, compaction, and installation of site surfacing material.
2. Install substation perimeter masonry wall panels on the three exterior sides of the Phase I yard, including a sliding drive gate along E. 16th Ave.
3. The existing fence between the Phase I and Phase II areas will require a minor adjustment and serve as an isolation safety fence between Phases.
4. Construct all foundations and include the oil containment system for the transformer.
5. Install vaults, drainage pipes, LV conduits, HV feeder conduits, and grounding.
6. Install the new power transformer and control building on their foundation pads.
7. Install steel structures, non-segregated bus, rigid bus, bus supports, jumpers, and other equipment to make the physical construction complete.
8. Perform all low-voltage wiring interconnections.
9. Complete preparation and readiness for testing and energization.
10. The PUD will install HV cable, make-up terminations, energize Phase I equipment and transfer load as desired.

**Phase 2 (The Phase I substation facility will be in service during this construction phase):**

1. Demolish the equipment in the existing substation.
2. Site development includes an access driveway, clearing, excavation, grading, backfill, compaction, and installation of site surfacing material.
3. Install substation perimeter masonry wall panels on the three perimeter sides of the Phase II yard to interconnect with the Phase I panels, including a swing drive gate and walk gate along E. 16th Ave
4. Remove the existing chain link between Phase I and Phase II and install a temporary isolation fence.
5. Construct all foundations and include the oil containment system for the transformer.
6. Install vaults, drainage pipes, LV conduits, HV feeder conduits, and grounding.
7. Install the new power transformer and control building on their foundation pads.
8. Install steel structures, non-segregated bus, rigid bus, bus supports, jumpers, and other equipment to make the physical construction complete.
9. Perform all low-voltage wiring interconnections.
10. Complete preparation and readiness for testing and energization.
11. The PUD will install HV cable, make-up terminations, energize Phase II equipment and transfer load as desired.

Bids must be submitted on the prescribed form and accompanied by a certified check or bid bond executed on the prescribed form, payable to the OWNER as described in the INSTRUCTIONS TO BIDDERS. Unsigned bid bond forms may constitute grounds for non-responsiveness.

The successful Bidder shall submit payment and performance bonds as indicated in the Contract Documents. Prices quoted shall remain in effect for a period of **60** days past the bid opening date.

Pursuant to ORS 279B.110, OAR 137-049-0440, and District Policies and Administrative Regulations, before awarding a Contract, the OWNER may conduct such investigation as it deems necessary to determine whether the apparent low Bidder is responsible and has the experience, capability, financial resources, and capacity to perform the Work. Upon request, the Bidder shall promptly provide any information the OWNER deems necessary to evaluate the Bidder's responsibility and qualifications. Failure to provide the requested information may be grounds for determining the Bidder to be non-responsible.

A Contract, if awarded, shall be to the lowest responsive, responsible Bidder in accordance with applicable District Policy, Administrative Regulations, Oregon law and the Solicitation Documents.

A mandatory pre-bid meeting will be held on Wednesday, September 23, 2026 @ 9:00 AM PDT at the Northern Wasco County People's Utility District located at 2345 River Road, The Dalles, Oregon, to be immediately followed by a mandatory Columbia Heights Substation site visit on Wednesday, September 23, 2026 @ located at 1100 East 16<sup>th</sup> Place, The Dalles, Oregon.

**Interested bidders must attend both the mandatory pre-bid meeting and site visit and sign attendance sheet at both locations to qualify to submit a bid.**

**END OF SECTION**

**SECTION 00 21 16**  
**INSTRUCTIONS TO BIDDERS**

**PART 1      CONTRACT DOCUMENTS**

**1.1      FORMAT**

- A. The Contract Documents are divided into parts and sections for convenient organization and reference. There has been no attempt to divide the Specification sections into work performed by the various building trades, work by separate subs, or work required for separate facilities in the project. Each Bidder is responsible for reviewing the Bid and Contract Documents in their entirety including all Work necessary to complete the Project in accordance with this solicitation.

**1.2      DOCUMENT INTERPRETATION**

- A. The separate sections of the Bid Documents are intended to be complementary and shall be construed together to describe and provide the details necessary for the proper completion of the work.
- B. The OWNER reserves the right to: (1) reject any or all Bids; (2) reject any Bid that is nonresponsive or submitted by a Bidder determined to be nonresponsive; (3) waive minor informalities or irregularities in accordance with applicable law; and (4) postpone the award of the Contract for a period not to exceed sixty (60) calendar days from the date of Bid opening. If the Contract is awarded, it will be awarded to the lowest responsive, responsible Bidder.

**1.3      GENERAL DESCRIPTION OF THE PROJECT**

- A. Columbia Heights Substation is an existing substation. The work consists of furnishing and installing all necessary materials involved with rebuilding the two-bay substation in two phases.

**1.4      BIDDER'S UNDERSTANDING**

- A. Each Bidder is responsible for becoming familiar with the conditions affecting the performance of the Work. Each Bidder shall visit the Project site, examine the site conditions, and thoroughly review the Contract Documents prior to submitting a Bid. Failure to do so will not relieve the successful Bidder of its obligation to execute the Contract and perform and complete the Work in accordance with the Contract Documents. Each Bidder is responsible for independently evaluating all information reasonably necessary to prepare its Bid, including available information regarding site and subsurface conditions.
- B. The Geotechnical Investigation Report (GIR) is provided as identified in Part 5 of the Contract Documents. Bidders shall consider the GIR in preparing their Bids. The contractual status and limitations of the GIR are as set forth in the Contract Documents.

- C. Each Bidder shall be familiar with all applicable federal, state, and local laws, regulations, ordinances, and codes applicable to the Work. The successful Bidder shall comply with all such requirements in the performance of the Work. These requirements include, but are not limited to, prevailing wage requirements, nondiscrimination laws, occupational safety and health requirements, environmental protection laws, natural resource protection requirements, fire prevention requirements, permit requirements, applicable fees, and other applicable legal requirements.

## **1.5 TYPE OF BID - LUMP SUM**

### **A. UNIT PRICE**

1. When the Bid requires unit prices, the Bidder shall submit a unit price for each item identified in the Bid Schedule, except for items designated as lump sum. The estimated quantities shown in the Bid Schedule are provided solely for the purpose of Bid evaluation and Contract award and are approximate only. The Contractor will be paid in accordance to the Contract Documents. The OWNER reserves the right to increase or decrease the quantities of unit price items as necessary, subject to the Contract Documents and any applicable provisions of the Supplementary Conditions.

### **B. LUMP SUM**

1. When a Bid is to be submitted on a lump sum basis, a single lump sum price shall be submitted in the appropriate place. The total amount to be paid the Contractor under the Bid Schedule shall be the amount of the lump sum in accordance to the Contract Documents. When required, the Bidder shall furnish, in the space provided in the Bid, a breakdown of the lump sum bid.

## **PART 2 PREPARATION OF BIDS**

### **2.1 GENERAL**

- A. All blank spaces in the Bid Form must be filled in, as required, in BLACK ink. All price information shall be shown in both words and figures where required. No changes shall be made in the phraseology of the forms. Written amounts shall govern in case of discrepancy between the amounts stated in writing and the amounts stated in figures. In case of discrepancy between unit prices and extended totals, unit prices shall prevail.
- B. The Bidder shall acknowledge receipt of all addenda in the Bid. Bids received without acknowledgment of all addenda will be considered informal and may be rejected by the OWNER.

### **2.2 SIGNATURE**

- A. The Bidder shall sign the Bid Form in the space provided. If the Bidder is a corporation, the legal name of the corporation shall be set forth above, together with the signature of the officer or officers authorized to sign Contracts on behalf of the corporation. If the Bidder is a partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners

authorized to sign Contracts on behalf of the partnership. If the signature is by an agent, other than an officer of a corporation or a member of a partnership, a notarized power-of-attorney must be on file with the OWNER prior to opening of Bids or submitted with the Bid, otherwise the Bid will be regarded as not properly authorized and may be rejected by the OWNER.

### **2.3 ATTACHMENTS**

- A. Bidder shall complete and submit the following forms:
  - 1. Bid Forms
  - 2. Bid Bond
  - 3. Bidder's Experience Form
  - 4. Non-Collusion Affidavit
  - 5. Critical Path Method (CPM) Schedule

### **2.4 CHANGES IN QUANTITIES**

- A. The OWNER reserves the right to increase or decrease the amount of any class of unit price work item shown in the Bid per the Contract Documents.
- B. Any changes in the lump-sum portion(s) of the project shall be authorized, administered, and compensated through the Change Order process described in the Contract Documents.

### **2.5 SUBMISSION OF BIDS**

- A. All Bids must be submitted no later than the time prescribed and in the manner set forth in the Invitation to Bid. Bids must be made on the Bid form provided herewith and submitted intact with the volume containing the Bidding Requirements, Contract Forms, Attachments, and Conditions of the Contract.

### **2.6 PRE-CLOSING MODIFICATION OR WITHDRAWAL OF BIDS**

- A. Pursuant to OAR 137-047-0440, Prior to the time and date designated for receipt of Bids, any Bid submitted may be withdrawn or modified by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall follow the process described in OAR 137-047-0440.

### **2.7 EXCEPTIONS**

- A. The Bidder shall state in the Bid that they have complied with the Specifications. If exceptions are taken, they shall be listed under this heading. Printed terms and conditions shall not be considered as exceptions to this Bid Document. The Bidder may offer alternate designs of equipment if, in his/her judgment, such alternate designs will better and more economically serve the OWNER's service requirements.

## **2.8 AWARD OF CONTRACT**

- A. Pursuant to OAR 137-04-0395, a Notice of Intent to Award shall be issued to all bidders at least seven (7) calendar days before the Award of a Public Improvement Contract.
- B. In the event of failure of the successful Bidder to sign the Contract and provide acceptable Performance and Payment Bonds and insurance certificate(s), the OWNER may award the Contract to the next lowest responsive responsible bidder.

## **2.9 BASIS OF AWARD**

- A. If awarded by the OWNER the award will be made to the lowest responsive responsible bidder.
- B. The OWNER reserves the right to reject all Bids, or any Bid not in conformance with the intent of the Contract Documents, and to waive any informalities and irregularities in said Bids. OWNER may exercise such rights in its sole discretion to best serve the OWNER's interests.

## **2.10 PROTESTS**

- A. A Bidder must file any protest to the terms, conditions, and specifications of this Invitation to Bid, including contract terms, within seven (7) calendar days prior to bid opening. Solicitation protests must conform to ORS Chapters 279A and 279C, OAR Chapter 125, and Owner Administrative Regulations.
- B. A Bidder must file any protest of contractor award within seven (7) calendar days of the date of OWNER's notice of intent to award. Award protests must conform to applicable provisions of ORS Chapters 279A and 279C, OAR Chapter 125, and Owner Administrative Regulations.

## **2.11 EXPERIENCE AND RESPONSIBILITY**

- A. CONTRACTOR's responsibility shall be determined in accordance with the standards of responsibility set forth in ORS 279B.110 (2). The OWNER will use the Bidder's Experience Form to evaluate such capability.

## **2.12 NON-COLLUSION AFFIDAVITS**

- A. Each bid shall be accompanied by a properly executed non-collusion affidavit on the furnished form.

## **PART 3 EXECUTION OF CONTRACT**

### **3.1 GENERAL**

- A. The successful Bidder shall, within ten (10) business days after receiving notice of award, sign and deliver to the OWNER a Contract executed by the successful Bidder on the form hereto attached together with the acceptable Performance and Payment Bond and insurance certificates as required in the Contract Documents.

Within ten (10) business days after receiving the signed Contract with the required bonds from the successful Bidder, the OWNER's authorized agent will sign the Contract. Signature by both parties constitutes execution of the Contract.

### **3.2 FAILURE TO EXECUTE CONTRACT**

- A. The Bidder who has a Contract awarded and who fails to promptly and properly execute and return the Contract within the ten (10) business days along with all Exhibits, Payment and Performance Bonds, and Certificate of Insurance at the specified limits, shall forfeit the Bid security that accompanied the Bid. The Bid security shall be retained as liquidated damages by the OWNER, and it is agreed that this said sum is a fair estimate of the amount of damages the OWNER will sustain in case the Bidder fails to enter into a Contract as hereinbefore provided. Bid security deposited in the form of cash, a certified check, or cashier's check shall be subject to the same requirement as a Bid bond.

## **PART 4 CONTRACT BONDS**

### **4.1 PERFORMANCE AND PAYMENT BONDS**

- A. The successful Bidder shall file with the OWNER separate Performance and Payment Bonds as required by the Contract Documents. The Surety furnishing this bond shall have a sound financial standing and a record of service satisfactory to the OWNER and shall be authorized to do business in the State of Oregon.

### **4.2 POWER-OF-ATTORNEY**

- A. The Attorney-in-Fact (Resident Agent) who executes this Performance and Payment Bonds on behalf of the Surety must attach a notarized copy of his/her power-of-attorney as evidence of his/her authority to bind the Surety on the date of execution of the bond.

**END OF SECTION**



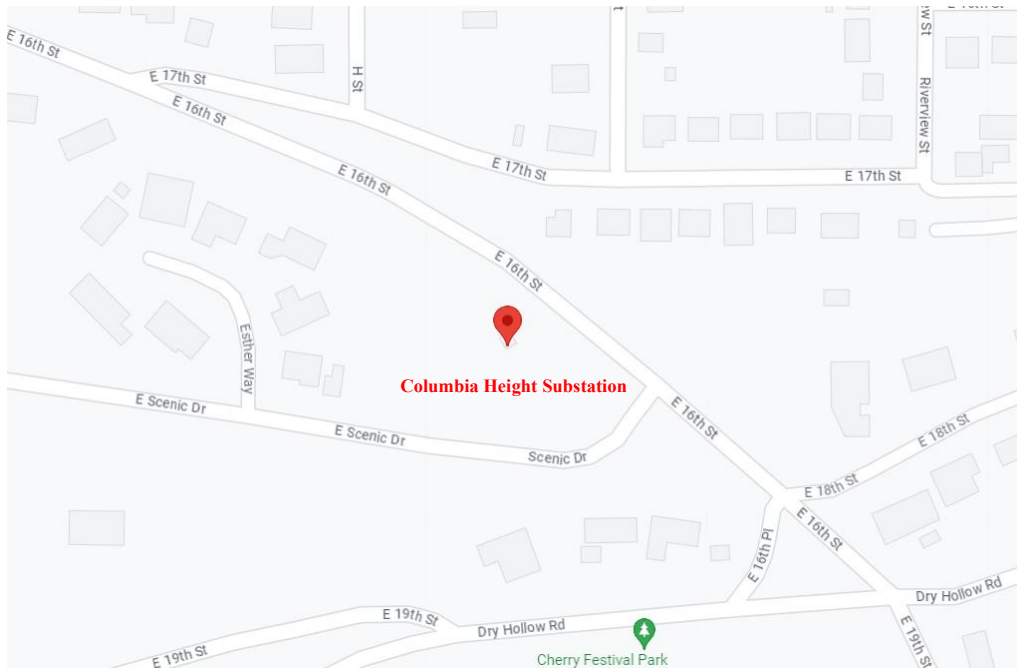
# SECTION 00 30 00 VICINITY AND LOCATION MAPS



CALIFORNIA  
STATE MAP



VICINITY MAP



### DETAIL VICINITY MAP



Address: 1100 East 16th Place, The Dalles, Oregon 97058.

### LOCATION MAP



Contractor shall coordinate the staging site with the PUD. Two potential sites are available for consideration:

- A. Open and slightly sloped yard across the road from the substation yard.
- B. Open yard behind 1905 Oakwood Drive, 0.8 mile from the project site.

#### STAGING AREA OPTIONS

**SECTION 00 41 00  
BID FORM**

To: Purchasing, Northern Wasco County PUD

Address: 2345 River Road, The Dalles, Oregon 97058

Project Title: Columbia Heights Substation

Project No.: 26NWCPUD001

Bidder's person to contact for additional information regarding their Bid:

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

Email: \_\_\_\_\_

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

**BIDDER'S DECLARATION AND UNDERSTANDING**

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, is made without collusion with any official of the OWNER, and is made without any connection or collusion with any person submitting another Bid for this Contract.

The Bidder further declares that they have carefully examined the Contract Documents for the construction of the project, that they have personally inspected the site, that they have confirmed as to the quantities involved, including materials and equipment, and conditions of work involved, including the fact that the description of the quantities of work and materials, as included herein, is brief and is intended only to indicate the general nature of the work and to identify the said quantities with the detailed requirements of the Contract Documents, and that this Bid is made according to the provisions and under the terms of the Contract Documents, which Documents are hereby made a part of this Bid.

Oral interpretations or information shall not be binding upon the OWNER. Formal written bid clarification or Addendum will be issued by the OWNER, as necessary.

The Bidder further agrees that they have made their own analysis and investigation and exercised their own judgment regarding subsurface conditions.

By submitting this Bid, the Bidder certifies that they have not and will not discriminate against any subcontractor in the awarding of a contract on the basis of race, color, sex, sexual orientation, national origin, age, or status as a minority-owned, woman-owned, or emerging small business enterprise (MWESB), in accordance with applicable Oregon Revised Statutes

(ORS) and Oregon Administrative Rules (OAR).

#### CONTRACT EXECUTION AND BONDS

The Bidder agrees that if this Bid is accepted, they will, within 10 business days, after notice of award, sign the Contract in the form annexed hereto, and will at that time, deliver to the OWNER the Performance and Payment Bonds as indicated in the Contract Documents.

#### CERTIFICATES OF INSURANCE

The Bidder further agrees to furnish the OWNER, within 10 business days after notice of award of Contract, the Certificate of Insurance with relevant endorsements, waivers, and supporting documentation at the specified limits with Northern WASCO PUD as additional insured as indicated in the Contract Documents.

#### SHOP DRAWING COMPLETION

The Bidder agrees to submit in accordance with Article 7 of the General Conditions, and in final approved form, the complete set of shop drawings as follows:

|                                                                                                |    |
|------------------------------------------------------------------------------------------------|----|
| Number of working days for first submittal after Commencement Date stated in Notice to Proceed | 20 |
| Number of working days for OWNER's review                                                      | 10 |
| Number of working days for revision and resubmittal of shop drawings                           | 10 |
| Number of working days for OWNER's review                                                      | 10 |

#### START OF CONSTRUCTION AND CONTRACT COMPLETION TIME

The Bidder further agrees to begin work commencing on the date specified in the Notice to Proceed. The project will be ready for CONTRACTOR construction as stated in the Notice to Proceed. **The CONTRACTOR shall complete the construction project in its entirety by August 9<sup>th</sup>, 2028, or as otherwise amended.**

#### LIQUIDATED DAMAGES

Liquidated Damages will apply as indicated in the Contract Documents.

#### ADDENDA ACKNOWLEDGEMENT

The Bidder, by signing this Bid, hereby acknowledges that they have received Addenda Nos. \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, and agrees that all Addenda issued are hereby made part of the Contract Documents, and the Bidder further agrees that their Bid includes all impacts resulting from said addenda.

## SALES, USE, AND OTHER TAXES

There is no sales tax in the state of Oregon. The Proposer agrees to pay all other applicable Federal, State, and local taxes for the work herein. These taxes are to be included for all work in the written lump sum bid amount and stated separately as noted.

## OWNER-FURNISHED MATERIALS

The LIST OF OWNER-FURNISHED EQUIPMENT describes the equipment that will be furnished by the OWNER. Some of the equipment is to be delivered to the Project site by the CONTRACTOR from the OWNER's storage warehouse. The CONTRACTOR will coordinate delivery with the OWNER to the project site and be responsible for its care and handling once accepted. The CONTRACTOR will provide a MATERIALS RECEIPT in writing to the OWNER.

At the time of delivery or acceptance the CONTRACTOR shall inspect the equipment to its satisfaction that the equipment is in new condition and is undamaged. If the equipment is in new condition and undamaged, the CONTRACTOR shall accept delivery, unload, handle, and transport as necessary at its own expense, unless otherwise stated. If the equipment is damaged, the CONTRACTOR shall notify the OWNER in writing of the equipment condition.

Once accepted by the CONTRACTOR, the CONTRACTOR becomes responsible for the storage, handling, installation, and protection of the equipment at its own expense.

## PURCHASE OF MATERIALS NOT FURNISHED BY OWNER

The Bidder will purchase all materials and equipment (other than Owner-Furnished-Equipment) outright and not subject to any conditional sales agreements, bailment, lease, lien or other agreement reserving unto the seller any right, title, or interest therein. All such materials and equipment shall become the property of the OWNER when erected in place. CONTRACTOR shall remain responsible for all of the work, including, without limitation, installation warranty and such materials and equipment, until the work is accepted by the OWNER as complete and the CONTRACTOR has furnished all required contract closeout documentation.

## BID ON LUMP SUM AND UNIT COST BASIS

The Bidder understands and agrees to accept as full payment, for the work described in these Contract Documents, the amounts shown in the following Bid Schedules. The Bidder further agrees that the lump sum price and unit prices represent a true measure of the labor, materials, overhead, and profit required to perform the work or construct the unit described. The breakout of labor and material is required for the OWNER's information and use in evaluating Bids and to facilitate monthly progress payments. If so requested by the OWNER or ENGINEER, the CONTRACTOR will substantiate any itemized price or prices with further information.

In the event of a discrepancy between the written lump sum stated and the arithmetic total of the unit price itemization, the lump sum stated in writing shall have precedence.

Where a bid schedule requires unit prices, the Bidder understands that unit quantities indicated are estimated, and that the unit prices are independent of the quantities eventually constructed.

LUMP SUM BID FOR THE COLUMBIA HEIGHTS SUBSTATION CONSTRUCTION PROJECT

The Bidder agrees to accept as full payment for the lump sum work of each Bid Schedule proposed under this project, as herein specified and as shown on the Drawings, based upon the undersigned's own estimate of quantities and costs, the following lump sum, including all taxes, of:

LUMP SUM BID \_\_\_\_\_ Dollars  
and \_\_\_\_\_ Cents \$ \_\_\_\_\_  
(Amount written in words has precedence)

TAXES \_\_\_\_\_ Dollars  
and \_\_\_\_\_ Cents \$ \_\_\_\_\_  
(Included in Lump Sum Bid. Amount written in words has precedence.)

**NORTHER WASCO COUNTY PEOPLE'S UTILITY DISTRICT  
THE COLUMBIA HEIGHTS SUBSTATION CONSTRUCTION  
BID SCHEDULE**

**GENERAL REQUIREMENTS**

| <b>Unit No.</b> | <b>Name and Description of Construction Units</b> | <b>No. of Units</b> | <b>Lot or Unit Labor</b> | <b>Lot or Unit Materials</b> | <b>Total Unit Price</b> | <b>Ext. Price</b> |
|-----------------|---------------------------------------------------|---------------------|--------------------------|------------------------------|-------------------------|-------------------|
| G1.             | Payment and Performance                           | LS                  | N/A                      | N/A                          | N/A                     | \$_____           |
| G2.             | Insurance                                         | LS                  | N/A                      | N/A                          | N/A                     | \$_____           |
| G3.             | Mobilization                                      | LS                  | N/A                      | N/A                          | N/A                     | \$_____           |
| G4.             | Demobilization                                    | LS                  | N/A                      | N/A                          | N/A                     | \$_____           |
| G5.             | Construction Permit(s)                            | LS                  | N/A                      | N/A                          | N/A                     | \$_____           |

**Note:** Combined mobilization and demobilization total shall not exceed 5 percent of bid schedule total.

**GENERAL REQUIREMENTS SUBTOTAL**      \$\_\_\_\_\_



## SUBSTATION CONSTRUCTION SCHEDULE OF VALUES

| Unit No.       | Name and Description of Construction Units                                                                                                                                              | No. of Units | Lot or Unit Labor | Lot or Unit Materials | Total Unit Price | Ext. Price |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|-----------------------|------------------|------------|
| <b>Phase 1</b> |                                                                                                                                                                                         |              |                   |                       |                  |            |
| C1-1           | Site clearing, excavation, grading, and spoils removal, complete                                                                                                                        | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-2           | Furnish and install subgrade fill, compaction, base course, and finish course crushed rock surfacing, complete                                                                          | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-3           | Furnish and install access driveway, including grading, culverts, fill, compaction, curbing, and paving, complete                                                                       | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-4           | Furnish and install substation masonry wall panels (by Superior Concrete Product) on the three perimeter sides of the Phase I yard to include a sliding drive gate along E. 16th Place. | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-5           | Adjust the existing chain link fence to isolate the Phase I and Phase II areas.                                                                                                         | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-6           | Construct reinforced concrete foundations, including excavation, compaction, forming, anchor bolts, and testing, complete                                                               | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-7           | Construct the transformer oil containment system, complete                                                                                                                              | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-8           | Furnish and install below grade vaults, LV and HV conduits, and drainage pipes, and ground grid, complete                                                                               | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-9           | Integrate the power transformer and metalclad control building, and all ancillary components, complete                                                                                  | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-10          | Furnish and install steel structures complete.                                                                                                                                          | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-11          | Furnish and install the non-segregated bus systems, complete                                                                                                                            | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C1-12          | Furnish and install all LV and HV insulators, bus work, surge arresters, all fittings, and connectors, and disconnect switches, complete                                                | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C-13           | Furnish and install low voltage circuits to equipment, outdoor lights, and receptacles, complete                                                                                        | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |

| Unit No.       | Name and Description of Construction Units                                                                                                                                                                                                    | No. of Units | Lot or Unit Labor | Lot or Unit Materials | Total Unit Price | Ext. Price |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|-----------------------|------------------|------------|
| C-14           | Finish preparation and readiness for testing and energization                                                                                                                                                                                 | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| <b>Phase 2</b> |                                                                                                                                                                                                                                               |              |                   |                       |                  |            |
| C2-1           | Disconnect the existing equipment and relocate as directed by the PUD                                                                                                                                                                         | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-2           | Remove all existing foundations and subgrade facilities                                                                                                                                                                                       | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-3           | Furnish and install subgrade fill, compaction, base course, and finish course crushed rock surfacing, complete                                                                                                                                | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-4           | Furnish and install access driveway, including grading, culverts, fill, compaction, curbing, and paving, complete                                                                                                                             | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-5           | Furnish and install substation masonry wall panels (by Superior Concrete Product) on the three perimeter sides of the Phase II yard, to interconnect with Phase I wall panels, and to include a swing gate and walk gate along E. 16th Place. | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-6           | Remove existing chain link fence separating Phase I and Phase II, and install a temporary isolation fence.                                                                                                                                    | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-7           | Construct reinforced concrete foundations, including excavation, compaction, forming, anchor bolts, and testing, complete                                                                                                                     | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-8           | Construct oil containment system, complete                                                                                                                                                                                                    | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-9           | Furnish and install below grade vaults, LV and HV conduits, and drainage pipes, and grounding grid, complete                                                                                                                                  | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-10          | Furnish and install asphalt in the driveway and perimeter as noted in the grounding design, complete                                                                                                                                          |              |                   |                       |                  |            |
| C2-11          | Integrate the power transformer and metalclad control building, and all ancillary components, complete                                                                                                                                        | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-12          | Furnish and install steel structures complete.                                                                                                                                                                                                | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |
| C2-13          | Furnish and install the non-segregated bus systems,                                                                                                                                                                                           | 1 lot        | \$_____           | \$_____               | \$_____          | \$_____    |

| Unit No. | Name and Description of Construction Units                                                                                               | No. of Units | Lot or Unit Labor | Lot or Unit Materials | Total Unit Price | Ext. Price |
|----------|------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|-----------------------|------------------|------------|
|          | complete                                                                                                                                 |              |                   |                       |                  |            |
| C2-14    | Furnish and install all LV and HV insulators, bus work, surge arresters, all fittings, and connectors, and disconnect switches, complete | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C2-15    | Furnish and install low voltage circuits to equipment, outdoor lights, and receptacles, complete                                         | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |
| C2-16    | Finish preparation and readiness for testing and energization                                                                            | 1 lot        | \$ _____          | \$ _____              | \$ _____         | \$ _____   |

**SUBSTATION CONSTRUCTION SUBTOTAL**    \$ \_\_\_\_\_

**BID TOTAL** \$ \_\_\_\_\_

### UNIT RATES

| Item | Description     | Unit | Unit Rate |
|------|-----------------|------|-----------|
| 1    | Rock Excavation | Hr   | \$        |
| 2    |                 |      |           |
| 3    |                 |      |           |
| 4    |                 |      |           |

## MATERIALS RECEIPT

INSTRUCTIONS: Prepare 3 copies, forward original to OWNER, one copy to CONTRACTOR and one copy to ENGINEER.

[illegible]

RECEIVED BY \_\_\_\_\_  
Representing \_\_\_\_\_

RECEIVED FROM \_\_\_\_\_  
Representing \_\_\_\_\_

## CONSTRUCTION SCHEDULE

### *Weather-Related Delays*

If “abnormal weather conditions” as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:

1. Every workday on which one or more of the following conditions exist will be considered a “bad weather day”:
  - a. Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds **[threshold precipitation quantity]** of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference.
  - b. Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: **[Bidder Enter Temperature ]** degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: **[Bidder Enter Temperature ]** degrees Fahrenheit.
2. Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by **National Oceanic and Atmospheric Administration** “NOAA” weather monitoring station at **The Dalles Municipal Airport (KDLS)**
  - a. Contractor has anticipated **[Bidder Enter Number of Days ]** Foreseeable Bad Weather Days.
  - b. Every bad weather day exceeding the number of foreseeable bad weather days established above will be considered as “abnormal weather conditions.” The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor’s then-current Progress Schedule’s critical path for the Project.

### BASIS OF PAYMENT

The CONTRACTOR shall submit to the OWNER a monthly invoice for payment stating the unit prices, unit quantities completed, and percent of Completion for "1 lot" items.

Payment to the CONTRACTOR shall be in accordance with the Contract Documents.

### SUBCONTRACTORS

The Bidder further certifies that the following subcontractors will be awarded subcontracts for the following portions of the work in the event that the Bidder is awarded the Contract. Additional subcontractors or the replacement of the foregoing may only be made with the approval of the OWNER after award of the Contract.

|                      |       |                                  |     |
|----------------------|-------|----------------------------------|-----|
| Work to be Performed | State | Business License Number          |     |
| Name                 | State | CONTRACTOR's Registration Number |     |
| Street               | City  | State                            | Zip |

|                      |       |                                  |     |
|----------------------|-------|----------------------------------|-----|
| Work to be Performed | State | Business License Number          |     |
| Name                 | State | CONTRACTOR's Registration Number |     |
| Street               | City  | State                            | Zip |

### SURETY

If the Bidder is awarded a construction Contract on this Bid, the Surety who provides the Performance and Payment Bond will be \_\_\_\_\_ whose address is

|        |      |       |     |
|--------|------|-------|-----|
| Street | City | State | Zip |
|--------|------|-------|-----|

BID EXECUTION

Name of Entity submitting Bid \_\_\_\_\_

The name of the Bidder submitting this Bid is \_\_\_\_\_  
\_\_\_\_\_ doing business at

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
Street City State Zip

which is the address to which all communications concerned with this Bid and with the Contract shall be sent.

State CONTRACTOR's Registration Number: \_\_\_\_\_

State Business License Number: \_\_\_\_\_

The names of the principal officers of the corporation submitting this Bid, or of the partnership, or of all persons interested in this Bid as principals are as follows:

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

If Sole Proprietor or Partnership

IN WITNESS hereto the undersigned has set its hand this \_\_\_\_ day of \_\_\_\_\_, 2026.

\_\_\_\_\_  
Signature of Bidder

\_\_\_\_\_  
Title

If Corporation

IN WITNESS WHEREOF the undersigned corporation has caused this instrument to be executed and its

seal affixed by its duly authorized officers this \_\_\_\_\_ day of \_\_\_\_\_, 2026.

(SEAL)

\_\_\_\_\_  
Name of Corporation

By \_\_\_\_\_

Title \_\_\_\_\_

Attest \_\_\_\_\_

Secretary



[illegible]

Proj. #: 26NWCPU001  
00 41 00

**SECTION 00 43 13**  
**BID BOND**

BOND NO. \_\_\_\_\_

AMOUNT: \$ \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_

\_\_\_\_\_

hereinafter called the CONTRACTOR (Principal), and \_\_\_\_\_

\_\_\_\_\_

a corporation duly organized under the laws of the State of \_\_\_\_\_

having its principal place of business at \_\_\_\_\_

and authorized to do a general surety business in the State of Oregon, as SURETY, are held and firmly bound unto Northern Wasco County People's Utility District, hereinafter called the OWNER (Obligee), in the

sum of \_\_\_\_\_ DOLLARS

(\$ \_\_\_\_\_) for the payment for which we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the CONTRACTOR is herewith submitting his or its Bid Proposal for the construction of Columbia Heights Substation to the OWNER, said Bid Proposal, by reference thereto, being hereby made a part hereof.

NOW, THEREFORE, if the Bid Proposal submitted by the CONTRACTOR is accepted, and the Contract awarded to the CONTRACTOR, and if the CONTRACTOR shall execute the proposed Contract and shall furnish the bond(s) and other submittals as required by the Contract Documents within the time fixed by the Documents, then this obligation shall be void; if the CONTRACTOR shall fail to execute the proposed Contract and furnish the required bonds, the SURETY hereby agrees to pay to the OBLIGEE the said sum as liquidated damages.

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

\_\_\_\_\_  
CONTRACTOR

By \_\_\_\_\_

\_\_\_\_\_  
SURETY

By \_\_\_\_\_  
Attorney-In-Fact

The Attorney-in-Fact who executes this bond in behalf of the SURETY, must attach a copy of their power-of-attorney as evidence of his authority.

**END OF SECTION**

**SECTION 00 43 43**  
**PREVAILING WAGE RATES**

All Services under this Agreement are subject to prevailing wage rates and all workers providing labor for the Services shall be paid not less than the prevailing minimum hourly rate of wage for the same character of work in the same trade located in The Dalles Oregon. Contractor will include the requirement to pay prevailing wages as a material provision in every contract with a contractor or subcontractor, to the extent those contracts are permitted and applicable, and will ensure compliance with the prevailing wage requirements.

BOLI does not oversee the District and will not require certified payroll or other reporting activities to be submitted to Oregon State Bureau of Labor & Industries BOLI. BOLI rates are to be paid to employees based on the active rates BOLI posts.

Prevailing Wage Rates for Northern Wasco County in Oregon State are available via the look-up system posted by BOLI.

**SECTION 00 45 13**  
**BIDDER'S EXPERIENCE FORM**

The OWNER requests a statement as to Bidders' experience to be completed and submitted by prospective CONTRACTOR's submitting a bid.

Entity Submitting Experience: \_\_\_\_\_ A Corporation  
(Bidder) \_\_\_\_\_ A Partnership  
\_\_\_\_\_ An Individual

Principal Office: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Email: \_\_\_\_\_

**EXPERIENCE QUESTIONNAIRE**

1. How many years has your organization been in business as a general CONTRACTOR under your present business name? \_\_\_\_
2. How many years' experience in substation construction work has your organization had:
  - a) As a general contractor \_\_\_\_\_;
  - b) As a subcontractor \_\_\_\_\_?
3. What experience has your organization had in construction of electric utility substations?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. List major substation construction projects your organization has completed:

| <u>Type and Size<br/>of Project</u> | <u>Contract<br/>Amount</u> | <u>Completed</u> | <u>Name &amp; Address<br/>of OWNER</u> |
|-------------------------------------|----------------------------|------------------|----------------------------------------|
|-------------------------------------|----------------------------|------------------|----------------------------------------|

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5. Have you ever failed to complete any work awarded to you? If so, where and why?

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6. List at least two utilities, corporations, individuals, cities, counties, or states for whom you have performed substation work, and the name of the individual to whom you refer:

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7. What is the construction experience of the principal individuals of your organization to be assigned to this project?

| <u>Individual's<br/>Name</u> | <u>Present<br/>Position<br/>or Office</u> | <u>Years of<br/>Construction<br/>Experience</u> | <u>Magnitude<br/>&amp; Type<br/>of Work</u> | <u>In What<br/>Capacity?</u> |
|------------------------------|-------------------------------------------|-------------------------------------------------|---------------------------------------------|------------------------------|
|------------------------------|-------------------------------------------|-------------------------------------------------|---------------------------------------------|------------------------------|

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8. List the major items of equipment which you own or which will be available for use on the proposed work:

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9. List below the contracts which you or your company or corporation have engaged in during the previous 10 years that required court action for settlement:

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**END OF SECTION**





## **PART 2**

### **CONTRACT FORMS**

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

Agreement # \_\_\_\_\_

This Agreement is by and between Northern Wasco County PUD ("Owner") and [name of contracting entity] ("Contractor").

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

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:

## ARTICLE 2—THE PROJECT

- 2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: construction of the Columbia Heights Substation.

## ARTICLE 3—ENGINEER

- 3.02 The part of the Project that pertains to the Work has been designed by **Stoddard Power Systems LLC**.

## ARTICLE 4—CONTRACT TIMES

### 4.01 *Time is 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 be ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **8/09/2028**.
- B. Phase 1, as described and defined in General Requirements, will be substantially complete on or before [to be completed after Owner's review and selection of the Contractor and the Contractor's projected contract times]
- C. Phase 2, as described and defined in General Requirements, will be substantially complete on or before [to be completed after Owner's review and selection of the Contractor and the Contractor's projected contract times].

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#### 4.04 *Milestones*

- A. Parts of the Work must be substantially completed on or before the following Milestone(s):
1. Milestone 1: Delivery & Start Installation of OFOI Transformer 1 - 6/17/2027
  2. Milestone 2: Delivery & Start Installation of OFOI Transformer 2 5/4/2028
  3. Milestone 3: Delivery & Start Installation of OFOI SWGR Metal Clad Building 1 7/15/2027
  4. Milestone 4: Delivery & Start Installation of OFOI SWGR Metal Clad Building 2 - 6/01/2028

#### 4.05 *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 Contract Times, as duly modified. The parties hereby acknowledge and agree that it would be difficult, if not impossible, to ascertain and quantify the actual damages that the Owner would incur if the Work is not completed within the Contract Times as provided in Paragraph 4.02 above, as such may be revised in accordance with the Contract. Accordingly, it is expressly agreed that liquidated damages payable under the Agreement do not constitute a penalty and that the parties, having negotiated in good faith for such specific liquidated damages and having agreed that the amount of such liquidated damages is reasonable in light of the anticipated harm caused by the breach related thereto, are estopped from contesting the validity or enforceability of the per-day rate of the liquidated damages on the basis that such per-day rate constitutes a penalty or is otherwise unenforceable or invalid. Notwithstanding any provision hereto to the contrary, if Contractor or anyone on its behalf successfully challenges the per-day rate of any liquidated damages, Contractor specifically agrees to pay the Owner all actual damages incurred by the Owner in connection with such breach, including any and all consequential damages (such as loss of profits and revenues, business interruption, loss of opportunity and use) and all costs incurred by the Owner in proving the same, without regard to any limitations whatsoever set forth in the Contract:
1. *Substantial Completion Phase 1:* Contractor shall pay Owner **\$5,500.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion of Phase 1, until the Work is substantially complete.
  2. *Substantial Completion Phase 2:* Contractor shall pay Owner **\$5,500.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion of Phase 2, until the Work is substantially complete.
  3. *Completion of Remaining Work:* After Substantial Completion of Phases 1 and 2, 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 **\$1,000.00** for each day that expires after such time until the Work is completed and ready for final payment.
  3. *Milestones:* Contractor shall pay Owner **\$5,500.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.04 above for the

achievement of each Milestone until each Milestone of Milestones 1, 2, 3, and 4 is achieved, or until the time specified for Substantial Completion is reached, at which time the rate indicated in Paragraphs 4.05.A.1 & 4.05.A.2 will apply, rather than the Milestone rate.

4. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.
- B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

## 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 other than Unit Price Work, a lump sum of **\$[number]**.

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

- B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

| Unit Price Work                                                                                           |             |      |                    |            |                |
|-----------------------------------------------------------------------------------------------------------|-------------|------|--------------------|------------|----------------|
| Item No.                                                                                                  | Description | Unit | Estimated Quantity | Unit Price | Extended Price |
|                                                                                                           |             |      |                    | \$         | \$             |
|                                                                                                           |             |      |                    | \$         | \$             |
|                                                                                                           |             |      |                    | \$         | \$             |
|                                                                                                           |             |      |                    | \$         | \$             |
|                                                                                                           |             |      |                    | \$         | \$             |
| Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities) |             |      |                    |            | \$             |

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

- C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) **\$[number]**.

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## ARTICLE 6—PAYMENT PROCEDURES

### 6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 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 the basis of Contractor's Applications for Payment on or about the last work 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. **95** percent of the value of the Work completed (with the balance being retainage).
    - b. **95** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion of Phase 2, Owner shall pay an amount sufficient to increase total payments to Contractor to **100** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **200** 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, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

### 6.04 *Consent of Surety*

- A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

### 6.05 *Interest*

- A. All amounts not paid when due will bear interest at the rate of **3.5** percent per annum.

## **ARTICLE 7—CONTRACT DOCUMENTS**

### **7.01**    *Contents*

- A. The Contract Documents consist of all the following:
  - 1. This Agreement.
  - 2. Bonds:
    - a. Performance bond (together with power of attorney).
    - b. Payment bond (together with power of attorney).
  - 3. General Conditions.
  - 4. Supplementary Conditions.
  - 5. Specifications as listed in the table of contents of the project manual (copy of list attached).
  - 6. Drawings listed on the attached Drawing Sheet Index.
  - 7. Geotechnical Investigation Report
  - 8. Section 00 43 43 – Prevailing Wage Rates
  - 9. Exhibit A – Application for Payment
  - 10. Addenda (numbers [number] to [number], inclusive).
  - 11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    - a. Work Change Directives.
    - b. Change Orders.
    - c. Field Orders.
    - d. Warranty Bond, if any.
- B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

## **ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS**

### **8.01**    *Contractor's Representations*

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

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1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work and represents that the Work can and shall be performed in conformity with, and the Work performed in accordance with, all such Laws and Regulations.
4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. 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 Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
7. 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.
8. 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.
9. Contractor has given Owner and Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. 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.

#### 8.02 *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 8.02:
  1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything 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.

#### 8.03 *Standard General Conditions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are modified versions of EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, then upon Contractor's written request, Owner will furnish a version of said General Conditions plainly showing all modifications to the standard wording of such published document, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

### **ARTICLE 9—WARRANTIES AND OTHER REPRESENTATIONS**

- A. Contractor represents and warrants to the Owner that:
  1. Contractor is an expert in performing the Services required under this Contract and that the Contractor is competent to know which materials, methods, apparatuses, procedures, notifications, practices, and coordination protocols are required, necessary, suitable, and advisable to perform the Work described in this Contract;
  2. The Contractor is duly licensed to perform the Work requested and will maintain at its own expense all required licenses, certifications, and permits necessary to deliver all of the services and perform the Work under this Contract;

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3. Contractor fully understands and will perform its obligations under this Contract and will not make any claims for, or have any rights to relief based on its claim that it misunderstood the terms of this Contract or lacked information related to its required performance under this Contract;
  4. Contractor has the legal authority to enter into and perform this Contract;
  5. This Contract, when executed and delivered, is a valid and binding obligation of Contractor enforceable in accordance with its terms.
- B. The warranties set forth in this section are in addition to, and not in lieu of, any other warranties provided by the Contractor in the Contract.

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

This Agreement will be effective upon execution by Owner and Contractor (whichever is the later date is the Effective Date of the Contract).

Owner:

\_\_\_\_\_  
(typed or printed name of organization)

By: \_\_\_\_\_  
(individual's signature)

Date: \_\_\_\_\_  
(date signed)

Name: \_\_\_\_\_  
(typed or printed)

Title: \_\_\_\_\_  
(typed or printed)

\_\_\_\_\_

Contractor:

\_\_\_\_\_  
(typed or printed name of organization)

By: \_\_\_\_\_  
(individual's signature)

Date: \_\_\_\_\_  
(date signed)

Name: \_\_\_\_\_  
(typed or printed)

Title: \_\_\_\_\_  
(typed or printed)

(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

\_\_\_\_\_

**SECTION 00 61 13.13  
PERFORMANCE BOND**

BOND NO. \_\_\_\_\_

AMOUNT: \$ \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that the undersigned, \_\_\_\_\_

\_\_\_\_\_

hereinafter called the CONTRACTOR (Principal), and \_\_\_\_\_  
a corporation duly authorized to do a general surety business in the State of Oregon, hereinafter  
called SURETY, are held and firmly bound unto NORTHERN WASCO COUNTY PEOPLE'S  
UTILITY DISTRICT, hereinafter called the OWNER (Obligee), in the sum of  
\_\_\_\_\_ DOLLARS  
(\$ \_\_\_\_\_) to be paid to the OWNER, for which sum of money will truly be  
paid, we bind ourselves and our successors and assigns, jointly and severally, firmly by these  
presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain contract, hereto  
attached, with the OWNER, dated \_\_\_\_\_, for:

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

If the CONTRACTOR shall faithfully perform all the terms, covenants, and conditions of the  
Contract Documents, to be by such CONTRACTOR performed, and shall honor all claims for  
defective work made within 5 years after the completion and acceptance of the work under this  
Contract (which 5-year period shall expire on the expiration of the warranty period defined in the  
GENERAL CONDITIONS), and shall pay over, make good and reimburse to the OWNER, all  
loss or damage which the OWNER may sustain by reason of failure or default on the part of  
CONTRACTOR, then this obligation shall be void; otherwise it shall be and remain in full force  
and effect.

