

**TRAVERSE CITY LIGHT & POWER
DEPARTMENT**

TRAVERSE CITY, MICHIGAN

Project Manual for

Aero Park Underground
Electrical Cable & Equipment Installation

CONSTRUCTION BID DOCUMENTS

GRP
Engineering, Inc.

Power Utility & Electrical Engineering
Grand Rapids/Petoskey, Michigan

Project No. 19-1026.01
January 2020

**TRAVERSE CITY LIGHT & POWER
DEPARTMENT
Traverse City, Michigan**

**Project Manual
For
Aero Park Underground
Electrical Cable & Equipment Installation
CONSTRUCTION BID DOCUMENTS**

**19-1026.01
January 2020**

GRP
Engineering, Inc.

Grand Rapids Location:
3300 Eagle Run Drive NE
Suite 101
Grand Rapids MI 49525

Petoskey Location:
459 Bay Street
Petoskey MI 49770

TABLE OF CONTENTS
TRAVERSE CITY LIGHT & POWER DEPARTMENT
AERO PARK UNDERGROUND
ELECTRICAL CABLE & EQUIPMENT INSTALLATION

<u>SECTION TITLE</u>	<u>PAGE NO.</u>
Invitation to Bid	A-1
Instructions to Bidders (C-200).....	00200-1 thru 00200-9
Bid Form (C-410).....	00410-1 thru 00410-5
Bid Bond (C-435).....	00435-1 thru 00435-2
Iran Economic Sanctions Act.....	1
Schedule of Values / Unit Lists.....	SV-1 thru SV-1
Construction Unit Descriptions.....	CUD-1 thru CUD-2
Contract Agreement (C-520).....	00520-1 thru 0520-6
Performance Bond (C-610).....	00610-1 thru 00610-3
Payment Bond (C-615).....	00615-1 thru 00615-3
General Conditions (C-700).....	00700-1 thru 00700-67
Supplementary Conditions	SC-1 thru SC-5
Construction Specifications	
Division 1 – General Requirements	01100-1 thru 01100-4
Section 01400 – Quality Requirements.....	01400-1 thru 01400-6
Section 01700 – Execution Requirements.....	01700-1 thru 01700-3
Division 2 – Site	
Section 02221 – Trenching & Backfilling.....	02221-1 thru 02221-4
Section 02260 – Excavation & Slope Protection.....	02260-1 thru 02260-2
Section 02300 – Earthwork.....	02300-1 thru 02300-7
Section 02920 – Lawns & Grasses.....	02920-1 thru 02920-5
Division 16 – Electrical	
Section 16061 – Utility System Grounding.....	16061-1 thru 16061-2
Section 16075 – Power & Control Circuit Tagging.....	16075-1 thru 16075-2
Section 16111 – Conduit.....	16111-1 thru 16111-2
Section 16117 – Underground Power Distribution.....	16117-1 thru 16117-2
Section 16124 – Medium Voltage Cable.....	16124-1 thru 16124-3
Section 16128 – Medium Voltage Cable Terminations & Splices.....	16128-1 thru 16128-2
Section 16135 – Manholes & Handholes.....	16135-1 thru 16135-2
Section 16292 – Fault Indicators.....	16292-1 thru 16292-2
Section 16315 – Medium & High Voltage Overhead Lines.....	16315-1 thru 16315-5
Section 16345 – Medium Voltage Sectionalizing Cabinets.....	16345-1
Section 16346 – Medium Voltage Pad-mounted Switchgear.....	16346-1 thru 16346-3

Construction Staking Sheets

Assembly Drawings

Tag Lists

Bill of Materials

Documents C-200, C-300, C-435, C-500, C-615, C-620, and C-700 are copyright ©2013, National Society of Professional Engineers for EJCDC and are modified herein through a license agreement dated January 2018.

(All Rights Reserved.)

Project Manual in its entirety is copyright © 2020 by GRP Engineering, Inc.

INVITATION TO BID

Project Owner: TRAVERSE CITY LIGHT & POWER DEPARTMENT
Project Name: AERO PARK UNDERGROUND
ELECTRICAL CABLE & EQUIPMENT INSTALLATION
Project Location: CITY OF TRAVERSE CITY
GRAND TRAVERSE COUNTY, MICHIGAN

Project Scope & Information

You are invited to bid on a general construction contract. The Contract provides for the furnishing of all labor, equipment, and materials necessary to construct the Electrical Cable & Equipment Installation portion of the Aero Park Underground Project. Project substantial completion date is November 15, 2020.