PROVIDED, HOWEVER, that the SURETY, for value received, hereby stipulates and agrees  
that no change, extension of time, alteration, or addition to the terms of the Contract  
Documents or to the work to be performed thereunder shall in any way affect its obligation on

this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract Documents.

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

CONTRACTOR

\_\_\_\_\_  
By \_\_\_\_\_ (Seal)

\_\_\_\_\_  
Attest

SURETY

\_\_\_\_\_  
By \_\_\_\_\_ (Seal)

\_\_\_\_\_  
Attest

APPROVED AS TO FORM: \_\_\_\_\_, 20 \_\_\_\_

By \_\_\_\_\_

NOTE: The SURETY named on this bond shall be one who is licensed to conduct business in the State of Oregon and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All bonds signed by an agent must be accompanied by a certified copy of the authority to act for the SURETY at the time of the signing of this bond.

**END OF SECTION**

**SECTION 00 61 16.16  
PAYMENT BOND**

BOND NO. \_\_\_\_\_

AMOUNT: \$ \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that the undersigned, \_\_\_\_\_

\_\_\_\_\_ hereinafter called the CONTRACTOR (Principal), and \_\_\_\_\_ a corporation duly authorized to do a general surety business in the State of Oregon, hereinafter called SURETY, are held and firmly bound unto NORTHER WASCO COUNTY PEOPLE'S UTILITY DISTRICT, hereinafter called the OWNER (Obligee), in the sum of \_\_\_\_\_

DOLLARS

(\$ \_\_\_\_\_) to be paid to the OWNER, for which sum of money, will truly be paid, we bind ourselves and our successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain contract, hereto attached, with the OWNER, dated \_\_\_\_\_, for:

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

If the CONTRACTOR shall make all payments as required by the terms and conditions of the Contract Documents, as well as all other payments for goods and services rendered in connection with the performance of the work under this Contract for which any common law or statutory mechanics lien is available, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

PROVIDED, HOWEVER, that the SURETY, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the work to be performed thereunder shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract Documents.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR

shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

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

CONTRACTOR

\_\_\_\_\_  
By \_\_\_\_\_ (Seal)

\_\_\_\_\_  
Attest

SURETY

\_\_\_\_\_  
By \_\_\_\_\_ (Seal)

\_\_\_\_\_  
Attest

APPROVED AS TO FORM: \_\_\_\_\_, 20 \_\_\_\_

By \_\_\_\_\_

NOTE: The SURETY named on this bond shall be one who is licensed to conduct business in the State of Oregon and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All bonds signed by an agent must be accompanied by a certified copy of the authority to act for the SURETY at the time of the signing of this bond.

**END OF SECTION**

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## **PART 3**

### **CONDITIONS OF THE CONTRACT**

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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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This document is a MODIFIED version of EJCDC® C-700, Standard General Conditions of the Construction Contract.  
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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

## 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 document prepared by Contractor, in a form acceptable to Engineer, to request 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; 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; 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.

- 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.
  - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
  - d. 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), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations 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 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. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions,

including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *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.
24. *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.
  - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
  - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
  - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *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.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *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.
30. *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.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, construction subcontractors, Suppliers, 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.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *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.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.
36. *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.
37. *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.
38. *Site*—Lands or areas indicated in the Contract Documents upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas as may be required for Work.
39. *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.
40. *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.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which (1) 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



and (2) the Substantial Completion Requirements as established in accordance with Section 15.03A hereof have been satisfied. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, 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.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
  - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
  - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *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.

50. *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 Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives*: 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*: The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective*: The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
  - 1. does not conform to the Contract Documents;
  - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
  - 3. 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 Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
  - 1. The word “furnish,” when used in connection with services, materials, or equipment, means 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, means 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, means 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. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. 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 Performance and Payment Bonds; Evidence of Insurance***

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), 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 signed 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 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 *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 the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will 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.
  4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

## 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents 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 Electronic Documents.

## **ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

### 3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document 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 versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will 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.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will 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.
- G. Nothing in the Contract Documents creates:
  - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
  - 2. 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.

### 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, means 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, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer 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 or Engineer 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 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 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 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 in writing 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.
- 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 notify Owner and Contractor in writing 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 versions, 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 precludes 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 30th 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 60th day after the day of Bid opening or the 30th 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 may be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Owner 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 must 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 will 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 Contract Price or 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. Such an adjustment will 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. Unusually Severe Weather conditions;
  - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
  - 4. Acts of war or terrorism.
- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
  - 1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
  - 2. 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. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
  - 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
  - 1. The circumstances that form the basis for the requested adjustment;
  - 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
  - 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
  - 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
  - 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

- F. 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, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses 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.

## **ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

### **5.01 *Availability of Lands***

- A. Owner shall furnish the Site. Contractor shall be responsible for obtaining and maintaining access to the Site. Upon request by Contractor, Owner shall notify Contractor in writing 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, or to improvements, structures, utilities, or similar facilities located at such adjacent lands 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 7.13, 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 in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify, defend, 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 will 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 of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
  - 2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
  - 3. Technical Data contained in such reports and drawings.
- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.
- C. *Reliance by Contractor on Technical Data:* 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 Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* 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;
  2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
  3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
  4. 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:
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;
  2. is of such a nature as to require a change in the Drawings or Specifications;
  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 whether it is necessary for Owner to obtain 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; 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. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
  - 1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, 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 subject to the provisions of Paragraphs 4.05.D and 4.05.E.
  - 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;
    - 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 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, then any such adjustment will 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, 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.

- F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
  2. complying with applicable state and local utility damage prevention Laws and Regulations;
  3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
  4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
  5. 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 on the Drawings, or was not shown or indicated on the Drawings 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), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review*: Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
  2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
  3. obtain any pertinent cost or schedule information from Contractor; 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
  4. 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. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown or indicated on the Drawings, 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. 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;
    - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
    - c. 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, then any such adjustment will 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, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
  - 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; 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 on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. 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;
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 or anyone for whom Contractor is responsible creates or exacerbates a Hazardous Environmental Condition and Owner direct Contractor to remove or remediate the condition.

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, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, 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. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- 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, 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 obligates 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 obligates 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 Contractor's obligations under the Contract. These bonds must 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 terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, 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 must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. 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.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

#### 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. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages 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, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.
- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages 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, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. 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, will not be construed as a waiver of the other party’s obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner’s option, may purchase and maintain Owner’s own liability insurance. 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.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
  2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain 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.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) 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 will be adjusted accordingly.
- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, 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 and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
1. include at least the specific coverages required;
  2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
  3. remain in effect at least until the Work is complete and for an extended reporting period of at least twenty-four (24) months on all claims made policies or specify that tail coverage is provided. If any of the required insurance is on a claims-made basis and does not include an extended reporting period of at least 24 (twenty-four) months, Contractor shall maintain either tail coverage or continuous claims made liability coverage, provided the effective date of the continuous claims made coverage is on or before the Effective Date of the Contract, for a minimum of twenty-four (24) months following the later of Contractor's completion and the Owner's Final Acceptance of the Work in the final Phase of Work required under this Contract;
  4. apply with respect to the performance of the Work, whether such performance is 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;
  5. include all necessary endorsements to support the stated requirements; and
  6. specify that Contractor will pay for all deductibles, self-insured retention; and self-insurance, if any.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
1. include and list as additional insureds Owner ("Northern Wasco County People's Utility District and its directors, officers, employees, and agents") and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
  2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
  3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);
  4. not seek contribution from insurance maintained by the additional insured; and
  5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other 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 Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations).

The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

- B. *Property Insurance for Facilities of Owner Where Work Will Occur:* Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities:* Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- 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 advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. 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 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, including the Owner or its officers, directors, employees, and agents, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.
  - 1. 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, risks, 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 individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater 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.

2. None of the above waivers extends 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. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, 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, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. 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 all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights 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 insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract 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 fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

**6.06 *Receipt and Application of Property Insurance Proceeds***

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 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 6.04 shall maintain such proceeds in a segregated account, and 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, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

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

### **7.01 Contractor's Means and Methods of Construction**

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.
- C. *Standard of Care*: The standard of care for all Construction performed or furnished by Contractor under this Contract will be the care and skill ordinarily practiced by recognized United States construction firms practicing in the electric utility industry performing high quality services and/or construction on projects similar to the Project, under similar circumstances at the same time and in the same locality.

### **7.02 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, including the standard of care provided in Paragraph 7.01.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer.

### **7.03 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 maintain good discipline and order at the Site.
- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.



- C. 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 will 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.

#### 7.04 *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 must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will 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 must 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.

#### 7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, 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 equipment or material, or items from other proposed Suppliers, under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
      - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) 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) has a proven record of performance and availability of responsive service; and

- 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
  - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
  - 2) the item 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 will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

#### 7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material 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 equipment or material under the circumstances described below. To the extent possible such requests must 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 equipment or material from anyone other than Contractor.
  2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.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 equipment or material that Contractor seeks to furnish or use. The application:
  - a. will 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 the item specified; and
    - 3) be suited to the same use as the item 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 the item specified; and
    - 2) available engineering, sales, maintenance, repair, and replacement services.
  - d. will 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 will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

#### 7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers 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 or Supplier 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 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. 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 or Suppliers 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 or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, 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 or Supplier, whether initially or as a replacement, will 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 solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

#### 7.08 *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 an 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 will be disclosed 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.

**7.09**    *Permits*

- A. Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. 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.

**7.10**    *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.

**7.11**    *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. 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 is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written 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 written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

**7.12**    *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.

#### 7.13 *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.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. 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.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.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).
- E. 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.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that 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.

- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. 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.
- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will 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.

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as 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 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 by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

#### 7.16 *Submittals*

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

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
  - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determine and verify:
    - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
    - 2) 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



- 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
    - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
  2. Each Shop Drawing or Sample must 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 Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
    - a. Contractor shall submit the number of copies required in the Specifications.
    - b. Data shown on the Shop Drawings must 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.C.
  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.C.
  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. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. 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, comply with the requirements of 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 will 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 or other appropriate Contract modification.
5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 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, will 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 or Sample will 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.C.4.

**D. *Resubmittal Procedures for Shop Drawings and Samples***

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 Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
    - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
    - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
    - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.
    - d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
  2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be performed and completed in a professional and workmanlike manner, in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee. Contractor further warrants that each item of equipment incorporated into the Work, will be new and undamaged at the time of installation, will be of suitable grade of its respective kind and for its intended use, will be free from defects in design, engineering, materials, construction, and workmanship, and shall conform in all respects to all applicable legal requirements, permits, design drawings, specifications, and the requirements of the utility, and all other requirements of the Contract Documents. Additionally the conductor, insulators, terminal hardware, switches, circuit breakers, and all other appurtenant equipment provided by Contractor (the "Major Equipment") shall, to the extent required to be procured by Contractor under this Agreement, be covered by manufacturer warranties with terms suitable to and approved by Owner, and Contractor will take all necessary steps to ensure that the manufacturer warranties for the Owner-Furnished Equipment are preserved and not limited or diminished through Substantial Completion. Upon Substantial Completion, Contractor will ensure that all warranties have been assigned to Owner.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited

only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
  2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
1. abuse, or improper modification, 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.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
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. The end of the correction period established in Paragraph 15.08;
  8. Any inspection, test, or approval by others; or
  9. Any correction of defective Work by Owner.
- E. 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 will 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 defend, 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 losses, damages, costs, and judgments (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 from third-party claims or actions relating to or resulting from the

performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage 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 will 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.* 7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.
- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
  - 1. Checking for conformance with the requirements of this Paragraph 7.19;
  - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
  - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

#### 7.20 *Cyber Security and Data Safeguards*

- A. *Data Safeguards.* Contractor shall employ administrative, physical, and technical safeguards that are reasonably designed to prevent the unauthorized collection, access, disclosure, and use of the Owner data while in Contractor's custody. The safeguards that Contractor employs must (1) meet, at a minimum, industry practice; and (2) be reasonably designed to ensure that only Contractor personnel with a need-to-know have access to Owner's data. Contractor shall immediately notify the Owner of any known breach of any safeguards, and Contractor and Owner will cooperate to investigate and remedy any such breach and any related dispute, inquiry, or claim. If Owner data disclosure by Contractor results in third party claims, Contractor will defend, indemnify, and hold the Owner harmless from and against such claims.
- B. *Surreptitious Code.* Contractor warrants that, to the best of its knowledge, its system is free of and does not contain any code or mechanism that collects personal information or asserts control of the system without the Owner consent, or which may restrict the Owner's access to or use of the Owner data. Contractor further warrants that it will not knowingly introduce, via any means, spyware, adware, ransomware, rootkit, keylogger, virus, trojan, worm, or other code or mechanism designed to permit unauthorized access to the Owner data, or which may restrict the Owner's access to or use of the Owner data.
- C. *Data Breach.* If Contractor becomes aware that the Owner's data may have been accessed, disclosed, or acquired without proper authorization and contrary to the terms of this Agreement, then the Contractor shall use reasonable efforts to alert the Owner of any data breach within forty-eight (48) hours, and shall immediately take such actions as may be necessary to preserve forensic evidence and eliminate the cause of the data breach. Contractor shall give highest priority to immediately correcting any data breach and shall devote such resources as may be required to accomplish that goal. Contractor shall provide the Owner information necessary to fully understand the nature and scope of the data breach.

### 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 third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. 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.
- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, 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.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

#### 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 for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, 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. 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 will 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, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will 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 or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- 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.
  - 1. 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 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 8.03.B.
  - 2. 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 Contractor.
- C. 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, and shall provide to Contractor a written notice of the replacement engineer. The replacement engineer’s status under the Contract Documents will 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 (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.

9.13 *Limitation of Owner's Liability as Public Entity*

- A. OWNER'S LIABILITY FOR ANY AND ALL CLAIMS, SUITS, AND ACTIONS FOR ANY TYPE OF DAMAGES ARISING AGAINST OWNER UNDER OR RELATING TO ANY CLAIMS AGAINST THE OWNER UNDER THE CONTRACT SHALL, AT ALL TIMES, BE SUBJECT TO THE LIMITATIONS OF LIABILITY FOR PUBLIC BODIES UNDER OREGON LAW. NOTHING IN THE CONTRACT SHALL BE CONSTRUED AS A WAIVER BY OWNER OF ANY STATUTORY NOTICE OR DEFENSE OR IMMUNITY FROM ANY CLAIM AGAINST OWNER.

**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 10.07. 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 *Resident 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 the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

**10.04 *Engineer's Authority***

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.
- E. Engineer's authority as to Applications for Payment is set forth in Article 15.

**10.05 *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.

**10.06 *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.

**10.07 *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, will 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 Contractor under 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 10.07 also apply to the Resident Project Representative, if any.

#### 10.08 *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 of which Engineer has been informed.

### **ARTICLE 11—CHANGES TO THE CONTRACT**

#### 11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that 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, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

#### 11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
  - 1. Changes in 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 11.05, (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 that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

#### 11.03 *Work Change Directives*

- A. 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 11.07 regarding change of Contract Price.
- B. If Owner has issued a Work Change Directive and:
1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
  2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

#### 11.04 *Field Orders*

- A. 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.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.05 *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. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work 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 must be performed under the applicable conditions of the Contract Documents.

- C. Nothing in this Paragraph 11.05 obligates 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.

#### 11.06 *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.C.2.

#### 11.07 *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 must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must 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);
  - 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 11.07.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 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will 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 will be 15 percent;
    - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 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 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.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 5 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 will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;

- d. No fee will 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 of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
- f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

#### 11.08 *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 must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

#### 11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.
- B. *Change Proposal Procedures*
  - 1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data:* 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.
  - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
  - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must 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.

3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must 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.
5. *Binding Decision:* Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *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 in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion:* Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

#### 11.10 *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 are subject 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;
  - 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; and
  - 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- 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 rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, 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 will 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 will 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 will 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 will 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 will 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 will 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 will be incorporated in a Change Order or other written document 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. When needed 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 will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will 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 in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, 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, will 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 accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will 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, which 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 will 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 or retained for services specifically related to the Work.
5. Other costs consisting of 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, 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.
    - 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.
  - c. *Construction Equipment Rental*
    - 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

- 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
  - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed 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 builder's risk or other property insurance established in accordance with Paragraph 6.04), 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 include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will 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 does not include any of the following items:
1. Payroll costs and other compensation of Contractor's officers, executives, principals, general 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. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
5. 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.
6. Expenses incurred in preparing and advancing Claims.
7. 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**

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
  - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
  - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
    - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
    - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. Documentation and Audit:** Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner shall be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors shall afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

**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 for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's 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 for Work covered by allowances, and the Contract Price will 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, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.
- E. *Adjustments in Unit Price*
1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
    - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
    - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
  2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other

Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

#### **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 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 with such procedures and programs as applicable.

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

- A. Contractor shall give Engineer and Owner 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 will 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 will 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 will 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 written 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 will 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, 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 will 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 defective Work as required by Engineer, then Owner may, after 7 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 for 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.
  - 2. 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 must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) 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.
  - 3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  - 4. 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;
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
  - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; 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 based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from 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 has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
  - j. Liquidated or other 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; or
  - l. Other items entitle Owner to a set-off against the amount recommended, including but not limited to failure to agree to a mutually agreeable list of Substantial Completion Requirements as provided in Article 15.03A.
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 will 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 will be treated as an amount due as determined by Paragraph 15.01.D.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 7 days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. Following the submission by Contractor of all Phase 2 deliverables, Engineer and Owner shall jointly develop a detailed list of requirements applicable to the completion of the Work that must be achieved for the Work to achieve Substantial Completion (the "Substantial Completion Requirements"). Contractor shall provide comments within 10 days and the mutually agreed upon Substantial Completion Requirements shall be documented in an amendment to the Agreement. Failure to agree to a mutually agreeable list of Substantial Completion Requirements may result in reductions in payment by Owner as provided in Article 15.01.E.
- B. When Contractor considers the entire Work to have achieved Substantial Completion, 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.
- C. 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.

- D. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will 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 7 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.
- E. 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.
- F. 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.
- G. 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*

- A. Contractor acknowledges and agrees that, during the course of the Project and prior to Substantial Completion, Owner will require from time to time, use of portions of the Work to supply electricity to certain customers. Contractor agrees to coordinate and schedule the Work so as not to interfere with Owner's use and supply of electricity to these customers. Owner shall identify to Contractor such portions of the Work which it will require to use and shall cooperate with Contractor to facilitate Contractor's performance of the Work in these areas of the Project.
- B. In addition to Paragraph 15.04.A., prior to Substantial Completion of all the Work, Owner may use 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 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 15.03.E for that part of the Work.
4. No use or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 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 7.12), and other documents, Contractor may submit a proposed application for final payment, which proposed application for final payment shall not become effective until after completion of the Owner's audit as provide in Section 14.06.B. below.
2. The final Application for Payment must 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 duly pending Change Proposals and Claims; and
  - e. complete and legally effective releases or waivers attached to this Agreement as Exhibit A 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 Final Application and Recommendation of Payment:* The Owner's accountants or representatives will conduct such review and audit of the Contractor's proposed final application for payment and the accompanying final accounting as they deem appropriate and will report the results of same in writing to the Engineer and Contractor within forty-five (45) days after delivery of the proposed final application for payment to the Owner by the Contractor. Based upon the results of such review and audit, and provided that, 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 10 days after receipt of the written report of the review and audit, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will 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. Otherwise, Engineer will return the proposed final application for payment to Contractor, indicating in writing the reasons for not accepting the proposed application for final payment, in which case Contractor shall make the necessary corrections and resubmit the proposed application for final payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *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 and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

#### 15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.



- 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 as a Claim, 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 Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect 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 adjacent areas;
  - 2. correct such defective Work;
  - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, 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 from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, 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 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). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. 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.
- E. 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.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to 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 directly attributable to any such suspension. Any Change Proposal seeking such adjustments must 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) 10 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) written 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 7 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 will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate for Convenience*

- A. Upon 7 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.
    - a. The amount payable to Contractor pursuant to Section 16.03.A shall be determined in the Owner's sole reasonable discretion, based on Owner's audit of cost records submitted by Contractor.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, 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, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

## 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, pursuant to Article 12; and
  - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise 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;
  - 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 requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
  - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
  - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
  - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

### 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 will not constitute a waiver of that provision, nor will 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 of the Contract or 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 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party 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.

18.09 *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.

18.10 *Headings*

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

# Exhibit A Pay Application



## Contractor's Application for Payment No. \_\_\_\_\_

|                       |                           |                          |
|-----------------------|---------------------------|--------------------------|
| Application Period:   |                           | Application Date:        |
| To (Owner):           | From (Contractor):        | Via (Owner's Site Repres |
| Project:              | Contract:                 |                          |
| Owner's Contract No.: | Contractor's Project No.: |                          |

### Application For Payment Change Order Summary

| Approved Change Orders | 1. ORIGINAL CONTRACT PRICE..... \$                                |
|------------------------|-------------------------------------------------------------------|
| Number                 | 2. Net change by Change Orders..... \$                            |
| Additions              | 3. Current Contract Price (Line 1 ± 2)..... \$                    |
| Deductions             | 4. TOTAL COMPLETED AND STORED TO DATE                             |
|                        | (Column F total on Progress Estimates)..... \$                    |
|                        | 5. RETAINAGE:                                                     |
|                        | a. 5% X _____ Work Completed..... \$                              |
|                        | b. 5% X _____ Stored Material..... \$                             |
|                        | c. Total Retainage (Line 5.a + Line 5.b)..... \$                  |
|                        | 6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c)..... \$            |
|                        | 7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)..... \$ |
|                        | 8. AMOUNT DUE THIS APPLICATION..... \$                            |
|                        | 9. BALANCE TO FINISH, PLUS RETAINAGE                              |
|                        | (Column G total on Progress Estimates + Line 5.c above)..... \$   |
| TOTALS                 |                                                                   |
| NET CHANGE BY          |                                                                   |
| CHANGE ORDERS          |                                                                   |

### Contractor's Certification

The undersigned Design-Builder certifies, to the best of its knowledge, the following:

(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Design-Builder's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;

(2) Title to all Work, materials and equipment incorporated in said Construction, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and

(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

### Contractor's Signature

|     |       |
|-----|-------|
| By: | Date: |
|-----|-------|

Payment of: \$ \_\_\_\_\_  
(Line 8 or other - attach explanation of the other amount)

is recommended by: \_\_\_\_\_ (Date)  
Owner's Site Representative (if applicable)

Payment of: \$ \_\_\_\_\_  
(Line 8 or other - attach explanation of the other amount)

is approved by: \_\_\_\_\_ (Date)  
Owner

Approved by: \_\_\_\_\_ (Date)  
Funding or Financing Entity (if applicable)

### Progress Estimate - Lump Sum Work

## Contractor's Application

|                           |             |                      |                                 |             |                                               |                                                      |              |                              |
|---------------------------|-------------|----------------------|---------------------------------|-------------|-----------------------------------------------|------------------------------------------------------|--------------|------------------------------|
| For (Contract):           |             |                      |                                 |             | Application Number:                           |                                                      |              |                              |
| Application Period:       |             |                      |                                 |             | Application Date:                             |                                                      |              |                              |
|                           |             | B                    | Work Completed                  |             | E                                             | F                                                    |              | G                            |
| A                         |             | B                    | C                               | D           | Materials Presently<br>Stored (not in C or D) | Total Completed<br>and Stored to Date<br>(C + D + E) | %<br>(F / B) | Balance to Finish<br>(B - F) |
| Specification Section No. | Description | Scheduled Value (\$) | From Previous Application (C+D) | This Period |                                               |                                                      |              |                              |
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|                           | Totals      |                      |                                 |             |                                               |                                                      |              |                              |

### Progress Estimate - Unit Price Work

## Contractor's Application

[illegible]



## Stored Material Summary

## Contractor's Application

[illegible]

CONTRACTOR INTERIM LIEN AND CLAIM WAIVER FORM

CONTRACTOR CONDITIONAL LIEN AND CLAIM WAIVER AND RELEASE  
UPON INTERIM PAYMENT

Contract: Engineering, Procurement, and Construction Contract dated as of \_\_\_\_\_, 20\_\_ (the "Agreement") between \_\_\_\_\_ ("Company") and \_\_\_\_\_ ("Contractor")  
Contract Number: \_\_\_\_\_  
Project Name: \_\_\_\_\_ (the "Project")  
Property Name: \_\_\_\_\_ (the "Property")  
Invoice No. (as applicable): \_\_\_\_\_  
Invoice Amount: \_\_\_\_\_  
Purchase Order Number: \_\_\_\_\_  
Waiver Date: \_\_\_\_\_ [must be the same date as the end date of the period covered by the Invoice submitted for payment]

The undersigned Contractor, upon receipt and in consideration of the sum of \$ \_\_\_\_\_, hereby waives and releases any and all liens, claims, and rights to liens against the Project, and any and all other property owned by and/or the title to which is in the name of the above-referenced Company and/or its Affiliates (as defined in the Agreement) and against any and all funds of the Company and/or its Affiliates (as defined in the Agreement) appropriated or available for the construction of said Project, and any and all warrants drawn upon or issued against any such funds or monies, which Contractor may have as a result of the furnishing of labor, services, or materials to the Project, through the date of the application of payment for which this Waiver and Release is submitted. Notwithstanding anything to the contrary, this Waiver and Release does not apply to or otherwise cover compensation for retention or for labor, services, or materials provided after the date specified.

Any and all contractors, subcontractors, laborers, suppliers and materialmen that have provided labor, material or services to the Contractor for use or incorporation into the construction of the improvements to the Property have been paid and satisfied in full to the extent of all payments to Contractor as of the date of this Waiver and Release, and there are no outstanding claims of any character arising out of, or related to, the Contractor's activities on, or improvements to, the Property.

This Waiver and Release constitutes a representation by the undersigned signatory, for and on behalf of the firm or company listed below, that the payment referenced above, once received, constitutes full and complete payment for all work performed, and all costs and/or expenses incurred (including, but not limited to, costs for supervision, field office overhead, home office overhead, interest on capital, profit, and general conditions costs) relative to the work or improvements at the Property as of the date of this Waiver and Release, except for the payment of retainage. The undersigned signatory further represents that Contractor (i) has paid its suppliers and subcontractors in full for such work performed as of the date of this Waiver and Release to the extent of all payments to Contractor as of the date of this Waiver and Release, and Agreement (ii) has collected Lien and Claim Waiver and Releases from all suppliers and subcontractors who performed Work or Services and/or furnished Goods in connection with or on account of the Agreement as required under the Agreement and shall provide such executed Lien and Claim Waiver and Releases to Company. The Contractor hereby specifically waives, quitclaims and releases any claim for damages due to delay, hindrance, interference, acceleration, loss of productivity, inefficiencies and/or extra work, and any other claim of any kind it may have against the Company, Affiliates (as defined in the Agreement) of the Company, Company's and Company Affiliates' respective officers, directors, employees, agents, shareholders, successors and assigns, Company's lender, any tenant of the Company, the Company's project and/or development manager (if any), and any other person and/or entity with a legal or equitable interest in the Property, as of the Waiver Date, except as follows: [list any pending change orders, and/or claims which the undersigned remains entitled to assert in accordance with the undersigned's contract with respect to the Project.

Contractor further represents and warrants that, except as specifically noted above, it is not entitled to request any changes to the Contract Price to perform its obligations under the Agreement and hereby waives any such requests.

This Waiver and Release is specifically made for the benefit of the Company and the Company's lender, and any other person and/or entity with a legal or equitable interest in the Property. The amount of money set forth as due and owing in the immediately preceding Waiver and Release dated \_\_\_\_\_, 20\_\_, has been received, and is deemed paid in full.

The individual signing on behalf of Contractor states and affirms to the Company that: (i) he/she is the [insert title of person signing] of Contractor; (ii) he/she is duly authorized on behalf of Contractor to execute and deliver this Contractor Interim Lien and Claim Waiver and Release; and (iii) he/she is familiar with the facts herein stated.

Contractor is signing this Waiver and Release on \_\_\_\_\_, 20\_\_, to be effective as of the Waiver Date.

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

Name:  
Title:

Sworn to and subscribed  
before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

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

(NOTARY SEAL)

My Commission Expires:

FINAL LIEN AND CLAIM WAIVER AND RELEASE FORM

FOR CONTRACTOR LIEN AND CLAIM WAIVER AND RELEASE  
UPON FINAL ACCEPTANCE

Contract: Engineering, Procurement and Construction Contract dated as of \_\_\_\_\_, 20\_\_ (the "Agreement") between \_\_\_\_\_ ("Company") and \_\_\_\_\_ ("Contractor")  
Contract Number: \_\_\_\_\_  
Project Name: \_\_\_\_\_ (the "Project")  
Property Name: \_\_\_\_\_ (the "Property")  
Invoice No. (as applicable): \_\_\_\_\_ [must be the final invoice as issued in connection with final completion of the Work]  
Invoice Amount (as applicable): \_\_\_\_\_  
Purchase Order Number (as applicable): \_\_\_\_\_  
Waiver Date: \_\_\_\_\_ [must be a date not earlier than the date of Final Acceptance]

The undersigned Contractor, upon receipt and in consideration of the sum of \$ \_\_\_\_\_, and in consideration of the Company's execution of the Final Completion Certificate pursuant to Section 13.5.2 of the Terms and Conditions of the Agreement, states that it has been paid in full, and this Waiver and Release shall become effective to waive and release any and all liens, claims, and rights to liens against the Project, and any and all other property owned by and/or the title to which is in the name of the above-referenced Company and/or its Affiliates (as defined in the Agreement) and against any and all funds of the Company and/or its Affiliates (as defined in the Agreement) appropriated or available for the construction of said Project, and any and all warrants drawn upon or issued against any such funds or monies, which Contractor may have as a result of the furnishing of labor, services, or materials to the Project, through the later of the Waiver Date or the date of the application of payment for which this Waiver and Release is submitted.

Any and all contractors, subcontractors, laborers, suppliers and materialmen that have provided labor, material or services to the Contractor for use or incorporation into the construction of the improvements to the Property have been paid and satisfied in full to the extent of all payments to Contractor as of the date of this Waiver and Release, and there are no outstanding claims of any character arising out of, or related to, the Contractor's activities on, or improvements to, the Property.

Contractor certifies that, upon receipt of payment all bills for labor, materials, licenses, taxes and other expenses and claims for which the Company might be sued, including but not limited to cumulative impact claims or loss of productivity claims, or for which a lien might be filed on account of the Agreement through Final Acceptance have been fully satisfied.

This Waiver and Release constitutes a representation by the undersigned signatory, for and on behalf of the firm or company listed below, that the payment referenced above, once received, constitutes full and final payment for all work performed, and all costs and/or expenses incurred (including, but not limited to, costs for supervision, field office overhead, home office overhead, interest on capital, profit, and general conditions costs) relative to the work or improvements at the Property as of the date of this Waiver and Release. The undersigned signatory further represents that Contractor (i) has paid its suppliers and subcontractors in full for such work performed as of the date of this Waiver and Release to the extent of all payments to Contractor as of the date of this Waiver and Release, and shall make final payment to all suppliers and subcontractors upon receipt of final payment from Company. The undersigned further represents that, it has obtained Lien and Claim Waiver and Releases from all suppliers and subcontractors who performed Work or Services and/or furnished Goods in connection with or on account of the Agreement and, shall provide such executed Lien and Claim Waiver and Releases to Company. The Contractor hereby specifically waives, quitclaims and releases any claim for damages due to delay, hindrance, loss of productivity, interference, acceleration, inefficiencies and/or extra work, and any other claim of any kind it may have against the Company, Affiliates (as defined in the Agreement) of the Company, Company's and Company Affiliates' respective officers, directors, employees, agents, shareholders, successors and assigns, Company's lender, any tenant of the Company, the Company's project and/or development manager (if any), and any other person and/or entity with a legal or equitable interest in the Property, as of the Waiver Date.

This Waiver and Release is specifically made for the benefit of the Company and the Company's lender, and any other person and/or entity with a legal or equitable interest in the Property. The amount of money set forth as due and owing in the immediately preceding Waiver and Release dated \_\_\_\_\_, 20\_\_, has been received, and is deemed paid in full.

This Waiver and Release has been submitted by the Contractor in accordance with Articles 10 and 37 of the Terms and Conditions of the Agreement.

The individual signing on behalf of Contractor states and affirms to the Company that: (i) he/she is the [insert title of person signing] of Contractor; (ii) he/she is duly authorized on behalf of Contractor to execute and deliver this Contractor Final Lien and Claim Waiver and Release; and (iii) he/she is familiar with the facts herein stated.

Contractor is signing this Waiver and Release on \_\_\_\_\_, 20\_\_, to be effective as of the Waiver Date.

CONTRACTOR:

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

Name:

Title:

Sworn to and subscribed  
before me this \_\_\_\_\_ day of  
\_\_\_\_\_, 20\_\_.

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

(NOTARY SEAL)

My Commission Expires:

\_\_\_\_\_

# SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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# SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

## ARTICLE 1—DEFINITIONS AND TERMINOLOGY

- 1.01 *Geotechnical Investigation Report (GIR)*—The factual report that collects and presents data regarding actual subsurface conditions at or adjacent to the Site, including Technical Data and other geotechnical data, prepared by or for Owner in support of the Geotechnical Baseline Report. The GIR's content may include logs of borings, trenches, and other site investigations, recorded measurements of subsurface water levels, the results of field and laboratory testing, and descriptions of the investigative and testing programs. The GIR does not include an interpretation of the data. If opinions, or interpretive or speculative non-factual comments or statements appear in a document that is labeled a GIR, such opinions, comments, or statements are not operative parts of the GIR and do not have contractual standing. Subject to that exception, the GIR is a Contract Document.

## ARTICLE 2—PRELIMINARY MATTERS

### 2.02 *Copies of Documents*

- SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor **two** printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF).

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

- SC-2.04 Delete Paragraph 2.04.A in its entirety and insert the following in its place:

Contractor shall schedule, before any of the work at the site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate, 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.

2.05 *Acceptance of Schedules*

SC-2.05 Delete Paragraph 2.05.A in its entirety and insert the following in its place:

Contractor shall, at least 10 days before submission of the first Application for Payment, schedule a conference, attended by Contractor, Engineer, and others as appropriate, to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.

**ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

3.06 Add the following new paragraphs immediately after Paragraph 3.05:

*SC-3.06 Public Records*

A. Contractor understands and agrees that Owner is a public entity subject to public records disclosure laws. As such, this Contract, all records, invoices, requests for payment, and all other documents pertaining to this Contract, including Contractor's work products, are public records and may be subject to public disclosure according to Oregon Public Records Laws, ORS 192.311 to 192.478.

*SC-3.07 No Right to Owner's Intellectual Property*

A. Except as expressly set forth in this Contract, nothing in this Contract may be construed as granting to or conferring upon Contractor any right, title, or interest in any intellectual

**ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK**

4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

- a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.
- b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
  - 1) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":
    - i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a

workday) through 7:00 p.m. on the workday in question equals or exceeds **[threshold precipitation quantity]** of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference.

- ii) Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: **[temperature]** degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: **[temperature]** degrees Fahrenheit.
- 2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by **National Oceanic and Atmospheric Administration “NOAA”** weather monitoring station at **The Dalles Municipal Airport (KDLS)**
- 3) Contractor has anticipated [Number of Days] Foreseeable Bad Weather Days.
- 4) Every bad weather day exceeding the number of foreseeable bad weather days established in SC-4.05.5.3 will be considered as “abnormal weather conditions.” The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor’s then-current Progress Schedule’s critical path for the Project.

## **ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS**

### **5.03    *Subsurface and Physical Conditions***

SC-5.03        Add the following new paragraphs immediately after Paragraph 5.03.D:

- E.    The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

| <b>Report Title</b>        | <b>Date of Report</b> | <b>Technical Data</b>                    |
|----------------------------|-----------------------|------------------------------------------|
| EE Report No. 10-250039-01 | 5/12/2025             | <b>Geotechnical Investigation Report</b> |
|                            |                       |                                          |
|                            |                       |                                          |

### **5.06    *Hazardous Environmental Conditions***

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

| Report Title                  | Date of Report | Technical Data |
|-------------------------------|----------------|----------------|
| No Such Report Known to Exist |                |                |
|                               |                |                |
|                               |                |                |

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

| Drawings Title                 | Date of Drawings | Technical Data |
|--------------------------------|------------------|----------------|
| No Such Drawing Known to Exist |                  |                |
|                                |                  |                |
|                                |                  |                |

## ARTICLE 6—BONDS AND INSURANCE

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

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form*: form provided in the Contract Documents.
2. *Required Payment Bond Form*: The form provided in the Contract Documents.

### 6.02 *Insurance—General Provisions*

### 6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- D. *Workers' Compensation and Employer's Liability*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

| Workers' Compensation and Related Policies | Policy limits of not less than: |
|--------------------------------------------|---------------------------------|
| <b>Workers' Compensation</b>               |                                 |
| State                                      | \$1,000,000                     |
|                                            |                                 |
|                                            |                                 |
| <b>Employer's Liability</b>                |                                 |
| Each accident                              | \$2,000,000                     |
| Each employee                              | \$2,000,000                     |



| <b>Workers' Compensation and Related Policies</b>                                                                                                                                           | <b>Policy limits of not less than:</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Policy limit                                                                                                                                                                                | \$1,000,000                            |
| <b>Stop-gap Liability Coverage</b>                                                                                                                                                          |                                        |
| For work performed in monopolistic states, stop-gap liability coverage must be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of: | \$1,000,000                            |

- F. *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 claims for:
1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
  2. damages insured by reasonably available personal injury liability coverage, and
  3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
    - a. Such insurance must 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, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
  4. Underground, explosion, and collapse coverage.
  5. Personal injury coverage.
  6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage (for example, through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together) or similar endorsements). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
  7. 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.

- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of “insured contract” (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
  2. Any exclusion for water intrusion or water damage.
  3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01 or its equivalent.
  4. Any exclusion of coverage relating to earth subsidence or movement.
  5. Any exclusion for the insured’s vicarious liability, strict liability, or statutory liability (other than worker’s compensation).
  6. Any limitation or exclusion based on the nature of Contractor’s work.
  7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79 or its equivalent.
- I. *Commercial General Liability—Minimum Policy Limits*

| <b>Commercial General Liability</b>               | <b>Policy limits of not less than:</b> |
|---------------------------------------------------|----------------------------------------|
| General Aggregate                                 | \$10,000,000                           |
| Products—Completed Operations Aggregate           | \$5,000,000                            |
| Personal and Advertising Injury                   | \$2,000,000                            |
| Bodily Injury and Property Damage—Each Occurrence | \$5,000,000                            |

- J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance 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 must be written on an occurrence basis.

| <b>Automobile Liability</b>                               | <b>Policy limits of not less than:</b> |
|-----------------------------------------------------------|----------------------------------------|
| <b>Combined Single Limit</b>                              |                                        |
| Combined Single Limit (Bodily Injury and Property Damage) | \$1,000,000                            |

- K. *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. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

| <b>Excess or Umbrella Liability</b> | <b>Policy limits of not less than:</b> |
|-------------------------------------|----------------------------------------|
| Each Occurrence                     | \$10,000,000                           |
| General Aggregate                   | \$10,000,000                           |

- L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein.
- M. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

| <b>Contractor's Pollution Liability</b> | <b>Policy limits of not less than:</b> |
|-----------------------------------------|----------------------------------------|
| Each Occurrence/Claim                   | \$2,000,000                            |
| General Aggregate                       | \$2,000,000                            |

- N. *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 must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

| <b>Contractor's Professional Liability</b> | <b>Policy limits of not less than:</b> |
|--------------------------------------------|----------------------------------------|
| Each Claim                                 | \$2,000,000                            |
| Annual Aggregate                           | \$2,000,000                            |

- O. P. *Unmanned Aerial Vehicle Liability Insurance:* If Contractor uses unmanned aerial vehicles (UAV—commonly referred to as drones) at the Site or in support of any aspect of the Work, Contractor shall obtain UAV liability insurance in the amounts stated; name Owner, Engineer, and all individuals and entities identified in the Supplementary Conditions as additional insureds; and provide a certificate to Owner confirming Contractor's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

| <b>Unmanned Aerial Vehicle Liability Insurance</b> | <b>Policy limits of not less than:</b> |
|----------------------------------------------------|----------------------------------------|
| Each Claim                                         | \$5,000,000                            |
| General Aggregate                                  | \$5,000,000                            |

#### 6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).
  - a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.
  - b. 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 will be provided through other insurance policies acceptable to Owner and Contractor.
2. 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.
3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).
4. 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). If this coverage is subject to a sublimit, such sublimit will be a minimum of \$2,000,000.
5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of \$2,000,000.
6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.

7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.
8. include performance/hot testing and start-up, if applicable.
9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.
10. include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds."
11. include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:
  - a. Breakers, \$500,000
12. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of \$2,000,000.

## ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

### 7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be **6am-5pm M-TH**.
2. Owner's legal holidays are **federal holidays**.

SC-7.03 Amend the first and second sentences of Paragraph 7.03.C to state "...all Work at the Site must be performed during regular working hours, **Monday** through **Thursday**. Contractor will not perform Work on a Friday, Saturday, or Sunday, or any Owner holiday without Owner's written authorization."

### 7.13 *Safety and Protection*

SC-7.13 Insert the following new subparagraphs immediately after Paragraph 7.13.G:

- A. Contractor shall provide a safety orientation to all Contractor employees, Subcontractor employees, and other personnel under Contractor's control who access Owner property or any Project Site, including personnel performing work involving Owner-furnished equipment, prior to their initial access to the Site. Contractor shall submit attendance records for each safety orientation to Owner. MUTCD high-visibility apparel requirements shall apply at all times while on Owner property or Project Sites. Contractor shall submit weekly tailboards to the OSR. Contractor shall immediately report all accidents, incidents, and near misses to the OSR.

## ARTICLE 8—OTHER WORK AT THE SITE

### 8.02 *Coordination*

SC-8.02 Add the following new Paragraph 8.02.C immediately after Paragraph 8.02.B:

- C. Owner intends to contract with others for the performance of other work at or adjacent to the Site.
  - 1. Contractor shall be responsible for coordinating Site logistics of the various contractors and work forces installing Owner Furnished Owner Installed Equipment.
  - 2. The following specific matters are to be covered by such authority and responsibility: scheduling, acceptable site access as required by Owner's contractors, staging, and other coordinated requirements.

## ARTICLE 9—OWNER'S RESPONSIBILITIES

SC-9.01 Delete Paragraph 9.01.A in its entirety and insert the following in its place:

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer. Contractor and Engineer shall copy Owner on all forms of written (including electronic) communications between them and Engineer shall regularly report to Owner on the substantive non-written communications with Contractor. Contractor and Engineer also shall allow Owner's Site Representative to attend and participate in any and all meetings between Contractor and Engineer and their subcontractors, agents, and designees.

## ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

### 10.03 *Resident Project Representative*

SC-10.3 Add the following new subparagraph immediately after Paragraph 10.03.B:

- C. Owner will furnish an "Owner's Site Representative" (OSR), who is not Engineer's consultant, agent, or employee, to represent Owner at the Site and assist Owner and Engineer in observing the progress and quality of the Work. Owner's Site Representative will be **The District's Project Manager** Specifically designed by Owner pursuant to Article 2.04.B. The authority and responsibilities of OSR follow:
  - 1. The OSR will be Owner's representative at the Site. OSR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. OSR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor.
  - 2. **Conferences and Meetings:** OSR is authorized to attend any and all meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings).
  - 3. **Safety Compliance:** OSR shall comply with Site safety programs, as they apply to OSR, and if required to do so by such safety programs, receive safety training specifically related to OSR's own personal safety while at the Site.

#### **4. Liaison**

- a. Serve as Owner's liaison with Engineer and Contractor. Working principally through Contractor's and Engineer's respective authorized representatives or designees, assist in providing information regarding the provisions and intent of the Contract Documents.
- b. Assist when Contractor's operations affect Owner's on-Site operations.
- c. Assist in obtaining additional details or information, when required for Contractor's proper execution of the Work.

#### **5. Review of Work; Defective Work**

- a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
- b. Observe whether any Work in place appears to be defective.
- c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
- d. Assist Engineer in evaluating any Change Proposals.
- e. Assist Engineer in making any and all other determinations Engineer is required to make under the Contract pertaining to Contractor's Work, unless expressly provided otherwise in the Contract.

#### **6. Inspections and Tests**

- a. Observe Contractor-arranged inspections required by Laws and Regulations and the Contract, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
- b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
- c. Payment Requests: Review Applications for Payment with Contractor.

#### **7. Completion**

- a. Participate in Engineer's Site visits to evaluation Substantial Completion.
- b. Assist in the preparation of any punch lists of items to be completed or corrected, including, but not limited, to Substantial Completion Requirements.
- c. Participate in visit to the Site in the company of Engineer, and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
- d. Observe and assist Engineer in determining whether items on the final punch list have been completed or corrected.

#### **8. The OSR will not:**

- a. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items) without Engineer’s approval and signature.
- b. Undertake any of the responsibilities of Engineer, Contractor, Subcontractors, or Suppliers.
- c. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
- d. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Engineer or Contractor.
- e. Authorize changes in schedule or cost.

#### **ARTICLE 11—CHANGES TO THE CONTRACT**

No Supplementary Conditions in this Article.

#### **ARTICLE 12—CLAIMS**

No Supplementary Conditions in this Article.

#### **ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK**

##### *13.01 Cost of the Work*

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of **60% of the Rental Rate Blue Book**.

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

- a. For purposes of this paragraph, “small tools and hand tools” means any tool or equipment whose current price if it were purchased new at retail would be less than \$1,000.

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

No Supplementary Conditions in this Article.



## **ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD**

### **15.01** *Progress Payments*

SC-15.01 Delete Paragraph 15.01.B.1 in its entirety and insert the following in its place:

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 Owner and 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.

### **15.03** *Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

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

## **ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES**

SC-17.02 Add the following new paragraphs and subparagraphs immediately after Paragraph 17.01.

### **17.02** *Arbitration*

- A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of \$100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.
- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.
- C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages,

except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.

- D. Each party shall bear one half the cost of the arbitration filing, hearing, and administrative fees, and the cost of the arbitrator(s). Each party shall bear their own costs and fees, including attorneys' fees in any arbitration proceeding conducted pursuant to this Article 17. Nothing in this Paragraph or Article alters, or is intended to alter, any of the Contractor's defense and indemnity obligations to Owner under the Contract.
- E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.
- F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.
- G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
  - 1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;
  - 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;
  - 3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and
  - 4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.
- H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract.

## **ARTICLE 18—MISCELLANEOUS**

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## **PART 4**

# **SPECIFICATIONS**

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**SECTION 01 00 00**  
**GENERAL REQUIREMENTS**

**PART 1      PROJECT DESCRIPTION**

**1.1      SCOPE**

- A.    The following information is provided to assist the CONTRACTOR with evaluation of the work required to perform the construction of the Columbia Heights Substation project.

**1.2      DESCRIPTION**

- A.    Columbia Heights Substation is an existing substation. The work consists of furnishing and installing all necessary materials and labor involved with rebuilding the existing substation into a two-bay substation, performed in two construction phases (as shown in General Requirements and Drawings), to include:
1. Obtaining any necessary Construction Permits.
  2. Construction of all necessary clearing, excavation, backfill, compaction, installation of base and finish course rock surfacing material, driveway access development, paving, and site restoration.
  3. Installation of perimeter masonry wall panels, footings and gates, including any necessary excavation, backfill, compaction, and signage installation, complete.
  4. Construction of all reinforced concrete foundations including any necessary excavation, backfill and compaction, forms, and anchor bolt installation, complete.
  5. Miscellaneous installation assistance of the metalclad switchgear control buildings (2) to foundation slab, complete.
  6. Miscellaneous installation assistance of the power transformers (2 to foundation slab, complete.
  7. Construction of the oil containment systems (2) including any necessary piping and drain lines, excavation, backfill and compaction, complete.
  8. Construction of the low voltage conduit systems including capped stub-ups, vaults and any necessary excavation, backfill and compaction, complete.
  9. Construction of the ground grid system installation, grounding of all structures and equipment and including any necessary excavation, backfill and compaction, complete.
  10. Construction of the below grade 15-kV feeder getaway conduits and vault system including any necessary excavation, backfill and compaction, complete.

11. All necessary low voltage cable installation and termination, complete.
12. Testing and readiness per technical specifications.

B. UNIQUE CONSTRUCTION ACTIVITIES

1. The finished substation will include two identical transformers and control building line-ups, with each line-up constructed in separate phases, Phase I and Phase II (as defined in Drawings).
2. Phase I will be constructed first and will essentially be constructed outside the existing substation yard.
3. The existing substation facility must remain in service during construction of Phase I.
4. The Phase I construction will include site development and the installation of a perimeter masonry wall panel system that will include a sliding drive gate. The masonry wall panels and gate is to be a Superior Concrete Inc. system.
5. The Phase I grounding system must be isolated from the existing site grounding to secure a safe construction site.
6. The existing substation southern fence, with some modifications, will act as an isolation barrier between the energized existing substation and Phase I construction site.
7. Once Phase I construction is complete, tested, and ready for service, feeder loads will be transferred from the existing substation to the Phase I facilities by the OWNER.
8. The existing substation site infrastructure, foundations, and all below-grade facilities will be removed prior to the Phase II construction. The removed materials are to be transferred to locations as noted on the drawing and coordinated with the OWNER.
9. The Phase II construction will include site development and the installation of a perimeter masonry wall panel system that will include a driveway with a swing gate and a walk gate. The masonry wall panels and gates are to be a Superior Concrete Inc. system
10. The existing substation southern fence will be removed, and a temporary isolation/security fence will be installed during construction of Phase II.
11. During Phase II construction, its grounding system must be isolated from the Phase I grounding to secure a safe construction site.
12. Once Phase II construction is complete, the isolation fencing is to be removed and the Phase I - Phase II ground systems interconnected with the use of precautionary temporary grounds in accordance with IEEE Std 1246.

13. Once Phase II construction is complete, tested, and ready for service feeder loads will be transferred from the Phase I facility as desired by the OWNER.
  14. During the site development, a storm drainage system will be installed that will drain off-site.
  15. During the site development and transformer foundation construction, the oil containment system water accumulation will drain off-site.
  16. The transformer foundations will include UFER grounding.
  17. The control building foundations will include UFER grounding.
  18. The transformer foundations are to be constructed to include SPI oil stop valves, and SPI quenching grating and frame support systems.
  19. Due to high fault current conditions, the finish grade surfacing gravel material must have a minimum 6,500 ohm-m resistivity and a preferred 8,000 ohm-m resistivity.
  20. Due to high fault current conditions, an asphalt pad will be installed around the masonry wall outside perimeter and at the driveway apron area.
  21. The contractor is responsible for procuring and installing the non-segregated LV bus systems between the transformers and control buildings. The bus systems shall interconnect with throat fittings at each termination end.
  22. The contractor is responsible for procuring and installing LV bus supports that meet the non-segregated LV bus height and anchoring requirements.
  23. The finished facility will have the ability to be served from transmission sources as follows:
    - a. From two independent transmission sources, one source to serve Phase I and another source to serve Phase II.
    - b. From either transmission source serving both Phase I and Phase II.
    - c. From either one source, with one transformer out of service, serving through the operable transformer and control building on to the other control building.
- C. Solid Rock Excavation. The Contractor is requested to provide a unit cost to excavate solid rock. Although no solid rock excavation is expected, if encountered, this work will be awarded at the OWNER's discretion.

## **PART 2      SEQUENCE OF OPERATIONS**

### **2.1      SCHEDULING**

- A. Plan the work and carry it out with minimum interference to the work of other Contractors in the area.

## **2.2 COORDINATION**

- A. CONTRACTOR's shall cooperate in the coordination of their separate activities in a manner that will provide the least interference with any other Contractors' work in the area (if applicable), and in the interfacing and connection of the separate elements of the overall project work.
- B. If any difficulty or dispute should arise in the accomplishment of the above, the problem shall be brought immediately to the attention of the OWNER's representative for resolution.

## **2.3 CONSTRUCTION PROGRESS**

- A. The work shall proceed in a systematic manner so that a minimum of inconvenience will result to others in the course of construction.

## **2.4 MATERIAL TO BE FURNISHED BY THE OWNER**

- A. The CONTRACTOR shall receive, unload, inspect, and properly protect the OWNER-furnished material at the jobsite. Material found damaged or unsuitable for use shall be immediately reported to the OWNER's representative.
- B. OWNER-furnished material that is damaged by the CONTRACTOR's operations shall be promptly replaced, or, if approved by the OWNER's representative, satisfactorily repaired.
- C. Payment for handling, installing, adjusting, and connecting OWNER furnished material shall be included in the Contractor's Proposal and included in the Contractor's applicable unit prices for installing the material.
- D. At the time of request for this Invitation to Bid there are no intended OWNER furnished materials to be issued to the CONTRACTOR.

## **2.5 PROJECT COORDINATION**

- A. Once a month, CONTRACTOR shall prepare a one-page brief including, but not limited to, work completed, work in progress, work to be done, changes in schedule, and estimated completion date.
- B. Once a week, CONTRACTOR and OWNER's representative shall meet to discuss work in progress and schedules for the upcoming weeks. Meetings will be informal in nature. Meetings are meant to ensure coordination between all parties involved is maintained and shall be the responsibility of Contractor to schedule and take meeting minutes.

## **PART 3 SITE CONDITIONS**

### **3.1 SITE INVESTIGATION AND REPRESENTATION**

- A. The CONTRACTOR acknowledges the nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, access to the site, disposal, handling and storage of materials, availability of labor, water, electric power, fill materials, roads, and uncertainties of weather, water levels, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this Contract.
- B. The CONTRACTOR further acknowledges the character, quality, and quantity of surface and subsurface materials to be encountered from his inspection of the site and from reviewing any available records of exploratory work furnished by the OWNER or included in these Documents. Failure by the CONTRACTOR to acquaint himself/herself with the physical conditions of the site and all the available information will not relieve him/her from responsibility for properly estimating the difficulty or cost of successfully performing the work.
- C. The CONTRACTOR warrants that as a result of the examination and investigation of all the aforesaid data, the CONTRACTOR can perform the work in a good and workmanlike manner and to the satisfaction of the OWNER's representative. The OWNER's representative assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefore is assumed by the OWNER.

### **3.2 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE**

- A. Where the CONTRACTOR's operations could cause damage or inconvenience to telephone, television, power, oil, gas, water, sewer, storm drains, or other systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the CONTRACTOR.
- B. Notify all utility offices which are affected by the construction operation at least 48 hours in advance. Under no circumstances expose any underground utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for all existing underground utilities.
- C. The CONTRACTOR shall be solely and directly responsible to the OWNER, the OWNER's representative, and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.
- D. Neither the OWNER, the OWNER's representative, nor their officers or agents shall be responsible to the CONTRACTOR for damages as a result of the



location of underground utilities being other than that shown on the Drawings, for the existence of underground utilities not shown on the Drawings, or the CONTRACTOR's failure to protect utilities encountered in the work.

- E. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any utility service be allowed to exist outside working hours unless prior approval is granted.
- F. The CONTRACTOR shall replace, at his own expense, any and all existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract Documents or ordered by the OWNER's representative.
- G. The CONTRACTOR shall be responsible for obtaining all necessary permits and licensing to perform the work unless such work is to be performed by the OWNER, or the OWNER's representative and stated so herein.

### **3.3 INTERFERING FACILITIES**

- A. Take necessary precautions to prevent damage to existing facilities or structures whether on the surface, aboveground, or underground. An attempt has been made to show major facilities and structures on the Drawings. While the information has been compiled from the best available sources, its completeness and accuracy cannot be guaranteed, and it is presented simply as a guide to possible difficulties.
- B. Where existing buildings, poles, or any other structure must be removed in order to properly carry out the construction, or are damaged during construction, restore to their original condition to the satisfaction of the property OWNER involved at the CONTRACTOR's own expense. Notify the OWNER's representative of any damaged facility and of any damaged underground structure and make repairs or replacements before backfilling.

## **PART 4 TEMPORARY CONSTRUCTION UTILITIES AND FACILITIES**

### **4.1 TEMPORARY WATER**

- A. The CONTRACTOR shall make his own arrangement to obtain suitable water and shall pay all costs.

### **4.2 TEMPORARY ELECTRIC POWER**

- A. Subject to the OWNER's or OWNER's representative approval, temporary electric power for use during construction may be obtained from OWNER's electric system where adequate facilities, capacity, and switching are available, and where the normal operation of any of the OWNER's or OWNER's representative facilities will not be adversely affected. In such case, the CONTRACTOR shall make arrangements for obtaining a separate electric

power service and pay all costs for the electric power used during the construction.

#### **4.3 SAFETY REQUIREMENTS FOR TEMPORARY ELECTRIC POWER**

- A. Temporary electric power installation shall meet the construction safety requirements of the NESC, OSHA, and state and other governing agencies.

#### **4.4 LAYOUT OF TEMPORARY FACILITIES**

- A. Before starting the work, the CONTRACTOR shall submit to the OWNER's representative his requirements for space for temporary structures and storage of materials. Where onsite space for temporary facilities is limited, the allocation of the available space will be made by the OWNER. Should the CONTRACTOR require space in addition to that allocated, the CONTRACTOR shall make his own arrangements for storage of materials and equipment in locations off the construction site. For the allocated space, the CONTRACTOR shall submit to the OWNER's representative for approval his proposed plan and layout for all temporary offices, sanitary facilities, temporary construction roads, storage buildings, storage yards, temporary water service and distribution, and temporary power service and distribution.

#### **4.5 STORAGE BUILDINGS**

- A. The CONTRACTOR shall provide as-approved, temporary storage facilities required for the protection of mechanical and electrical equipment and materials as recommended by manufacturers of such equipment and materials. The facilities shall be provided with such environmental control systems that meet recommendations of manufacturers of all equipment and materials stored in the buildings. The facilities shall be of sufficient size and so arranged or partitioned to provide security for their contents and provide ready access for inspection and inventory. At or near the completion of the work, and as directed by the OWNER's representative, the temporary storage facilities shall be dismantled, removed from the site, and remain the property of the CONTRACTOR.
- B. Combustible materials (paints, solvents, fuels, etc.) shall be stored in a well-ventilated facility removed from other facilities. All storage shall comply with NFPA and applicable state and local requirements.

#### **4.6 STORAGE YARDS**

- A. The CONTRACTOR shall construct temporary storage yards for the storage of materials that are not subject to damage by weather conditions. Materials shall be stored on pallets or racks, off the ground, and stored in a manner to allow ready access for inspection and inventory. Temporary gravel surfacing of a storage yard at the site shall meet with the approval of the OWNER.

#### **4.7 STORAGE OF MATERIALS**

- A. Materials shall be so stored as to ensure the preservation of their quality and fitness for the work. All items, as a minimum shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground. Materials subject to vandalism shall be placed under locked cover. Stored materials shall be

located so as to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the property OWNER or lessee.

#### **4.8 CONTRACTOR'S WORK AREA**

- A. The CONTRACTOR shall limit his operations and storage of equipment and materials to the areas designated and as directed by the OWNER's representative.
- B. Provide parking facilities for personnel working on the project.

### **PART 5 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

#### **5.1 MOVE IN AND SITE PREPARATION**

- A. Set up construction facilities in a neat and orderly manner within designated areas at locations of choice as approved. Accomplish all required work in accordance with applicable portions of these Specifications or as approved. Confine operations to work areas described or as approved.

#### **5.2 LAYING OUT THE WORK**

- A. Where construction requires the establishment of elevations, the CONTRACTOR shall:
  - 1. Establish grades and set batter boards and reference points as required.
  - 2. Have available on the job, as required, an accurate instrument for checking lines, grades, and elevations.
  - 3. Establish all lines and elevations from the benchmarks indicated or furnished by the ENGINEER or OWNER.
  - 4. Maintain and protect the batter boards until all related work is complete and approved.

### **PART 6 PUBLIC SAFETY AND CONVENIENCE**

#### **6.1 ACCESS BY FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS**

- A. Authorized representatives of the United States Environmental Protection Agency, the State Department of Transportation, State Board of Health, and other government officials shall at all times have safe access to the work wherever it is in preparation of progress, and the CONTRACTOR shall provide proper facilities for such access and inspection.

#### **6.2 TRAFFIC MAINTENANCE AND SAFETY**

- A. The CONTRACTOR shall comply with all applicable sections of the State Department of Transportation, Utility Accommodation Guide, latest edition, and the department's Manual on Traffic Control and Safe Practices. The CONTRACTOR shall comply with all other rules and regulations of the city, state, federal, and county authorities regarding closing or restricting the use of

public streets or highways. No public or private road shall be closed, except by express permission of the OWNER. Conduct the work so as to assure the least possible obstruction to traffic and normal commercial pursuits. Protect all obstructions within traveled roadways by installing approved signs, barricades, and lights where necessary for the safety of the public. The convenience of the general public and residents adjacent to the project, and the protection of persons and property are of prime importance and shall be provided for in an adequate and satisfactory manner.

### **6.3 PROTECTION OF PROPERTY**

- A. Protect stored materials, trees, landscaping, and other items located adjacent to the proposed work. Notify the OWNER at least 48 hours in advance of the time construction begins, allowing the OWNER adequate time to inform property owners affected by the construction. During construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property.

### **6.4 FIRE PREVENTION AND PROTECTION**

- A. The CONTRACTOR shall perform all work in a fire safe manner. He shall supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. The CONTRACTOR shall comply with applicable federal, local, and state fire prevention regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations, (NFPA No. 241) shall be followed.

### **6.5 PROTECTION OF THE ENVIRONMENT**

- A. The CONTRACTOR shall maintain all work areas within and outside the project boundaries free from environmental pollution which would be in violation to any federal, state, or local regulations.
- B. Contamination Precautions:
  - 1. Prevent contamination of the project area. Do not dump waste oil, rubbish, or other similar materials on the ground. Use caution to prevent stream or groundwater contamination. Do not deposit materials of any type in any stream. Upon completion of the project, remove the construction facilities, complete, and clean up the construction area to the satisfaction of the OWNER.
- C. Protection of Waterways:
  - 1. The CONTRACTOR shall observe the rules and regulations of the State of Oregon and agencies of the United States Government prohibiting the pollution of stream or river waters by the dumping of any refuse, rubbish, or debris therein.
- D. Protection of Air Quality:

1. Air pollution due to construction operations shall be minimized by wetting down bare soils during windy periods, the use of properly operating combustion emission control devices on construction vehicles and equipment used by CONTRACTORS, and by shutting down motorized equipment not actually in use.
  2. Trash burning will not be permitted on the construction site.
  3. If temporary heating devices are necessary for protection of the work, such devices shall be of an approved type that will not cause pollution of the air.
- E. Construction Noise Control:
1. The CONTRACTOR shall conduct his work, use appropriate construction methods and equipment, and furnish and install acoustical barriers, as necessary so that no noise emanating from the process or any related tool or equipment will exceed legal noise levels.
- F. Nighttime Work:
1. If the CONTRACTOR desires to perform any work between the hours of 8 p.m. and 7 a.m., CONTRACTOR shall obtain all necessary permits from the appropriate agencies and make all necessary arrangements through the OWNER prior to commencing.

## **PART 7 PRESERVATION, RESTORATION, AND CLEANUP**

### **7.1 SITE RESTORATION AND CLEANUP**

- A. At all times during the work, keep the premises clean and orderly, and upon completion of the work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.
- B. Stockpile excavated materials (if applicable) in a manner that will cause the least damage to adjacent lawns, grassed areas, gardens, shrubbery, or fences, regardless of whether these are on private property, or on city, state, or county rights-of-way. Remove all excavated materials from grassed and planted areas, and leave these surfaces in a condition equivalent to their original condition. Replace top soiled areas, raked and graded to conform to their original contours, unless noted otherwise on the Drawings.
- C. All existing drainage ditches and culverts shall be reopened and graded and natural drainage restored. Restore culverts broken or damaged to their original condition and location.
- D. Upon completion of constructing operations, hand rake and drag all former grassed and planted areas, leaving all disturbed areas free from rocks, gravel, clay, or any other foreign material. The finished surface shall conform to the original surface, and shall be free-draining and free from holes, ruts, rough spots, or other surface features detrimental to a seeded area, unless noted otherwise on the Drawings.

- E. The CONTRACTOR shall restore and replace damaged or destroyed vegetation in a manner suitable to the OWNER and in accordance with these Contract Documents and the Landscape Plan. All surface restoration shall be the responsibility of the CONTRACTOR.

## **7.2 FINISHING OF SITE, BORROW, AND STORAGE AREAS**

- A. Upon completion of the project, all areas used by the CONTRACTOR shall be properly cleared of all temporary facilities, structures, rubbish, and waste materials and properly graded to drain and blend in with the adjacent land. Areas used for the deposit of waste materials shall be finished to properly drain and blend with the surrounding terrain.

## **7.3 CLEANING DURING CONSTRUCTION**

- A. Thoroughly clean all spilled soil, gravel, or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's construction.
- B. During execution of work, clean site and public properties and dispose of waste materials, debris, and rubbish to assure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish at the conclusion of each day's operation.
- C. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- D. Provide approved containers for collection and disposal of waste materials, debris, and rubbish.
- E. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from exposed and semi-exposed surfaces.
- F. Repair, patch, and touch up marred surfaces to specified finish to match adjacent surfaces.

## **7.4 DUST PREVENTION**

- A. If required by the OWNER, give all unpaved streets, roads, detours, or haul roads used in the construction area an approved dust preventive treatment or periodically water to prevent dust. Applicable environmental regulations for dust prevention shall be strictly enforced.

## **7.5 FINAL CLEANING**

- A. At the completion of work and immediately prior to final inspection, cleaning of the entire project will be accomplished according to the following provisions:
  - 1. The CONTRACTOR for general construction work shall thoroughly clean, sweep, wash, and polish all work and equipment provided under his Contract, including finishes. The cleaning shall leave the structures and site in a complete and finished condition to the satisfaction of the OWNER.

2. All other CONTRACTORS working shall similarly perform, at the same time, an equivalent thorough cleaning of all work and equipment provided under their Contracts.
  3. Should any CONTRACTOR not remove rubbish or debris or not clean the site as specified above, the OWNER reserves the right to have the cleaning done at the expense of the offending CONTRACTOR.
  4. In the event that the responsibility for not cleaning any part of the work cannot be accurately determined, the OWNER reserves the right to have the cleaning done at the expense of all CONTRACTORS who have worked in the area.
- B. Employ experienced workers, or professional cleaners, for final cleaning.
  - C. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.
  - D. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces so designated to shine finish.
  - E. Repair, patch, and touch up marred surfaces to specified finish, to match adjacent surfaces.
  - F. Broom clean paved surfaces; rake clean other surfaces of grounds.
  - G. Remove from the OWNER's property all temporary structures and all materials, equipment, and appurtenances not required as a part of, or appurtenant to, the completed work.
  - H. The OWNER will assume responsibility for cleaning as of the date of Substantial Completion of the project or portions thereof.

## **PART 8 SUBMITTALS DURING CONSTRUCTION**

### **8.1 GENERAL**

- A. The following requirements are in addition to any specific requirements for submittals specified in other sections of these Contract Documents. Submittals to the OWNER's representative shall be addressed to:

Attention: Steven Horzynek  
Northern Wasco County People's Utility District  
2345 River Road  
The Dalles, Oregon 97058  
Email: [steven-horzynek@nwascopud.org](mailto:steven-horzynek@nwascopud.org)  
Phone: 541-506-3806
- B. Submitted data shall be fully sufficient in detail for determination of compliance with the Contract Documents.

- C. Approval of substitutions, schedules, lists of materials, and procedures submitted or requested by the CONTRACTOR shall not add to the Contract amount, and any additional costs that may result therefrom shall be solely the obligation of the CONTRACTOR.
- D. It shall not be the responsibility of the OWNER or OWNER's representative to provide engineering or other services to protect the CONTRACTOR from additional costs accruing from such approvals.
- E. The OWNER and the OWNER's representative are not precluded, by virtue of review, acceptance, or approval, from obtaining a credit for construction savings resulting from allowed concessions in the work or materials therefore.
- F. No equipment or material for which listings, drawings, or descriptive material is required shall be installed until the OWNER's representative has on hand copies of such approved lists and the appropriately stamped final shop drawings.
- G. The review of drawings by the OWNER's representative will be limited to general design requirements only, and shall in no way relieve the CONTRACTOR from responsibility for errors or omissions contained therein.
- H. Submittals will be acted upon by the OWNER's representative as promptly as possible, and returned to the CONTRACTOR not later than the time allowed for review in Paragraph SHOP DRAWING SUBMITTAL PROCEDURE. Delays caused by the need for resubmittals shall not constitute reason for an extension of Contract time.

## **8.2 SHOP DRAWING SUBMITTAL PROCEDURE**

- A. The CONTRACTOR shall submit to the OWNER's representative for his review four copies of shop drawings and/or catalog cuts or catalog numbers for all fabricated and manufactured items for the construction. Shop drawings shall be submitted in sufficient time to allow the OWNER's representative not less than 10 regular working days for examining the shop drawings.
- B. These shop drawings shall be accurate, distinct, and complete, and shall contain all required information, including satisfactory identification of items, units, and assemblies in relation to the Contract Drawings and Specifications.
- C. Unless otherwise approved by the OWNER's representative, shop drawings shall be submitted only by the CONTRACTOR, who shall indicate by a signed stamp on the shop drawings, or other approved means, that he (the CONTRACTOR) has checked and approved the shop drawings, and that the work shown is in accordance with Contract requirements and has been checked for dimensions and relationship with work of all other trades involved. The practice of submitting incomplete or unchecked shop drawings for the OWNER's representative to correct or finish will not be acceptable, and shop drawings which, in the opinion of the OWNER's representative, clearly indicate that they have not been checked by the CONTRACTOR will be



considered as not complying with the intent of the Contract Documents and will be returned to the CONTRACTOR for resubmission in the proper form.

- D. When the shop drawings have been reviewed by the OWNER's representative, one set of submittals will be returned to the CONTRACTOR appropriately stamped. If major changes or corrections are necessary, the shop drawing may be rejected and one set will be returned to the CONTRACTOR with such changes or corrections indicated, and the CONTRACTOR shall correct and resubmit the shop drawings in the same manner and quantity as specified for the original submittal, unless otherwise directed by the OWNER's representative. If changes are made by the CONTRACTOR (in addition to those requested by the OWNER's representative) on the resubmitted shop drawings, such changes shall be clearly explained in a transmittal letter accompanying the resubmitted shop drawings.
- E. The review of such shop drawings, catalog cuts, and catalog numbers by the OWNER's representative shall not relieve the CONTRACTOR from responsibility for correctness of dimensions, fabrication details, and space requirements, or for deviations from the Contract Drawings or Specifications, unless the CONTRACTOR has called attention to such deviations in writing by a letter accompanying the shop drawings and the OWNER's representative approves the change or deviation in writing at the time of submission; nor shall review by the OWNER's representative relieve the CONTRACTOR from the responsibility for errors in the shop drawings. When the CONTRACTOR does call such deviations to the attention of the OWNER's representative, the CONTRACTOR shall state in his letter whether or not such deviations involve any deduction or extra cost adjustment.
- F. The CONTRACTOR agrees that shop drawing submittals processed by the OWNER's representative do not become Contract Documents and are not Change Orders; that the purpose of the shop drawing review is to establish a reporting procedure and is intended for the CONTRACTOR's convenience in organizing his work and to permit the OWNER's representative to monitor the CONTRACTOR's progress and understanding of the design.

### **8.3 SHOP DRAWING CATEGORIES**

- A. The shop drawings shall be divided into three categories for review. The procedure to be used shall be as follows:
  - 1. Class A: Items that are completely identical to the specified item and can be completely described by name, manufacturer, and specific model number may be submitted as a letter submittal. The letter submittal will identify the item manufacturer, model number, specification number, and specification page number. The submittal number must be the same item as specified. Items not submitted per specifications shall be submitted per Class C.
  - 2. Class B: Items that are submitted identical to the specifications but cannot be described by model number may be submitted by letter submittal with a catalog cut showing any deviations or additional

information required by the specification. Items not submitted per specifications shall be submitted per Class C.

3. Class C: Items requiring full detailed shop drawings whether specified or substituted. Generally, all major equipment, submittals, and unspecified items are included in this category.

#### **8.4 RECORD DRAWINGS**

- A. The OWNER's representative will prepare a set of Record Drawings for the project that will include the changes made in materials, equipment, locations, and dimensions of the work. Each month, or as otherwise agreed, the CONTRACTOR shall submit to the OWNER's representative a current listing and description of each change incorporated into the work since the preceding submittal.

### **PART 9 MATERIAL AND EQUIPMENT**

#### **9.1 MATERIALS**

- A. The CONTRACTOR shall furnish and install all materials not provided by the OWNER.
- B. In many cases, material items are specified on the Drawings, with specific manufacturer and catalog numbers. Where material is so specified, and not furnished by the OWNER, the CONTRACTOR shall furnish the material item as specified, or an equivalent as approved by the OWNER's representative.
- C. All incidental materials, fasteners, bolts, connections, and other items which are not shown on the Drawings and Construction Details, and which are necessary to complete the work as specified herein, shall be furnished and installed by the CONTRACTOR as though such materials, connections, and other items were shown on the Drawings.
- D. Manufacturer, type, and catalog number specify the type and quality of equipment and material to be installed. Products by other manufacturers of equivalent quality and characteristics are acceptable, if approved, in writing, by the OWNER's representative.
- E. All materials shall be new and suitable for the intended purpose. Catalog numbers or shop drawings of all items of material shall be submitted to the OWNER's representative for approval, prior to placement of material orders by the CONTRACTOR.

#### **9.2 DELIVERY OF OWNER-FURNISHED MATERIALS**

- A. CONTRACTOR shall take delivery of the OWNER-furnished material listed in the Proposal.

#### **9.3 CONSTRUCTION COMPLETION**

- A. Upon completion of construction and cleanup the CONTRACTOR shall provide written notice to the OWNER's representative in accordance with

applicable sections of these Contract Document specifications and the General Conditions of the Contract.

**END OF SECTION**

## **SECTION 01 42 13 ABBREVIATIONS**

### **PART 1 GENERAL**

#### **1.1 REFERENCES TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES**

- A. Reference to standards and specifications of technical societies and reporting and resolving discrepancies associated therewith shall be as provided in paragraph 3.03 of the General Conditions, and as may otherwise be required herein and in the individual Specification sections.
- B. Work specified by reference to the published standard or specification of a government agency, technical association, trade association, professional society or institute, testing agency, or other organization shall meet the requirements or surpass the minimum standards of quality for materials and workmanship established by the designated standard or specification.
- C. Where so specified, products or workmanship shall also meet or exceed the additional prescriptive or performance requirements included within the Contract Documents to establish a higher or more stringent standard of quality than that required by the referenced standard.
- D. Where two or more standards are specified to establish quality, the product and workmanship shall meet or exceed the requirements of the most stringent.
- E. Where both a standard and a brand name are specified for a product in the Contract Documents, the proprietary product named shall meet or exceed the requirements of the specified reference standard.
- F. Copies of standards and specifications of technical societies
  - 1. Copies of applicable referenced standards have not been bound in these Contract Documents.
  - 2. Where copies of standards are needed by the CONTRACTOR, obtain a copy or copies directly from the publication source and maintain in an orderly manner at the site as Work site records, available to the CONTRACTOR's personnel, Subcontractors, OWNER's Representative , and ENGINEER.

#### **1.2 ABBREVIATIONS**

- A. Abbreviations for trade organizations and government agencies: Following is a list of construction industry organizations and government agencies to which references may be made in the Contract Documents, with abbreviations used.
  - 1. AA Aluminum Association
  - 2. AABC Associated Air Balance Council
  - 3. AAMA American Architectural Manufacturers Association

4. AASHTO American Association of State Highway and Transportation Officials
5. ACI American Concrete Institute
6. AFBMA Anti Friction Bearing Manufacturers' Association
7. AGA American Gas Association
8. AGMA American Gear Manufacturers' Association
9. AI Asphalt Institute
10. AISC American Institute of Steel Construction
11. AISI American Iron and Steel Institute
12. AITC American Institute of Timber Construction
13. ALS American Lumber Standards
14. AMA Acoustical Materials Association
15. AMCA Air Movement and Control Association
16. ANSI American National Standards Institute
17. APA American Plywood Association
18. API American Petroleum Institute
19. APWA American Public Works Association
20. AREA American Railway Engineering Association
21. ARI Air Conditioning and Refrigeration Institute
22. ASA American Standards Association
23. ASAE American Society of Agricultural Engineers
24. ASCE American Society of Civil Engineers
25. ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.
26. ASNT American Society for Nondestructive Testing
27. ASME American Society of Mechanical Engineers
28. ASTM American Society for Testing and Materials
29. AWI Architectural Wood Work Institute
30. AWPAA American Wood Preservers' Association
31. AWPB American Wood Preservers Bureau
32. AWPI American Wood Preservers' Institute
33. AWS American Welding Society

34. AWWA American Water Works Association
35. BHMA Builders Hardware Manufacturers' Association
36. CBMA Certified Ballast Manufacturers' Association
1. CDA Copper Development Association
2. CGA Compressed Gas Association
3. CIPRI Cast Iron Pipe Research Institute
4. CISPI Cast Iron Soil Pipe Institute
5. CMAA Crane Manufacturers' Association of America
6. CRSI Concrete Reinforcing Steel Institute
7. CS Commercial Standard
8. CSA Canadian Standards Association
9. CSI Construction Specifications Institute
10. CTSS Caltrans Standard Specification
11. EJCDC Engineers Joint Contract Documents' Committee
12. ETL Engineering Test Laboratories
13. FCC Federal Communications Commission
14. FEMA Federal Emergency Management Agency
15. FGMA Flat Glass Marketing Association
16. FM Factory Mutual
17. Fed. Spec. Federal Specifications
18. FS Federal Specification
19. GA Gypsum Association
20. HI Hydraulic Institute
21. HMI Hoist Manufacturers' Institute
22. ICBO International Conference of Building Officials
23. ICEA Insulated Cable Engineers' Association
24. IEEE Institute of Electrical and Electronics Engineers, Inc.
25. IES Illuminating Engineering Society
26. IFI Industrial Fasteners Institute
27. ISA Instrument Society of America
28. ISO Insurance Service Office

- 29. JIC     Joint Industry Conferences of Hydraulic Manufacturers
- 30. MIA     Marble Institute of America
- 31. Mil. Sp. Military Specification or MIL
- 32. MS     Military Specifications
- 33. MMA     Monorail Manufacturers' Association
- 34. NAAMM     National Association of Architectural Metal Manufacturers
- 35. NACE     National Association of Corrosion Engineers
- 36. NBHA     National Builders' Hardware Association
- 37. NEC     National Electrical Code
- 38. NECA     National Electrical Contractor's Association
- 39. NEMA     National Electrical Manufacturers' Association
- 40. NESC     National Electric Safety Code
- 41. NFPA     National Fire Protection Association
- 42. NHLA     National Hardwood Lumber Association
- 43. NHPMA     Northern Hardwood and Pine Manufacturer's Association
- 44. NLMA     National Lumber Manufacturers' Association
- 45. NRCA     National Roofing Contractors Association
- 46. NSF     National Sanitation Foundation Testing Laboratory
- 47. NSPE     National Society of Professional Engineers
- 48. NTMA     National Terrazzo and Mosaic Association
- 49. NWWDA     National Wood Window and Door Association
- 50. OECI     Overhead Electrical Crane Institute
- 51. OSHA     Occupational Safety and Health Act (both Federal and State)
- 52. PCI     Prestressed Concrete Institute
- 53. PEI     Porcelain Enamel Institute
- 54. PPI     Plastic Pipe Institute
- 55. PS     Product Standards Section U.S. Department of Commerce
- 56. RMA     Rubber Manufacturers' Association
- 57. SAE     Society of Automotive Engineers
- 58. SCPRF     Structural Clay Products Research Foundation
- 59. SDI     Steel Deck Institute

- 60. SDI     Steel Door Institute
- 61. SIGMA Sealed Insulating Glass Manufacturing Association
- 62. SJI     Steel Joist Institute
- 63. SMACNA     Sheet Metal and Air Conditioning Contractors National Association
- 64. SPI     Society of the Plastics Industry
- 65. SSPC     Steel Structures Painting Council
- 66. SWI     Steel Window Institute
- 67. TEMA     Tubular Exchanger Manufacturers' Association
- 68. TCA     Tile Council of America
- 69. UBC     Uniform Building Code
- 70. UFC     Uniform Fire Code
- 71. UL     Underwriters Laboratories Inc.
- 72. UMC     Uniform Mechanical Code
- 73. US     U.S. Bureau of Standards
- 74. USBR     U.S. Bureau of Reclamation
- 75. WCLIB     West Coast Lumber Inspection Bureau
- 76. WWPA     Western Wood Products Association

**END OF SECTION**



**SECTION 01 77 00  
CONTRACT CLOSEOUT**

**PART 1      GENERAL**

**1.1      SCOPE**

- A.    This section outlines the procedure to be followed in closing out the Contract.

**PART 2      SUBSTANTIAL COMPLETION**

**2.1      GENERAL**

- A.    The substantial completion date shall be established as stated in the General Conditions.

**PART 3      FINAL INSPECTION**

**3.1      GENERAL**

- A.    After final cleaning and upon written notice from the CONTRACTOR that the work is completed, the OWNER's representative will make a preliminary inspection with the CONTRACTOR present. Upon completion of this preliminary inspection, the OWNER's representative will notify the CONTRACTOR, in writing, of any particulars in which this inspection reveals that the work is defective or incomplete.
- B.    Upon receiving written notice from the OWNER's representative, the CONTRACTOR shall immediately undertake the work required to remedy defects and complete the work to the satisfaction of the OWNER's representative.
- C.    When the CONTRACTOR has corrected or completed the items as listed in the OWNER's representative's written notice, he shall inform the OWNER's representative, in writing, that the required work has been completed. Upon receipt of this notice, the OWNER's representative, in the presence of the CONTRACTOR, shall make his final inspection of the project.
- D.    Should the OWNER's representative find all work satisfactory at the time of his inspection, the CONTRACTOR will be allowed to make application for final payment in accordance with the provisions of the General Conditions. Should the OWNER's representative still find deficiencies in the work, the OWNER's representative will inform the CONTRACTOR of the deficiencies and will deny the CONTRACTOR's request for final payment until such time as the CONTRACTOR has satisfactorily completed the required work.

**PART 4      FINAL SUBMITTALS**

**4.1      GENERAL**

- A.    No Contract will be finalized until all the following have been submitted:

1. Final shop drawings.
  2. Record drawings.
  3. Interface information.
- B. No Contract will be finalized until all required submittals have been submitted.

## **PART 5 GUARANTEES, BONDS, AND AFFIDAVITS**

### **5.1 GENERAL**

- A. No Contract will be finalized until all guarantees, bonds, certificates, licenses, and affidavits required for work or equipment as specified are satisfactorily filed with the OWNER's representative.

## **PART 6 ACCESSORY ITEMS**

### **6.1 GENERAL**

- A. All CONTRACTORS furnishing and/or installing equipment on this project shall provide to the OWNER's representative, upon acceptance of the equipment, all special accessories required to place each item of equipment in full operation.

## **PART 7 RELEASE OF LIENS OR CLAIMS**

### **7.1 GENERAL**

- A. No Contract will be finalized until satisfactory evidence of release of liens has been submitted to the OWNER's representative as required by the General Conditions.

**END OF SECTION**

**SECTION 01 64 00**  
**INSTALLATION OF OWNER-FURNISHED EQUIPMENT**

**PART 1      GENERAL**

**1.1      WORK OF THIS SECTION**

- A.    Work necessary to install, coordinate functional and performance testing, complete and ready for operation, the OWNER-furnished equipment.

**1.2      CONTRACTOR'S RESPONSIBILITY FOR COMPLETE SYSTEM**

- A.    CONTRACTOR shall have complete responsibility for necessary handling, installing, adjusting, maintaining, lubricating, and coordinating testing and operational startup of OWNER-furnished products. Provide and coordinate the construction of interconnecting structures, equipment, piping, electrical and instrumentation work, and appurtenances to achieve installation and operation of the OWNER-furnished products as shown and specified and as required to provide a complete and functional system.

**1.3      MANUFACTURER'S SERVICES**

- A.    A manufacturer's representative for the OWNER-furnished equipment shall be present at the jobsite and/or classroom designated by the OWNER for installation assistance; inspection and certification of the installation; testing; startup assistance; and training of OWNER's personnel as required to ensure correct installation and operation of the equipment. The CONTRACTOR shall coordinate with the various manufacturer representatives as to when they are required at the jobsite and/or classroom.

**1.4      SEQUENCING AND SCHEDULING**

- A.    CONTRACTOR shall verify availability of OWNER-furnished equipment by contacting the OWNER before making final arrangements for, or committing resources to, the handling, protection, or installation of such products.
- B.    OWNER-furnished equipment in this project includes.
  - 1. Two x 115 kV – 12.47/7.2 kV, 24/32/40 MVA Power Transformers
  - 2. Two x Metalclad Switchgear Buildings, 12.47/7.2 kV, 2000 A
  - 3. Two x Circuit Breakers, 115 kV 1200 A, 40 kAIC

**PART 2      PRODUCTS**

**2.1      GENERAL**

- A.    Furnish and install incidental products required to complete the work under this section, except where specifically specified as "OWNER-furnished." Such products include, but are not limited to, fasteners, fittings, inserts, hangers and

supports, wiring, conduit, finish painting, and expendable materials, all as necessary to provide a complete and properly functioning system.

## **PART 3      PART 3   EXECUTION**

### **3.1      GENERAL**

- A. Installation work shall conform with manufacturer's recommended procedures, instructions, and shop drawings, as accepted by the OWNER.
- B. CONTRACTOR shall transport to the project site, unload, and store two 115 kV circuit breakers.
- C. The Power Transformer and metalclad control building deliveries and placements on the foundation pads are the responsibility of the suppliers.
- D. Transport to its place of installation, inspect, store, handles, and protect OWNER-furnished products.
- E. Maintain complete inventory on all OWNER-furnished products after their transfer to CONTRACTOR.
- F. Install and connect electrical equipment in accordance with Division 26, ELECTRICAL, and with equipment manufacturer's instructions.

### **3.2      INSPECTION PRIOR TO RELOCATION**

- A. Prior to transfer of OWNER-furnished products to the CONTRACTOR, the CONTRACTOR, OWNER's Representative, and the manufacturer's representative shall jointly inspect the condition of each product and shall note, in writing, the condition of the material transferred to the CONTRACTOR's care, noting any defects in the equipment.
  - 1. CONTRACTOR shall record in writing the products transferred to the CONTRACTOR's care.
  - 2. Damage to or loss of equipment and materials shall be immediately reported to the OWNER.

### **3.3      STORAGE AND PROTECTION**

- A. Following transfer of OWNER-furnished products, and until final acceptance of the completed work, CONTRACTOR shall protect and maintain products to prevent damage in accordance with manufacturer's instructions.
- B. Equipment susceptible to damage by the elements shall be placed in an acceptable temporary storage building prior to installation. Replace products that become corroded, damaged, or deteriorated with new precuts prior to installation and acceptance of the work.

- C. Damage to or loss of products after the date of their transfer to CONTRACTOR shall be repaired to original conditions, or replaced with new identical products, as reviewed and accepted by OWNER.

### **3.4 PREINSTALLATION MEETING**

- A. CONTRACTOR shall arrange and attend a preinstallation meeting with the manufacturer(s) representative to review general procedures, erection and installation instructions, and installation sequence.
  - 1. Provide 15 days' advance notice of the proposed date for starting installation.
  - 2. Additional meetings prior to installation may be required, as determined by the OWNER, to transmit manufacturer's installation instructions to the CONTRACTOR.
  - 3. OWNER's representative may attend the meetings.

### **3.5 INSTALLATION, GENERAL**

- A. Provide supervision, labor, tools, construction equipment, incidental materials, and necessary services required to install the OWNER-furnished products.
- B. Excavation, concrete, mechanical, and electrical work shall conform to applicable standards, final stamped and reviewed shop drawings, Specifications, and Drawings included in these Contract Documents.
- C. Installation of equipment shall not begin prior to satisfactory completion of the supporting structures. Support structure columns, beams, or walls shall not be used to move the equipment into position.
- D. Equipment shall be properly aligned, plumb and level, with no stresses on connecting piping or conduit.
- E. Verify direction of motor rotation before starting equipment drives.
- F. Verify operability and safety of electrical system needed to operate the equipment. Check electrical system for continuity, phasing, grounding, and proper functions.

### **3.6 INSTALLATION OF 24/32/40 MVA POWER TRANSFORMER**

- A. The power transformer shall be unloaded, assembled, and installed on the foundation location as shown, by the power transformer manufacturer's representative.
- B. The power transformer manufacturer's representative shall perform all receiving inspection procedures, testing, reporting, and all installation preparation, accessory attachments, and pre-operational testing in accordance with the power transformer manufacturer's instructions, and as noted in the Operation and Instruction Manual.