The overall scope of the project consists of the installation of 10,380 feet of underground three-phase 13.8kV line in conduit installed via directional boring (by others) in the Aero Park Industrial Park. Work covered under this contract includes cable, termination, and padmount equipment installation, system testing and energization, and removal of the existing padmount equipment in the project area. A bid alternate for a new substation exit including recloser foundation, recloser installation, grounding and wiring, substation riser stand and connections, 1,055' of cable, padmount switchgear and site restoration is being requested. The project is being undertaken to replace and upgrade the existing underground electrical system in the Aero Park Industrial Park. The Contractor will be required to closely coordinate all construction activities with the Conduit Installation Contractor and TCL&P crews.

The Owner will furnish certain material as listed in the Project Manual to the Contractor. The Contractor will be required to pickup and transport all material which is supplied from the Owner's warehouse to the project site and also be responsible for receipt and unloading of large material at the Project site(s).

Bid Information

Bidding documents including drawings, specifications, and all necessary forms for bidders may be examined and/or obtained on January 30, 2020 at the following locations:

<u>Engineer</u> GRP Engineering, Inc. 459 Bay Street Petoskey, MI 49770	<u>Owner</u> Traverse City Light & Power Department 1131 Hastings Street Traverse City, MI 49686
--	---

A mandatory pre-bid meeting will be held on Thursday, February 6, 2020, at 10:00am, local time, at TCL&P Offices, 1131 Hastings Street, Traverse City, Michigan 49686. Bids received by Bidders not present at the pre-bid meeting will be returned unopened.

Sealed bids will be received by the Traverse City Light & Power at their offices (address listed below) on or before 11:00am, local time, Wednesday, February 26, 2020, at which time and place the bids will be publicly opened and read.

Bid Opening Location
Traverse City Light & Power
1131 Hastings Street
Traverse City, MI 49686

Bid security in the form of a Bid Bond in the amount of not less than 10 percent of the total Bid Price must accompany each Bid in accordance with the Instructions to Bidders.

Owner's Right to Reject Bids

The Owner reserves the right to reject any or all bids and to waive irregularities therein, and all bidders must agree that such rejection shall be without liability on the part of the Buyer for any damage or claim brought by any bidder because of such rejections, nor shall the bidders seek any recourse of any kind against the Owner or Engineer because of such rejections. The filing of any bid in response to this invitation shall constitute an agreement of the bidder to these conditions.

INSTRUCTIONS TO BIDDERS
TRAVERSE CITY LIGHT & POWER DEPARTMENT
AERO PARK UNDERGROUND
ELECTRICAL CABLE & EQUIPMENT INSTALLATION

Table of Contents

Article 1 – DEFINED TERMS	2
Article 2 – COPIES OF BIDDING DOCUMENTS	2
Article 3 – QUALIFICATIONS OF BIDDERS	2
Article 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER’S SAFETY PROGRAM; OTHER WORK AT THE SITE	2
Article 5 – BIDDER’S REPRESENTATIONS	4
Article 6 – PRE-BID CONFERENCE	4
Article 7 – INTERPRETATIONS AND ADDENDA	5
Article 8 – BID SECURITY	5
Article 9 – CONTRACT TIMES	5
Article 10 – LIQUIDATED DAMAGES	5
Article 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS	5
Article 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS	6
Article 13 – PREPARATION OF BID	6
Article 14 – BASIS OF BID	7
Article 15 – SUBMITTAL OF BID	7
Article 16 – MODIFICATION AND WITHDRAWAL OF BID	7
Article 17 – OPENING OF BIDS	8
Article 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE	8
Article 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT	8
Article 20 – BONDS AND INSURANCE	8
Article 21 – SIGNING OF AGREEMENT	8
Article 22 – SALES AND USE TAXES	9

ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.
 - B. *Bidder* – The individual or entity who submits a Bid directly to Owner
 - C. *Successful Bidder* – The lowest responsible Bidder submitting a responsive Bid to whom Owner (on the basis of Owner’s evaluation as herinafter provided) makes an award.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office listed below in the number and format stated in the advertisement or invitation to bid.
- GRP Engineering, Inc.
459 Bay Street
Petoskey, MI 49770
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 The owner has prepared a list of pre-qualified bidders.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER’S SAFETY PROGRAM; OTHER WORK AT THE SITE

- 4.01 *Site and Other Areas*
- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.
- 4.02 *Existing Site Conditions*
- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
 - 1. The Supplementary Conditions identify:
 - a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
 - b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
 - c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
 3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
- B. **Underground Facilities:** Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or adjacent to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.
- C. **Adequacy of Data:** Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request,

Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER’S REPRESENTATIONS

- 5.01 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
 - B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
 - C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
 - D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;
 - E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs;
 - F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
 - G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
 - H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
 - I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
 - J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A mandatory pre-bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of ten (10) percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, Milestones are to be achieved, and the Work is to be substantially completed, and completed and ready for final payment, are set forth in the Agreement. The times will be taken into consideration by Owner during the evaluation of Bids, and it will be necessary for the apparent Successful Bidder to satisfy Owner that it will be able to achieve Substantial Completion and be ready for final payment within the times designated in the Bid.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

- 11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.
- 12.03 Each Bidder shall submit to Owner a list of the Subcontractors or Suppliers proposed for the Work with their bid. If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form shall be typed or completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
- B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."
- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.
- 13.03 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The partnership's address for receiving notices shall be shown.
- 13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the firm's address for receiving notices shall be shown.
- 13.05 A Bid by an individual shall show the Bidder's name and address for receiving notices.
- 13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture's address for receiving notices shall be shown.