- C. The CONTRACTOR shall cooperate and coordinate activities as necessary to assist during the transformer installation.
- D. The CONTRACTOR shall supply and install all cable and miscellaneous materials necessary to make control and station service connections to the power transformer, make all high voltage bus connections, and grounding connections required for power transformer operation.
- E. The CONTRACTOR shall provide and install non-segregated bus, and coordinate and install all terminal connections and secondary connections.

### **3.7 INSTALLATION OF 115 KV CIRCUIT BREAKERS**

- A. The circuit breakers shall be transported by the CONTRACTOR from the OWNER's warehouse or storage yard to the project site, unloaded, assembled as necessary, and installed on the foundation location as shown. This work shall be performed under the supervision of the circuit breaker manufacturer's representative, unless impractical.
- B. Supply and install all cable and miscellaneous materials necessary to make control and station service connections to the circuit breaker and make all high voltage bus connections and grounding connections required for the circuit breaker operation.
- C. Perform all receiving procedures, testing, reporting, and all installation preparation, accessory attachments, and pre-operational testing in accordance with the circuit breaker manufacturer's instructions, and as noted in the Operation and Instruction Manual.

### **3.8 INSTALLATION OF METALCLAD CONTROL BUILDINGS**

- A. The control buildings shall be unloaded and installed on the foundation location as shown, by the control building manufacturer's representative.
- B. The control building manufacturer's representative shall perform all receiving inspection procedures, testing, reporting, and all installation preparation, accessory attachments, and pre-operational testing in accordance with the control building manufacturer's instructions, and as noted in the Operation and Instruction Manual.
- C. The CONTRACTOR shall cooperate and coordinate activities as necessary to assist during the control building installation.
- D. The CONTRACTOR shall supply and install all external cable and miscellaneous materials necessary to make control and station service connections to the control buildings and field equipment.

### **3.9 PAINTING**

- A. Protect equipment to minimize damage to the finished painted surfaces.

- B. Repair damage to painted surfaces to the satisfaction of the OWNER.

### **3.10 MAINTENANCE**

- A. Follow manufacturer's instructions for maintenance during storage, after installation but prior to testing and startup, and after startup but prior to OWNER's acceptance.
- B. Notify OWNER immediately in the event that manufacturer's spare parts and maintenance materials are not available.
- C. Furnish incidental maintenance, labor, and supplies including lubricants, cleaning fluids, nuts and bolts, and similar products not furnished by manufacturer, as needed for maintaining the OWNER-furnished products.

### **3.11 FIELD TESTING**

- A. In accordance with Section 26 01 26, ELECTRICAL TESTING.

**END OF SECTION**

**SECTION 03 30 00  
REINFORCED CONCRETE**

**PART 1      GENERAL**

**1.1      WORK INCLUDED**

- A.    This section covers the work necessary for the reinforced concrete, complete.

**PART 2      PRODUCTS**

**2.1      CONCRETE**

- A.    All concrete supply shall conform to the American Concrete Institute Standard Specifications for Concrete, ACI 301, and the building code requirements for reinforced concrete, ACI 318, current editions.
- B.    Concrete shall be ready-mixed conforming to ASTM C94, Alternate 3, and these Specifications. Portland cement shall be Type I or Type II. The use of non-agitating equipment will not be allowed.
- C.    Concrete shall be agitated by at least 70 revolutions of the mixing drum but not by more than 270 revolutions. Concrete shall be placed within 1 1/2 hours after the cement has been added to the mix. A delivery ticket shall be furnished to the OWNER with the following information:
1. Name of concrete firm.
  2. Serial number of tickets.
  3. Date.
  4. Truck number.
  5. Specific class of concrete.
  6. Amount of concrete.
  7. Time loaded.
  8. Water added.
  9. Time unloaded.
- D.    Minimum allowable 28 day compressive field strength shall be 4,000 psi when cured and tested in conformance with ASTM C31 and C39. Size of coarse aggregate shall be 1 1/2 inches. Approval of other aggregate gradations must be received in writing before use on the project.
- E.    Minimum cement content (or combined cement plus fly ash content when fly ash used) shall be:
1. 470 pounds per cubic yard for concrete with 1 1/2 inch maximum size aggregate.



2. 494 pounds per cubic yard for 1 inch maximum size aggregate.
  3. 564 pounds per cubic yard for 3/4 inch maximum size aggregate.
  4. Increase cement content as required to meet strength requirements.
- F. Maximum water-cement ratio (or water-cement plus pozzolan ratio, if applicable):
1. Ratio will control total amount of water added to concrete.
  2. Maximum 0.49 by weight.
  3. Water reducer complying with ASTM C494, Type A or Type D shall be added to the mix as required to control the water-cement ratio.
- G. Slump range shall be 2 to 4 inches and the air entrainment between 3 percent and 6 percent by volume. Submit complete data on the concrete mix for approval in conformance with the requirements of ASTM C94, Alternate 3. The CONTRACTOR shall have test cylinders taken and tested by an approved testing laboratory to verify the strength of the concrete. Acceptance and evaluation of the concrete strengths shall be by the OWNER in accordance with ACI 318, current edition.

## **2.2 REINFORCING STEEL**

- A. Deformed bars of sizes shown, conforming to ASTM A615, Grade 60, minimum.
- B. Provide concrete blocks of same strength as the concrete mix to support reinforcing bars. Do not use broken concrete brick or stone.

## **2.3 EXPANSION JOINT FILLER**

- A. ASTM D994, 1/2-inch thick, or as shown.

## **2.4 FORMS**

- A. New plywood for exposed areas, and new shiplap or plywood for unexposed areas. Materials shall produce tight forms and an acceptable finish.

## **2.5 FORM TIES**

- A. Form ties on exposed surfaces shall be located in a uniform pattern or as indicated on the Drawings. Form ties shall be constructed so that the tie remains embedded in the wall, except for a removable portion at each end. Form ties shall have conical or spherical type inserts, inserts shall be fixed so that they remain in contact with forming material, and shall be constructed so that no metal is within 1 inch of the concrete surface when the forms, inserts, and tie ends are removed. Wire ties will not be permitted. Ties shall withstand all pressures and limit deflection of forms to acceptable limits.
- B. Flat bar ties for panel forms shall have plastic or rubber inserts having a minimum depth of 1 inch and sufficient dimensions to permit proper patching of the tie hole.

## **2.6 GROUT**

- A. All grout shall be non-shrink type, mixed according to the manufacturer's instructions with a minimum compressive strength of 5000 psi.

## **PART 3 EXECUTION**

### **3.1 EXCAVATIONS – SPREAD FOOTING TYPE FOUNDATIONS**

- A. Excavation shall be as specified in section EARTHWORK.

### **3.2 FORMS**

- A. Construct forms accurately to dimensions and elevations required and to be strong and unyielding. Construct forms with tight joints to prevent the escape of mortar and to avoid the formation of fins. Brace as required to prevent distortion during concrete placement.

### **3.3 PLACING REINFORCING STEEL – SPREAD FOOTING TYPE FOUNDATIONS**

- A. All concrete installation shall conform to the American Concrete Institute Standard Specifications for Concrete, ACI 301, and the building code requirements for reinforced concrete, ACI 318, current editions.
- B. Place reinforcing steel in conformance with the information on the Drawings and CRSI Recommended Practice for Placing Reinforcing Bars, except as modified herein. Minimum length of splices shall be as herein specified. Top bars shall be defined as any horizontal bar placed such that 12 inches of fresh concrete is cast below in any single pour. Horizontal wall bars are considered top bars. All top bars shall have 54 diameter-lap with minimum of 24 inches. All other bars shall have 42 diameter-lap with minimum of 18 inches. Tie splices with 18-gauge annealed wire as specified in the referenced CRSI standard.

### **3.4 PLACING ANCHOR BOLTS**

- A. Anchor bolts shall be securely held in a rigid template, plumbed, and set with the required thread projection. Concrete shall not be placed until the reinforcing steel, and anchor bolts are inspected and approved by the OWNER.

### **3.5 PLACING CONCRETE – SPREAD FOOTING TYPE FOUNDATIONS**

- A. Prior to placing concrete, remove water from excavation and all debris and foreign material from forms. Check the reinforcing steel for proper placement and correct any discrepancies.
- B. Before depositing new concrete on old concrete, clean surface using a sandblast or bush-hammer or other mechanical means to obtain a 1/4 inch rough profile and pour a cement sand grout to a minimum depth of 1 inch over the surface. Proportions of cement and sand shall be as in the concrete mix.

- C. Place concrete as soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 2 feet deep. The vertical drop to final placement shall not exceed 6 feet. Placement shall conform to the requirements of ACI 318, except as modified herein.
- D. Do not place concrete when the ambient temperature is below 40 degrees F or approaching 40 degrees F and falling, without special protection as approved by the OWNER. Any concrete damaged by freezing shall be removed and replaced at no additional cost to the OWNER.

### **3.6 COMPACTION**

- A. Apply approved vibrator at points spaced not farther apart than vibrator's effective radius. Apply close enough to forms to vibrate surface effectively but not damage form surfaces. Vibrate until concrete becomes uniformly plastic. Vibrator must penetrate the fresh placed concrete and into the previous layer of fresh concrete below.

### **3.7 FINISHING**

- A. Screed surfaces of floor slabs and tops of exposed walls to true level planes. After the initial water has been absorbed, float with wood float and trowel with steel trowel to a smooth finish free from trowel marks.
- B. Do not absorb wet spots with neat cement. Concrete floors shall not vary from level or true plane more than 1/4 inch in 10 feet when measured with a straightedge. Surfaces of concrete slabs which will not be exposed to view in the finished work shall be screeded to a true surface and ball floated with a wood float, and wood trowel to seal surface.

### **3.8 EXTERIOR SLABS AND SIDEWALKS**

- A. Slabs shall be bull floated with a wood float, wood troweled, and lightly troweled with a steel trowel, and finished with a broom to obtain a nonskid surface. All exposed edges shall be finished with a steel edging tool.

### **3.9 REMOVAL OF FORMS**

- A. Remove after concrete has set sufficiently to carry the dead load and construction load it has to sustain and when approved by the OWNER. Remove forms with care to prevent scarring and damaging the surface.

### **3.10 FINISHING FORMED SURFACES**

- A. Areas Not Subject to Water: Cut out all honeycombed and defective areas. Cut edges perpendicular to surface at least 1 inch deep, no feather edge allowed, and patch. Using bonding agent fill holes flush with cement mortar composed of 1 part cement and 2 parts sand. Rub surface with wood float and burlap. Keep patches damp for a minimum of 7 days or spray with curing compound to minimize shrinking. Fill all form tie holes in same manner.
- B. Areas Subject to Water:

1. Cut out all honeycombed and defective areas, cut edges perpendicular to surface at least 1 inch deep, no featheredge allowed soak area to be patched for 24 hours, then allow surface to drain free of standing water, then patch with color matched nonshrink grout:
  - a. Upcon High Flow, the UPCO Co., Cleveland, OH.
  - b. Master Flow 713, the Master Builder Co., Cleveland, OH.
  - c. Crystex, L & M Construction Chemicals, Inc., Omaha, NE.
2. The grout used shall be cured as recommended by grout manufacturer.
3. As soon as forms are removed, remove fins or projections from surface of exposed areas and rub surfaces with wood float or burlap sack to provide a uniform surface texture.

### **3.11 PROTECTION AND CURING**

- A. Protect fresh concrete from direct rays of the sun, dry winds, and wash by rain. Keep concrete slabs continuously wet for a 7 day period. Intermittent wetting is not acceptable. Cure formed surfaces with an approved curing compound applied in conformance with the manufacturer's directions as soon as the forms are removed and finishing completed.

### **3.12 CONCRETE TESTING**

- A. Five representative cylinders of each batch of concrete shall be taken and tested as follows:
  1. 1 at 7 days.
  2. 1 at 14 days.
  3. 2 at 28 days.
  4. 1 spare.
- B. Test cylinders shall be taken at the site of the pour and shall be prepared and cured in a manner similar to the concrete work being done. The CONTRACTOR shall provide adequate facilities for the safe storage and proper curing of the concrete test cylinders for the first 24 hours and for additional time as may be required before transporting to the test lab.
- C. Test cylinders shall be made in accordance with the following criteria:
  1. 1 set every 100 cubic yards.
  2. At least 1 set each day of concrete pouring.
  3. 1 set for each different mix of concrete supplier.
  4. 1 set for a significantly different environmental condition.

## **END OF SECTION**

**SECTION 05 12 00**  
**STRUCTURAL STEEL FRAMING**

**PART 1      GENERAL**

**1.1      GENERAL REQUIREMENTS**

- A. This section covers the Work necessary for designing, detailing, fabricating, and erecting the galvanized steel structures, complete.
- B. The CONTRACTOR shall furnish all materials and items of Work to make the structures complete and ready for their intended use.
- C. The CONTRACTOR will be responsible for the job-site erection of the steel structures and assembly of materials and equipment.
- D. The general arrangement of the structures is shown on the Drawings. It is intended that frames shall be constructed with moment-type connections and that bracing will be kept to a minimum. Bracing may be designed for portions of the structures as shown on the Drawings. Bracing in other areas will not be permitted without written authorization from the OWNER.
- E. The OWNER has designed structure fabrication drawings to meet the current standards and code requirements. These drawings are intended to be ready for use by the successful CONTRACTOR. The CONTRACTOR is responsible to review and modify any structural details as necessary to ensure the structures are satisfactory for erection, assembly, and equipment mounting in accordance with these contract documents.
- F. If desired, the OWNER'S structure conceptual and general arrangement design drawings, plus the steel structure fabrication drawings can be made available in CAD format to the successful Contractor.
- G. The structures shall be fabricated from steel wide flange, channel, and angle shapes, except as otherwise shown.
- H. The structures and major equipment to be provided are described in general on the Proposal Schedule (located in 01 64 00 Installation of Owner Furnished Equipment) and shown in detail on the Drawings.
- I. Materials required for the substation above ground grounding connections to the steel structures and equipment are also to be provided.
- J. Materials required for the substation above ground conduit connections to the structure mounted equipment and major equipment devices are also to be provided.
- K. Foundation Plan and Detail Drawings show the foundation anchor bolt size and spacing. The steel structures shall be fabricated to conform to the foundation anchor bolts for each structure type.

- L. Any recommended steel structure modification must be pre-approved by the OWNER prior to steel structure fabrication.

## **1.2 REFERENCES**

- A. The structures shall be manufactured, tested, rated, and furnished in accordance with the latest applicable standards and regulations of the following:
  - 1. AISC: American Institute of Steel Construction.
  - 2. ANSI: American National Standards Institute.
  - 3. NEMA: National Electrical Manufacturers' Association.
  - 4. ASTM: American Society for Testing and Materials.
  - 5. UBC: Uniform Building Code.
  - 6. MSC: Manual of Steel Construction

## **1.3 SUBMITTALS**

### **A. GENERAL**

- 1. Within 30 days after execution of Contract and prior to commencing fabrication of any structures or associated items, the CONTRACTOR shall submit to the OWNER a minimum of three sets of the following information for review.
  - a. Shop drawings of all structures including all details and dimensions.
  - b. Design calculations for all of the items covered by these shop drawings. Calculations shall show design stresses in all structural members and connections for all loading combinations.
- 2. The design and the calculations shall be made by an engineer registered in the State of Oregon and the shop drawings and calculations shall bear the registered engineer's stamp and signature at the time of submittal of this information

### **B. PRODUCT DATA**

- 1. Name and address of manufacturer(s).
- 2. Product specifications.
- 3. Manufacturers' testing procedures and standards.
- 4. Preparation and installation of application instructions, as appropriate.

### **C. SHOP DRAWINGS**

- 1. Meet requirements of AISC recommendations and specifications referenced herein.
- 2. Provide with details showing:
  - a. Members and their connections

- b. Anchor bolt layouts
- c. Hardened washer details
- d. Schedules for fabrication procedures
- e. Sequences of erection
- f. All necessary information and dimensions

D. QUALITY CONTROL SUBMITTALS

1. Manufacturing Sequence
2. Welder Certifications:
  - a. Submit for shop welders
  - b. Issued by recognized testing laboratory
3. Weld Inspection Tests Reports:
4. Submit for review prior to completion of work in this section.
  - a. High Strength Connection Bolts (Galvanized and Non-galvanized):
5. Certificates of Compliance:
  - a. Products meet chemical and mechanical requirements of standards specified herein for either production or shipping lot
  - b. Manufacturer's inspection test report results for production lot(s) furnished, to include:
    - 1) Tensile strength
    - 2) Yield strength
    - 3) Reduction of area
    - 4) Elongation and hardness
  - c. Certified Mill Test Reports for Bolts and Nuts:
    - 1) Name and address of manufacturer.
    - 2) Bolts correctly marked.
    - 3) Marked bolts and nuts used in required mill tests and manufacturer's inspection tests.
6. Mill Certificates.
7. Direct Tension Indicators:
  - a. Furnish manufacturer's test report meeting requirements of ASTM F959-85
8. Method proposed to resolve misalignment between anchor bolts and bolt holes in steel members.

## **1.4 QUALITY ASSURANCE**

### **A. QUALIFICATIONS**

#### **1. Welders:**

- a. Meet requirements of AWS D1.1, Code for Procedures and Quality of Welders.

### **B. REGULATORY REQUIREMENTS:**

#### **1. Comply with current provisions of following, except as otherwise indicated:**

- a. AISC "Code of Standard Practice for Steel Buildings and Bridges".
- b. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" and including "Commentary of the AISC Specification".
- c. AISC "Specifications for Structural Joints Using ASTM A325 or A490 Bolts" approved by Research Council on Structural Connections of the Engineering Foundation; endorsed by American Institute of Steel Construction and Industrial Fasteners Institute.
- d. AWS Structural Welding Code AWS D1.1 and "Standard Qualification Procedure".
- e. Manual of Steel Construction, American Institute of Steel Construction, Inc

## **1.5 DELIVERY, STORAGE, AND HANDLING**

### **A. PREPARATION FOR SHIPMENT**

1. Insofar as is practical, the items provided hereunder shall be factory assembled. The parts and assemblies, that of necessity are shipped unassembled, shall be packaged and clearly tagged in a manner that will protect the materials from damage, and facilitate the identification and final assembly in the field.

### **B. DELIVERY**

1. Load structural members in such a manner that they will be transported and unloaded without being stressed, deformed, or otherwise damaged.

### **C. STORAGE**

1. Protect structural steel members and packaged materials from corrosion and deterioration.
2. Store in dry area and not in direct contact with ground.

### **D. HANDLING**

1. Handle materials to avoid distortion or damage to members or supporting structures



## **1.6 GENERAL REQUIREMENTS**

- A. Standard Products - Material and equipment shall be the standard products of manufacturers regularly engaged in the manufacture of these products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to the date of proposal.
- B. Performance Requirements - Provide switchboards manufactured in accordance with Article 408 of the latest National Electrical Code and applicable portions of the NEMA PB2, UL 891 and NFPA 70, the National Electrical Code.

## **PART 2 PRODUCTS**

### **2.1 STRUCTURAL STEEL FRAMING**

#### **A. GENERAL**

##### **1. Like Items of Material:**

- a. End Products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.

##### **2. Provide metal parts as required for permanent connection of structural steel.**

#### **B. DESIGN LOADS:**

- 1. The structures shall be designed for all structural member dead load plus all weights of equipment to be placed on the structure. Equipment weights shall be itemized by the designer and shall include every item that is supported by the structure but is not intended to carry calculated stresses as part of the structure. The structures shall also be designed for the following additional loads:

- a. Snow Load: 24 psf.
- b. Wind Load: 100 mph.
- c. Earthquake Load: Seismic Site Class D,  $S_{ds} = 0.435$ .
- d. Ice Load: 1 inch of ice buildup on all surfaces of members and equipment supported.
- e. Occupancy Category IV.

#### **C. DESIGN**

- 1. The following design criteria, although specified in the National Electrical Manufacturer's Association Standards Publication SC 6, Part 36, is repeated below to emphasize certain design criteria:
  - a. Classes of Structures:
    - 1) Substation structures shall be one of the following classes:

- a) Class A structures are those intended for the support of high voltage equipment (i.e., air switches, interrupter switches, and circuit interrupting devices).
  - b) Class B structures are those on which the deflections within the limits do not affect the performance of supported equipment (i.e., dead end structures and miscellaneous equipment supports).
- 2. The following deflection limits shall apply when the structure is under a set of compatible loads consisting of apparatus, dead load, wire loads, ice loads, and wind loads (described in SG-6-36.4) without short-circuit forces, unless it is specified that all forces shall act simultaneously.
- 3. Class A structures:
  - a. The horizontal deflection of vertical members shall be limited to 1/100 of the vertical height or the structure. The vertical deflection of horizontal members shall be limited to 1/200 of the span. The horizontal deflection of horizontal members shall be limited to 1/200 of the span.
- 4. Class B structures:
  - a. The horizontal deflection of vertical members shall be limited to 1/50 of the vertical height or the structure. The vertical deflection of horizontal members shall be limited to 1/200 of the span. The horizontal deflection of horizontal members shall be limited to 1/100 of the span.

D. ROLLED PLATES, SHAPES, AND BARS

- 1. ASTM A36 unless otherwise shown.

E. STRUCTURAL STEEL PIPE

- 1. ASTM A501, or ASTM A53, Type E or S, Grade B.

F. STRUCTURAL TUBING

- 1. ASTM A500, Grade B ( $f_y=46$  ksi)
- 2. Provide full-length members without splices unless otherwise noted or approved.

G. ANCHOR BOLTS

- 1. ASTM A307

H. HIGH STRENGTH CONNECTION BOLTS

- 1. ASTM A325

I. HARDENED WASHERS

- 1. ASTM F436

## J. FASTENERS

1. A 10-percent excess quantity of bolts, nuts, lock-washers, and washers over the quantity actually required shall be furnished for field assembly of the structures and equipment. A locknut is required for each bolt. A complete list of bolts shall be shown on the erection diagrams.
2. The anchor bolts are to be provided with leveling nuts.

## K. FABRICATION

### 1. General:

- a. Fabricate as shown and in accordance with these Specifications, AISC Specifications, CONTRACTOR's design requirements, and approved shop drawings.
- b. Mark and matchmark materials for field assembly.
- c. Complete assembly, including bolting and welding of units, before start of finishing operations.
- d. Fabricate to agree with field measurements.

### 2. Connections:

- a. Shop Connections: Weld or bolt, as shown.
- b. Field Connections: Bolt except where welded or other connections are shown or specified.
- c. Develop full strength of members joined and meet requirements of AISC Standard Connections, unless otherwise shown.

### 3. Welded Construction:

- a. Comply with current AWS D1.1 Code for procedures, appearance, and quality of welds, and methods used in correcting welding work.
- b. Butt Welds: Complete penetration unless otherwise specified.

### 4. Interface With Other Work:

- a. Holes: Provide as necessary or as indicated for securing other Work to structural steel framing, and for passage of other Work through steel framing members.
  - 1) No torch cut holes are permitted.
- b. Provide threaded nuts welded to framing, and other specialty items as shown to receive other Work.

## L. SOURCE QUALITY CONTROL

### 1. Shop Inspection:

- a. OWNER may engage inspectors to inspect fabrication and shop assembly of members, high strength bolted and welded connections, to perform tests and to prepare test reports.
- b. Provide ample notice to OWNER for inspection prior to start of fabrication work.
- c. Furnish facilities for inspection of materials and workmanship. Provide inspectors with unlimited access to the Work.

## **PART 3 EXECUTION**

### **3.1 GENERAL**

#### **A. FABRICATION**

1. The fabrication CONTRACTOR shall verify all dimensions, shall make any measurements necessary, and shall be fully responsible for accuracy of the components to be assembled. The OWNER shall review the Drawings and any discrepancies shall be reported to the fabrication CONTRACTOR for clarification prior to the CONTRACTOR starting erection.
2. Fabrication CONTRACTOR shall provide to the OWNER a sequence the erection work, as necessary, before the CONTRACTOR commences with the steel structure assembly.
3. Meet requirements of AISC Specifications and Code of Standard Practice as referenced herein.

#### **B. HARDENED WASHERS**

1. Provide at locations required by AISC Specification for Structural Joints using ASTM A325 Bolts.
2. Install under turned element (bolthead or nut) and between turned element and indicator washer protrusions.

#### **C. HIGH STRENGTH CONNECTION BOLTS**

1. Tighten using direct tension indicators meeting ASTM F959-85 for Structural Joints using ASTM A325 or A490 Bolts.
2. Assembly Tightening: Progress systematically from most rigid part of joint toward free edges until indicator washers on all bolts have been closed to average gap less than that shown in Table 2 of ASTM F959-85.
3. Do not substitute load indicating washers for hardened flat washers required for oversized holes.

#### **D. ANCHOR BOLTS**

1. Install anchor bolts and other connectors required for securing structural steel to in-place work.

2. Provide templates and other devices for presetting bolts and other anchors to accurate locations.

#### E. SETTING BASES AND BEARING PLATES

1. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces.
2. Clean bottom surface of base and bearing plates.
3. Set loose and attached baseplates and bearing plates for structural members on wedges, leveling nuts, or other adjustable devices.
4. Tighten anchor bolts after supported members have been positioned and plumbed.
5. Grout baseplates prior to placing loads on structure.

#### F. FIELD ASSEMBLY

1. Set structural frames accurately to lines and elevations shown.
2. Support all elements with temporary construction bracing members until construction is complete.
3. Align and adjust various members forming a part of a complete frame or structure before permanently fastening.
4. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly.
5. Perform necessary adjustments to compensate for minor discrepancies in elevations and alignment.
6. Level and plumb individual members of structure within specified AISC tolerances.
7. Establish required leveling and plumbing measurements on mean operating temperature of structure.

#### G. MISFITS AT ANCHOR BOLTS

1. Resolve misalignments between anchor bolts and bolt holes in steel members in accordance with approved submittal.
2. Do not flame cut to enlarge holes.

#### H. GAS CUTTING

1. Do not use gas cutting torches in field for correcting fabrication errors in structural framing.
2. Secondary members not under stress and concealed in finished structure may be accepted upon approval of OWNER.
3. Finish gas-cut sections equivalent to sheared appearance.

## I. GALVANIZING AND REPAIR

1. Galvanizing of steelplates, shapes, bars (and products fabricated from these items), and strip 1/8-inch thick or thicker, shall conform to ASTM A123. Pipe, welded or seamless steel, shall conform to ASTM A120. Galvanize material thinner than 1/8 inch either before fabrication in conformance with the requirements of ASTM A525, Coating Designation G210, or after fabrication in conformance with the requirements of ASTM A123, except that the weight of zinc coating shall average not less than 1.2 ounces per square foot of actual surface area with no individual specimen having a weight of less than 1.0 ounce. Unless otherwise provided, galvanizing before or after fabrication, or material which is thinner than 1/8 inch, is at the option of the CONTRACTOR. Galvanizing will not be required for stainless steel, monel metal, and similar corrosion-resistant parts.
2. Thoroughly clean all welded areas prior to galvanizing to remove all slag or other material that would interfere with the adherence of the zinc. When it is necessary to straighten any sections after galvanizing, perform such work without damage to the zinc coating.
3. In like manner, galvanizing of iron and steel hardware, and nuts and bolts, shall conform to ASTM A153. Perform galvanizing after fabrication. Galvanizing of tapped holes will not be required.
4. Fabrication shall include all operations such as shearing, cutting, punching, forming, drilling, milling, bending, welding, and riveting.
5. Galvanize components of bolted assemblies separately before assembly.
6. The minimum pitch diameter of the threaded portion of all bolts, anchor bars, or studs shall conform to ANSI B1.1, having a Class 2A tolerance before galvanizing. After galvanizing, the pitch diameter of the nuts or other internally threaded parts may be tapped over ANSI B1.1, Class 2B tolerance, by the following maximum amounts:
  - a. 3/8 Inch Through 9/16 Inch: 0.016 inch oversize.
  - b. 5/8 Inch Through 1 Inch: 0.023 inch oversize.
  - c. 1/8 Inch and Larger: 0.033 inch oversize.
7. Galvanized surfaces which are specifically to be painted shall not be chemically treated after galvanizing, and prior to cleaning and painting:
8. All edges of tightly contacting surfaces, where galvanized is required, shall be completely sealed by welding before galvanizing.
9. Repair galvanized surfaces that are abraded or damaged after the application of the zinc coating by solvent cleaning the damaged area (Steel Structures Painting Council SP 1) and hand or power tool (Steel Structures Painting Council SP 2 or SP 3) the damaged areas, removing all loose and cracked coating. Then paint the cleaned areas with one of the following coatings:

## J. One coat of Inorganic Zinc Silicate (MIL-P-23236, Class 3).

- a. Two coats of Galvanizing Repair Paint (MIL-P-21035).
- b. Two coats of Zinc Dust Paint (MIL-E-15145, Formula 102).
- c. Apply paint to a cleaned surface. Abrasive blasting is required for inorganic zinc silicate.

K. FIELD QUALITY CONTROL

- 1. OWNER may engage inspectors to inspect high strength bolted and welded connections, to perform tests and to prepare test reports.
- 2. High Strength Bolt Installation Inspection: Acceptable if average gap is less than that shown in Table 2 of ASTM F959-85.
- 3. Moment-Resisting Steel-Beam-Column Welded Connection Weld Inspection:
- 4. Provide approved independent test lab to inspect and test all such welded connections for all structures by nondestructive methods.
- 5. Welding Procedures and Methods: Subject to inspection for conformance with AWS Structural Welding Code.
- 6. Butt Welds: 100 percent tested in accordance with AWS D1.1-81, Chapter 6.
- 7. Examine, Report, and Disposition of Radiographs: Meet requirements of Section 6.12, AWS Structural Welding Code.
- 8. Correction of Defective Welds and Retesting: As required by OWNER to meet Welding Code and OWNER's approval or certification of approved independent testing lab.

**END OF SECTION**

## **SECTION 10 14 00 SIGNAGE**

### **PART 1 GENERAL**

#### **1.1 SCOPE**

- A. This section covers the furnishing and installation of substation signs.
- B. The CONTRACTOR shall furnish all signs and attachment materials.
- C. All safety signage shall conform to the latest issue of ANSI Z535.

### **PART 2 PRODUCTS**

#### **2.1 MATERIALS**

- A. The station signs shall be engraved laminated lamincoid plastic, retro-reflective and non-fading. The sign inscriptions and letter size shall be in accordance with ANSI Z535 and the Station Sign List as shown on the Drawings.
- B. Station signs shall have the word DANGER in white letters on red background, the word WARNING in black letters on orange background, the word NOTICE in white letters on blue background, and all other words in black letters on white background. Danger and Warning signs shall each include an appropriate symbol to convey the message.
- C. The warning signs shall be 10 inches x 24 inches, with the words "WARNING, Keep Out, High Voltage Inside, May cause injury or death". The signs shall be located on each gate and each side of the masonry wall at intervals as shown on Drawings. Refer to EVERLAST Signs, UTICOM Systems, Inc., Rockford Silk Screen Process Inc., or approved equivalent.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. The signs shall be located as shown on the drawings. Plastic signs shall be fastened with a suitable permanent epoxy or other approved weather-resistant adhesive, or bolted to mounting angles as approved by the OWNER.
- B. Signs shall be mounted and positioned to provide clear visibility and legibility.

**END OF SECTION**



**SECTION 26 00 00**  
**BASIC ELECTRICAL MATERIALS AND METHODS**

**PART 1      GENERAL**

**1.1      SUBMITTALS**

- A.    Shop Drawings (if applicable):
  - 1. Junction and pull boxes used at, or below, grade.
  - 2. Terminal junction boxes.

**1.2      QUALITY ASSURANCE**

- A.    UL Compliance: Materials manufactured within scope of Underwriters Laboratories shall conform to UL Standards and have an applied UL listing mark.

**PART 2      PRODUCTS**

**2.1      JUNCTION AND PULL BOXES**

- A.    Large Sheet Steel Box: NEMA 250, Type 1.
  - 1. Box: Code-gauge, galvanized steel.
  - 2. Cover: Full access, screw type.
  - 3. Machine Screws: Corrosion-resistant.
- B.    Large Stainless Steel Box: NEMA 250, Type 4X.
  - 1. Box: 14 gauge, ASTM A240, Type 304 stainless steel.
  - 2. Cover: Hinged with clamps.
  - 3. Hardware and Machine Screws: ASTM A167, Type 304 stainless steel.
  - 4. Manufacturers:
    - a. Hoffman Engineering Co.
    - b. Robroy Industries.
- C.    Large Steel Box: NEMA 250, Type 4.
  - 1. Box: 12 gauge steel, with white enamel painted interior and gray primed exterior, over phosphated surfaces, with final ANSI Z55.1, No. 61 gray enamel on exterior surfaces.
  - 2. Cover: Hinged with screws.
  - 3. Hardware and Machine Screws: ASTM A167, Type 316 stainless steel.
  - 4. Manufacturers:
    - a. Hoffman Engineering Co.

b. Robroy Industries.

D. Concrete Handhole:

1. Box: Reinforced, cast concrete.
2. Cover: Cast iron.
3. Cover Marking: ELECTRICAL, TELEPHONE, or as indicated.
4. Manufacturers:
  - a. Brooks Products Inc.; No. 36/36T.
  - b. Qwikset; W 17.

**2.2 TERMINAL JUNCTION BOX**

- A. Cover: Hinged, unless otherwise shown.
- B. Terminal Blocks: Provide separate connection point for each conductor entering or leaving box.
  1. Spare Terminal Points: 25 percent.
- C. Interior Finish: Paint with white enamel or lacquer.

**2.3 TERMINAL BLOCK (0 TO 600 VOLTS)**

- A. UL 486E and UL 1059.
- B. Size components to allow insertion of necessary wire sizes.
- C. Capable of termination of all control circuits entering or leaving equipment, panels, or boxes.
- D. Except as noted, provide screw clamp compression, dead front barrier type, with current bar providing direct contact with wire between the compression screw and yoke and with the following features:
  1. Yoke, current bar, and clamping screw of high strength and high conductivity metal.
  2. Yoke shall guide all strands of wire into terminal.
  3. Current bar shall ensure vibration-proof connection.
  4. Terminals:
    - a. Capable of wire connections without special preparation other than stripping.
    - b. Capable of jumper installation with no loss of terminal or rail space.
    - c. Individual, rail mounted.
  5. Marking system allowing use of preprinted or field-marked tags.
  6. Manufacturers:
    - a. Weidmuller.

- b. Entrelec.
  - c. Wieland.
  - d. Schneider/Square D
  - e. Allen-Bradley
- E. For current-transformers secondary circuit, provide shorting-type terminal blocks suitable for use with ring-tongue wire terminations. Provide General Electric EB-27 or equal.

## **PART 3 EXECUTION**

### **3.1 GENERAL**

- A. Install equipment in accordance with National Electric Installation Standards (NEIS).

### **3.2 JUNCTION AND PULL BOXES**

- A. Install where shown and where necessary to terminate, tap-off, or redirect multiple conduit runs.
- B. Install pull boxes where necessary in raceway system to facilitate conductor installation.
- C. Install in conduit runs at least every 150 feet or after the equivalent of three right-angle bends.
- D. Use outlet boxes as junction and pull boxes wherever possible and allowed by applicable codes.
- E. Installed boxes shall be accessible.
- F. Do not install on finished surfaces.
- G. Install plumb and level.
- H. Support boxes independently of conduit by attachment to building structure or structural member.
- I. Install bar hangers in frame construction, or fasten boxes directly with wood screws on wood, bolts and expansion shields on concrete or brick, toggle bolts on hollow masonry units, and machine screws or welded threaded studs on steelwork.
- J. Threaded studs driven in by powder charge and provided with lock washers and nuts are acceptable in lieu of expansion shields.
- K. Boxes embedded in concrete or masonry need not be additionally supported.
- L. At or Below Grade:
  - 1. Install boxes for below grade conduits flush with finished grade in locations outside of paved areas, roadways, or walkways.
  - 2. If adjacent structure is available, box may be mounted on structure surface just above finished grade in accessible but unobtrusive location.

3. Obtain OWNER's written acceptance prior to installation in paved areas, roadways, or walkways.
  4. Use boxes and covers suitable to support anticipated weights.
- M. Flush Mounted:
1. Install with concealed conduit.
  2. Holes in surrounding surface shall be no larger than required to receive box.
  3. Make edges of boxes flush with final surface
- N. Mounting Hardware:
1. Non-corrosive Areas: Galvanized.
  2. Corrosive Areas: PVC-coated steel.
- O. Location/Type:
1. Finished, Indoor, Dry: NEMA 250, Type 1.
  2. Unfinished, Indoor, Dry: NEMA 250, Type 12.
  3. Outdoor: NEMA 250, Type 4.
  4. Underground Conduit: Concrete.
  5. Corrosive Locations: Nonmetallic.

## **END OF SECTION**

## **SECTION 26 01 26 ELECTRICAL TESTING**

### **PART 1      GENERAL**

#### **1.1      PURPOSE**

- A. This section describes the major items of the Columbia Heights Substation Upgrade projects, requiring inspection, testing, calibration, and complete checkout prior to startup. The purpose of this work is to assure the OWNER that all equipment installed by the CONTRACTOR receives proper checkout, testing, and is ready for startup and energization.

#### **1.2      REFERENCES**

- A. The following is a list of standards that may be references in this section:
  - 1. Acceptance Testing Specifications (ATS)
  - 2. American National Standards Institute (ANSI)
  - 3. American Society for Testing and Materials (ASTM)
  - 4. Institute of Electrical and Electronics Engineers (IEEE)
  - 5. National Electrical Manufacturers Association (NEMA)
  - 6. International Electrical Testing Association (NETA)
  - 7. National Fire Protection Association (NFPA)
  - 8. National Electrical Code (NEC)

#### **1.3      SUBMITTALS**

- A. Administrative Submittals: Submit 10 days prior to performing inspections or tests:
  - 1. Schedule for performing inspection and tests.
  - 2. List of references to be used for each test.
  - 3. Sample copy of equipment and materials inspection form(s).
  - 4. Sample copy of individual device test form.
  - 5. Sample copy of individual system test form
- B. Quality Control Submittals:
  - 1. Submit within 10 days after completion of test:
    - a. Test or inspection reports and certificates for each electrical item tested.
- C. Contract Closeout Submittals:

1. Operation and Maintenance Data:

- a. After test or inspection reports and certificates have been reviewed by OWNER and returned, insert a copy of each in operation and maintenance manual.

**1.4 QUALITY ASSURANCE**

A. Testing Firm Qualifications:

- 1. Corporately and financially independent organization of manufacturers, and suppliers functioning as an unbiased testing authority.
- 2. Professionally, independent of manufacturers and suppliers of electrical equipment and systems being tested.
- 3. Employer of engineers and technicians regularly engaged in testing and inspecting of electrical equipment, installations, and systems.
- 4. Supervising engineer accredited as Certified Electrical Test Technologist by National Institute for Certification of Engineering Technologists (NICET), International Electrical Testing Association and having a minimum of 5 years testing experience on similar projects, or approved equivalent.
- 5. Technicians certified by NICET, NETA, or approved equivalent.
- 6. Assistants and apprentices assigned to project at ratio not to exceed two certified to one noncertified assistant or apprentice.
- 7. Registered Professional Engineer, who is a full time employee of the test company, with at least 5 years of experience testing electrical apparatus, to provide comprehensive project report outlining services performed, results of such services, recommendations, actions taken, and opinions.
- 8. In compliance with OSHA Title 29, Part 1907 criteria for accreditation of testing laboratories or a full Member Company of International Electrical Testing Association.
- 9. Test equipment shall have an operating accuracy equal to, or greater than, requirements established by NETA ATS.
- 10. Test instrument calibration shall be in accordance with NETA ATS.

**1.5 SEQUENCING AND SCHEDULING**

- A. Perform inspection and electrical tests after equipment has been installed.
- B. Perform tests with apparatus de-energized whenever feasible.
- C. Inspection and electrical tests on energized equipment are to be:
  - 1. Scheduled with OWNER prior to de-energization.
  - 2. Minimized to avoid extended period of interruption to the operating plant equipment.

- D. Notify OWNER at least 24 hours prior to performing tests on energized electrical equipment.

## **1.6 RESPONSIBILITY**

- A. The visual and mechanical inspections and electrical tests described in this specification section shall be performed by the CONTRACTOR, if qualified, or an independent testing company, as described in the following paragraphs. The inspections and tests not covered by the equipment supplier's work description in the Installation of OWNER-Furnished Materials, are part of this Contract. This specification describes the minimum testing requirements for the majority of equipment. Duplication of tests by each responsible group is not intended.
- B. The following equipment shall be inspected and tested by others:
  - 1. Power Transformers (Two): These units are to be installed, tested, made ready for startup, and commissioned by a factory representative.
  - 2. Metalclad Switchgear Control Buildings: These units are to be installed, tested, made ready for startup, and commissioned by a factory representative.
- C. The CONTRACTOR shall perform the tests noted in Part 2. All required procedures stated in equipment instruction manuals consisting of the necessary functional and performance testing prior to start-up must be performed. In addition, all work necessary to make the facility complete and ready to energize, less the equipment supplier's responsibilities as noted above, must be accomplished. This is to include verification of proper wiring connections between all interconnecting equipment that is not furnished as a self-contained unit. The testing company shall notify the OWNER prior to commencement of any testing. Unless specific tests are identified, the testing company shall perform complete inspections and tests for the designated equipment category.
  - 1. 115-kV Circuit Breaker
    - a. High-voltage connections
    - b. Low-voltage cable interconnections
    - c. Grounding system
  - 2. 115-kV to 12.47 kV Power Transformer
    - d. High-voltage connections
    - e. Manual-Operated Disconnect Switch
    - f. Relaying and Metering
    - g. Low-voltage cable interconnections
    - h. Grounding system
  - 3. 15-kV System Equipment
    - a. Manual-Operated Disconnect Switches

- b. PT Instrument Transformers
  - c. Circuit Breakers
  - d. Relaying and Metering
  - e. Low-voltage cable interconnections
  - f. Grounding system
4. Low Voltage System Equipment
- a. Substation Enclosure, complete
  - b. Low Voltage Circuit Breakers
  - c. Relaying and Metering
  - d. Low-voltage cable interconnections
  - e. Grounding system
- D. The CONTRACTOR shall notify the testing contractor when equipment becomes available for electrical testing. The testing contractor shall perform the type of tests and/or procedures noted in the Execution Section of these specifications.

## **PART 2 EXECUTION**

### **2.1 GENERAL**

- A. Tests and inspection shall establish that:
- 1. Electrical equipment is operational within industry and manufacturer's tolerances.
  - 2. Installation operates properly.
  - 3. Equipment is suitable to energize.
  - 4. Installation conforms to requirements of all drawings, Contract Documents, and NFPA 70, NFPA 70E, and ANSI C2.
- B. Perform inspection and testing in accordance with NETA ATS, industry standards, and manufacturer's recommendations.
- C. Set, test, and calibrate protective relays, circuit breakers, fuses, and other applicable devices to coordinate with the other system protective devices and short circuit ratings. Protective device settings will be provided by Owner's Engineer.
- D. Adjust mechanisms and moving parts for free mechanical movement.
- E. Adjust relays and sensors to correspond to operating conditions, or as recommended by manufacturer.



- F. Verify nameplate data for conformance to drawings, Contract Documents, and Equipment Procurement Agreements.
- G. Realign equipment not properly aligned and correct levelness.
- H. Properly anchor electrical equipment found to be inadequately anchored.
- I. Tighten accessible bolted connections, including wiring connections, with calibrated torque wrench to manufacturer's recommendations, or as otherwise specified.
- J. Clean contaminated surfaces with cleaning solvents as recommended by manufacturer.
- K. Provide proper lubrication of applicable moving parts.
- L. Notify OWNER of working clearances not in accordance with NFPA 70.
- M. Investigate and after OWNER notification repair or replace:
  - 1. Electrical items that fail tests.
  - 2. Active components not operating in accordance with manufacturer's instructions.
  - 3. Damaged electrical equipment.
- N. All Electrical equipment. Notify OWNER if corrective action is beyond this scope of work and if any equipment requiring corrective action is determined to be the responsibility of the equipment supplier:
  - 1. Remove foreign material and moisture from enclosure interior.
  - 2. Vacuum and wipe clean enclosure interior.
  - 3. Remove corrosion found on metal surfaces.
  - 4. Repair or replace improperly operating latching, locking, or interlocking devices.
  - 5. Replace missing or damaged hardware.
  - 6. Finish, provide matching paint and touch up scratches and marks.

## **2.2 POWER TRANSFORMER**

- A. This work is not intended to overlap with the responsibility of the manufacturer's representative, and applies to the external connection work performed by the CONTRACTOR.
- B. Visual and Mechanical Inspection:
  - 1. Physical and insulator damage.

2. Bolt torque level of electrical connections in accordance with NETA ATS, Table 10.12, unless otherwise specified by manufacturer.
3. Defective wiring.
4. Proper operation of fans, indicators, and auxiliary devices.
5. Integrity and contamination of bus insulation system.
6. Verify proper secondary voltage phase-to-phase and phase-to-ground after energizing and prior to loading.
7. Verify settings and operation of all temperature devices.
8. Verify operation of all alarm, control and trip circuits from all monitor and control devices.
9. Verify the presence of transformer surge arresters.
10. Manufacturer's representative to perform specific inspection and mechanical tests in accordance with manufacturer's recommendations.

C. Electrical Tests:

1. All electrical tests to be performed by manufacturer's representative.
2. Insulation Resistance Tests:
  - a. Applied megohmmeter dc voltage in accordance with NETA ATS, Table 10.5 for each:
  - b. Winding-to-winding.
  - c. Winding-to-ground.
  - d. 10-minute test duration with resistances tabulated at 30 seconds, 1 minute, and 10 minutes.
  - e. Results temperature corrected in accordance with NETA ATS Table 10.14.
  - f. Temperature corrected insulation resistance values equal to, or greater than, ohmic values established by manufacturer.
  - g. Insulation resistance test results to compare within 1 percent of adjacent windings.
3. Perform tests and adjustments for fans, controls, and alarm functions as suggested by manufacturer.
4. Perform turns-ratio tests at all tap positions. Tests shall not deviate more than one-half percent from the adjacent coils or the calculated ration.
5. Perform insulation power-factor/dissipation-factor tests on windings in accordance with manufacturer's published data.
6. Perform power-factor/dissipation-factor tests on bushings in accordance with manufacturer's published data.

7. Sample insulating oil in accordance with ASTM D923 and have laboratory tested for:
- a. Dielectric breakdown voltage in accordance with ASTM D877 or D1816.
  - b. Acid neutralization number in accordance with ASTM D974 and D665.
  - c. Interfacial tension in accordance with ASTM D971 or D2285.
  - d. Color in accordance with ASTM D1500.
  - e. Visual condition in accordance with ASTM D1524.
  - f. Specific gravity in accordance with ASTM D1298.
  - g. Water content, in parts per million, in accordance with ASTM D1533.
  - h. Dielectric fluid test results in accordance with NETA ATS, Table 10.4.
  - i. Remove sample of oil in accordance with ASTM D3613 and perform dissolved gas analysis (DGA) in accordance with ASTM D3612. Evaluate results in accordance with ANSI/IEEE Standard C57.104.
  - j. Power factor at 25 degrees C and at 100 degrees, in accordance with ASTM D924.
  - k. Maximum power factor, corrected to 20 degrees C, in accordance with manufacturer's specifications.

## **2.3 115 KV CIRCUIT BREAKERS**

### **A. Visual and Mechanical Inspection:**

- 1. Compare equipment nameplate data with drawings and specifications.
- 2. Inspect physical and mechanical condition.
- 3. Inspect anchorage, alignment, and grounding.
- 4. Perform all mechanical operation and contact alignment tests on both the recloser and its operating mechanism in accordance with manufacturer's published data.
- 5. Verify the unit is clean.
- 6. When provisions are made for sampling, remove a sample of SF6 gas and test in accordance with Table 100.13. Do not break seal or distort "sealed-for-life" interrupters.
- 7. Inspect operating mechanism and/or hydraulic or pneumatic system and SF6 gas-insulated system in accordance with manufacturer's published data.
- 8. Test for SF6 gas leaks in accordance with manufacturer's published data.

9. Verify correct operation of alarms and pressure-limit switches for pneumatic, hydraulic, and SF6 gas pressure in accordance with manufacturer's published data.
10. If recommended by manufacturer, slow close/open breaker and check for binding, friction, contact alignment, and penetration. Verify that contact sequence is in accordance with manufacturer's published data. In the absence of manufacturer's data, refer to IEEE C37.04.
11. Perform all mechanical operation tests on the operating mechanism in accordance with the manufacturer's published data.
12. Inspect all bolted electrical connections for high resistance by calibrated torque-wrench method in accordance with manufacturer published data or NETA ATS, Table 10.12.
13. Verify the appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
14. Perform contact-timing test.
15. Perform mechanism motion analysis.
16. Record as-found and as-left operation counter readings.

B. Electrical Tests:

1. Perform resistance measurements through all bolted connections with low resistance ohmmeter.
2. Perform insulation-resistance tests in accordance with Table 100.1 from each pole-to ground with breaker closed and across open poles at each phase. For single-tank breakers, perform insulation resistance tests in accordance with Table 100.1 (NETA ATS) from pole-to-pole.
3. Perform a contact/pole-resistance test.
4. Perform minimum pickup voltage tests on trip and close coils in accordance with manufacturer's published data.
5. Verify correct operation of any auxiliary features such as electrical close and trip operation, trip-free, and anti-pump function. Reset all trip logs and indicators.
6. Trip circuit breaker by operation of each protective device.
7. Perform power-factor or dissipation-factor tests on each pole with the breaker open and on each phase with the breaker closed.
8. Perform power-factor or dissipation-factor tests on each bushing equipped with a power factor/capacitance tap. In the absence of a power-factor/capacitance tap, perform hot-collar tests. These tests shall be in accordance with the test equipment manufacturer's published data.
9. Perform a dielectric withstand voltage test in accordance with manufacturer's published data.

10. Verify operation of heaters.
11. Test instrument transformers.

## **2.4 15 KV CIRCUIT BREAKERS**

### **A. Visual and Mechanical Inspection:**

1. Compare equipment nameplate data with drawings and specifications.
2. Inspect physical and mechanical condition.
3. Inspect anchorage, alignment, and grounding.
4. Verify that all maintenance devices such as special tools and gauges specified by the manufacturer are available for servicing and operating the breaker.
5. Verify the unit is clean.
6. Perform all mechanical operation tests on the operating mechanism in accordance with manufacturer's published data
7. Measure critical distances such as contact gap as recommended by manufacturer
8. Inspect bolted electrical connections for high resistance.
9. Verify cell fit and element alignment.
10. Verify racking mechanism operation.
11. Verify appropriate lubrication on moving, current-carrying parts and on moving and sliding surfaces.
12. Perform contact-timing test.
13. Record as-found and as-left counter operations.

### **B. Electrical Tests:**

1. Perform resistance measurements through all bolted connections with low resistance ohmmeter.
2. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with the circuit breaker closed, and across each open pole. Test voltage shall be in accordance with manufacturer's published data. In the absence of manufacturer's data, use Table 100.1 (NETA ATS)
3. Perform a contact/pole-resistance test.
4. Perform minimum pickup voltage tests on trip and close coils in accordance with manufacturer's published data.
5. Verify correct operation of any auxiliary features such as electrical close and trip operation, trip-free, and antipump function.

6. Trip circuit breaker by operation of each protective device. Reset all trip logs and indicators.
7. Perform power-factor or dissipation-factor tests on each pole with the breaker open and on each phase with the breaker closed.
8. Perform power-factor or dissipation-factor tests on each bushing equipped with a power factor/capacitance tap. In the absence of a power-factor/capacitance tap, perform hot-collar tests. These tests shall be in accordance with the test equipment manufacturer's published data.
9. Perform vacuum bottle integrity (dielectric withstand voltage) test across each vacuum bottle with the breaker in the open position in strict accordance with manufacturer's published data.
10. Perform a dielectric withstand voltage test in accordance with manufacturer's published data.
11. Verify operation of heaters.

## **2.5 METAL-ENCLOSED BUSWAYS**

### **A. Visual and Mechanical Inspection:**

1. Compare equipment nameplate data with drawings and specifications.
2. Inspect physical and mechanical condition.
3. Inspect anchorage, alignment, and grounding.
4. Verify correct connection in accordance with single-line diagram.
5. Inspect all bolted electrical connections for high resistance by calibrated torque-wrench method in accordance with manufacturer published data or NETA ATS, Table 10.12.
6. Confirm physical orientation in accordance with manufacturer's labels to insure adequate cooling.
7. Verify "weep-hole" plugs are in accordance with manufacturer's published data.
8. Verify correct installation of joint shield.
9. Verify ventilating openings are clean.

### **B. Electrical Tests:**

1. Compare equipment nameplate data with drawings and specifications.  
.Perform resistance measurements through all bolted connections with low resistance ohmmeter.
2. Perform insulation-resistance tests for one minute on busway, phase-to-ground with the phases not under test grounded. Test voltage shall be in accordance with manufacturer's published data. In the absence of manufacturer's data, use Table 100.1 (NETA ATS)

3. Perform a dielectric withstand voltage test on each busway, phase-to-ground with phases not under test grounded, in accordance with manufacturer's published data. In the absence of manufacturer's data, use Table 100.17 (NETA ATS).
4. Perform phasing test on each busway tie section energized by separate sources. Tests must be performed from their permanent sources.

## **2.6 MEDIUM VOLTAGE CABLES, 15 KV MAXIMUM**

### **A. Visual and Mechanical Inspection:**

#### **1. Inspect Each Individual Exposed Cable For:**

- a. Physical damage plus jacket and insulation condition.
- b. Proper connections in accordance with single-line diagram.
- c. Proper shield grounding.
- d. Proper cable support.
- e. Proper cable termination.
- f. Cable bends not in conformance with manufacturer's minimum allowable bending radius.
- g. Proper arc and fireproofing in common cable areas.
- h. Proper circuit and phase identification.

#### **2. Mechanical connections for:**

- a. Proper lug type for conductor material.
- b. Proper lug installation.
- c. Bolt torque level in accordance with NETA ATS, Table 10.12, unless otherwise specified by manufacturers.

#### **3. Conductors Terminated Through Window Type CTs: Verify that shields, neutrals, and grounds are terminated for correct operation of protective devices.**

### **B. Electrical Tests (after installation):**

#### **1. Insulation Resistance Tests:**

- a. Utilize 5,000-volt megohmmeter for 15 kV conductors.
- b. Test each cable individually with remaining cables and shields grounded.
- c. Test each conductor with respect to ground and to adjacent conductors in accordance with IEEE 118 procedures for 1 minute.
- d. Evaluate ohmic values by comparison with conductors of same length and type.

- e. Investigate values less than 50 megohms.
- 2. Shield Continuity Tests:
  - a. By ohmmeter method on each section of conductor.
  - b. Investigate values in excess of 10 ohms per 1,000 feet of conductors.
- 3. High Potential dc Tests:
  - a. In NEMA WC 7 for TR-XLP and NEMA WC 8 for EPR insulated conductors.
  - b. Each conductor section tested with:
    - 1) Splices and terminations in-place but disconnected from equipment.
    - 2) Remaining conductors and shields grounded in accordance with IEEE 400.
  - c. Apply maximum dc test voltage of 65 kV for 15 kV 133 percent insulation conductor, unarmored cable. Apply test values for armored cable rated 80 percent of unarmored cable. The maximum field test voltage values shall be 80 percent of the maximum factory test values referenced in the standards.
  - d. Measure only the leakage current associated with conductor.
  - e. Utilize guard ring or field reduction sphere to suppress corona at disconnected terminations.
  - f. Maximum test voltage shall not exceed limits for terminators specified in IEEE 48 or manufacturer's specifications.
  - g. Leakage Current Versus Voltage:
    - 1) Apply test voltage in a minimum of five equal increments until maximum acceptable test voltage is reached.
    - 2) Increments not to exceed ac voltage rating of conductor.
    - 3) Record dc leakage current at each step after a constant stabilization time consistent with system charging current.
    - 4) Provide a graphic plot of the test values at each voltage step, leakage current (X axis) versus voltage (Y axis).
  - h. Leakage Current Versus Time:
    - 1) Raise conductor to specified maximum test voltage and hold for 15 minutes, or as specified by conductor manufacturer. Record dc leakage current at 30 seconds and 1 minute and at 1-minute intervals, thereafter.
    - 2) Provide a graphic plot of maximum test voltage results of leakage current (Y axis) versus time (X axis).
  - i. Immediately following test, ground conductor for adequate time period to drain insulation stored charge.
  - j. Test results evaluated on a pass/fail basis. Repair or replace cables not passing test. Repaired cables must pass same test.



## **2.7 LOW VOLTAGE CABLES, 600 VOLTS MAXIMUM**

### **A. Visual and Mechanical Inspection:**

4. Inspect each individual exposed power cable No. 4 and larger for:
  - a. Physical damage.
  - b. Proper connections in accordance with single-line diagram.
  - c. Cable bends not in conformance with manufacturer's minimum allowable bending radius where applicable.
  - d. Color coding conformance with specifications.
  - e. Proper circuit identification.
5. Mechanical Connections For:
  - a. Proper lug type for conductor material.
  - b. Proper lug installation.
  - c. Bolt torque level in accordance with NETA ATS, Table 10.12, unless otherwise specified by manufacturer.
6. Shielded Instrumentation Cables For:
  - a. Proper shield grounding.
  - b. Proper terminations.
  - c. Proper circuit identification.
7. Control Cables For:
  - a. Proper termination.
  - b. Proper circuit identification.
8. Cables Terminated Through Window Type CTs: Verify that neutrals and grounds are terminated for correct operation of protective devices.

### **B. Electrical tests for Conductors No. 4 and larger:**

1. Insulation Resistance Tests:
  - a. Utilize 1,000-volt dc megohmmeter for 600-volt insulated conductors.
  - b. Test each conductor with respect to ground and to adjacent conductors per IEEE 118 procedures for 1 minute.
  - c. Evaluate ohmic values by comparison with conductors of same length and type.
  - d. Investigate values less than 50 megohms.
2. Continuity test by ohmmeter method to ensure proper cable connections.

## **2.8 SAFETY SWITCHES, 600 VOLTS MAXIMUM**

### **A. Visual and Mechanical Inspection:**

1. Proper blade pressure and alignment.
2. Proper operation of switch operating handle.
3. Cable connection bolt torque level in accordance with NETA ATS, Table 10.12.
4. Proper phase barrier material and installation.
5. Perform mechanical operational test and verify mechanical interlocking system operation and sequencing.

### **B. Electrical Tests:**

#### **1. Insulation Resistance Tests:**

- a. Applied megohmmeter dc voltage in accordance with NETA ATS, Table 10.1.
- b. Phase-to-phase and phase-to-ground for 1 minute on each pole.
- c. Insulation resistance values equal to, or greater than, ohmic values established by manufacturer.

#### **2. Contact Resistance Tests:**

- a. Contact resistance in microhms across each switch blade.
- b. Investigate deviation of 50 percent or more from adjacent poles or similar switches.

## **2.9 PROTECTIVE RELAYS**

### **A. Visual and Mechanical Inspection:**

#### **1. Visually check each relay for:**

- a. Tight cover gasket and proper seal.
- b. Unbroken cover glass.
- c. Condition of spiral spring and contacts, if applicable.
- d. Disc clearance, if applicable.
- e. Condition of case shorting contacts if present.

#### **2. Mechanically check each relay for:**

- a. Freedom of movement.
- b. Proper travel and alignment.

#### **3. Verify that each relay:**

- a. Complies with Contract Documents and application.
  - b. Is set in accordance with recommended settings.
- B. Electrical Tests:
  - 1. Insulation resistance test on each circuit to frame except for solid state devices.
  - 2. Determine from the manufacture's instruction manuals the allowable procedures for solid-state and microprocessor based relay testing.
  - 3. Verify operation of light-emitting diode indicators.
  - 4. Set contrast for liquid-crystal display readouts.
  - 5. Tests on Nominal Recommended Setting For:
    - a. Pickup parameters on each operating element.
    - b. Timing at three points on time-current curve.
    - c. Pickup target and seal-in units.
    - d. Special tests as required to check operation of restraint, directional, and other elements in accordance with manufacturer's instruction manual.
  - 6. Verify that each of the relay contacts performs its intended function in the control scheme including breaker trip tests, close inhibit tests, lockout tests, and alarm tests.
  - 7. Phase angle and magnitude contribution tests on differential and directional relays after energization to vectorially verify proper polarity and connections.
  - 8. Current Injection Tests:
    - a. For entire current circuit.
    - b. Secondary injection for current flow of 1 ampere.
    - c. Test current at each device.

## **2.10 INSTRUMENT TRANSFORMERS**

- A. Visual and Mechanical Inspection:
  - 1. Visually check current, potential, and control transformers for:
    - a. Cracked insulation.
    - b. Broken leads or defective wiring.
    - c. Proper connections.
    - d. Adequate clearances between primary and secondary circuit wiring.
  - 2. Verify mechanically that:

- a. Grounding and shorting connections have good contact.
- b. Withdrawal mechanism and grounding operation, when applicable, operate properly.
- c. Verify proper primary and secondary fuse sizes for potential transformers.

**B. Electrical Tests:**

**1. Current Transformer Tests:**

- a. Insulation resistance test of transformer and wiring-to-ground at 1,000 volts dc for 30 seconds.
- b. Polarity test.
- c. Verify wiring against drawings at each terminal point by secondary injection of current at the C.T. locations.

**2. Potential Transformer Tests:**

- a. Insulation resistance test at test voltages in accordance with NETA ATS, Table 10.1 for 1 minute on:
  - 1) Winding-to-winding.
  - 2) Winding-to-ground.
- b. Polarity test to verify polarity marks or H1-X1 relationship as applicable.
- c. Verify wiring against drawings at each terminal point by secondary injection of voltage at the P.T. locations.

- C. Insulation resistance measurement on instrument transformer shall not be less than that shown in NETA ATS, Table 10.1.**

**2.11 METERING**

**A. Visual and Mechanical Inspection:**

- 1. Verify meter connections in accordance with appropriate diagrams.
- 2. Verify meter multipliers.
- 3. Verify that meter types and scales conform to Contract Documents.
- 4. Check calibration of meters at cardinal points.
- 5. Check calibration of electrical transducers.

**2.12 GROUNDING SYSTEMS**

**A. Visual and Mechanical Inspection:**

- 1. Equipment and circuit grounds in panelboards, switchboards, and switchgear assemblies for proper connection and tightness.
- 2. Ground bus connections in panelboards, switchboards, and switchgear assemblies for proper termination and tightness.

3. Effective transformer core and equipment grounding.
4. Accessible connections to grounding electrodes for proper fit and tightness.
5. Accessible exothermic-weld grounding connections to verify that molds were fully filled and proper bonding was obtained.

B. Electrical Tests:

1. Fall-Of-Potential Test:

- a. In accordance with IEEE 81, Section 8.2.1.5 for measurement of main ground system's resistance.
- b. Main ground electrode system resistance to ground to be no greater than 5 ohms.

2. Two-Point Direct Method Test:

- a. In accordance with IEEE 81, Section 8.2.1.1 for measurement of ground resistance between main ground system, equipment frames, and system neutral and derived neutral points.
- b. Equipment ground resistance shall not exceed main ground system resistance by 0.50 ohm.

## **2.13 MEDIUM VOLTAGE AND HIGH VOLTAGE SURGE ARRESTORS**

A. Visual Inspection:

1. Ground connections to ground bus.
2. Shortest practical jumper connections to line.

B. Electrical Tests:

1. Grounding electrode resistance test in accordance with IEEE 81, Section 8.2.1.5 using three-point fall-of-potential method.
2. Insulation power factor.
3. Insulation resistance.
4. RF noise test using Standard Noise Test set with applied voltage of 1.18 times maximum continuous operating voltage.
5. Insulation power factor leakage current, watts loss, and insulation resistance tests in accordance with manufacturer's test values. RIV value not to exceed 10 microvolts above background noise.
6. Leakage current and watts loss tests.

## **2.14 LOW VOLTAGE SURGE ARRESTORS**

A. Visual and Mechanical Inspection:

1. Adequate clearances between arrestors and enclosures.
2. Ground connections to ground bus.

B. Electrical Tests:

1. Clamping voltage test.
2. Rated RMS voltage test.
3. Rated dc voltage test.
4. Varistor arrestor test values in accordance with ANSI C62.33, Section 4.4 and 4.7.

**2.15 DISCONNECT SWITCHES**

A. Visual and Mechanical Inspection:

1. Compare equipment nameplate data with drawings and specifications.
2. Inspect physical and mechanical condition.
3. Confirm correct application of manufacturer's recommended lubricants.
4. Verify grounding is in accordance with industry standards and project specifications.
5. Inspect all bolted electrical connections for high resistance by calibrated torque-wrench method in accordance with manufacturer published data or NETA ATS, Table 10.12.
6. Perform mechanical operator tests in accordance with manufacturer's published data.
7. Verify correct operation and adjustment of limit switches and mechanical interlocks.
8. Verify correct blade alignment, blade penetration, travel stops arc interrupter operation, and mechanical linkage and operation.
9. Verify that all interconnecting pipe, control arms and guides, and switchblades couple and de-couple properly during operation for manual or motor-operated switches.

B. Electrical Tests:

1. Perform an overpotential test on each pole with switch closed. Test each pole-to-ground with all other poles grounded. Test voltage shall be in accordance with NETA ATS, Table 10.11.
2. Perform contact-resistance test across each switchblade and fuse holder.
3. Compare bolted connection resistances to values of similar connections.
4. Bolt-torque levels should be in accordance with NETA ATS, Table 10.12, unless otherwise specified by manufacturer.
5. Microhm and millivolt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer published data. Investigate any values that deviate from similar connections by more than 50 percent.

6. Insulation resistance values shall be in accordance with NETA ATS, Table 10.1.
7. The insulation shall withstand the overpotential test voltage applied.
8. Contact resistance shall be determined in microhms. Investigate any value exceeding 500 microhms or values that deviate from adjacent pole or switches by 25 percent.

## **2.16 BATTERY SYSTEM**

### **A. Visual and Mechanical Inspection:**

1. Physical damage and electrolyte leakage.
2. Evidence of corrosion.
3. Intercell bus link integrity.
4. Battery cable insulation damage and contamination.
5. Operating conditions and ventilating equipment.
6. Visual check of electrolyte level.

### **B. Electrical Tests:**

1. Measure:
  - a. Bank charging voltage.
  - b. Individual cell voltage.
  - c. Electrolyte specific gravity in each cell.
  - d. Measured test values to be in accordance with manufacturer's published data.
2. Verify during recharge mode:
  - a. Charging rates from charger.
  - b. Individual cell acceptance of charge.
3. Load test for integrity and capacity.
  - a. Test values in accordance with ANSI 450.

## **2.17 FIBER OPTIC CABLES**

### **A. Visual and Mechanical Inspection:**

1. Compare cable, connector, and splice data with drawings and specifications.
2. Inspect cable and connections for physical and mechanical damage.
3. Verify that all connectors and splices are correctly installed.

### **B. Electrical Tests:**

1. Perform cable length measurement, fiber fracture inspection, and construction defect inspection using an optical time domain reflectometer.
2. Perform connector and splice integrity test using an optical time domain reflectometer. Signal should be analyzed for excessive connection, splice, or cable backscatter by viewing the reflected power/distance graph.
3. Perform cable attenuation loss measurement with an optical power loss test set.
4. Perform connector and splice attenuation loss measurement from both ends of the optical cable with an optical power loss test set.
5. Attenuation loss measurements shall be expressed in dB/km. Losses shall be within the manufacturer's recommendations when no local site specifications are available.

**END OF SECTION**



**SECTION 26 05 19**  
**LOW VOLTAGE CABLES AND CONDUCTORS**

**PART 1      GENERAL**

**1.1      SUBMITTALS**

- A.    Shop Drawings:
  - 1. Wire and cable descriptive product information.
  - 2. Wire and cable accessories descriptive product information.

**1.2      UL COMPLIANCE**

- A.    Materials manufactured within scope of Underwriters Laboratories shall conform to UL Standards and have an applied listing mark.

**PART 2      PRODUCTS**

**2.1      CONDUCTORS 600 VOLTS AND BELOW**

- A.    Conform to applicable requirements of NEMA WC 3, WC 5, and WC 7.
- B.    Conductor Type: Stranded copper.
- C.    Insulation: Type XHHW.
- D.    Flexible Cords and Cables:
  - 1. Type SOW A/50 with ethylene propylene rubber insulation in accordance with UL 62.
  - 2. Conform to physical and minimum thickness requirements of NEMAWC 8.

**2.2      600 VOLT RATED CABLE**

- A.    General:
  - 1. Type: TC, meeting requirements of UL 1277, including Vertical Tray Flame Test at 20,000 Btu/hr, and NFPA 70, Article 340, or UL 13 Listed Power Limited Circuit Cable meeting requirements of NFPA 70, Article 725.
  - 2. Permanently and legibly marked with manufacturer's name, maximum working voltage for which cable was tested, type of cable, and UL listing mark.
  - 3. Suitable for installation in open air, in cable trays, or conduit.
  - 4. Minimum Temperature Rating: 90 degrees C dry locations, 75 degrees C wet locations.
  - 5. Overall Outer Jacket: PVC, flame-retardant, sunlight- and oil-resistant.

B. Type 1 Multiconductor Control Cable:

1. Conductors:

- a. Class B stranded, coated copper.
- b. Insulation: 15 mil PVC with 4 mil nylon.
- c. UL 1581 listed as Type THHN/THWN rated VW 1.
- d. Conductor group bound with spiral wrap of barrier tape.
- e. Color Code: In accordance with NEMA WC 5, Method 1, Sequence K 2.

2. Cable: Passes the ICEA T 29 520 210,000 Btu/hr Vertical Tray Flame Test.

3. Cable Sizes:

| <b>Conductor Size (AWG)</b> | <b>No. of Conductors</b> | <b>Max. Outside Diameter (inches)</b> | <b>Jacket Thickness (mils)</b> |
|-----------------------------|--------------------------|---------------------------------------|--------------------------------|
| 12                          | 3                        | 0.44                                  | 45                             |
| 12                          | 5                        | 0.52                                  | 45                             |
| 12                          | 7                        | 0.60                                  | 45                             |
| 12                          | 12                       | 0.78                                  | 60                             |
| 12                          | 19                       | 0.95                                  | 60                             |
| 10                          | 3                        | 0.49                                  | 60                             |
| 10                          | 4                        | 0.57                                  | 80                             |

4. Manufacturers:

- a. Okonite Co.
- b. Rome Cable

C. Type 2-Multiconductor Power Cable:

1. Conductors:

- a. Class B stranded, coated copper.
- b. Insulation: Chemically crosslinked ethylene-propylene with Hypalon jacket.
- c. UL 1581 listed as Type EPR, rated VW 1.
- d. Color Code: Conductors, size No. 8 AWG and smaller, colored conductors, NEMA WC5 Method 1, color 5 per Article POWER CONDUCTOR COLOR CODING. Conductors, size No. 6 AWG and larger, NEMA WC5, Method 4.

2. Cable pass the ICEA T-29-520 210,000 Btu/hr Vertical Tray Flame Test.

3. Cable Sizes:

| <b>Conductor Size</b> | <b>Minimum Ground Wire Size</b> | <b>No. of Conductors</b> | <b>Max. Outside Diameter (Inches)</b> | <b>Nominal Jacket Thickness (Mils)</b> |
|-----------------------|---------------------------------|--------------------------|---------------------------------------|----------------------------------------|
| 12                    | 12                              | 2                        | 0.42                                  | 45                                     |
|                       |                                 | 3                        | 0.45                                  | 45                                     |
|                       |                                 |                          | 0.49                                  | 45                                     |
| 10                    | 10                              | 2                        | 0.54                                  | 60                                     |
|                       |                                 | 3                        | 0.58                                  | 60                                     |
|                       |                                 |                          | 0.63                                  | 60                                     |
| 8                     | 10                              | 3                        | 0.66                                  | 60                                     |
|                       |                                 |                          | 0.72                                  |                                        |

4. Manufacturers:

- a. Okonite Co.
- b. Rome Cable

D. Type 3-No. 16 AWG, Twisted, Shielded Pair, Instrumentation Cable: Single pair, designed for noise rejection for process control, computer, or data log applications meeting NEMA WC 55 requirements.

- 1. Outer Jacket: 45 mil nominal thickness.
- 2. Individual Pair Shield: 1.35 mil, double-faced aluminum/synthetic polymer overlapped to provide 100 percent coverage.
- 3. Dimension: 0.31 inch nominal OD.

4. Conductors:

- a. Bare soft annealed copper, Class B, Seven-strand concentric, meeting requirements of ASTM B8.
- b. 20 AWG, seven-strand tinned copper drain wire.
- c. Insulation: 15 mil nominal PVC.
- d. Jacket: 4 mil nominal nylon.
- e. Color Code: Pair conductors black and red.

5. Manufacturers:

- a. Okonite Co.
- b. Rome Cable

E. Type 4-No. 16 AWG, Twisted, Shielded Triad Instrumentation Cable: Single triad, designed for noise rejection for process control, computer, or data log applications meeting NEMA WC 55 requirements.

- 1. Outer Jacket: 45 mil nominal.

2. Individual Pair Shield: 1.35 mil, double-faced aluminum/synthetic polymer, overlapped to provide 100 percent coverage.
3. Dimension: 0.32 inch nominal OD.
4. Conductors:
  - a. Bare soft annealed copper, Class B, seven-strand concentric, meeting requirements of ASTM B8.
  - b. 20 AWG, seven-strand, tinned copper drain wire.
  - c. Insulation: 15 mil nominal PVC.
  - d. Jacket: 4 mil nylon.
  - e. Color Code: Triad conductors black, red, and blue.
5. Manufacturers:
  - a. Okonite Co.
  - b. Alpha Wire Corp.

F. Type 5-No. 18 AWG, Multi-Twisted, Shielded Pairs with a Common, Overall Shield Instrumentation Cable: Designed for use as instrumentation, process control, and computer cable, meeting NEMA WC 55 requirements.

1. Conductors:
  - a. Bare soft annealed copper, Class B, seven-strand concentric, in accordance with ASTM B8.
  - b. Tinned copper drain wires.
  - c. Pair drain wire size AWG 20, group drain wire size AWG 18.
  - d. Insulation: 15-mil PVC.
  - e. Jacket: 4-mil nylon.
  - f. Color Code: Pair conductors black and red with red conductor numerically printed for group identification.
  - g. Individual Pair Shield: 1.35 mil, double-faced aluminum/synthetic polymer.
2. Cable Shield: 2.35 mil, double-faced aluminum/synthetic polymer, overlapped for 100 percent coverage.
3. Cable Sizes:

| <b>Number of Pairs</b> | <b>Maximum Outside Diameter (inches)</b> | <b>Nominal Jacket Thickness (mils)</b> |
|------------------------|------------------------------------------|----------------------------------------|
| 4                      | 0.50                                     | 45                                     |
| 8                      | 0.68                                     | 60                                     |
| 12                     | 0.82                                     | 60                                     |

4. Manufacturers:

- a. Okonite Co.
- b. Alpha Wire Corp.

**2.3 SPECIAL CABLES**

A. Type 6: Fiber Optic Cable:

- 1. NFPA70 Type: OFNP
- 2. Fiber Type: 62.5 Micron
- 3. Multimode Fiber
- 4. Number of Stands: 4
- 5. Buffer Tube Material: Thermoplastic
- 6. Outer Jacket: Riser Rated, PVC, Orange.
- 7. Listing: UL 1661 Riser.
- 8. Optical Characteristics:
- 9. Maximum Attenuation at 1300nm: 1.2dB/km
- 10. Minimum Bandwidth at 1300nm: 600MHz\*km
  - a. Maximum Gigabit Ethernet Length at 1300nm: 550 meters.

B. Ethernet Cable:

- 1. Suitable for installation in cable trays and conduit and for general use.
- 2. Conform to EIA 568B.2, Category 5e type.
- 3. Listing: UL 1661 Riser.
- 4. Conductor material: Copper.
- 5. Conductor Size: No. 24 AWG, 4 twisted pair.
- 6. Insulation on individual conductors:
  - a. Type: Polyolefin
  - b. Color: Conform to NEMA WC 57, Table E-2.
- 7. Shielding: Conform to NEMA WC 57.
  - a. Aluminum Foil-Polyester Tape: 100% coverage
  - b. Tinned Copper Braid: 70% coverage.
  - c. Shield Drain Wire: Tinned Copper
- 8. Overall flame-retardant covering (jacket): Plenum rated.

C. Type 7: RS-485 Cable:

1. Twin-axial, shielded cable, NEX Type PLTC CL2.
2. insulation, characteristic impedance 120 ohms, nominal.
3. Conductors: Two #18 AWG stranded copper.
4. Shield: Overall tape shield with tinned copper drain wire and 55% tinned copper braid.
5. Cable shall be Belden Type 3074F or equal.

D. Type 8: Coaxial Cable:

6. Coaxial, shielded cable, NEX Type CL2X.
7. Type RG-58/U, characteristic impedance 50 ohms, nominal.
8. Center conductor: #20 stranded bare copper.
9. Shield: Tinned copper braid, 95% coverage.
10. Jacket: Black PVC.
11. Provide 50 ohm BNC or other type connectors as required.
12. Cable shall be Belden Type 8240 or equal

## **2.4 GROUNDING CONDUCTORS**

- A. Equipment: Stranded copper with green, Type USE/RHH/RHW XLPE or THHN/THWN, insulation.
- B. Direct Buried: Bare stranded copper.

## **2.5 ACCESSORIES FOR CONDUCTORS 600 VOLTS AND BELOW**

A. Tape:

1. General Purpose, Flame Retardant: 7 mil, vinyl plastic, Scotch Brand 33, rated for 90 degrees C minimum, meeting requirements of UL 510.
2. Flame Retardant, Cold and Weather Resistant: 8.5 mil, vinyl plastic, Scotch Brand 88.
3. Arc and Fireproofing:
  - a. 30-mil, elastomer.
4. Manufacturers and Products:
  - a. Scotch; Brand 77, with Scotch Brand 69 glass cloth tapebinder.
  - b. Plymount; Plyarc 30, with Plymount Plyglas glass cloth tapebinder.

B. Identification Devices:

1. Sleeve: Permanent, PVC, yellow or white, with legible machine-printed black markings.
  2. Marker Plate: Nylon, with legible designations permanently hot stamped on plate.
  3. Grounding Conductor: Permanent green heat-shrink sleeve, 2 inch minimum.
- C. Connectors and Terminations:
1. Nylon, Self-Insulated Crimp Connectors:
    - a. Manufacturers and Products:
      - 1) Thomas & Betts; Sta-Kon.
      - 2) Burndy; Insulink.
      - 3) ILSCO.
    2. Nylon, Self-Insulated, Crimp Locking-Fork, Torque-Type Terminator:
      - a. Manufacturers and Products:
        - 1) Thomas & Betts; Sta-Kon.
        - 2) Burndy; Insulink.
        - 3) ILSCO.
      3. Self-Insulated, Freespring Wire Connector (Wire Nuts):
        - a. Plated steel, square wire springs.
        - b. UL Standard 486C.
        - c. Manufacturers and Product:
          - 1) Thomas & Betts.
          - 2) Ideal; Twister

D. Cable Lugs:

    1. In accordance with NEMA CC 1.
    2. Rated 600 volts of same material as conductor metal.
    3. Insulated, Locking-Fork, Compression Lugs:
      - a. Suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity.
      - b. Manufacturers and Products:
        - 1) Thomas & Betts; Sta-Kon.
        - 2) ILSCO; ILSCONS.
    4. Uninsulated Crimp Connectors and Terminators:
      - a. Suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity.
      - b. Manufacturers and Products:
        - 1) Square D; Versitide.

- 2) Thomas & Betts; Color-Keyed.
- 3) ILSCO.

5. Uninsulated, Bolted, Two-Way Connectors and Terminators:

a. Manufacturers and Products:

- 1) Thomas & Betts; Locktite.
- 2) Burndy; Quiklug.
- 3) ILSCO.

E. Cable Ties: Nylon, adjustable, self-locking, and reusable.

1. Manufacturer and Product:

- a. Thomas & Betts; TY-RAP.

F. Heat Shrinkable Insulation: Thermally stabilized, crosslinked polyolefin.

1. Manufacturer and Product:

- a. Thomas & Betts; SHRINK-KON.

## **2.6 PULLING COMPOUND**

- A. Nontoxic, non-corrosive, noncombustible, nonflammable, wax-based lubricant; UL listed.
- B. Suitable for rubber, neoprene, PVC, polyethylene, hypalon, CPE, and lead-covered wire and cable.
- C. Suitable for zinc-coated steel, aluminum, PVC, bituminized fiber, and fiberglass raceways.
- D. Manufacturers and Products:
  - 1. Ideal Co.; Yellow 77.
  - 2. Polywater, Inc.
  - 3. Cable Grip Co.

## **2.7 SOURCE QUALITY CONTROL**

- A. Conductors 600-Volts and Below: Test in accordance with UL 44 and 854 Standards.

## **PART 3 EXECUTION**

### **3.1 GENERAL**

- A. Conductor installation to be in accordance with NECA 5055.
- B. Conductor and cable sizing shown is based on copper conductors, unless noted otherwise.



- C. Do not exceed cable manufacturer's recommendations for maximum pulling tensions and minimum bending radii.
- D. Tighten screws and terminal bolts in accordance with UL 486A for copper conductors.
- E. Cable Lugs: Provide with correct number of holes, bolt size, and center-to-center spacing as required by equipment terminals.
- F. Bundling: Where single conductors and cables in manholes, handholes, vaults, cable trays, and other indicated locations are not wrapped together by some other means, bundle conductors from each conduit throughout their exposed length with cable ties placed at intervals not exceeding 18 inches on center.
- G. Ream, remove burrs, and clear interior of installed conduit before pulling wires or cables,
- H. Concrete-Encased Raceway Installation: Prior to installation of conductors, pull through each raceway a mandrel approximately 1/4 inch smaller than raceway inside diameter.

### 3.2 POWER CONDUCTOR COLOR CODING

- A. Conductors 600 Volts and Below:
  - 1. No. 6 AWG and Larger: Apply general purpose, flame retardant tape at each end, and at accessible locations wrapped at least six full overlapping turns, covering an area 1 1/2 to 2 inches wide.
  - 2. No. 8 AWG and Smaller: Provide colored conductors.
  - 3. Colors:

| System                                    | Conductor           | Color |
|-------------------------------------------|---------------------|-------|
| All Systems                               | Equipment Grounding | Green |
| 240/120 Volts<br>Single-Phase, Three-Wire | Grounded Neutral    | White |
|                                           | One Hot Leg         | Black |
|                                           | Other Hot Leg       | Red   |
| Three-Phase, Four-Wire                    | Grounded Neutral    | White |
|                                           | Phase A             | Black |
|                                           | Phase B             | Red   |
|                                           | Phase C             | Blue  |

### 3.3 CIRCUIT IDENTIFICATION

- A. Circuits Appearing in Circuit Schedules: Identify power, instrumentation, and control conductor circuits, using circuit schedule designations, at each termination and in accessible locations such as manholes, handholes, panels, switchboards, motor control centers, pull boxes, and terminal boxes.
- B. Circuits Not Appearing in Circuit Schedules:

1. Assign circuit name based on device or equipment at load end of circuit.
  2. Where this would result in same name being assigned to more than one circuit, add number or letter to each otherwise identical circuit name to make it unique.
- C. Method:
1. Conductors No. 3 AWG and Smaller: Identify with sleeves.
  2. Cables, and Conductors No. 2 AWG and Larger:
    - a. Identify with marker plates.
    - b. Attach marker plates with nylon tie cord.
  3. Taped-on markers or tags relying on adhesives not permitted.

### **3.4 CONDUCTORS 600 VOLTS AND BELOW**

- A. Install 10 AWG or 12 AWG conductors for branch circuit power wiring in lighting and receptacle circuits.
- B. Do not splice conductors No. 6 AWG and larger unless specifically indicated or approved by OWNER.
- C. Connections and Terminations:
1. Install nylon self-insulated crimp connectors and terminators for instrumentation, control, and power circuit conductors No. 6 AWG and smaller.
  2. Install uninsulated crimp connectors and terminators for instrumentation, control, and power circuit conductors No. 4 AWG through No. 2/0 AWG.
  3. Install uninsulated, bolted, two-way connectors and terminators for power circuit conductors No. 4/0 AWG and larger.
  4. Install uninsulated bolted, two-way connectors for motor circuit conductors No. 12 and larger.
  5. Tape insulate all uninsulated connections.
  6. Place no more than one conductor in any single-barrel pressure connection.
  7. Install crimp connectors with tools approved by connector manufacturer.
  8. Install terminals and connectors acceptable for type of material used.
  9. Compression Lugs:
    - a. Attach with a tool specifically designed for purpose.
    - b. Tool shall provide complete, controlled crimp and shall not release until crimp is complete.
    - c. Do not use plier type crimpers.

- D. Do not use soldered mechanical joints.
- E. Splices and Terminations:
  - 1. Indoors: Use general purpose, flame retardant tape.
  - 2. Outdoors: Use flame retardant, cold- and weather-resistant tape.
- F. Cap spare conductors and conductors with UL listed end caps.
- G. Cabinets, Panels, and Motor Control Centers:
  - 1. Remove surplus wire, bridle and secure.
  - 2. Where conductors pass through openings or over edges in sheet metal, remove burrs, chamfer edges, and install bushings and protective strips of insulating material to protect the conductors.
- H. Control and Instrumentation Wiring:
  - 1. Terminate with methods consistent with terminals provided, and in accordance with terminal manufacturer's instructions.
  - 2. Locate splices in readily accessible cabinets or junction boxes using terminal strips.
  - 3. Cable Protection:
    - a. Under Infinite Access Floors: May be installed without bundling.
    - b. All Other Areas: Install individual wires, pairs, or triads in flex conduit under the floor or grouped into bundles at least 1/2 inch in diameter.
    - c. Maintain integrity of shielding of instrumentation cables.
    - d. Ensure grounds do not occur because of damage to jacket over the shield.
- I. Extra Conductor Length: For conductors to be connected by others, install minimum 6 feet of extra conductor in freestanding panels and minimum 2 feet in other assemblies

### **3.5 FIELD QUALITY CONTROL**

- A. In accordance with Section 26 01 26, ELECTRICAL TESTING.

**END OF SECTION**

## **SECTION 26 05 33 CONDUITS**

### **PART 1 GENERAL**

#### **1.1 SCOPE**

- A. This section covers the furnishing and installation of substation conduit.
- B. The CONTRACTOR shall furnish and install all materials designated on the Drawings, and any other associated materials and work even though not shown on the Drawings but required to provide a complete conduit system.
- C. The CONTRACTOR shall furnish first-quality, new materials, free from any defects, in first-class condition, and suitable for the use intended. Provide materials approved by UL wherever standards have been established by that agency.

### **PART 2 PRODUCTS**

#### **2.1 STANDARDS**

- A. The conduit shall be manufactured, tested, rated, and furnished in accordance with the latest applicable standards and regulations of the following:
  - 1. ANSI: American National Standards Institute.
  - 2. NEMA: National Electrical Manufacturers' Association.
  - 3. NESC: National Electrical Safety Code.
  - 4. UL: Underwriters' Laboratories.
  - 5. NEC: National Electrical Code.
  - 6. ANSI: American National Standards Institute.
  - 7. ASTM: American Society for Testing and Materials.
  - 8. IEEE: Institute of Electrical and Electronics Engineers.

#### **2.2 MATERIALS**

- A. Conduit, PVC: All underground substation conduit shall be rigid polyvinyl chloride (PVC) conduit, gray color, UL listed for concrete encased, direct burial underground, and exposed use. PVC Schedule 40 shall be used for the main underground runs with rigid steel used for riser 90-degree bends and steel conduit or PVC coated flexible steel conduit, into equipment and control cabinets unless otherwise stated. Refer to conduit details for clarification. Rigid PVC conduit, including couplings, elbows, and nipples shall conform to the requirements of the latest edition of NEMA TC-2, NEC, Federal Specification W-C-1094, and shall meet applicable ASTM test requirements for the intended use.

- B. Conduit, Rigid Steel, Zinc-Coated: Rigid steel conduit, including couplings, elbows, and nipples shall be galvanized by hot-dipping, electroplating, sherardizing, or metalizing process, and shall meet the requirements of ANSI C80.1, UL, and the NEC.
- C. Conduit, Rigid Aluminum: Rigid aluminum conduit, including couplings, elbows, and nipples, shall meet the requirements of ANSI C80.5, Federal Specification WW-C-540, UL, and the NEC, and shall be manufactured by Kaiser Aluminum Company, Aluminum Company of America, or as approved. Aluminum conduit shall not be direct buried or encased in concrete.
- D. Conduit, Flexible: All flexible conduit shall be moisture proof flexible steel, polyvinyl chloride jacketed type, gray color, UL approved.
- E. Conduit Fittings, Metallic: Metallic conduit fittings shall be of the type indicated or required for the anticipated purpose and shall meet applicable requirements of ANSI C80.4, UL, the NEC, and NEMA FB 1. Fittings used with aluminum conduit shall be made of aluminum.

## **PART 3 EXECUTION**

### **3.1 GENERAL**

- A. Work shall be performed in a workmanlike manner by craftsmen skilled in the particular trade. All work shall present a neat and finished appearance.
- B. The conduit installation shall be in accordance with the National Electric Code.
- C. Conduits shall terminate with bushings or as otherwise indicated on the Drawings. All exposed ends shall be plugged during construction.
- D. A mandrel of proper size shall be pulled through all conduit runs to ensure the conduits are free of debris after installation. A pull wire or rope shall be left in all unused conduits to facilitate further installation of cables.
- E. A run of conduit shall not contain more than the equivalent of four quarter bends (360 degrees total), including those bends located immediately at the outlet fitting.
- F. Underground substation conduits for control and low voltage power cables shall be installed a minimum of 24 inches below subgrade. Underground conduits for 15 kV power cables shall be installed 36 inches below finish grade, unless otherwise shown.
- G. For all underground bends, the radii shall be as large as practical and no less than 24 inches. Shop or factory bends may be used, provided they meet the requirements of these Specifications. All conduit and conduit bends shall be free of flattening or cracks, and all cuts shall be made square with the inside of the ends carefully reamed. Conduits shall terminate with an adapter and threaded cap.

- H. PVC conduit joints shall be solvent welded with the solvent recommended by the conduit manufacturer. Use factory-made bends for all bends 30 degrees or larger. Use approved heating methods for forming smaller bends. Provide expansion joints as required or as recommended by the manufacturer. When joining PVC to rigid steel conduit, use an approved PVC female adapter.
- I. The backfill shall be free from rocks or debris and thoroughly compacted.

**END OF SECTION**

**SECTION 26 05 43**  
**UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.    This section covers work necessary for trench excavation, backfill, restoration, and the furnishing and installation of duct banks, conduits, and vaults, complete.
- B.    Trench Excavation: Excavation is unclassified. Complete all excavation regardless of the type of materials encountered. The CONTRACTOR shall make its own estimate of the kind and extent of the various materials that will be encountered in the excavation.

**PART 2      PRODUCTS**

**2.1      TRENCH SYSTEM**

- A.    Trench Safety System: Trench excavation exceeding 5 feet in depth shall have an adequate safety system for trench excavation.
- B.    Trench Backfill:
  - 1. Select Backfill: Excavated material free from roots, organic matter, trash, debris, rocks larger than 2 inches, clay type soil, and other deleterious materials. Provide imported material of equivalent quality, if required to accomplish the work.
  - 2. Crushed Aggregate Base Backfill: Crushed aggregate base for backfill shall be 1-1/4 inch - 0 or 3/4 inch - 0 meeting all the requirements set forth in Section 9-03.9(3) of the Oregon Department of Transportation (ODOT) Standard Specifications for Road, Bridge and Municipal Construction.
  - 3. Gravel Base Backfill: 4-inch minus gravel; free from clay balls, roots, and organic matter; well-graded from coarse to fine, with less than 5 percent by weight passing the No. 200 sieve. Gravel backfill shall meet the requirements for granular wall backfill of Section 9-03.12(2) of the Oregon Department of Transportation (ODOT) Standard Specifications for Road, Bridge and Municipal Construction.
  - 4. Sand Backfill: Natural sand or sand produced from crushed gravel or crushed rock, maximum size 1/4 inch; 95 percent shall pass a No. 4 sieve, free from clay and organic material with a maximum of 8 percent passing the No. 200 sieve.
  - 5. Controlled Density Fill (CDF) Backfill: Controlled Density Fill shall obtain a compressive strength of at least 1.0 MPa (150 psi) but not more than 2.0 MPa (300 psi) in 28 days. The coarse aggregate shall be no larger than 3/8" round. The mix design, production and placement shall conform to ACI 229R.

- C. Water for Trench Backfill: The CONTRACTOR shall make all arrangements for a source of water and bear all costs for the delivery of the water to the trench side.
- D. Compaction Equipment: Compaction equipment shall be of suitable type and adequate to obtain the amount of compaction specified. Compaction equipment shall be operated in strict accordance with the manufacturer's instructions and recommendations and shall be maintained in such condition that it will deliver the manufacturer's rated compactive effort.

## **2.2 CONCRETE – DUCTBANK ENCASEMENT**

- A. Concrete for duct bank encasement shall have a 28 day compressive field strength of at least 3.0 MPa (450 psi) but not more than 6 MPa (900 psi) when cured and tested in accordance with ASTM C31 and C39. Concrete shall be provided with batch plant certificate for normal strength and will not be tested.
- B. Aggregate for concrete duct encasement shall be pea gravel or 5/8 inch minus crushed rock aggregate to allow for proper flow between, around and under the conduits.
- C. Concrete shall be provided with manufacturer's standard red color. Site application by raking to thoroughly mix a sufficient quantity of red iron oxide dye to the top 1 inch of freshly poured concrete of the duct bank encasement to present a permanent, consistent, and unmistakable red color to the concrete surface, may be an option accepted by the OWNER.

## **2.3 CRUSHED ROCK SURFACING TOP COURSE**

- A. This Specification applies to the crushed rock material that shall be used when replacing, adding, and shaping roadway shoulders around vaults and over the cable trench.
- B. Crushed surfacing top course shall be crushed rock, including sand manufactured from gravel, in accordance with the requirements for 1-1/4 inch minus (1-1/4"–0) or 3/4 inch minus (3/4"–0) aggregate, as specified in the Oregon Department of Transportation (ODOT) Standard Specifications for Construction, Sections 00641 and 00642 (Crushed Aggregate Base Course and Aggregate Subbase/Base Course), as applicable.
- C. PVC Duct DB (Direct Burial): Use rigid PVC Type DB 120 duct, UL listed for concrete encased. Use conduits, couplings, bushings, nipples, and other fittings meeting the requirements of NEMA TC 6 and TC 9. Use only duct with a factory formed bell on one end. Conduit that requires the use of couplings for straight runs will not be acceptable.
- D. PVC Schedule 40 Conduit: Use rigid PVC Schedule 40 conduit, UL listed for concrete-encased, underground direct burial, concealed and directed sunlight exposed use, and UL listed and marked for use with conductors having 90 degrees C installation. Use conduits, couplings, bushings, elbows, nipples, and other fittings meeting the requirements of NEMA TC 2 and TC 3, Federal



Specification W-C 1094, UL, NEC, and ASTM specified tests for the intended use. Conduit that requires the use of couplings for straight runs will not be acceptable.

- E. PVC Schedule 80 Conduit: Use rigid PVC Schedule 80 conduit, UL listed for concrete-encased, underground direct burial, concealed and directed sunlight exposed use, and UL listed and marked for use with conductors having 90 degrees C installation. Use conduits, couplings, bushings, elbows, nipples, and other fittings meeting the requirements of NEMA TC 2 and TC 3, Federal Specification W-C 1094, UL, NEC, and ASTM specified tests for the intended use. Conduit that requires the use of couplings for straight runs will not be acceptable.

## **2.4 PRECAST VAULTS**

- A. Vaults shall be precast type with features, components, and load ratings common in standard catalog products manufactured by Utility Vault Co.; or approved equal.
- B. Install steel reinforced concrete vaults precast with 28 day, 33,100 kPa (4,800 psi) minimum compressive strength concrete and designed for AASHTO H 20 wheel loading.
- C. Install vaults plumb and level, allowing vault floors to drain toward the floor sump or drain line, leaving no pockets or other nondraining areas.
- D. Provide four duct bank entrances on each end of the vault and four duct bank entrances on each side. For duct banks installed under this Contract, knockout panels and precast individual bell end fittings shall be used. On sides where no ducts are installed under this Contract, provide 12 inch high by 12 inch wide (minimum) knockout panels for future raceway installation.
- E. Hinged diamond-plate steel doors shall be dimensioned as shown on the Drawings, suitable for H 20 wheel loading, and all parts hot-dip galvanized. Doors and frames shall be of the same design and quality as Utility Vault Company Catalog No. 332P, 2-332P, or 3-332-P, or as noted on the Drawings.
- F. Where cast iron manhole covers are specified, utilize heavy duty type manhole frames and 42 inch minimum diameter solid manhole covers made of cast iron, suitable for high density traffic H 20 loading, and having machined bearing surfaces. Provide indented type covers, solid top design, with two drop handles each.
- G. Provide vault identification on the upper side of each cover, cast or burned by welder (before galvanizing on diamond-plate doors), in integral letters not less than 2 inches high appropriate titles, ELECTRIC. Provide adequate space for OWNER to field stamp covers with the vault number designation; vault numbers shall be 2 inches tall.
- H. Provide standard weight cable racks for supporting all cables in each vault. Set adjustable unistrut-type inserts in the concrete walls for the attachment of racks.

Do not use bolts or studs embedded in concrete for attaching racks. Set racks and inserts on not greater than 3.3 foot centers around the entire inside perimeter of the vault, arranged so that all spare conduit ends are clear for future cable installation. Provide racks with a sufficient number of arms to accommodate cables for each conduit entering or leaving the vault.

- I. Provide a pulling iron embedded in the concrete wall opposite each duct bank entrance. Utilize 3/4 inch round stock securely fastened to the overall steel reinforcement before concrete is poured.
- J. Each vault more than 6.6 feet deep from grade to vault floor shall be furnished with an easily removable galvanized steel ladder. Ladder shall be designed in accordance with OSHA standards.
- K. Utilize vault hardware of steel, hot dip galvanized after fabrication.

## **2.5 IDENTIFICATION TAPE**

- A. Identification tape shall be 6 inch wide Terra Tape as supplied by Reef Industries, P.O. Box 33248, Houston, TX 77033, or equivalent. The (red) tape shall read CAUTION BURIED ELECTRICAL INSTALLATION BELOW or shall identify the appropriate utility.
- B. Identification tape shall only be required for primary electrical circuit installations that are main backbone feeder trunks, or major circuit taps as defined by OWNER.

## **2.6 SUBMITTALS**

- A. After award of Contract, the CONTRACTOR shall submit to OWNER the proposed manufacturer, type, and catalog number of vaults, DB and PVC duct, spacers, and detail dimensioned vault Drawings.

# **PART 3 EXECUTION**

## **3.1 GENERAL**

- A. Provide duct bank systems meeting or exceeding the requirements of any state, county, or local safety standards for Electrical Construction.
- B. Placement of all fill or backfill shall be done in 6 inch lifts with each lift compacted as specified in Article BACKFILLING.
- C. Trenches for ducts may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of surface is disturbed. Road patrols or graders shall not be used to excavate the trench. The bottom surface of the trenches shall be essentially smooth and free from coarse aggregate.
- D. The CONTRACTOR shall excavate power cable trenches to a width not less than 18 inches, unless otherwise shown on the drawings. The trenches shall be excavated to a depth at least 6 inches below the required conduit depth. Any

depth greater than 6 inches below the bottom of the conduit shall be replaced with bedding material (sand) of select backfill. The bedding material shall be tamped until firm.

### **3.2 PROTECTION DURING CONSTRUCTION**

- A. In addition to the requirements of the General Conditions, prior to installation, store all products specified in this section in a dry and secure location. Following installation, protect products from the effects of moisture, corrosion, vandalism, and physical damage during construction. Keep openings in conduit capped with manufactured seals during construction. Keep ends of stored or un-terminated cable sealed with heat-shrink seals or factory caps.

### **3.3 TRENCH SYSTEM CONSTRUCTION METHODS**

- A. Trench Safety System:
  - 1. The CONTRACTOR shall be solely responsible for making all excavations in a safe manner. Provide appropriate measures to retain excavation side slopes and preventing rock falls to ensure that persons working in or near the excavation are protected.
  - 2. The CONTRACTOR shall also be responsible for the daily closing of any trench across a walkway, driveway, street, or roadway with a secured, steel nonskid covering.
- B. Pavement, Curb, and Sidewalk Removal: Cut all bituminous and concrete pavements, regardless of the thickness, and all curbs and sidewalks, prior to excavation of the trenches with an approved pavement saw. Width of the pavement cut shall be at least equal to the required width of the trench at ground surface. Pavement and concrete materials removed shall be hauled from the site and not used for trench backfill.
- C. Trench Width: Minimum width of trenches in which conduit or cable is to be laid shall be as shown on the Drawings or specified in other sections of these Specifications.
- D. Shoring, Sheet piling, and Bracing of Trenches: Sheet and brace the trench when necessary to prevent caving during excavation in unstable material, or to protect adjacent structures, property, workers, and the public. Increase trench widths accordingly by the thickness of the sheet piling. Maintain sheet piling in place until the conduit or cable has been placed and backfilled at the conduit or cable zone. Shoring and sheet piling shall be removed, as the backfilling is done, in a manner that will not damage the conduit or cable or permit voids in the backfill. All sheet piling, shoring, and bracing of trenches shall conform to the safety requirements of the federal, state, or local public agency having jurisdiction. The most stringent of these requirements shall apply.
- E. Location of Excavated Materials: During trench excavation, place the excavated material only within the construction easement, right-of-way, or approved working area. Do not obstruct any private- or public-traveled roadways or streets without prior permission and/or cooperation from the agency responsible

for the street, etc. Conform to all federal, state, and local codes governing the safe loading of all trenches with excavated material.

F. Removal of Water:

1. At all times provide and maintain ample means and devices to promptly remove and dispose of all water entering the trench excavation during the time the trench is being prepared for conduit or cable laying, during the laying, and until the backfill at the conduit or cable zone has been completed. These provisions shall apply during the noon hour as well as overnight.
2. Dispose of the water in a manner to prevent damage to adjacent property. Drainage of trench water through conduit is prohibited.

G. Finishing and Compaction:

1. Backfill for this project shall include only acceptable and approved materials placed in trenches and under or adjacent to other structures.
2. After spreading, the backfill material shall be thoroughly compacted by rolling, tamping, or other approved methods. The compaction effort shall continue until the material has been compacted to the percent density required as shown on the Contract Compaction Requirements Table of these Specifications.
3. The course shall not be compacted when the underlying course is soft or yielding or when the compaction effort causes undulation of the underlying material.
4. Sprinkling during compaction, if necessary and applicable, shall be in the amount and by equipment as necessary for proper compaction.
5. Backfilling over concrete duct banks shall not be allowed until the concrete has achieved at least 75 percent of its final strength. The CONTRACTOR shall use adequate curing compound so that high early strength concrete is suitable for backfill within 8 hours or same day of pour. The CONTRACTOR shall have laboratory tests made under OWNER's supervision to establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or methods of placing it.
6. The intent of backfilling within 8 hours or the same day of pour is to safeguard the public. If in the opinion of the CONTRACTOR same day backfill is not probable, it is the CONTRACTOR's responsibility to arrange trench covering or otherwise avoid the hazard of open trenches while the CONTRACTOR is not on site. The maximum length of trench covered, but left open while the CONTRACTOR is not on site, shall not exceed 100 feet.
7. Backfill shall not be measured for direct payment. Performance of this work shall be considered as a direct subsidiary obligation of the CONTRACTOR covered under the Contract price for the area involved

### **3.4 DUCTBANK INSTALLATION REQUIREMENTS**

- A. Arrange multiple conduit runs substantially in accordance with any details shown on the Drawings.
- B. Make minor changes in location or cross section as necessary to avoid obstructions or conflicts. Where duct bank runs cannot be installed substantially as shown because of conditions not discoverable prior to digging of trenches, refer the condition to the OWNER for instructions before further work is done.
- C. Install conduit sections such that the bell end faces opposite the direction of pull. This practice avoids cable damage caused by conduit end edges.
- D. Where other utility piping systems are encountered or being installed along or over a duct bank route and, unless otherwise specified, maintain a 12 inch minimum vertical separation between conduits and other systems at crossings. Maintain a 12 inch minimum separation between conduits and other systems in parallel runs. Do not place conduits over valves or couplings in other piping systems. Refer conflicts with these requirements to the OWNER for instructions before further work is done.
- E. Provide bell-ends flush with vault walls on all nonmetallic conduits entering vault(s).
- F. In duct banks, stagger conduit coupling locations so that couplings in adjacent conduits are not in the same transverse line.
- G. Where the duct bank is not in the shoulder of a road, provide cable route markers at a height 30 inches above grade to indicate the direction of the underground cables provided under this Contract as noted on the plan drawings, if applicable. Provide markers consisting of signs with white double-ended arrow and the words CABLE ROUTE attached to a galvanized steel post driven 3.3 feet deep. The sign shall be Type DS, as manufactured by Hall Signs, Inc., Bloomington, IN, or approved equal. The signs shall be placed at intervals between vaults not exceeding 100 feet.
- H. Unless indicated otherwise on the Drawings, all conduits shall enter vaults at right angles.
- I. Solvent weld PVC conduit joints with solvent recommended by the conduit manufacturer. Follow manufacturer's solvent welding instructions and provide watertight joints. Leave no solvent on the inside of the conduit joint.
- J. Where duct bank is not constructed in a walkway, driveway, parking area, street, roadway, or any graveled surface, and to the extent practical, duplicate existing topsoil layers and mound over the trench to account for any expected settling of the trench backfill

### **3.5 CONCRETE ENCASED DUCKBANK INSTALLATION REQUIREMENTS**

- A. The trench excavation along streets shall match the grade of the street and provide a substantially flat and smooth bed for the placement of the ducts.

- B. Trench excavation in terrain off of streets shall allow the duct bank to slope towards a vault to prevent the accumulation of water in the duct bank. Trenches dug in soils shall be as straight and as flat as possible between vault locations with no more than 1 percent slope break in any 10 foot section. Deeper trench excavation than the minimums shown on the Drawings may be required in uneven terrains to achieve the above requirement.
- C. Inadvertent over excavation in soil shall be backfilled with crushed aggregate base and compacted to prevent settling of the duct bank. Over excavation in rock shall be backfilled with crushed aggregate base, compacted to prevent duct bank settling.
- D. The trench shall be free from stones and debris. Any soft spots shall be over excavated and replaced with compacted crushed aggregate base backfill.
- E. 1 inch by 2 inch minimum wood furring strips, or spacer base sections, shall be placed under the duct bank at minimum 10 feet spacing to provide a space under the duct bank for encased concrete backfill.
- F. Duct spacers shall be placed 12 inches from each joint and a maximum of 10 foot centers throughout the duct bank run.
- G. The ducts shall be wire tied or duct taped to the spacers to provide a secure assembly.
- H. To prevent the duct bank from floating while pouring concrete, anchor the duct bank assembly with a welded T bar of reinforcing bar, or drive two No. 4 rebars at duct bank spacer locations or another means approved by OWNER. Placing weights on the duct bank or standing on the duct bank during the concrete pouring is not permitted.
- I. Do not backfill or pour any concrete until the duct bank placed in the excavation has been inspected by OWNER.
- J. Pour concrete from one end of the duct bank run to the other to allow the free end to expand. Do not pour concrete from each end of a duct bank run toward the center.
- K. The walls of the excavated trench shall serve as the forms for the duct bank concrete encasement.
- L. Place the concrete delivery chute as close to the duct bank as possible to reduce the concrete fall and minimize any disturbances to the duct bank assembly and the side walls of the excavation.
- M. Rod the concrete to assure complete encasement of the duct bank on the bottom, sides, and between ducts.
- N. Allow sufficient concrete curing time in accordance with manufacturer's recommendation before installing the earth backfill over an encased duct bank

### **3.6 VAULTS**

- A. Install vaults generally where shown on the Drawings. Coordinate with OWNER and the design of other facilities for each vault location.
- B. Do not install vaults until the elevation of final grading and surfacing has been determined. The determination of final grade is the responsibility of the CONTRACTOR and shall be coordinated with OWNER.
- C. Make installations so that conduits enter vaults at right angles and as near as possible to one end of a wall, unless otherwise indicated.
- D. Install two 3/4 inch by 10 foot ground rods at opposite corners of the vault, unless UFER ground style vaults are provided and approved by the OWNER. Connect all noncurrent carrying metal parts in the vault to 2/0 bare, stranded copper conductor, which is to be connected to the ground rods.
- E. All vaults shall have 6 inches of crushed aggregate base or pea gravel base for drainage. Backfill around vault walls shall be crushed aggregate base.
- F. Vault covers shall be 1 inch above finish grade to discourage water entry.
- G. All seams in vaults will be gasketed.
- H. All vaults shall have four shear pins (No. 4 rebar, 24 inches long) dowelled and epoxy grouted into the vault wall to join the encased duct bank to the vault.
- I. Conduit terminations at vaults shall enter through pre set knockouts only. Do not saw or drill through concrete walls without OWNER approval.

### **3.7 CONDUIT**

- A. All exposed ends of conduit shall be plugged during construction to prevent the entrance of foreign matter and moisture into the conduit. Burrs or sharp projections which might injure the cable shall be removed.
- B. The minimum bending radius of conduit shall be 18 times the overall diameter of the cable to be installed. In all cases, the minimum radius specified is measured to the surfaces of the conduit on the inside of the bend. No conduit bends shall be made within 12 inches of a cable termination or splice.

### **3.8 EMPTY RACEWAY**

- A. Certain ducts will not have conductors pulled in as part of this Contract. Provide a removable permanent cap over each end of each empty duct. Provide an appropriate nylon pull cord in each empty duct.

### **3.9 MANDREL DUCTS**

- A. A mandrel of proper size shall be pulled through all duct runs and duct banks to ensure the raceways are smooth and free of debris after installation.

- B. If cable is not immediately pulled into the conduit, an appropriate nylon pull cord shall be installed and the conduit capped.

### 3.10 BACKFILLING

- A. All sand embedded buried conduits shall be installed with 6 inches of sand or 6 inches of native backfill around them or as noted on the Drawings. If native backfill is used, it must be free from all debris and all material larger than 1 inch diameter. Compaction of these materials shall be in compliance with the requirements of the Compaction table included in this specification. The remainder of backfill shall be as follows:
1. For Sandy-Loam Areas: Backfill shall be native soil.
  2. For Native Soil with Rock: Backfill shall be either select backfill or native backfill free from all debris and from all materials greater than 2 inches in diameter.
  3. For Traffic Surface (Driveway/Sidewalk/Roadway): Backfill shall be crushed aggregate base or gravel base, as noted on the Drawings.
  4. For Vaults and Padmounted Equipment: Backfill shall be a minimum 6 inches of compacted crushed aggregate base.
- B. All compaction requirements shall be as shown in Table A.
- C. Place backfill in 6-inch layers and compact each layer by means of mechanical tampers or vibratory compactors to a density as shown in Table A. When in the judgment of OWNER the native backfill material is excessively wet due to rain, and is therefore noncompactible and unsuitable, OWNER will authorize the CONTRACTOR to initiate a Change Order to substitute Crushed Aggregate or Gravel Backfill, as required. The amount of the Change Order will be determined by the actual costs incurred by the CONTRACTOR.

| <b>Table A</b><br><b>CONTRACT COMPACTION REQUIREMENTS</b>                                         |                                |                                                                                                  |
|---------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Material Type</b>                                                                              | <b>Paved Areas</b>             | <b>Nonpaved Areas</b>                                                                            |
| Sand                                                                                              | N/A                            | Hand tamped, see Specifications                                                                  |
| Select Backfill                                                                                   | N/A                            | <sup>(1)</sup> 95% (Method B or D) for noncohesive soils; 90% (Method B or D) for cohesive soils |
| Crushed Aggregate Base                                                                            | <sup>(1)</sup> 100% (Method D) | <sup>(1)</sup> 95% (Method D)                                                                    |
| Gravel Base                                                                                       | 95% (Method D)                 | 90% (Method D)                                                                                   |
| <sup>(1)</sup> Values expressed are a percentage of the maximum density determined by ASTM D1557. |                                |                                                                                                  |

- D. When backfill is placed mechanically, push the backfill material onto the slope of the backfill previously placed and allow to slide down into the excavation. Do not push backfill into the excavation in such a way as to permit free fall of



the material until at least 1 foot of cover is provided over the top of plastic conduits.

1. Identification Tape: Place identification tape when applicable as noted on the Drawings. Place identification tape over the center of the conduit.
- E. Backfill to the existing finished grade and compact so that no settlement will occur. In areas to be reseeded or resodded, install approximately 6 inches of loam soil suitable for lawn restoration.
- F. Maintain the surface of the backfilled trench level with the existing grade or as noted on the Drawings until the entire project is accepted by OWNER. Any subsequent settlement of the finished surface during the warranty period shall be considered to be a result of improper or insufficient compaction and shall be promptly repaired by the CONTRACTOR at no cost to OWNER.
- G. This maintenance shall include, but not be limited to, the addition of crushed aggregate base or suitable backfill material to keep the surface of backfilled trenches reasonably smooth, free from ruts and potholes, and suitable for normal traffic flow. Cold patch work such as "poly-patch" material may be required for temporary surface repair.

### **3.11 DISPOSAL OF EXCESS EXCAVATED MATERIAL**

- A. Dispose of all excess excavated materials. Make arrangements for the disposal and bear all costs or retain any profit incidental to such disposal.
- B. OWNER may provide a disposal site for the deposit of waste material for the CONTRACTOR's use. If appropriate and approved by OWNER the CONTRACTOR may spread waste material to blend with the surrounding area.

### **3.12 SETTLEMENTS**

- A. Any settlement noted in backfill, fill, or in structures built over the backfill or fill within the 1-year warranty period in accordance with the General Conditions will be considered to be caused by improper compaction methods and shall be corrected at no cost to OWNER. Structures damaged by settlement shall be restored to their original condition by the CONTRACTOR at no cost to OWNER.

### **3.13 SURFACE FINISHING**

- A. Grass Areas: Where grass has been removed, replace with a sod similar in color and in quality to grass in adjacent areas, unless otherwise noted on the Drawings.
- B. Field Areas: Where vegetation has been removed or disturbed, resurface in accordance with local or county Erosion and Sedimentation Control requirements.

- C. Sidewalks and Driveways: Where sidewalks or driveways have been cut, replace with a matching material equal or greater in quality to a depth at least as thick as the existing cut area, unless otherwise noted on the Drawings.
- D. Roadways: Where roadways have been cut, replace with matching materials equal to or greater in quality, unless otherwise noted on the Drawings. Sand and apply tack coat to all saw-cut edges. Match existing pavement thickness of concrete or asphalt concrete, 4-inch minimum asphalt pavement in accordance with Oregon Department of Transportation (ODOT) Standard Specifications for Construction Section 00744 (Asphalt Concrete Pavement), or approved equal, and 8-inch minimum for concrete pavement in accordance with ODOT Section 00540 (Concrete Pavement), or as required by the local agency having jurisdiction.

### **3.14 COMPLIANCE TESTING**

- A. Material Acceptance: All imported materials intended for use on the project shall first be accepted by OWNER prior to use or placement. Acceptance shall be based on certifications, test results indicating compliance with the appropriate standard specification requirements, or other approved methods. It shall be the responsibility of the CONTRACTOR to supply such data.
- B. Project Sampling and Testing:
  - 1. Materials used on the project shall be sampled and tested by a variety of methods applicable to the specific material type. Some of the tests will be performed in the field and others will be performed in the laboratory.
  - 2. All backfill material, except the sand cushion, shall have density standards established in the laboratory prior to placement of that material in the field. The laboratory density standards are considered "Proctors." The Proctors will then be used to compare the field density of the material after placement in order to determine the percent compaction. Specific tests and standard requirements are shown on the Contract Compaction Requirements Table in this section.
  - 3. Following are specific tests necessary for monitoring compliance of the material during construction. See Paragraph TESTING FREQUENCY for the recommended frequency in which the tests shall be performed.
    - a. Crushed Aggregate Base and Gravel Base:
      - 1) Initial Approval: Based on recent previous state-approved aggregate or source acceptance testing performed on this specific project in accordance with the requirements in the Standard Specifications.
      - 2) Testing for Conformance:
        - a) Method for Reducing Field Samples of Aggregate to Testing Size -ASTM C702.
        - b) Method for Sieve Analysis of Fine and Coarse Aggregates -ASTM C136.

3) Compaction:

a) Laboratory (Proctor):

(1) Moisture -Density Relations of Soils -ASTM D1557.

b) Field Density (Either Method):

(1) Test Method for Density of Soil in Place by the Sand-Cone Method -ASTM D1556.

(2) Test Method for Density of Soil and Soil - Aggregate in Place by Nuclear Methods -ASTM D2922.

b. Select Backfill:

1) Initial Approval: Based on sieve analysis test data or approval by OWNER when natural trench excavation is used.

2) Testing for Conformance: Method for Sieve Analysis of Fine and Coarse Aggregates -ASTM C136 if applicable.

3) Compaction:

a) Laboratory (Proctor):

(1) Moisture -Density Relations of Soils -ASTM D1557.

b) Field Density (Either Method):

(1) Test Method for Density of Soil in Place by the Sand-Cone Method -ASTM D1556.

(2) Test Method for Density of Soil and Soil - Aggregate in Place by Nuclear Methods -ASTM D2992.

c. Sand Backfill:

1) Initial Approval: Based on recent test data indicating gradation meeting project specifications.

2) Testing for Conformance: Method for sieve Analysis of Fine and Coarse Aggregates ASTM C136.

3) Compaction: Visual—to the satisfaction of the OWNER.

d. Controlled Density Fill (CDF) Backfill:

1) Initial Approval: Based on submittal of concrete supplier mix design. Mix design must show expected compressive strength, aggregate sizes and quantities, cement quantities, and all admixtures. Approval will be by OWNER.

2) Testing for Conformance: Test Method for the Ball Drop on Controlled Low Strength Material (CLSM) to Determine Suitability for Load Application, ASTM D 6024.

3) Compaction: Compaction is not required for Controlled Density Fill.

C. Testing Frequency:

1. Testing:

- a. Initial Approval: Tests, if necessary for initial approval shall be conducted at the beginning of the project. No additional testing will be required unless the material does not meet the Specifications. If the material does not meet Specifications, the CONTRACTOR shall conduct additional tests to obtain approval of a new specimen of the material.
  - b. Crushed Aggregate Base: Sieve analysis and laboratory (Proctor) of representative material once during project unless source changes or otherwise directed by OWNER. Field density tests shall be taken on each course or layer of aggregate placed in each location that the aggregate is used or at approximately 250 foot intervals in long-run trenches. Additional tests may be required due to the CONTRACTOR's method of placing and compacting the aggregate, determined at OWNER's discretion.
  - c. Select Backfill: Sieve analysis once during project if imported material used. Visual approval is required by OWNER if natural material is used unless clay type soil encountered. Laboratory (Proctor) once during project unless different material types encountered. Field density tests shall be taken on each course or layer of material in each location that the material is used or at approximately 250 foot intervals in long-run trenches.
  - d. Sand: Sieve analysis of the material once during the project unless otherwise instructed by OWNER. No density testing will be required; however, the CONTRACTOR shall notify OWNER when placing sand in trenches so the procedure can be observed.
- 2. All efforts and costs required to obtain data, conduct material testing, or any retesting required shall be the responsibility of the CONTRACTOR. No separate payment will be made to the CONTRACTOR for any sampling, testing, or any other quality control requirement on this project.
  - 3. When backfill materials are placed in layers, passing density results shall be obtained on the lower layer of material before a subsequent layer is placed.
  - 4. OWNER shall be given copies of all data obtained by the CONTRACTOR.
  - 5. The agency and/or laboratory chosen by the CONTRACTOR to conduct the testing shall be certified as being competent to perform the required tasks and be approved by OWNER.

### **3.15 DESIGN CHANGES DURING TRENCHING**

- A. Design changes during trenching may occur due to unforeseen subsurface conditions. Such conditions shall be brought to OWNER's attention for evaluation. Any required changes shall be issued by OWNER in writing. Compensation for undoing completed construction due to such changes and the installation of items which do not have a Contract unit price shall be accomplished through a Change Order. The CONTRACTOR shall perform any necessary Change Order work expeditiously. Negotiation for the price of such work shall take place prior to the completion of such work.

- B. Design changes may also require the installation of additional Contract priced assembly units. Payment for such items shall be at the amount bid for those units.

**END OF SECTION**

**SECTION 26 18 29**  
**METAL ENCLOSED NON-SEGREGATED BUS**

**PART 1      GENERAL**

**1.1      SCOPE**

- A. This section covers the requirements for design, fabrication, inspection and testing of metal-enclosed, self-cooled, non-segregated phase bus duct assemblies.
- B. This specification defines the basic features and construction of the equipment required. The manufacturer shall ensure that the latest applicable standards are adhered to, in addition to this specification.
- C. The Contractor shall furnish and install the equipment as specified herein and as shown on the contract drawings.
- D. The non-segregated bus system and associated equipment shall have the electrical characteristics and arrangements as shown on the drawings.

**1.2      STANDARDS**

- A. The non-segregated bus shall be manufactured, tested, rated, and furnished in accordance with the latest applicable standards and regulations of the following:
  - 1. NEMA: National Electrical Manufacturers Association.
  - 2. NESC: National Electrical Safety Code.
  - 3. UL: Underwriters' Laboratories.
  - 4. NEC: National Electrical Code.
  - 5. ANSI: American National Standards Institute.
  - 6. ASTM: American Society for Testing and Materials.
  - 7. IEEE C37.23-2015    IEEE Standard for Metal Enclosed Bus
  - 8. AISC    American Institute of Steel Construction
  - 9. Seismic Certifications    IEEE-693-2018 High Level
  - 10. ISO 9001-2015    Quality Management Systems Requirements

**1.3      SUBMITTALS**

- A. The following information shall be submitted to the OWNER and ENGINEER for review and approval:
  - 1. Riser or isometric drawing
  - 2. Floor plan

3. Component list
  4. Conduit entry/exit locations
  5. Assembly ratings including:
    - a. Short-circuit rating
    - b. Voltage
    - c. Continuous current
    - d. Basic impulse level
  6. Cable terminal sizes, if applicable
  7. Busway connection to other equipment
  8. Space heater circuit wiring diagram where applicable
  9. Product data sheets
- B. The following information shall be submitted for record purposes
1. Final as-built drawings that incorporate all changes made during the manufacturing process.
  2. Certified production test reports
  3. Installation information
  4. Seismic certification and equipment anchorage details as specified
  5. Installation, operation and maintenance manual

#### **1.4 QUALIFICATIONS**

- A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.
- B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the ENGINEER, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
- D. The manufacturer shall provide product suitable for outdoor service with the following conditions:
  1. Maximum Elevation of Installed Site Above Sea Level: 800 feet.
  2. Maximum Ambient Air Temperature: 118 degrees F.

3. Minimum Ambient Air Temperature: -14 degrees F.
4. Seismic: Uniform Building Code Seismic Zone 2B, 0.20g.
5. Annual Average Precipitation: 14 inches.
6. Maximum Wind: 100 mph.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions.
- B. Each shipped bus section shall be adequately crated to ensure protection from transit damage and exposure to the weather.
- C. Packaging shall be labeled and numbered so that each section or assembly may be identified before being uncrated. All bus duct pieces and sections shall be clearly identified in accordance with the assembly drawings.
- D. Splice plates, gaskets, hardware, and other loose equipment required to assemble and connect bus duct to equipment shall be identified and shipped with the bus duct.

## **1.6 FIELD MEASUREMENTS**

- A. The Contractor shall be responsible for making all field measurements necessary to fabricate, install, and connect the bus system.

## **PART 2 PRODUCT**

### **2.1 MANUFACTURERS**

Product shall be manufactured by ABB, Eaton, nVent, or ENGINEER-approved equal.

### **2.2 GENERAL**

- A. The bus duct assembly shall be designed, fabricated and tested in accordance with IEEE C37.23-2015.
- B. Manufacturer shall supply metal-enclosed, non-ventilated, rigidly constructed bus duct rated for outdoor service. All required transitions and hardware for termination to line and load equipment will be provided by the manufacturer.
- C. Low-impedance sandwich-type, epoxy-encapsulated, or cable-constructed bus duct assemblies are not acceptable.
- D. The bus duct and its components shall be designed and fabricated to withstand without distortion and damage, all stresses incidental to shipping, installation, operation and seismic events (if required). Bus duct shall have minimum momentary Asymmetrical 3-phase fault rating equal to or greater than ratings list in Section 2.3.A.3.



### **2.3 BUS DUCT RATINGS**

- A. All bus ducts shall be suitable for the following system conditions:
  - 1. 12.47 kV (15 kV gear)
  - 2. 2000 AMP
  - 3. 25 / 39 kA (symmetrical/asymmetrical short-circuit withstand rating)
- B. Bus bar assembly, including the bus bracing, shall be capable of withstanding mechanical and thermal effects, without damage or deformation, of the short circuit withstand current.

### **2.4 CONDUCTORS**

- A. Bus conductor shall be Copper, uninsulated.
- B. Conductors must be of sufficient cross section so as not to exceed specified temperature limits when operated at the rated continuous current.
- C. All bus joints will be made utilizing a NEMA hole pattern, with bolts going through the bus conductors and shall be uniformly tightened per the manufacturer's torque recommendations.
- D. Bus joint design must allow for the removal of individual bus sections without disassembly of adjacent bus sections. Overlap or welded type bus joints are unacceptable.
- E. Contact surfaces shall be tin-plated.
- F. High strength Grade-5 plated steel hardware including lock washers and flat washers are to be supplied . Bus joints shall have sufficient total cross-sectional area of the splice plates that equal or exceed the main conductor cross-sectional area.
- G. Adjustable bus joints shall be provided to compensate for normal installation tolerances.

### **2.5 CONDUCTOR SUPPORTS**

- A. Insulators are to be track resistant, flame retardant and non-hygroscopic, having adequate mechanical strength to withstand forces imposed by the specified short circuit rating.
- B. Conductor supports are to be designed and mounted in a manner so that there will be no hardware accessible, exposed or penetrating through exterior of enclosure.

### **2.6 ENCLOSURES**

- A. Enclosures to be constructed of high conductivity aluminum and must be capable of resisting corrosive attack under normal environmental conditions. Enclosures will be designed and constructed so that no direct water or contaminant path exists into the enclosure.
- B. Surfaces will be finished utilizing an automated Electro-static Powder Coat Finish. Enclosure finish must be rated for 1000-hour salt spray testing. Protective plating is required between any mechanical assemblies consisting of unpainted dissimilar metals.
- C. Top and bottom covers must be removable for field access to all bus joints, bus supports and heater elements.
- D. Standard enclosure hardware shall be #400 Stainless Steel. Enclosure hardware shall be of the single wrench type for ease of field assembly.
- E. Enclosure shipping sections are to be designed and constructed in a manner so that there will be no enclosure joint hardware accessible, exposed or penetrating through the exterior side sheets or covers of the enclosure. Field drilling of enclosure for assembly shall be prohibited.
- F. All outdoor enclosures will be provided with lipped covers, gasketed with EPDM/Neoprene blend gasketing. Gaskets will be concealed to prevent deterioration and positioned to prevent assembly hardware from violating the gasket.
- G. Breather drains are required along bottom covers and at all low points of the installation.
- H. Enclosures are to be shipped in the longest practical shipping lengths (19 foot maximum) to minimize field assembly.

## **2.7 EQUIPMENT INTERFACE**

- A. Bus duct manufacturer is responsible for the design and coordination of connections to the associated equipment. Contractor will obtain the necessary interfacing details from the equipment manufacturers for termination design by the bus duct manufacturer.
- B. Equipment connections will include bolting hardware, bus adapters, insulating materials and assembly drawings.
- C. Braided flexible connectors are to be furnished for connection of the bus bars to all bushing assemblies. Flex connector assemblies will have a continuous current rating greater than the main bus conductors.

## **2.8 WALL/FLOOR PENETRATIONS**

- A. A flame retardant, vapor resistant, non-hygroscopic, non-conductive and weather/dust tight barrier shall be provided where the bus duct penetrates interior and exterior walls and floors.

## **2.9 SPACE HEATERS**

- A. Thermostatically Controlled Space Heaters shall be provided for all outdoor bus duct assemblies.
- B. Space heaters shall be rated for 240 volts and operated at 120 volts. Space heater capacity shall be as required to maintain the bus duct internal temperature above the dew point.
- C. Heaters are to be accessible and removable from the outside of the enclosure. Heater systems are only to be maintained during periods when the bus duct is de-energized.
- D. Space heater circuits are to be factory wired. Connection point for the 120-volt supply is to be located on the switchgear end of the bus duct. A connection junction box shall be provided.

## **2.10 EXPANSION JOINTS**

- A. Expansion joints, if required shall be provided. The location and quantity of expansion joints shall be determined by the bus manufacturer to compensate for the effects of bus thermal expansion due to continuous current. Expansion joints should be considered on continuous straight runs of over 80 feet for copper conductors, and 60 feet for aluminum conductor bus runs.
- B. Expansion joints may also be used to protect the bus duct for seismic application. These Joints are to be located near the connected equipment and allow for movement of the connected equipment during a seismic event independent of the bus run.

## **2.11 STRUCTURAL**

- A. Structural supports and hangers shall be provided.
- B. Outdoor structural supports shall be galvanized steel.
- C. Indoor Trapeze hangers may be painted steel or galvanized finish.
- D. Manufacturer to indicate recommended locations and type of support, if supports are to be supplied by contractor.
- E. Foundations, piers, anchor bolts, mounting bolts, threaded rod and hardware to be provided by contractor.
- F. All auxiliary support steel required for attaching the bus duct supports to the building shall be supplied and certified (building codes and seismic requirements) by contractor.

## **2.12 NAMEPLATES**

- A. The complete bus duct assembly shall have permanent nameplates, one at each end.

B. Information on the nameplate shall include the following as a minimum:

11. Manufacturer's name, date of manufacture
12. Shop order number
13. Maximum voltage
14. Rated continuous current
15. System: Phase, Wire
16. Frequency
17. Rated power frequency withstand voltage
18. Basic insulation level (BIL) if applicable
19. Rated short time withstand current (symmetrical)
20. Rated short-circuit withstand current (asymmetrical)
21. Temperature rise of busses and enclosure.

### **PART 3 EXECUTION**

#### **3.1 FACTORY TESTING**

- A. Each bus duct assembly shall be tested in accordance with IEEE C37.23-2015, Section 6.3, standard production tests.
- B. Insulating material for supporting, covering busses and connections shall be tested in accordance with IEEE C37.23-2015, Section 7.8.
- C. Purchaser (Contractor) reserves the right to inspect the bus duct and witness the production tests at the factory.

#### **3.2 INSTALLATION**

- A. The Contractor shall install all equipment per the manufacturer's recommendations and the contract drawings.

#### **3.3 WARRANTY**

- A. Manufacturer warrants that the Products manufactured by it will conform to the manufacturer's applicable specifications and be free from failure due to defects in workmanship and material for (1) year from the date of installation of the Product or (18) months from the date of shipment of the Product, whichever occurs first. Extended warranties shall be allowed as specified herein.

**END OF SECTION**

**SECTION 03 30 00  
REINFORCED CONCRETE**

**PART 1 GENERAL**

**1.1 WORK INCLUDED**

- A. The work required under this section consists of all excavating for foundations and site surfacing necessary to complete the work indicated on the Drawings and as specified herein.
- B. The CONTRACTOR is responsible for complying with only those articles of this specification required to complete the intended substation modification work.

**PART 2 PRODUCTS**

**2.1 EARTH FILL**

Substation site fill material shall be sand and silty sand free of organic matter or debris, with less than 8 percent by weight passing the #200 sieve. Compacted in 8" lifts to 95 percent relative compaction.

**2.2 CRUSHED ROCK SURFACING**

- A. Roadfill shall be a borrow or pit run material consisting of crushed, partially crushed or naturally occurring gravel, stone or granular material, with maximum dimension of approximately 4 inches, compacted in maximum 1-foot lifts. Road embankment slopes shall be topped with suitable soil (stripping from site is acceptable) to provide for an adequate base to accept and allow for reseeding.
- B. Base Course Crushed Rock to be supplied shall meet the requirements of 1-1/2-inch Base Aggregate as specified in the Oregon Department of Transportation Standard Specifications for Highway Construction.

| Sieve Size | Percent Passing by Weight |
|------------|---------------------------|
| 2"         | 100                       |
| 1-1/2"     | 95 - 100                  |
| 3/4"       | 55 - 75                   |
| 1/4"       | 35 - 50                   |
| No. 10     | 4 - 60                    |

- C. Finish Course Crushed Rock shall be crushed quarry rock, conforming to the requirements of 1-1/2-inch to 3/4-inch course aggregate for Portland cement concrete, as specified in the Oregon Department of Transportation Standard Specifications for Highway Construction, in addition to the following grading size requirements:

| Sieve Size | Percent Passing by Weight |
|------------|---------------------------|
| 1-1/2"     | 90 - 100                  |
| 1"         | 30 - 65                   |
| 3/4"       | 0 - 15                    |

### 2.3 SOIL STERILANT

- A. Soil sterilant shall conform to the following specifications. Commercial preparations meeting these requirements may be used.
- B. The soil sterilant shall be composed of a finely divided wettable powder containing a minimum of 80 percent active ingredients (5-bromo-3-sesbutyl-6-methyluracil) commonly known as Hyvar X. The soil sterilant shall consist of a mixture of sodium chlorate and sodium borates, containing not less than 25 percent sodium chlorate (NaClO<sub>3</sub>), not less than 45 percent boron trioxide (B<sub>2</sub>O<sub>3</sub>), and not more than 2 percent inert ingredients. The mixture shall have a minimum water solubility of 1 pound per gallon at 75 degrees F, ±5 degrees F.

## PART 3 EXECUTION

### 3.1 SITE PREPARATION

- A. Clearing: The site shall be cleared of rocks, boulders, trees, stumps, brush, and other vegetation.

### 3.2 GRADING OF SUBSTATION SITE

- A. After the site has been satisfactorily cleared, the area indicated shall be graded with special attention to proper drainage.
- B. The CONTRACTOR shall cut and fill as required to construct subgrades to the T.O.C. reference elevations and grades shown on the Drawings.
- C. Remove all unsuitable material and replace with approved fill material, and perform all wetting, drying, shaping, and compacting required to prepare a suitable subgrade.

### 3.3 SUBSTATION SUBGRADE

The finished subgrade of the fenced enclosure shall be a minimum of 3 inches higher at the high point, and/or sufficiently high to assure a gradient of from 0.50 to 1.0 percent, sloped evenly to the sides and edges, as shown on the Drawings, to assure proper drainage.

### 3.4 SOIL STERILANT

After completion of grading and compaction of the subgrade and fill, the CONTRACTOR shall apply soil sterilant to the final grade surfaced area and extending to a distance of 5 feet outside of the surfaced area or as indicated on the Drawings. Soil sterilant shall be applied to other areas as may be specified on the Drawings. Apply soil sterilant to the finished subgrade of all access roads.

### **3.5 SURFACING**

- A. A 3-inch base course of crushed rock, unless otherwise noted on Drawings, shall be installed after the site grading and underground construction is complete. The layer shall be compacted to obtain at least 95 percent of maximum dry density as determined by AASHTO T 99 to form an impervious surface to water. Additional crushed rock shall be added as required to develop a level, smooth surface.
- B. A 3-inch finish course of crushed rock, unless otherwise noted on Drawings, shall be placed over the base course to form an electrical insulating layer as part of the grounding system. The finish grade layer shall not be compacted.
- C. Any damage to the rock surfacing due to the CONTRACTOR's actions shall be repaired by the CONTRACTOR at his expense.

### **3.6 EXCAVATIONS FOR FOOTINGS AND OTHER CONCRETE WORK**

- A. The CONTRACTOR shall take precautions to ensure no damages to existing facilities or equipment, or to other work.
- B. Excavation shall include all materials found within the designated limits for excavation.
- C. Excavate width adequately to permit efficient erection and removal of forms.
- D. Trim to neat lines where details call for concrete to be deposited against earth.
- E. Restore bottom of excavation to proper elevation with concrete in areas over excavated.
- F. Excavate by hand in areas where space and access will not permit use of machines.
- G. Notify the ENGINEER immediately if a suitable bearing is not encountered at the depth indicated on Drawings. Proceed as instructed by the ENGINEER.
- H. Weight bearing surfaces shall be moistened with water and mechanically tamped firm and uniform.
- I. Excavation for conduit and grounding materials shall be made in accordance with the Drawings.
- J. Control grading around excavations to prevent surface water from flowing into excavation areas.
- K. Drain or pump as required to continually maintain excavated area free of water or mud from any source, and discharge to approved drains or channels.
- L. Remove subgrade material rendered unsuitable by excessive wetting and replace with approved backfill material.

- M. Waste materials, including excess materials unsuitable for use in backfilling, shall be disposed of by hauling and removing such materials from the site.

### **3.7 BACKFILL OF EXCAVATIONS**

- A. Backfill material shall conform to the specifications for base course crushed rock. After footings, concrete work, or cable conduits are in place, the CONTRACTOR shall place backfill in accordance with the following:
  - 1. Perform any wetting or drying of the backfill material as required and compact to obtain the specified subgrade density.
  - 2. Do not place backfill material in snow, ice, or frozen earth.
  - 3. Backfill against concrete work only after concrete has attained 70 percent design strength.
  - 4. Perform backfilling simultaneously on all sides of walled structures and only after construction of the structure is complete.
  - 5. Compaction material shall be placed in layers not exceeding 6 inches in depth after compaction. Lift materials shall be moistened and compacted to a density of 95 percent as determined by AASHTO T 99.
  - 6. Compact fill material with use of vibratory compactors or power tampers.
  - 7. Avoid the use of heavy equipment adjacent to structures or concrete work.

**END OF SECTION**



**SECTION 33 70 00**  
**SUBSTATION EQUIPMENT**

**PART 1      GENERAL**

**1.1      SCOPE**

- A. This section covers furnishing and delivery of electrical equipment and materials.

**PART 2      PRODUCTS**

**2.1      STANDARDS**

- A. The equipment shall be manufactured, tested, rated, and furnished in accordance with the latest applicable standards and regulations of the following:
  - 1. ANSI: American National Standards Institute.
  - 2. NEMA: National Electrical Manufacturers' Association.
  - 3. NESC: National Electrical Safety Code.
  - 4. UL: Underwriters' Laboratories.
  - 5. NEC: National Electrical Code.
  - 6. ANSI Publication B16.5 for Slip-On Welding Flanges.
  - 7. ASTM: American Society for Testing and Materials.
  - 8. EEI: Edison Electric Institute.
  - 9. IEEE: Institute of Electrical and Electronics Engineers.

**2.2      EQUIPMENT AND CONSTRUCTION**

- A. The CONTRACTOR shall furnish the material and equipment indicated on the Drawings. Representative manufacturers' catalog numbers have been listed for some of the material and equipment to indicate the type and quality required. Other manufacturers' materials and equipment of equal type and quality may be used as approved by the OWNER.
- B. The OWNER will furnish only that equipment so indicated on the Drawings and/or listed in other sections of the Specifications. The CONTRACTOR shall furnish all other material.
- C. The CONTRACTOR shall furnish any incidental materials and fasteners needed to make the equipment complete and ready for assembly and service.
- D. Upon delivery and acceptance of the materials furnished by the CONTRACTOR, the CONTRACTOR shall be responsible for material and equipment at the site. The CONTRACTOR shall keep accurate up-to-date records of all materials received, installed, and returned.
- E. Material and equipment shall be stored at the site by the CONTRACTOR in accordance with storage instructions provided by the manufacturer so as to ensure the preservation of material quality and their fitness for performance.

## **2.3 SUBMITTAL DRAWINGS, INSTRUCTION BOOKS**

### **A. Submittals Drawings:**

1. Within 4 weeks after the award of the Contract, the CONTRACTOR shall provide complete descriptive information and shop drawings for all equipment, material, and devices to be furnished.
2. As a minimum, the following submittal drawings and information shall be provided:
  - a. Equipment outline drawings showing general arrangement, physical dimensions, and center of gravity (shipping and installed), both horizontal and vertical, and the location of accessories. The manufacturer shall indicate phase-to-phase and phase-to-ground dimensions on the outline drawing.
  - b. Dimensional plan and section views.
  - c. Nameplate diagrams.
  - d. Bill-of-Material, keyed to plan and section drawings.
  - e. Certified test reports for all tests.
  - f. Furnish two complete sets of all factory tests and one additional set shall be shipped with each piece of equipment.
  - g. Furnish a complete component parts list including the original catalog numbers.
3. The information will be for the OWNER's approval.
4. Review of submittal information by the OWNER shall not relieve the CONTRACTOR from responsibility for deviations from Drawings and Specifications, unless he has in writing at time of or prior to submission, requested and received written approval from the OWNER for specific deviations. Review of submittal information shall not relieve the CONTRACTOR from responsibility for errors and omissions in shop drawings or literature.

B. Instruction Books: Provide four complete final sets of instruction books that include operating and maintenance instructions, catalog and replacement part information for each component (as listed above), and repair information. Also include in each set, all drawings submitted for approval in final form.

C. The CONTRACTOR and OWNER shall keep accurate up-to-date records of all materials received, installed, and returned.

## **PART 3 EXECUTION**

### **3.1 GENERAL**

- A. All equipment and materials shall be installed in strict accordance with the manufacturer's installation instructions. When gang-operated switches are installed the manufacturer's installation engineer shall inspect the installation and adjustment of the equipment unless the CONTRACTOR assumes this responsibility.

- B. Equipment delivered to the site awaiting installation shall be stored in a manner that will protect it from deteriorating effects of the elements and from physical damage. Material and equipment shall be stored on wooden platforms or other hard, clean surfaces, and also covered if necessary.
- C. All equipment shall be adjusted and lubricated in accordance with the manufacturer's instructions, so that it is left in a satisfactory operating condition. Extreme care shall be exercised in handling porcelain parts to avoid chipping or breakage.
- D. The CONTRACTOR shall perform any necessary minor field drilling on equipment steel racks or supports, and attach all brackets, extensions, or switch clip angles necessary for securely mounting the equipment. All holes drilled or punched in steel shall be treated in accordance with Section 05 12 00, STRUCTURAL STEEL FRAMING — GALVANIZING AND REPAIR.
- E. The CONTRACTOR shall assure that all equipment is installed on the structures and concrete footings with all items true, plumb, and level.
- F. The CONTRACTOR shall assure that all equipment has been tested after installation and adjusted for proper operating action.
- G. After the installation of all station equipment has been completed, the CONTRACTOR shall thoroughly clean all insulators and bushings.

### **3.2 DELIVERY, STORAGE, AND HANDLING**

- A. The CONTRACTOR shall delivery all equipment f.o.b. to the jobsite, with all freight charges paid by the CONTRACTOR. The CONTRACTOR shall provide the OWNER with a two-week notice of a delivery window, and 48-hours prior to delivery schedule a specific time(s) for unloading. The CONTRACTOR will perform off-loading of materials and equipment unless the CONTRACTOR has made other prior arrangements.
- B. The CONTRACTOR shall provide storage instructions for material and equipment delivered to the site so that it shall be stored in a manner that will protect it from deteriorating effects of the elements and from physical damage.
- C. The CONTRACTOR and OWNER shall perform a material and equipment inventory comparison with the shipping bill of lading upon delivery to the jobsite. Upon receipt, any missing or damaged equipment and material under the responsibilities of the CONTRACTOR, shall be promptly replaced by the CONTRACTOR at his expense.
- D. After acceptance, the CONTRACTOR shall be responsible for the loss or damage to materials and equipment on the site, unless it can be determined that the equipment was damaged during shipment and prior to receipt.
- E. Material and equipment shall be stored so as to ensure the preservation of their quality and fitness for the work. Material and equipment shall be stored on wooden platforms or other hard, clean surfaces, and also covered, if necessary, as described by the CONTRACTOR.

### **3.3 WARRANTY PERIOD**

- A. The equipment warranty shall extend for a period of 1 year following the final delivery and acceptance by the OWNER of all materials at the jobsite.
- B. During the warranty period the CONTRACTOR shall replace or repair failed equipment that does not function in accordance with its specifications and intended use if failure is not caused by faulty installation.

**END OF SECTION**

**SECTION 33 72 26**  
**SUBSTATION BUS AND CONNECTORS**

**PART 1      GENERAL**

**1.1      SCOPE**

- A. This section covers the furnishing and installation of the bus and connectors.
- B. The CONTRACTOR shall furnish and install all materials designated on the Drawings and any other associated materials and work even though not shown on the Drawings but required to provide a complete bus system.
- C. The CONTRACTOR shall furnish new materials in first-class condition, free from any defects and suitable for the use intended.
- D. Quantities shown are approximate. CONTRACTOR shall thoroughly familiarize themselves with the specified work requirements and determine for themselves the exact quantities necessary to complete the work.

**PART 2      PRODUCTS**

**2.1      STANDARDS**

- A. The equipment shall be manufactured, tested, rated, and furnished in accordance with the latest NEMA SG-1 standard and applicable standards and regulations of the following:
  - 1. ANSI: American National Standards Institute.
  - 2. NEMA: National Electrical Manufacturers' Association.
  - 3. NESC: National Electrical Safety Code.
  - 4. UL: Underwriters' Laboratories.
  - 5. NEC: National Electrical Code.
  - 6. ASTM: American Society for Testing and Materials.
  - 7. IEEE: Institute of Electrical and Electronics Engineers.

**2.2      MATERIALS**

- A. Rigid bus conductors shall be ASTM B241 or ASTM B249, 6063-T6, standard weight, ANSI Schedule 40 aluminum pipe.
- B. Cast aluminum fittings shall be of 356 aluminum alloy, heat treated to T6 condition.
- C. Use "Penatrox A13 S.I.", No-Ox-Id", or Alcoa No. 2 EJC electrical joint compound or an equivalent preparation as a corrosion-inhibitor.
- D. The filler rod material for welded connections shall be 4043 aluminum alloy.

**PART 3      EXECUTION**

**3.1      GENERAL**

A. Bus Erection:

1. Bus supports shall be set so that the centerline of the bus is uniform and in perfect alignment. Shimming may be necessary to accomplish this. The bus support shall be set so that the bus will fit snugly in the saddle. No skewing will be allowed. Horizontal bus shall be erected free from sags and parallel. Where joints are made, there shall be no declination. Vertical bus or risers shall be perpendicular to lower bus and in alignment.
2. Straight pieces of aluminum bus shall be prestressed and shall be erected with the "bow" up so that the bus shall be straight when mounted in the final position.
3. Aluminum bus supports shall be either the "slip" or "fixed" type as shown on the Drawings. With the "slip" type the bus is free to move in the longitudinal direction. The "fixed" type is welded to the aluminum bus. Both types are bolted to the insulator.
4. A connector sleeve shall be inserted in all end-to-end joints in bus runs before welding. The ends of the bus shall be beveled for all joints that are to be butt welded. All fillet welds, such as around terminals, risers, braces, and bus supports shall be 1/4-inch fillet welds.
5. Care shall be exercised in handling bus to prevent damage to the surface such as nicks and abrasions. Sharp edges and protrusions shall be ground smooth to prevent corona discharge from the bus.
6. Install the vibration damping cable inside all tube bus runs over 10 feet in length. Extend the cable through down-drops. Do not fasten the vibration damping cable to the bus at any point.
7. Open ends of tubular bus shall be sealed with end plugs.
8. A 1/4-inch "weep hole" shall be drilled at the lowest point of each tube span between supports to prevent buildup of condensation water within the tube.

B. Welded Connections:

1. Aluminum bus and connections shall be welded by the inert-gas-shielded metal arc (MIG) welding method or the inert-gas-shielded tungsten arc (TIG) method. Before welding, the surfaces to be welded shall be completely degreased with a nonaqueous solvent, and the oxide film removed by wire brushing. All welds of more than one pass shall also be thoroughly wire brushed between passes. All welds shall be free of imperfections and have good penetration. Grinding of butt welds will be required. All other welds will not require grinding, provided that a satisfactory and uniform bead is made without excessive lapping.
2. A degreasing solvent, acceptable to the ENGINEER, such as the Dupont - G.E. formula known as "Red Band Special Degreasing Fluid", may be used.

3. In performing welding of aluminum bus and component parts thereof, the CONTRACTOR shall be required to employ welders who have had training and experience in inert-gas metal arc welding of aluminum.
  4. Not less than 10 days prior to the start of welding work, the CONTRACTOR shall submit in writing the names of qualified welders to be used on the job, together with their experience record.
- C. Bolted Electrical Connections:
1. Copper-to-copper or copper-to-bronze connections:
    - a. Clean contact areas with a burnishing brush or fine emery cloth to brighten metal.
    - b. Grease with a corrosion inhibitor.
    - c. Bolt connectors together with:
      - 1) High strength silicon bronze 1/2 inch to 13 threads per inch bolts, a silicon bronze flat washer under the bolthead, a silicon bronze flat washer between the lock washer and underside connector, silicon bronze lock washer, and silicon bronze nut. Tighten nuts to manufacturer's recommended torque value, or,
      - 2) Stainless steel, Type 18-8, 1/2 inch to 13 threads per inch bolts, a stainless-steel flat washer under the bolthead, a stainless-steel flat washer between the Belleville washer and the underside connector, 302 stainless steel Belleville washer and stainless steel, Type 18-8 nut. Tighten nuts to manufacturer's recommended torque value.
  2. Aluminum-to-aluminum connections:
    - a. Clean contact areas to remove oxide and within 10 seconds after removing the oxide completely coat contact areas with a liberal amount of corrosion inhibitor to prevent oxidation.
    - b. Abrade contact areas through the grease with a stiff stainless steel wire brush to assure all the oxide is removed. CAUTION — Do not remove grease.
    - c. Add more compound to contact surfaces.
    - d. Bolt connectors together with:
      - 1) High strength aluminum 2024-T4 alloy, No. 205 Alumite finish, 1/2 inch to 13 threads per inch bolts, an aluminum 7075-T6 alloy flat washer under the bolthead, an aluminum flat washer between the lock washer and underside connector, an aluminum 7075-T6 alloy lock washer and aluminum 6061-T6 alloy nut. Tighten nuts to manufacturer's recommended torque value, or,
      - 2) Stainless steel, Type 18-8, 1/2 inch to 13 threads per inch bolts, a stainless-steel flat washer under the bolthead, a stainless-steel flat washer between the Belleville washer and the underside connector, 302 stainless steel Belleville washer and stainless

steel, Type 18-8 nut. Tighten nuts to manufacturer's recommended torque value.

### 3. Aluminum-to-Copper Connections:

- a. Prepare the aluminum pad as follows: (1) Clean contact area to remove oxide and within 10 seconds after removing the oxide completely coat the contact area with a liberal amount of corrosion inhibitor to prevent oxidation; (2) abrade the contact area through the corrosion inhibitor with a stiff stainless steel wire brush to assure all the oxide is removed. CAUTION — Do not remove grease.
- b. Do not abrade or wire brush plated contact surfaces. A few light rubs with fine steel wool before greasing is sufficient.
- c. Grease contact surfaces of the copper or bronze connector with corrosion inhibitor, adding more inhibitor to the aluminum contact.
- d. Be sure the copper connector is under the aluminum connector to prevent copper salts from washing down and corroding the aluminum connector.
- e. Bolt connectors together with:
  - 1) Stainless steel, Type 18-8, 1/2 inch to 13 threads per inch bolts, a stainless-steel flat washer under the bolthead, a stainless-steel flat washer between the Belleville washer and the underside connector, 302 stainless steel Belleville washer and stainless steel, Type 18-8 nut. Tighten nuts to manufacturer's recommended torque value.

### 4. Aluminum terminal with bonded copper contact on tongue to bronze or copper pad:

- a. Clean contact surfaces. Do not abrade or wire brush the plated contact surfaces. A few light rubs with fine light wool before greasing is sufficient.
- b. Grease the contact surfaces with corrosion-inhibitor.
- c. Be sure the copper connector is under the aluminum connector to prevent copper salts from washing down and corroding the aluminum connector.
- d. Bolt connectors together with:
  - 1) Stainless steel, Type 18-8, 1/2 inch to 13 threads per inch bolts, a stainless-steel flat washer under the bolthead, a stainless-steel flat washer between the Belleville washer and the underside connector, 302 stainless steel Belleville washer and stainless steel, Type 18-8 nut. Tighten nuts to manufacturer's recommended torque value.

### 5. Aluminum pad to copper or bronze pad, using bimetallic transition plate:



- a. Prepare aluminum, pad, and the aluminum side of the transition plate as follows:
  - 1) Clean contact area to remove oxide.
  - 2) Completely coat the contact area with a liberal amount of corrosion inhibitor.
  - 3) Abrade the contact area through the corrosion inhibitor with a stiff stainless steel wire brush. CAUTION — Do not remove grease.
- b. Clean the contact areas of the bronze or copper pad and the copper side of the transition plate.
- c. Grease the surfaces of the bronze or copper pad and the copper side of the transition plate with corrosion-inhibiting compound.
- d. Add more corrosion-inhibiting compound to the aluminum contact surfaces.
- e. Make the connection with the aluminum side of the contact plate in contact with the aluminum pad, and the copper side of the contact plate in contact with the copper pad.
- f. Be sure the copper connector is under the aluminum connector to prevent copper salts from washing down and corroding the aluminum connector.
- g. Bolt connectors together with:
  - 1) Stainless steel, Type 18-8, 1/2 inch to 13 threads per inch bolts, a stainless-steel flat washer under the bolthead, a stainless-steel flat washer between the Belleville washer and the underside connector, 302 stainless steel Belleville washer and stainless steel, Type 18-8 nut. Tighten nuts to manufacturer's recommended torque value.

D. Compression Connectors:

- 1. Compression connectors shall be installed in strict accordance with the manufacturer's recommendations.
- 2. Use an ample amount of corrosion-inhibiting compound.
- 3. The connector shall be the proper size to fit the cable as recommended by the manufacturer.
- 4. Tools and dies of the proper size and type as recommended by the connector manufacturer shall be used for installation.

**END OF SECTION**

## **SECTION 33 79 23 SUBSTATION GROUNDING**

### **PART 1 GENERAL**

#### **1.1 SCOPE**

- A. This section covers the furnishing and installation of the grounding system for the Power Transformer.
- B. The CONTRACTOR shall furnish all labor and ground conductor and materials listed in the project Bill of Materials, and any additional materials which do not appear in the Bill of Materials but are required to make the power transformer grounding system complete.
- C. The CONTRACTOR shall provide all labor, tools, and equipment necessary to excavate for and install the station grounding system as shown on the Drawings and specified herein.
- D. The CONTRACTOR shall furnish first-quality, new materials, free from any defects, in first-class condition and suitable for the use intended.

### **PART 2 PRODUCTS**

#### **2.1 STANDARDS**

- A. The grounding shall be manufactured, tested, rated, and furnished in accordance with the latest applicable standards and regulations of the following:
  - 1. NEMA: National Electrical Manufacturers' Association.
  - 2. NESC: National Electrical Safety Code.
  - 3. UL: Underwriters' Laboratories.
  - 4. NEC: National Electrical Code.
  - 5. ANSI: American National Standards Institute.
  - 6. ASTM: American Society for Testing and Materials.
  - 7. IEEE: Institute of Electrical and Electronics Engineers.

#### **2.2 MATERIALS**

- A. Ground Rods: Ground rods shall be copper-clad steel not less than 3/4-inch diameter and 10 feet long, unless otherwise stated. Ground rods shall be driven vertically the full length of the rod until its top is at least 14 inches below the subgrade elevation.
- B. Ground Conductors: Grounding conductors shall be of the size shown on the Drawings and the type specified herein. The main ground grid shall consist of bare stranded soft drawn copper of the size indicated. Equipment leads shall be as shown in the grounding details.

- C. Belowground Connectors: Connections below grade between individual conductors forming the grid and all grid taps shall be of the exothermal-welded type connectors as manufactured by Cadweld, Thermoweld, or equal.
- D. Aboveground Connectors: Connections above grade between grid taps and equipment requiring grounding shall be bronze bolted type connectors, having a NEMA rating equivalent to the ground grid conductor.
- E. Grounding Mats: Galvanized steel grate grounding mats shall be 3 feet by 5 feet by 1-1/2-inch or sized to fit specific locations between foundations. The mats shall be placed on the ground directly beneath the operating mechanisms of the manually operated switches. The ground grate shall be connected with a 4/0 AWG copper conductor directly to the switch operating mechanism ground.

## **PART 3 EXECUTION**

### **3.1 GENERAL**

- A. The grounding grid shall be installed at a depth of 18 inches below subgrade and located as shown on the Drawings. At cable crossings care shall be exercised so that the crossed-over cable is not damaged. Damaged cable shall be replaced with new cable. Labor and material costs of replacing damaged cable shall be completely borne by the CONTRACTOR.
- B. All intersections of grounding cables shall be connected together. All taps and ground rods shall be connected with separate connectors to the main ground grid.
- C. Below-grade grounding connections shall be of the exothermic-welded type specified herein and shall be installed in accordance with the manufacturer's recommendations. All dirt shall be removed from the splice area, and care shall be taken to ensure the conductors are clean and dry just prior to making the connection. Each connection shall be inspected and approved before the trench may be backfilled.
- D. After installing the below-grade ground conductor, the trench shall be backfilled with earth or other low resistivity backfill material. Do not backfill with sand, gravel, or crushed rock. The backfill shall be thoroughly compacted.
  - 1. The surface gravel material shall meet the minimum resistivity that is specified in the drawings.
- E. All equipment shall be grounded as indicated on the detailed grounding drawings and specified herein. Any additional holes required for making connections or securing cable fasteners to the structures shall be made at the expense of the CONTRACTOR. Holes drilled in the structures, to fasten ground cables, shall be "regalvanized". All unpainted or ungalvanized metal surfaces remaining after the ground connection has been made shall be restored to its original finish.

- F. The Subcontractor shall neatly train conductors to equipment along the face of the footing or structural steel, following all surfaces closely to the point of connection. Conductors running to equipment shall be supported and secured with cable fasteners at intervals no greater than 5 feet.
- G. The transformer and other major equipment shall be grounded through their ground pads with two-bolt connectors. Each major equipment item shall have at least two ground pad type connections and shall be attached to the main ground grid at a minimum of two locations.
- H. All metal conduits shall be bonded to the ground grid as shown on the grounding detail drawings.
- I. Connections of conductor to the equipment shall be made with two-hole bolt-on bar lugs, unless otherwise specified, and connected in accordance with the manufacturer's recommendations.
- J. Compression connections shall be installed in strict accordance with manufacturer's recommendations, using tools and dies of proper size and type.
- K. Except where specifically indicated otherwise, ground all exposed noncurrent-carrying metallic parts of electrical equipment, raceway systems, and the neutral of all wiring systems in strict accordance with the NEC, state, and other applicable laws and regulations.

#### **END OF SECTION**

**PART 5**  
**GEOTECHNICAL**  
**INVESTIGATION REPORT**

## Geotechnical Data Report (GDR)

References to Geotechnical Investigation Report within this document have the same meaning as GDR in the Contract Documents.



2411 Southeast 8<sup>th</sup> Avenue • Camas • WA 98607

Phone: 360-567-1806

[www.earth-engineers.com](http://www.earth-engineers.com)

March 12, 2025

Stoddard Power Systems, LLC  
Attention: Martin Stoddard  
1600 Valley River Drive, Suite 380  
Eugene, Oregon 97401

Phone: 541.228.9353  
Email: [martin.stoddard@stoddardpower.com](mailto:martin.stoddard@stoddardpower.com)

**Subject: Geotechnical Investigation Report  
Proposed Columbia Heights Substation Upgrade  
Intersection of East 16<sup>th</sup> Street and East Scenic Drive  
The Dalles, Oregon  
EE Report No. 10-250039-01**

Dear Mr. Stoddard,

**Earth Engineers, an RMA Company** (EE) is pleased to transmit our Geotechnical Investigation Report for the project referenced above. This report includes the results of our field investigation, an evaluation of geotechnical factors that may influence the proposed construction, general recommendations for foundation design, and comments regarding general site development and site drainage.

We appreciate the opportunity to perform this geotechnical study and look forward to continued participation during the design and construction phases of this project. If you have any questions pertaining to this report, or if we may be of further service, please contact our office at 360-567-1806.

Sincerely,  
**Earth Engineers, an RMA Company**

Tyler Pierce, P.E.  
Associate Geotechnical Engineer

Yonggui Xie, P.E.  
Geotechnical Engineer

Attachment: Geotechnical Investigation Report

Distribution (electronic copy only): Addressee

# GEOTECHNICAL INVESTIGATION REPORT

for the

**Proposed Columbia Heights Substation Upgrade  
Intersection of East 16<sup>th</sup> Street and East Scenic Drive  
The Dalles, Oregon**

Prepared for

**Stoddard Power System, LLC  
1600 Valley River Drive, Suite 380  
Eugene, Oregon 97401  
Attention: Martin Stoddard**

Prepared by

**Earth Engineers  
2411 Southeast 8<sup>th</sup> Avenue  
Camas, Washington 98607  
Telephone (360) 567-1806**

**EE Report No. 10-250039-01**

**March 12, 2025**



A handwritten signature in blue ink, appearing to read "Yonggui Xie".

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**Yonggui Xie, P.E.  
Geotechnical Engineer**



---

**Tyler Pierce, P.E.  
Associate Geotechnical  
Engineer**



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## **1.0 PROJECT INFORMATION**

### **1.1 Project Authorization**

Earth Engineers, an RMA Company (EE) has completed a geotechnical investigation for the proposed Columbia Heights Substation upgrade to be located at Intersection of East 16th Street and East Scenic Drive in the Dalles, Oregon. Our services were authorized by Martin Stoddard with Stoddard Power Systems, LLC on February 3, 2025 by signing EE Proposal No. 10-250039-P issued on the same date.

### **1.2 Project Description**

Our current understanding of the project is based on the information provided via email with EE Geotechnical Engineer, Yonggui Xie on January 28, 2025. The email contained a Google Maps link of the site location, and a street view showing the project location within the existing Columbia Heights Substation in the Dalles, Oregon. We have not been provided any drawings for the proposed construction.

Based on the information provided, we understand that the existing Columbia Heights substation will be upgraded, encompassing portions of the existing substation and the adjacent parking area, see Figure 1. We understand that the new construction will consist of a new power transformer weighing no more than 100,000 pounds.

We have not been provided with any grading information, nor have we been provided any special settlement criteria for this project. For the purposes of this proposal, we have assumed a maximum building pad load of approximately 100 kips, and we have assumed typical maximum total and differential static settlement criteria of 1 inch, and ½ inch, respectively. We should be notified by the Project Structural Engineer if the project design requires a more restrictive settlement criterion.

We have assumed the proposed development will be constructed in accordance with 2021 International Building Code (IBC), which references ASCE 7-16 for the seismic design parameters.



**Figure 1:** Site plan showing the proposed upgrade area relative to the existing substation (Blue line). Source: Stoddard Power System, LLC

### 1.3 Purpose and Scope of Services

The purpose of our services was to explore the subsurface conditions at the site to define the subsurface soil, rock, and groundwater properties in order to provide geotechnical related recommendations for the proposed project. Our site investigation consisted of four drilled borings advanced to depths ranging from approximately 5 feet to 21.5 feet below the existing ground surface (bgs). Soil samples were collected at regular intervals and returned to our laboratory for testing.

Laboratory testing was performed on select samples (from the borings) and accomplished in general accordance with ASTM procedures; the testing performed included "Moisture Content" (ASTM D2216), "Soil Particle Size" (ASTM D1140), "Atterberg Limit" (ASTM D4318), "Consolidation Test" (ASTM D2435), Particle Size Distribution Analysis (ASTM D422), and classification of soils "Unified Soil Classification System" (ASTM D2488).

This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and presents recommendations regarding the following:

- A description of the site and existing surficial conditions.
- Review of available and relevant geologic and/or geotechnical investigation reports for the site and/or subject area.
- A summary of subsurface conditions encountered, including groundwater conditions based on our explorations and as disclosed by information from past explorations (if available).
- Boring logs with laboratory data.
- Recommendations for site preparation, excavation, and structural fill placement.
- Seismic design parameters in accordance with ASCE 7-16.
- Geotechnical recommendations for conventional shallow foundation design including allowable bearing capacity, minimum footing dimensions and estimated settlements.
- Geotechnical recommendations for slab-on-grade support.
- A discussion of other geotechnical factors which may impact design and construction of the proposed facility improvements.

## **2.0 SITE AND SUBSURFACE CONDITIONS**

### **2.1 Site Location and Description**

The subject property is located in between East 16<sup>th</sup> Street and Scenic Drive in The Dalles, Oregon, see site location in Appendix A and Figure 2. More specifically, the subject property is approximately 1.33 acres in size and is bounded to the north, east and south by the aforementioned roads. It is bounded to the west by developed residential properties.

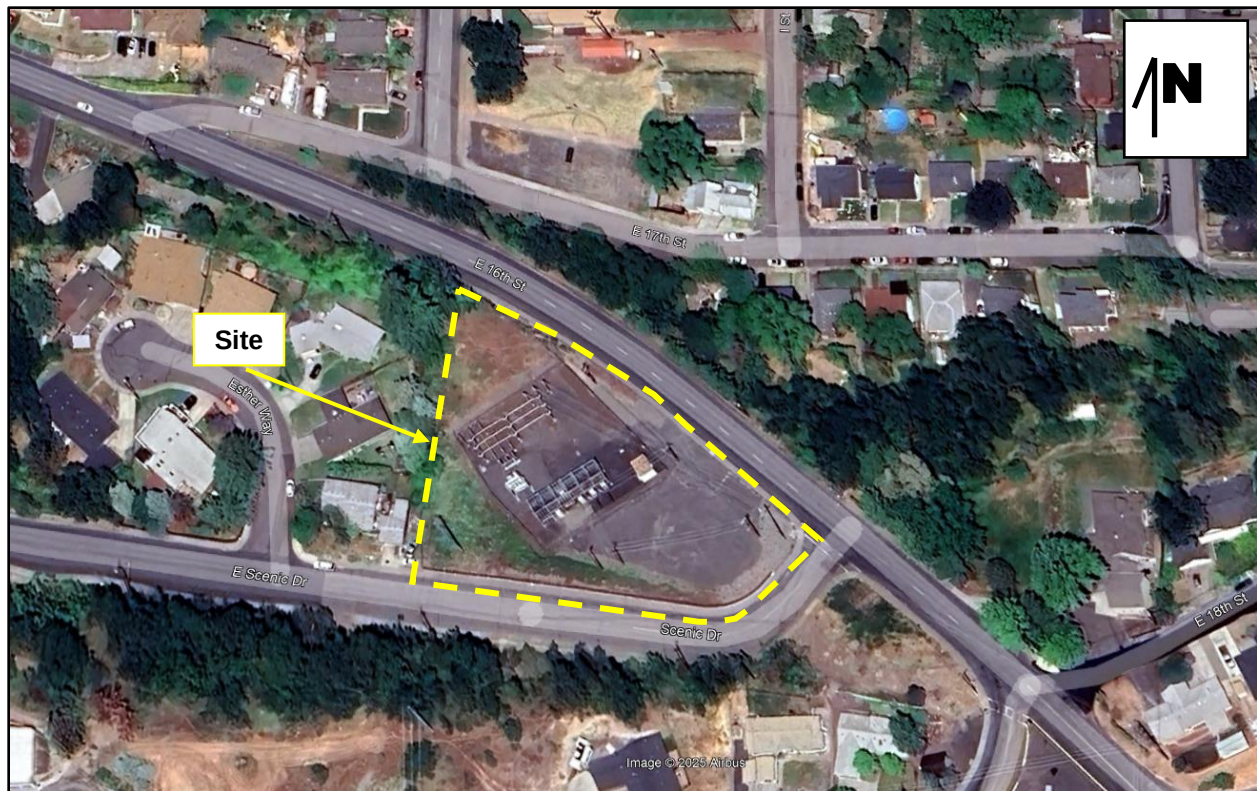


**Figure 2:** Airal view of the site captured from Google Earth.

In terms of topography, the property is relatively level, but its surrounding area slopes down generally from south to north. While on site, we did not observe signs of previous or current soil movement, such as leaning tree trunks, clearly identifiable landslide head scarps, or surface cracking in the soils. However, given that the site has been previously developed, any surficial evidence may have been covered or removed during site development. See Photos 1, 2, and 3 below for current site conditions.





**Photo 1:** Drill rig setup at exploration location B-4, looking south.



**Photo 2:** Site conditions at the time of our investigation, looking west from the eastern portion of the property.





**Photo 3:** Drill rig setup at exploration location B-1, looking northwest.

## 2.2 Mapped Soils and Geology

The underlying geologic unit at the subject property is mapped as Tdc – Chenoweth Formation. This unit is described as “Volcanoclastic and sedimentary rock consisting primarily of...laharic deposits... interbedded with conglomerate and sandstone... near the foothills of the Cascade Range.”<sup>1</sup>.

As mapped by the USDA Soil Survey, the site is situated within the 27F - Hesslan complex 30 to 70 percent slopes. This unit is formed on hillslopes, are well draining soils, and generally consist of stony and cobbly loam overlying weathered bedrock<sup>2</sup>.

A review of the Oregon Department of Geology and Mineral Industries (Oregon DOGAMI) HazVu and SLIDO indicated that the subject property is within a historic landslide (less than or equal to 150-years old). We understand, the City of The Dalles has installed dewatering pipes on the slope, effectively mitigating any concerns regarding landslides at the project site. It is mapped in the very low to low liquefaction susceptibility zone. In the event of a Cascadia earthquake, it is a mapped as very strong shaking intensity.

<sup>1</sup>Compiled by James L. Bela, 1982, Geological Compilation map of The Dalles 1° by 2° Quadrangle, Oregon and Washington, State of Oregon DOGAMI, GMS-027, scale 1:250,000

<sup>2</sup> Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>.

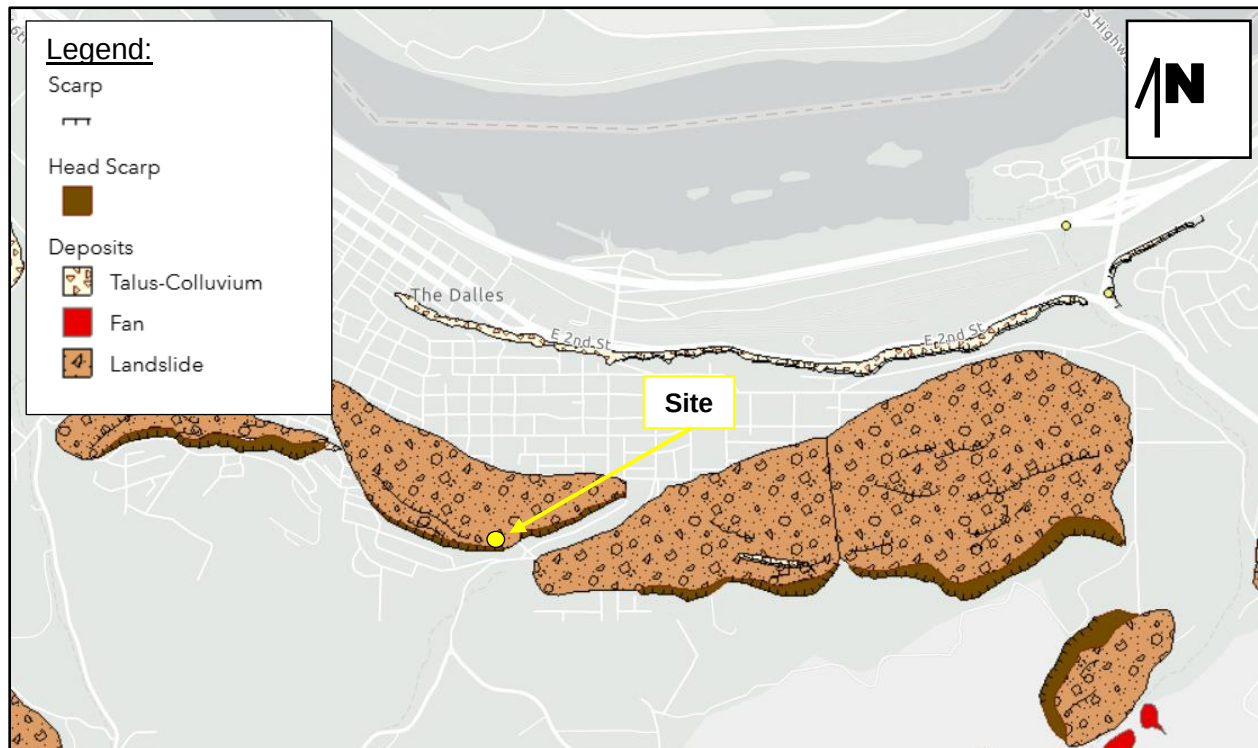


**Figure 2:** Location of the proposed site relative to mapped landslides. Captured from the Oregon DOGAMI SLIDO Landslide database: <https://gis.dogami.oregon.gov/maps/slido/>

### 2.3 Subsurface Materials

The site was explored with four drilled boring explorations (B-1 through B-4) located within the proposed development area. The drilled borings were advanced to depths ranging from approximately 5 to 21.5 feet below the ground surface (bgs) utilizing a trailer-mounted Little Beaver drill rig on February 21, 2025. This drill rig used solid stem augers with manual SPT hammer subcontracted from Dan Fischer Excavation of Forest Grove, Oregon. For the approximate exploration locations, see Appendix B.

Soil samples were obtained from the SPT samples. The soil samples were tested in our laboratory to determine material properties for our evaluation. Laboratory testing was accomplished in general accordance with ASTM procedures which included “Moisture Content” (ASTM D2216), “Soil Particle Size” (ASTM D1140), “Atterberg Limit” (ASTM D4318), and Particle Size Distribution Analysis (ASTM D422). The test results have been included on the Exploration Logs in Appendix C.

In general, we encountered an approximately 5- to 6-inch-thick layer of poorly graded gravel used for surface cover and grading within property. Generally, this surface layer overlies silty gravel with some sand with varying relative densities. In borings B-1 through B-3, this layer extended to the terminal depth of the boring. In boring B-4 this layer was not present; instead, we encountered



fine grained material, consisting of silt and sand, overlying a layer of ash that has weathered to an elastic silt. The ash layer extended to the terminal depths of the boring.

### **SURFICIAL COVER**

In all drilling borings, we encountered a thin layer of poorly graded gravel used as surficial cover across the project site, likely used as grading and erosion protection. This layer consisted of angular to subangular gravel, about 5 to 6 inches in thickness.

### **SILTY GRAVEL (GM)**

In three of the borings, we encountered brown to dark brown, dry to moist, medium dense to dense silty gravel that extended to the terminal depths of these borings. In boring B-3 drilling was terminated at relatively shallow depth due to auguring refusal. Moisture contents for this layer from the samples obtained from the explorations ranged from 6 to 26 percent. Fines content (material passing the #200 sieve) of the samples tested from this layer was 37 percent.

### **GRAVELY SILT (ML)**

In boring B-4, we encountered brown to dark brown, dry to moist, stiff to very stiff, gravelly silt that extended from approximately 1 feet bgs to 11.25 feet bgs. Moisture contents for this layer from the samples obtained from the explorations ranged from 15 to 25 percent.

### **ASH, SILT (MH)**

Underlying the gravelly silt in B-4 there was a layer of white with yellow and maroon, stiff to very stiff, dry to the touch, silt. Based on the coloring and the elasticity, this layer is likely an ash deposit. Moisture contents for this layer from the samples obtained from the explorations ranged from 41 to 62 percent. Fines content (material passing the #200 sieve) of the samples tested from this layer was 99 percent. The liquid limit for this layer is 99 and plastic limit is 53 (see Atterberg Limit test in Appendix E).

The classifications noted above were made in general accordance with the USCS as shown in Appendix D. The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The exploration logs included in the Appendix should be reviewed for specific information at specific locations. These records include soil descriptions, stratifications, and locations of the samples. The stratifications shown on the logs represent the conditions only at the actual exploration locations. Variations may occur and should be expected between locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on these logs. The samples that were not altered by laboratory testing will be retained for 90 days from the date of this report and then will be discarded.

## 2.4 Groundwater Information

Groundwater was not encountered in our borings drilled on this date. The nearest well log available from the Oregon Water Resources Departments' Well Query website, ([https://apps.wrd.state.or.us/apps/gw/well\\_log/Default.aspx](https://apps.wrd.state.or.us/apps/gw/well_log/Default.aspx)) was drilled near 929 E 19<sup>th</sup> Street, The Dalles, OR , about 0.1 miles away. The reported static water level at the time the well was drilled was 175 feet bgs. See Appendix F for a copy of this log.

It should be noted that the groundwater elevations can fluctuate seasonally, especially during periods of extended wet or dry weather or from changes in land use. Additionally, some perched groundwater may be encountered within explorations during or just after the wet winter months.

## 2.5 Seismicity

In accordance with ASCE 7-16, we recommend a Site Class D (stiff soil profile with an average standard penetration resistance of between 15 and 50 blows per foot) when considering the average of the upper 100 feet. This recommendation is based on the SPT  $N_{60}$ , as well as our local knowledge of the area geology.

Inputting our recommended Site Class as well as the site latitude and longitude into the ASCE 7 Hazard Tool website (<https://asce7hazardtool.online>), we obtained the seismic design parameters shown in Table 1 below. Note that the values for  $F_a$  and  $F_v$  in Table 1 were obtained from ASCE's Supplement 3 dated November 5, 2021, and issued for ASCE 7-16 to correct some seismic design issues in the original publication.

**Table 1:** Seismic Design Parameter Recommendations (ASCE 7-16, including Supplement 3 dated November 5, 2021)

| PARAMETER                                   | RECOMMENDATION |
|---------------------------------------------|----------------|
| Site Class                                  | D              |
| $S_s$                                       | 0.455g         |
| $S_1$                                       | 0.210g         |
| $F_a$                                       | 1.436          |
| $F_v$                                       | 2.180          |
| $S_{MS} (=S_s \times F_a)$                  | 0.653g         |
| $S_{M1} (=S_1 \times F_v)$                  | 0.458g         |
| $S_{DS} (=2/3 \times S_s \times F_a)$       | 0.435g         |
| $S_{D1} (=2/3 \times S_1 \times F_v)$       | 0.305g         |
| $MCE_G$ PGA                                 | 0.204g         |
| $F_{PGA}$                                   | 1.396          |
| $PGA_M (=MCE_G \text{ PGA} \times F_{PGA})$ | 0.285g         |
| Design PGA (= $2/3 \times PGA_M$ )          | 0.190g         |

Note: Site latitude = 45.5885, longitude = -121.17532

The return interval for the ground motions reported in the table above is 2 percent probability of exceedance in 50 years.

Per Section 11.4.8 of ASCE 7-16 a site-specific ground motion hazard analysis shall be performed in accordance with Section 21.2 for the following conditions:

1. Structures on Site Class D sites with  $S_1$  greater than or equal to  $0.2g$ .

Exception: ASCE 7-16 does not require a site-specific ground motion hazard analysis when the value of  $S_{M1}$  is elected to be increased by 50% for all applications of  $S_{M1}$  by the Structural Engineer. If  $S_{M1}$  is increased by 50% to avoid having to perform the seismic response analysis, then the resulting value of  $S_{D1}$  shall be equal to  $2/3 * [1.5 * S_{M1}]$ .

2. Structures on Site Class E sites with values of  $S_s$  greater than or equal to  $1.0$ , or values of  $S_1$  greater than or equal to  $0.2$ .

Exception: ASCE 7-16 does not require a site-specific ground motion hazard analysis when:

1. The Structural Engineer uses the equivalent lateral force design procedure and the value of  $C_s$  is determined by Eq. 12.8-2 for all values of  $T$ , or
2. Where (i) the value of  $S_{ai}$  is determined by Eq. 15.7-7 for all values of  $T_i$ , and (ii) the value of the parameter  $S_{D1}$  is replaced with  $1.5 * S_{D1}$  in Eq. 15.7-10 and 15.7-11.

We classified this site as Site Class D. Because the  $S_1$  value is greater than  $0.2g$  as shown in Table 1 above, a ground motion hazard analysis is required unless the Structural Engineer elects to increase the  $S_{M1}$  value by 50 percent (which results in also increasing the  $S_{D1}$  value by 50 percent). If the Structural Engineer elects not to utilize the 50 percent increase on  $S_{M1}$  and  $S_{D1}$ , then EE should be retained to perform a site-specific ground motion hazard analysis in accordance with Section 21.2 of ASCE 7-16.

### **3.0 EVALUATION AND FOUNDATION RECOMMENDATIONS**

#### **3.1 Geotechnical Discussion**

The primary factors influencing the proposed construction include:

- 1. Existing improvements to be demolished** – Some portions of the existing substation and its associated improvements will need to be demolished before the proposed construction can begin. It will be important to remove all the construction debris from the site and to backfill any voids with properly compacted structural fill that is approved by a representative of the Geotechnical Engineer.
- 2. Soft/Loose intermediate layer in B-2 and B-4** – In boring B-2, we encountered a layer of loose silty gravel at depth of between 3 to 6 feet. In boring B-4, a layer of soft gravelly silt was observed between 5 to 8 feet. If these loose layers are encountered at the base of the foundation excavations, the loose subgrade should be recompacted prior to placing the proposed foundations.
- 3. Lack of detailed design drawings** – We have not been provided with a design drawing set for the proposed development. We should be retained to review those drawings when they are complete to determine if the design complies with our recommendations or if our recommendations need to be modified.

In summary, provided the recommendations in this report are adhered to, we do not foresee any major issues that would preclude site development or the proposed construction. The above-mentioned factors are listed to draw the attention of the reader to the issues to address during design and construction of the proposed development.

#### **3.2 Site Preparation**

We recommend that the surface gravel, vegetation, roots, organic laden soils or soft soils, and any other deleterious soils will need to be stripped from beneath the proposed building and transformer areas. Our exploration revealed a 6-inch-thick layer of gravel at the surface.

After stripping and excavating to the proposed subgrade level, as required, the construction area should be inspected by a representative of the Geotechnical Engineer and proofrolled with a fully loaded, tandem axle, rubber tire dump truck or water truck. The proofroll should be observed by a representative of the Geotechnical Engineer. Soils that are observed to rut or deflect excessively under the moving load, or are otherwise judged to be unsuitable should be undercut and replaced with properly compacted fill. If the subgrade cannot be accessed with a dump truck, then the subgrade will need to be visually evaluated by a representative of the Geotechnical Engineer by soil probing.

Note that depending upon the condition of the exposed subgrade, EE may recommend that it be heavily recompact prior to proofrolling (i.e. if it appears to be loose and disturbed from the earthwork). Recompact may not be practical if earthwork occurs during the wetter winter months. In that case, the loose, disturbed material would need to be removed.

Any utilities present beneath the proposed construction will need to be located and rerouted as necessary and any abandoned pipes or utility conduits should be removed to inhibit the potential for subsurface erosion. Utility trench excavations should be backfilled with properly compacted structural fill as discussed in Section 3.3 below.

### 3.3 Structural Fill

Any structural fill to be placed should be free of organics or other deleterious materials, have a maximum particle size less than 3 inches, be relatively well graded, and have a liquid limit less than 45 and plasticity index less than 25.

In our professional opinion, the on-site soils are appropriate for use as structural fill, however we have significant concern that they will be too wet to compact in their current condition. The native soils will likely require drying out in order to reuse as properly compacted structural fill. It may be more practical to import granular, well graded, crushed rock structural fill. Structural fill should be moisture conditioned to within 3 percentage points below and 2 percentage points above optimum moisture as determined by ASTM D1557 (Modified Proctor).

Fill should be placed in relatively uniform horizontal lifts on the prepared subgrade which has been stripped of deleterious materials and approved by the Geotechnical Engineer or their representative. If loose soils exist on the prepared subgrades, they should be re-compacted. Each loose lift should be about 1-foot thick. The type of compaction equipment used will ultimately determine the maximum lift thickness. Structural fill should be compacted to at least 95 percent of modified proctor maximum dry density as determined by ASTM D1557. Each lift of compacted engineered fill should be tested by a representative of the Geotechnical Engineer prior to placement of subsequent lifts.

Any structural fill placed on slopes at or greater than 5H:1V should be properly benched. Level benches excavated into the existing slope should be a minimum of 4 feet wide laterally, and should be cut into the slope for no more than every five feet of vertical rise. The placement of fill should begin at the base of the fill. All benches should be inspected by a representative of the Geotechnical Engineer and approved prior to placement of structural fill lifts. If evidence of seepage is observed in the bench excavations, a supplemental drainage system may need to be designed and installed to prevent hydrostatic pressure buildup behind the fill. Final fill and/or cut slopes should be kept at or below a slope of 2H:1V. The fill should extend horizontally outward beyond the exterior perimeter of the structures and pavements at least 5 feet and 3 feet respectively, prior to sloping.

### 3.4 Foundation Recommendations

Once the site has been properly prepared as discussed above, the proposed building/transformer can be supported on a conventional shallow foundation system. In general, the native silty gravel or silty sand soils were loose to medium dense.

Spread footings can be designed for an allowable soil bearing pressure of up to 2,000 psf, when supported on the medium dense silty gravel/silty sand layer (the exposed surface of the loose silty gravel should be recompacted). Our recommended allowable bearing capacity is based on dead load plus design live load, and can be increased by one-third when including short-term wind or seismic loads. Minimum footing dimensions should be 18 inches for continuous wall footings and 24 inches for isolated pad footings.

Lateral frictional resistance between the base of footings and silty gravel/silty sand can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.35. In addition, lateral loads may be resisted by passive earth pressures based on an equivalent fluid pressure of 300 pounds per cubic foot (pcf) for footings poured “neat” against the native, fine-grained soils, or properly backfilled structural fill. These are ultimate values—we recommend a factor of safety of 1.5 be applied to the equivalent fluid pressure, which is appropriate due to the amount of movement required to develop full passive resistance. We recommend that the upper 1 foot should be disregarded for passive resistance unless this area is covered by pavement or concrete slab. To be clear, no safety factor has been applied to the friction coefficient discussed above.

Exterior footings and foundations in unheated areas should be located at a depth of at least 18 inches below the final exterior grade to provide adequate frost protection. If the improvements are to be constructed during the winter months or if the foundation soils will likely be subjected to freezing temperatures after foundation construction, then the foundation soils should be adequately protected from freezing. Otherwise, interior foundations can be located at nominal depths compatible with architectural and structural considerations.

The foundation excavations should be observed by a representative of the Geotechnical Engineer prior to steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Unsuitable soil zones encountered at the bottom of the foundation excavations should be removed to the level of suitable soils or properly compacted structural fill as directed by the Geotechnical Engineer.

After opening, foundation excavations should be observed and concrete placed as quickly as possible to avoid exposure of the excavation bottoms to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, the foundation concrete should be placed during the same day the excavation is made. If the soils will be exposed for more than 2 days, consideration should be given to placing a thin layer of rock atop the exposed subgrade to protect it from the elements.

Based on the known subsurface conditions and site geology, laboratory testing, and past experience, we anticipate that properly designed and constructed foundations supported on the recommended materials may experience maximum total and differential static settlements on the order of 1-inch and ½-inch over a horizontal distance of 20 feet, respectively.

### 3.5 Floor Slab-on-Grade Recommendations

For the purposes of this report, we have assumed that maximum floor slab loads will not exceed 150 psf. Based on the existing soil conditions, the design of slabs-on-grade can be based on a subgrade modulus (k) of 100 pci. This subgrade modulus value represents an anticipated value which would be obtained in a standard in-situ plate test with a 1-foot square plate. Use of this subgrade modulus for design or other on-grade structural elements should include appropriate modification based on dimensions as necessary.

Concrete floor slabs-on-grade can be supported on at least 6 inches of properly compacted crushed rock gravel structural fill overlying the heavily recompact native sandy soil surface. It is possible that there may be some isolated soft areas within proposed slab-on-grade areas that may require overexcavation and backfill with compacted structural fill. This will be determined by our geotechnical inspector during construction. The floor slabs should have an adequate number of joints to reduce cracking resulting from any differential movement and shrinkage.

Prior to placing the structural fill, the exposed subgrade surface should be prepared as discussed in Section 3.2. The subgrade will need to be visually evaluated by a representative of the Geotechnical Engineer by soil probing. If fill is required, the structural fill should be placed on the prepared subgrade after it has been approved by the Geotechnical Engineer.

The 6-inch-thick crushed rock structural fill should provide a capillary break to limit migration of moisture through the slab. If additional protection against moisture vapor is desired, a moisture vapor retarding membrane may also be incorporated into the design. Factors such as cost, special considerations for construction, and the floor coverings suggest that decisions on the use of vapor retarding membranes be made by the project design team, the contractor and the owner.

## **4.0 CONSTRUCTION CONSIDERATIONS**

### **4.1 Moisture Sensitive Soils/Weather Related Concerns**

The soils encountered at this site are expected to be sensitive to disturbances caused by construction traffic and to changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

### **4.2 Drainage and Groundwater Considerations**

Water should not be allowed to collect in the foundation excavations or on prepared subgrades for the slabs during construction. Positive site drainage should be maintained throughout construction activities. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff.

The site grading plan should be developed to provide rapid drainage of surface water away from the building areas and to inhibit infiltration of surface water around the perimeter of the proposed structure. The grades should be sloped away from the construction area to prevent saturation of the foundation/slab subgrades which could lead to softening of the soils and excessive settlement.

### **4.3 Excavations**

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document and subsequent updates were issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.



We are providing this information solely as a service to our client. EE does not assume responsibility for construction site safety or the contractor's compliance with local, state, and federal safety or other regulations.

#### 4.4 Geotechnical Construction Inspections

EE should be retained to perform geotechnical construction inspections to verify construction complies with the geotechnical engineering recommendations contained in this report. EE cannot accept responsibility for any conditions that deviate from those described in this report, if not engaged to also provide construction observation for this project.

A representative of the Geotechnical Engineer should perform the following "Special Inspections".

- Site stripping of organics and topsoil (periodic).
- Proofroll of stripped subgrade beneath footings and floor slabs-on-grade (periodic).
- Structural fill placement and compaction (periodic).
- Utility trench backfill compaction (periodic).

## **5.0 REPORT LIMITATIONS**

As is standard practice in the geotechnical industry, the conclusions contained in our report are considered preliminary because they are based on assumptions made about the soil, rock, and groundwater conditions exposed at the site during our subsurface investigation. A more complete extent of the actual subsurface conditions can only be identified when they are exposed during construction. Therefore, EE should be retained as your consultant during construction to observe the actual conditions and to provide our final conclusions. If a different geotechnical consultant is retained to perform geotechnical inspection during construction, then they should be relied upon to provide final design conclusions and recommendations, and should assume the role of geotechnical engineer of record.

The preliminary geotechnical recommendations presented in this report are based on the available project information and the subsurface materials described in this report. If any of the noted information is incorrect, please inform EE in writing so that we may amend the recommendations presented in this report if appropriate and if desired by the client. EE will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

Once construction plans are finalized and a grading plan has been prepared, EE should be retained to review those plans and modify our existing recommendations related to the proposed construction, if determined to be necessary.

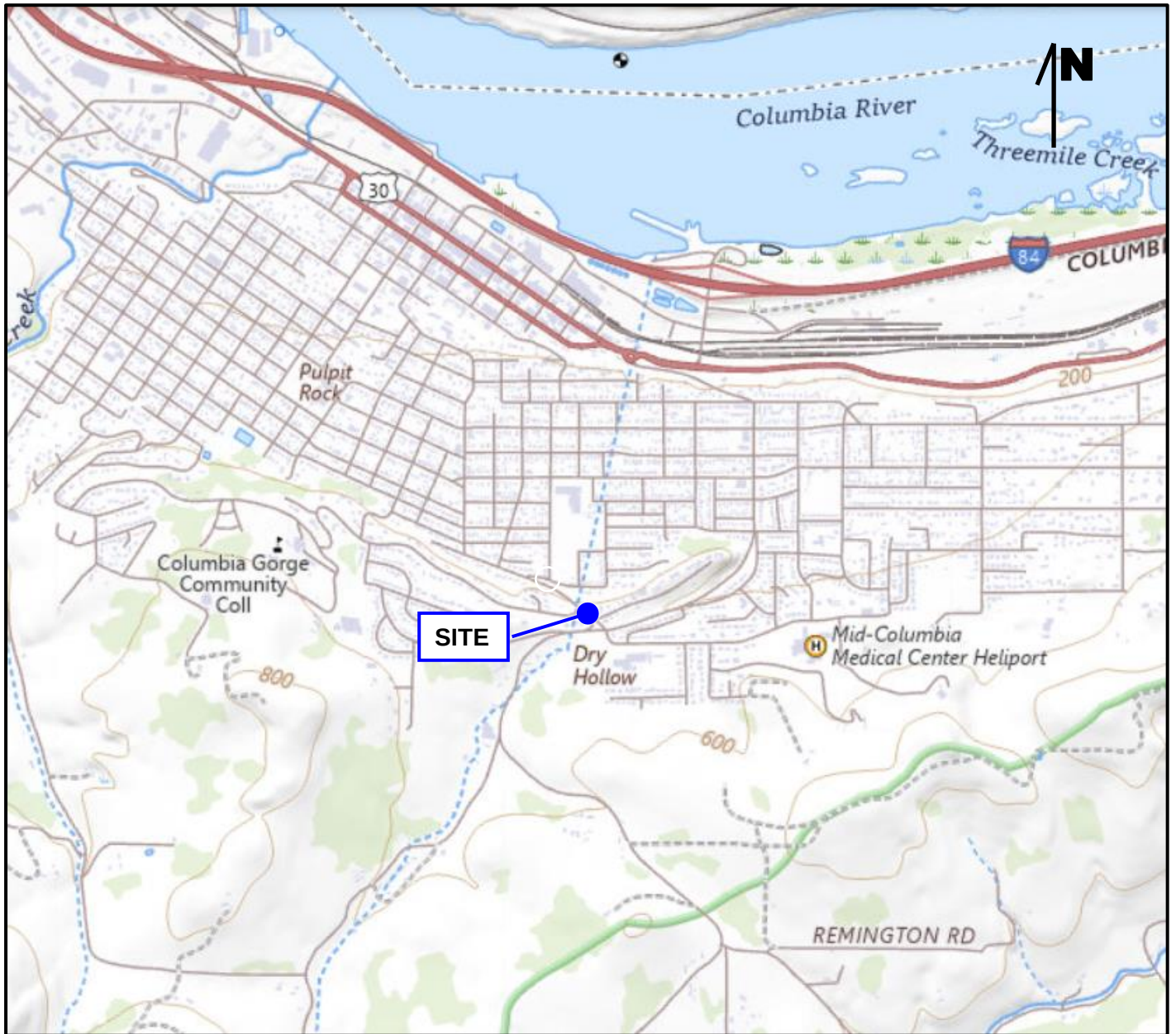
The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

This report has been prepared for the exclusive use of Stoddard Power Systems, LLC for the specific use for the proposed Columbia Heights Substation Upgrade, which will be sited at Intersection of East 16th Street and East Scenic Drive in the Dalles, Oregon. EE does not authorize the use of the advice herein nor the reliance upon the report by third parties without prior written authorization by EE.

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## **APPENDICES**

## APPENDIX A – SITE LOCATION PLAN



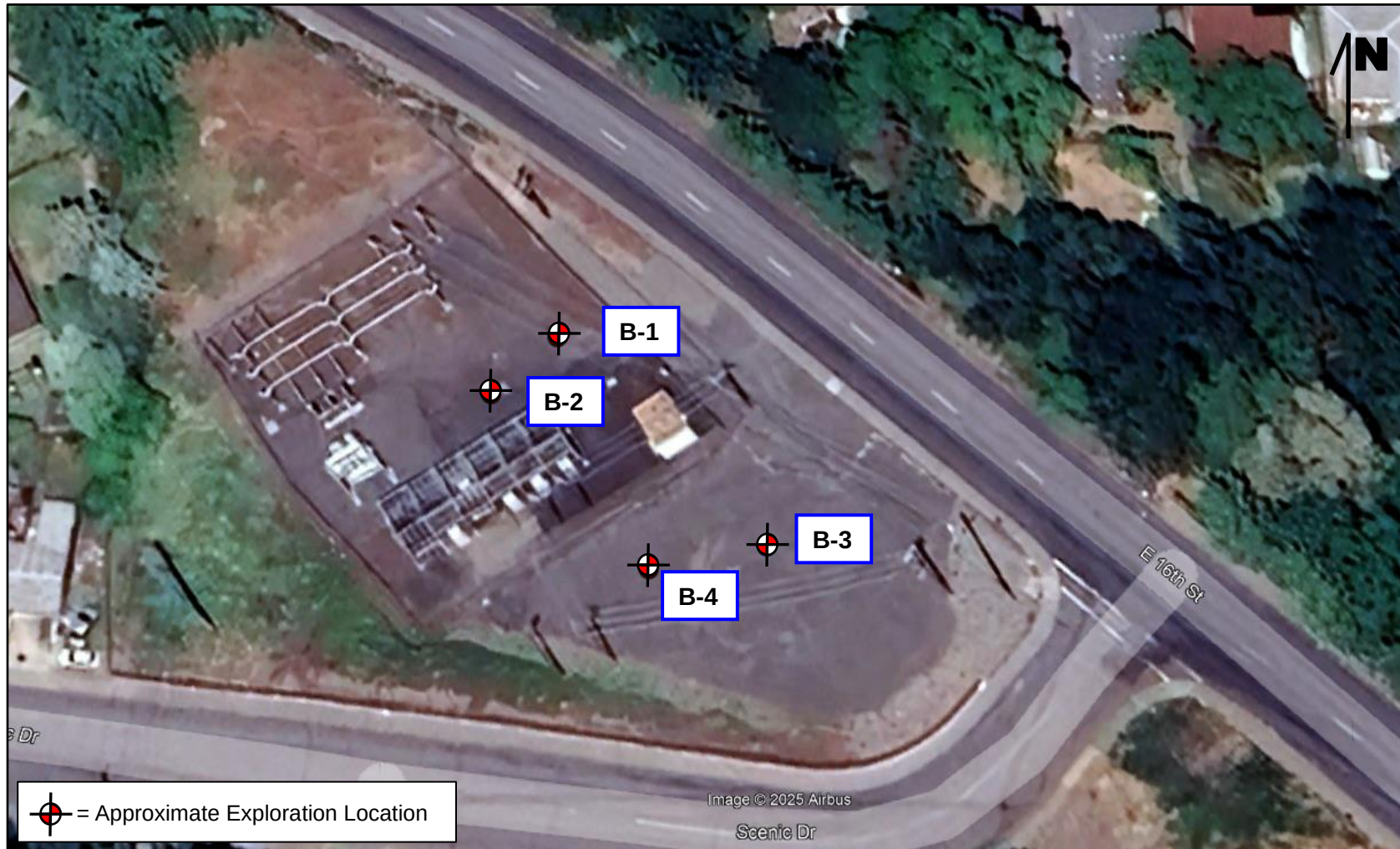
Proposed Columbia Heights Substation Upgrade  
Intersection of East 16<sup>th</sup> Street and East Scenic Drive  
The Dalles, Wasco County, OR

Report No.  
10-250039-01

March 12, 2025



## APPENDIX B – EXPLORATION LOCATION



Base Map: Sourced from Google Earth



**Proposed Columbia Heights Substation Upgrade  
Intersection of East 16<sup>th</sup> Street and East Scenic Drive  
The Dalles, Wasco County, OR**

**Report No.  
10-250039-01**

**March 12, 2025**



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## Appendix C: Boring B-1

Sheet 1 of 1

Client: Stoddard Power Systems, LLC  
Project: Columbia Heights Substation Upgrade  
Site Address: 1100 E 16th Street  
The Dalles, Oregon  
Location of Exploration: See Appendix B  
Logged By: J. Hill-Hylton

Report Number: 10-250039  
Drilling Contractor: Dan J Fischer Excavating  
Drilling Method: Big Beaver Drill Rig  
Drilling Equipment: Solid stem auger  
Approximate Ground Surface Elevation (ft msl):  
Date of Exploration: 2/21/2025

| Depth (ft) | Water Level | Lithology         |                                                                                                                      | Sampling Data |                    |                       |                      |                      |              |               |                  |         |
|------------|-------------|-------------------|----------------------------------------------------------------------------------------------------------------------|---------------|--------------------|-----------------------|----------------------|----------------------|--------------|---------------|------------------|---------|
|            |             | Lithologic Symbol | Geologic Description of Soil and Rock Strata                                                                         | Sample Number | Blows per 6 Inches | N <sub>60</sub> value | Moisture Content (%) | % Passing #200 Sieve | Liquid Limit | Plastic Limit | Pocket Pen (tsf) | Remarks |
| 0          |             |                   | Sandy GRAVEL FILL (GP); gray; dry to moist; crushed rock; loose                                                      |               |                    |                       |                      |                      |              |               |                  |         |
|            |             |                   | Silty GRAVEL (GM); well rounded to sub-rounded river gravels; dark brown to brown; moist; medium dense to very dense |               |                    |                       |                      |                      |              |               |                  |         |
| 2          |             |                   |                                                                                                                      |               | 4                  |                       |                      |                      |              |               |                  |         |
|            |             |                   |                                                                                                                      | SPT-1         | 5                  | 13                    | 17                   |                      |              |               |                  |         |
|            |             |                   |                                                                                                                      |               | 8                  |                       |                      |                      |              |               |                  |         |
| 4          |             |                   |                                                                                                                      |               | 10                 |                       |                      |                      |              |               |                  |         |
|            |             |                   |                                                                                                                      | SPT-2         | 8                  | 13                    | 13                   |                      |              |               |                  |         |
|            |             |                   |                                                                                                                      |               | 5                  |                       |                      |                      |              |               |                  |         |
|            |             |                   |                                                                                                                      |               | 7                  |                       |                      |                      |              |               |                  |         |
| 8          |             |                   |                                                                                                                      | SPT-3         | 8                  | 23                    | 19                   | 37                   |              |               |                  |         |
|            |             |                   |                                                                                                                      |               | 15                 |                       |                      |                      |              |               |                  |         |
|            |             |                   | becomes dry                                                                                                          |               | 25                 |                       |                      |                      |              |               |                  |         |
| 10         |             |                   |                                                                                                                      | SPT-4         | 29                 | 48                    | 7                    |                      |              |               |                  |         |
|            |             |                   |                                                                                                                      |               | 19                 |                       |                      |                      |              |               |                  |         |
|            |             |                   |                                                                                                                      | SPT-5         | 50/5"              | 100                   | 11                   |                      |              |               |                  |         |

12

Notes: Boring terminated at a depth of approximately 11.5 feet below ground surface (bgs). Groundwater was not encountered on this date. Boring backfilled with bentonite chips on February 21, 2025. Elevations approximated from Google Earth.



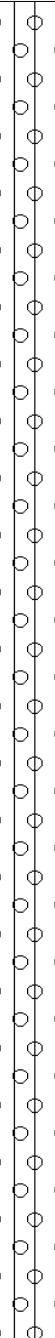
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## Appendix C: Boring B-2

Sheet 1 of 1

Client: Stoddard Power Systems, LLC  
Project: Columbia Heights Substation Upgrade  
Site Address: 1100 E 16th Street  
The Dalles, Oregon  
Location of Exploration: See Appendix B  
Logged By: J. Hill-Hylton

Report Number: 10-250039  
Drilling Contractor: Dan J Fischer Excavating  
Drilling Method: Big Beaver Drill Rig  
Drilling Equipment: Solid stem auger  
Approximate Ground Surface Elevation (ft msl):  
Date of Exploration: 2/21/2025

| Depth (ft) | Water Level | Lithology                                                                          |                                                                                                          | Sampling Data |                    |                       |                      |                      |              |               |                  | Remarks |
|------------|-------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------|--------------------|-----------------------|----------------------|----------------------|--------------|---------------|------------------|---------|
|            |             | Lithologic Symbol                                                                  | Geologic Description of Soil and Rock Strata                                                             | Sample Number | Blows per 6 Inches | N <sub>60</sub> value | Moisture Content (%) | % Passing #200 Sieve | Liquid Limit | Plastic Limit | Pocket Pen (tsf) |         |
| 0          |             |   | Sandy GRAVEL FILL (GP); gray; dry to moist; crushed rock; loose                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 1          |             |  | Silty GRAVEL (GM); well rounded to sub-rounded river gravels; dark brown to brown; moist; loose to dense |               |                    |                       |                      |                      |              |               |                  |         |
| 2          |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 3          |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 4          |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 5          |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 6          |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 7          |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 8          |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 9          |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 10         |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 11         |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 12         |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |
| 13         |             |                                                                                    | becomes tan                                                                                              |               |                    |                       |                      |                      |              |               |                  |         |
| 14         |             |                                                                                    |                                                                                                          |               |                    |                       |                      |                      |              |               |                  |         |

Notes : Boring terminated at a depth of approximately 11.5 feet below ground surface (bgs). Groundwater was not encountered on this date. Boring backfilled with bentonite chips on February 21, 2025. Elevations approximated from Google Earth.



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## Appendix C: Boring B-3

Sheet 1 of 1

Client: Stoddard Power Systems, LLC  
Project: Columbia Heights Substation Upgrade  
Site Address: 1100 E 16th Street  
The Dalles, Oregon  
Location of Exploration: See Appendix B  
Logged By: J. Hill-Hylton

Report Number: 10-250039  
Drilling Contractor: Dan J Fischer Excavating  
Drilling Method: Big Beaver Drill Rig  
Drilling Equipment: Solid stem auger  
Approximate Ground Surface Elevation (ft msl):  
Date of Exploration: 2/21/2025

| Depth (ft) | Water Level | Lithology         |                                                                 | Sampling Data |                    |                       |                      |                      |              |               |                  | Remarks                                                            |
|------------|-------------|-------------------|-----------------------------------------------------------------|---------------|--------------------|-----------------------|----------------------|----------------------|--------------|---------------|------------------|--------------------------------------------------------------------|
|            |             | Lithologic Symbol | Geologic Description of Soil and Rock Strata                    | Sample Number | Blows per 6 Inches | N <sub>60</sub> value | Moisture Content (%) | % Passing #200 Sieve | Liquid Limit | Plastic Limit | Pocket Pen (tsf) |                                                                    |
| 0          |             |                   | Sandy GRAVEL FILL (GP); gray; dry to moist; crushed rock; loose |               |                    |                       |                      |                      |              |               |                  |                                                                    |
| 2          |             |                   | Silty GRAVEL (GM); brown and black; dry; medium dense           |               |                    |                       |                      |                      |              |               |                  |                                                                    |
| 4          |             |                   | extremetly difficult drilling                                   | SPT-1         | 16                 | 26                    | 6                    |                      |              |               |                  | possibly large boulders or cobbles that prevented further dirlling |
|            |             |                   |                                                                 |               | 11                 | 21                    |                      |                      |              |               |                  |                                                                    |

Notes : Boring terminated at a depth of approximately 5 feet below ground surface (bgs). Groundwater was not encountered on this date. Boring backfilled with bentonite chips on February 21, 2025. Elevations approximated from Google Earth.





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## Appendix C: Boring B-4

Sheet 1 of 1

Client: Stoddard Power Systems, LLC  
Project: Columbia Heights Substation Upgrade  
Site Address: 1100 E 16th Street  
The Dalles, Oregon  
Location of Exploration: See Appendix B  
Logged By: J. Hill-Hylton

Report Number: 10-250039  
Drilling Contractor: Dan J Fischer Excavating  
Drilling Method: Big Beaver Drill Rig  
Drilling Equipment: Solid stem auger  
Approximate Ground Surface Elevation (ft msl):  
Date of Exploration: 2/21/2025

| Depth (ft) | Water Level                                       | Lithology         |                                                                           | Sampling Data                                                  |                    |                       |                      |                      |              |               |                                    |         |  |
|------------|---------------------------------------------------|-------------------|---------------------------------------------------------------------------|----------------------------------------------------------------|--------------------|-----------------------|----------------------|----------------------|--------------|---------------|------------------------------------|---------|--|
|            |                                                   | Lithologic Symbol | Geologic Description of Soil and Rock Strata                              | Sample Number                                                  | Blows per 6 Inches | N <sub>60</sub> value | Moisture Content (%) | % Passing #200 Sieve | Liquid Limit | Plastic Limit | Pocket Pen (tsf)                   | Remarks |  |
| 0          |                                                   |                   | Sandy GRAVEL FILL (GP); gray; dry to moist; crushed rock; loose           |                                                                | 11                 |                       |                      |                      |              |               |                                    |         |  |
|            | SILT (ML) with gravel; brown; moist to wet; stiff |                   | SPT-1                                                                     |                                                                | 8                  | 16                    | 23                   |                      |              |               |                                    |         |  |
| 2          |                                                   |                   |                                                                           | Silty SAND (SM) with gravel; brown to dark brown; medium dense |                    | 8                     |                      |                      |              |               |                                    |         |  |
|            |                                                   |                   |                                                                           | SPT-2                                                          |                    | 8                     |                      |                      |              |               |                                    |         |  |
|            |                                                   |                   |                                                                           |                                                                |                    | 9                     | 12                   | 15                   |              |               |                                    |         |  |
| 4          |                                                   |                   |                                                                           |                                                                | 3                  |                       |                      |                      |              |               | drill rig chatter throughout layer |         |  |
| 6          |                                                   |                   | Gravelly SILT (ML); brown to dark brown; moist; soft to very stiff        |                                                                | 1                  | 4                     | 17                   |                      |              |               |                                    |         |  |
|            |                                                   |                   | SPT-3                                                                     |                                                                | 1                  |                       |                      |                      |              |               |                                    |         |  |
| 8          |                                                   |                   |                                                                           |                                                                | 3                  |                       |                      |                      |              |               |                                    |         |  |
|            |                                                   |                   | SPT-4                                                                     | 4                                                              | 8                  | 22                    |                      |                      |              |               |                                    |         |  |
|            |                                                   |                   |                                                                           |                                                                | 4                  |                       |                      |                      |              |               |                                    |         |  |
| 10         |                                                   |                   | becomes dry                                                               |                                                                | 8                  |                       |                      |                      |              |               |                                    |         |  |
|            |                                                   | SPT-5             | 9                                                                         |                                                                | 21                 | 25                    |                      |                      |              |               |                                    |         |  |
| 12         |                                                   |                   | Elastic SILT (MH); white with yellow and maroon; dry; stiff to very stiff |                                                                | 12                 |                       |                      |                      |              |               |                                    |         |  |
|            |                                                   |                   |                                                                           | SPT-6                                                          | 8                  |                       |                      |                      |              |               |                                    |         |  |
|            |                                                   |                   |                                                                           |                                                                | 8                  | 17                    | 41                   |                      |              |               |                                    |         |  |
| 14         |                                                   |                   |                                                                           |                                                                | 9                  |                       |                      |                      |              |               |                                    |         |  |
|            |                                                   |                   |                                                                           | SPT-7                                                          | 6                  |                       |                      |                      |              |               |                                    |         |  |
| 16         |                                                   |                   | 7                                                                         |                                                                | 15                 | 62                    | 99                   |                      |              |               |                                    |         |  |
|            |                                                   |                   | 8                                                                         |                                                                |                    |                       |                      |                      |              |               |                                    |         |  |
| 18         |                                                   |                   |                                                                           |                                                                |                    |                       |                      |                      |              |               |                                    |         |  |
| 20         |                                                   |                   | SPT-8                                                                     | 4                                                              |                    |                       |                      |                      |              |               |                                    |         |  |
|            |                                                   | 6                 |                                                                           | 13                                                             | 65                 |                       |                      |                      |              |               |                                    |         |  |
|            |                                                   |                   |                                                                           | 7                                                              |                    |                       |                      |                      |              |               |                                    |         |  |

Notes : Boring terminated at a depth of approximately 21.5 feet below ground surface (bgs). Groundwater was not encountered on this date. Boring backfilled with bentonite chips on February 21, 2025. Elevations approximated from Google Earth.

# APPENDIX D: SOIL CLASSIFICATION LEGEND

| APPARENT CONSISTENCY OF COHESIVE SOILS (PECK, HANSON & THORNBURN 1974, AASHTO 1988) |                                      |                                  |                  |                                                         |
|-------------------------------------------------------------------------------------|--------------------------------------|----------------------------------|------------------|---------------------------------------------------------|
| Descriptor                                                                          | SPT N <sub>60</sub><br>(blows/foot)* | Pocket Penetrometer,<br>Qp (tsf) | Torvane<br>(tsf) | Field Approximation                                     |
| Very Soft                                                                           | < 2                                  | < 0.25                           | < 0.12           | Easily penetrated several inches by fist                |
| Soft                                                                                | 2 – 4                                | 0.25 – 0.50                      | 0.12 – 0.25      | Easily penetrated several inches by thumb               |
| Medium Stiff                                                                        | 5 – 8                                | 0.50 – 1.0                       | 0.25 – 0.50      | Penetrated several inches by thumb w/moderate effort    |
| Stiff                                                                               | 9 – 15                               | 1.0 – 2.0                        | 0.50 – 1.0       | Readily indented by thumbnail                           |
| Very Stiff                                                                          | 16 – 30                              | 2.0 – 4.0                        | 1.0 – 2.0        | Indented by thumb but penetrated only with great effort |
| Hard                                                                                | > 30                                 | > 4.0                            | > 2.0            | Indented by thumbnail with difficulty                   |

\* Using SPT N<sub>60</sub> is considered a crude approximation for cohesive soils.

| APPARENT DENSITY OF COHESIONLESS SOILS (AASHTO 1988) |                                        |
|------------------------------------------------------|----------------------------------------|
| Descriptor                                           | SPT N <sub>60</sub> Value (blows/foot) |
| Very Loose                                           | 0 – 4                                  |
| Loose                                                | 5 – 10                                 |
| Medium Dense                                         | 11 – 30                                |
| Dense                                                | 31 – 50                                |
| Very Dense                                           | > 50                                   |

| MOISTURE (ASTM D2488-06) |                                                                                                                     |
|--------------------------|---------------------------------------------------------------------------------------------------------------------|
| Descriptor               | Criteria                                                                                                            |
| Dry                      | Absence of moisture, dusty, dry to the touch, well below optimum moisture content (per ASTM D698 or D1557)          |
| Moist                    | Damp but no visible water                                                                                           |
| Wet                      | Visible free water, usually soil is below water table, well above optimum moisture content (per ASTM D698 or D1557) |

| PERCENT OR PROPORTION OF SOILS (ASTM D2488-06)                                                                        |                                          |
|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Descriptor                                                                                                            | Criteria                                 |
| Trace                                                                                                                 | Particles are present but estimated < 5% |
| Few                                                                                                                   | 5 – 10%                                  |
| Little                                                                                                                | 15 – 25%                                 |
| Some                                                                                                                  | 30 – 45%                                 |
| Mostly                                                                                                                | 50 – 100%                                |
| Percentages are estimated to nearest 5% in the field. Use "about" unless percentages are based on laboratory testing. |                                          |

| SOIL PARTICLE SIZE (ASTM D2488-06) |                                                                                                    |
|------------------------------------|----------------------------------------------------------------------------------------------------|
| Descriptor                         | Size                                                                                               |
| Boulder                            | > 12 inches                                                                                        |
| Cobble                             | 3 to 12 inches                                                                                     |
| Gravel - Coarse<br>Fine            | ¾ inch to 3 inches<br>No. 4 sieve to ¾ inch                                                        |
| Sand - Coarse<br>Medium<br>Fine    | No. 10 to No. 4 sieve (4.75mm)<br>No. 40 to No. 10 sieve (2mm)<br>No. 200 to No. 40 sieve (.425mm) |
| Silt and Clay ("fines")            | Passing No. 200 sieve (0.075mm)                                                                    |

| UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2488)                           |                                                     |                   |              |                                                                        |
|---------------------------------------------------------------------------|-----------------------------------------------------|-------------------|--------------|------------------------------------------------------------------------|
| Major Division                                                            |                                                     |                   | Group Symbol | Description                                                            |
| <b>Coarse Grained Soils</b><br><br>(more than 50% retained on #200 sieve) | <b>Gravel</b> (50% or more retained on No. 4 sieve) | Clean Gravel      | GW           | Well-graded gravels and gravel-sand mixtures, little or no fines       |
|                                                                           |                                                     |                   | GP           | Poorly graded gravels and gravel-sand mixtures, little or no fines     |
|                                                                           |                                                     | Gravel with fines | GM           | Silty gravels and gravel-sand-silt mixtures                            |
|                                                                           |                                                     |                   | GC           | Clayey gravels and gravel-sand-clay mixtures                           |
|                                                                           | <b>Sand</b> (> 50% passing No. 4 sieve)             | Clean sand        | SW           | Well-graded sands and gravelly sands, little or no fines               |
|                                                                           |                                                     |                   | SP           | Poorly-graded sands and gravelly sands, little or no fines             |
|                                                                           |                                                     | Sand with fines   | SM           | Silty sands and sand-silt mixtures                                     |
|                                                                           |                                                     |                   | SC           | Clayey sands and sand-clay mixtures                                    |
| <b>Fine Grained Soils</b><br><br>(50% or more passing #200 sieve)         | <b>Silt and Clay</b> (liquid limit < 50)            |                   | ML           | Inorganic silts, rock flour and clayey silts                           |
|                                                                           |                                                     |                   | CL           | Inorganic clays of low-medium plasticity, gravelly, sandy & lean clays |
|                                                                           |                                                     |                   | OL           | Organic silts and organic silty clays of low plasticity                |
|                                                                           | <b>Silt and Clay</b> (liquid limit > 50)            |                   | MH           | Inorganic silts and clayey silts                                       |
|                                                                           |                                                     |                   | CH           | Inorganic clays or high plasticity, fat clays                          |
|                                                                           |                                                     |                   | OH           | Organic clays of medium to high plasticity                             |
| <b>Highly Organic Soils</b>                                               |                                                     |                   | PT           | Peat, muck and other highly organic soils                              |



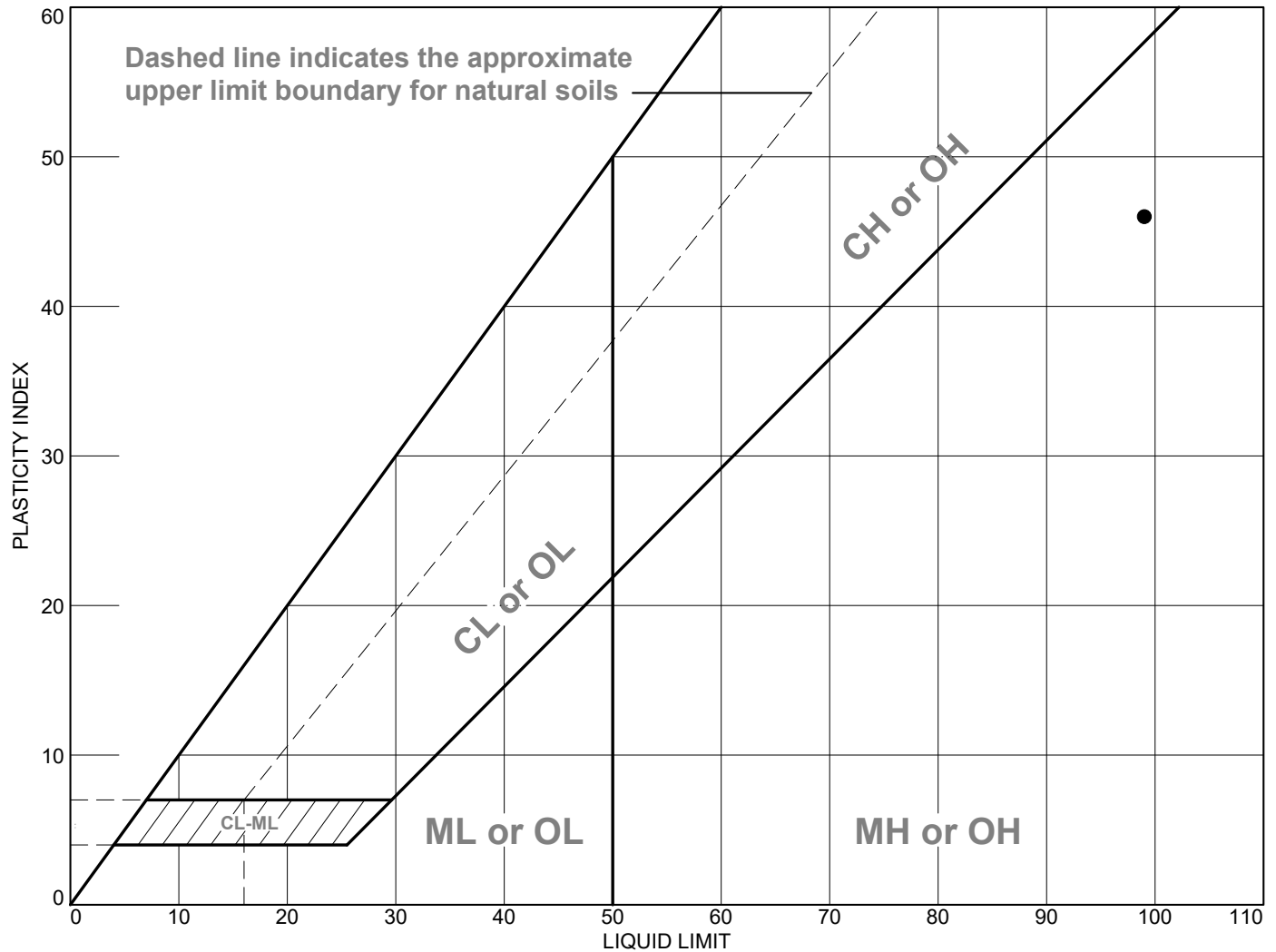
| GRAPHIC SYMBOL LEGEND |  |                                                              |
|-----------------------|--|--------------------------------------------------------------|
| GRAB                  |  | Grab sample                                                  |
| SPT                   |  | Standard Penetration Test (2" OD), ASTM D1586                |
| ST                    |  | Shelby Tube, ASTM D1587 (pushed)                             |
| DM                    |  | Dames and Moore ring sampler (3.25" OD and 140-pound hammer) |
| CORE                  |  | Rock coring                                                  |

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## **APPENDIX E**

### **Atterberg Limit Testing Results**

# LIQUID AND PLASTIC LIMITS TEST REPORT



|   | MATERIAL DESCRIPTION                        | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---------------------------------------------|----|----|----|-------|--------|------|
| • | white with yellow and marroon; elastic silt | 99 | 53 | 46 | 100   | 99.6   | MH   |
|   |                                             |    |    |    |       |        |      |
|   |                                             |    |    |    |       |        |      |
|   |                                             |    |    |    |       |        |      |
|   |                                             |    |    |    |       |        |      |

**Project No.** 10-250039-01 **Client:** Stoddard Power Systems, LLC

**Project:** Columbia Heights Substation Upgrade

• **Source of Sample:** Boirng B-4 **Depth:** 15' **Sample Number:** SPT 7

**Remarks:**



**Figure**

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## **APPENDIX F**

### **Historical Well Logs**



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