- 13.07 All names shall be printed in ink below the signatures.
- 13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Unit Price*

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.
- 15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED – AERO PARK UNDERGROUND ELECTRICAL CABLE & EQUIPMENT INSTALLATION." A mailed Bid shall be addressed to Ms. Stephanie Tvardek, Traverse City Light & Power, 1131 Hastings Street, Traverse City, MI 49686.
- 15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 19.03 Evaluation of Bids
- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 22 – SALES AND USE TAXES

22.01 Any sales or use tax required to be paid by the Bidder must be included in the bid price. Refer to Paragraph SC-7.09 of the Supplementary Conditions for additional information.

BID FORM

TRAVERSE CITY LIGHT & POWER DEPARTMENT AERO PARK UNDERGROUND ELECTRICAL CABLE & EQUIPMENT INSTALLATION

TABLE OF CONTENTS

Article 1 - BID RECIPIENT	2
Article 2 - BIDDER'S ACKNOWLEDGMENTS	2
Article 3 - BIDDER'S REPRESENTATIONS	2
Article 4 - BIDDER'S CERTIFICATIONS	3
Article 5 - BASIS OF BID	3
Article 6 - TIME OF COMPLETION	4
Article 7 - ATTACHMENTS TO THIS BID	4
Article 8 - DEFINED TERMS	4
Article 9 - BID SUBMITTAL	5

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:
Traverse City Light & Power Department
1131 Hastings Street
Traverse City, MI 49686

Attn: Ms. Stephanie Tvardek

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

<u>Addendum No.</u>	<u>Addendum, Date</u>
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs.

are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 6 – TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete on or before November 15, 2020, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before December 1, 2020.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

- 7.01 The following documents are submitted with and made a condition of this Bid:
- A. Required Bid security;
 - B. List of Proposed Subcontractors;
 - C. Schedule of Values

ARTICLE 8 – DEFINED TERMS

- 8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By: _____
[Signature]

_____ *[Printed name]*

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____
[Signature]

_____ *[Printed name]*

Title: _____

Submittal Date: _____

Address for giving notices:

Telephone Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____
(where applicable)

BID BOND

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

BIDDER *(Name and Address)*:

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

OWNER *(Name and Address)*: Traverse City Light & Power Department
1131 Hastings Street
Traverse City, MI 49686

BID

Bid Due Date: February 26, 2020
Description *(Project Name— Include Location)*: Aero Park Underground – Electrical Cable & Equipment Installation

BOND

Bond Number: _____
Date: _____
Penal sum _____ \$ _____
(Words) (Figures)

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

BIDDER _____ (Seal) **SURETY** _____ (Seal)
Bidder's Name and Corporate Seal Surety's Name and Corporate Seal

By: _____ By: _____
Signature Signature (Attach Power of Attorney)

Print Name Print Name

Title Title

Attest: _____ Attest: _____
Signature Signature

Title Title

*Note: Addresses are to be used for giving any required notice.
Provide execution by any additional parties, such as joint venturers, if necessary.*

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

SWORN AND NOTARIZED AFFIDAVIT OF COMPLIANCE

IRAN ECONOMIC SANCTIONS ACT

Michigan Public Act No. 517 of 2012

All bidders must submit the following certification statement in compliance with Public Act No. 517 of 2012 (the "Iran Economic Sanctions Act") and attach this form to the bid. **Traverse City Light & Power shall not accept any bid that does not include this sworn and notarized certification of statement.**

The undersigned, the owner or authorized officer of _____ (the Bidder), hereby certifies, represents and warrants that the Bidder (including its officers, directors and employees) is not an "Iran linked business" within the meaning of the Iran Economic Sanctions Act, and that in the event the Bidder is awarded a contract for the Aero Park Underground Project, the Bidder will not become an "Iran linked business" at any time during the course of performing the work or any services under the contract.

The Bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or two (2) times the amount of the contract or proposed contract for which the false certification is made, whichever is greater, the cost of Traverse City Light & Power's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a Request for Proposal for three (3) years from the date it is determined that the person has submitted the false certification.

BIDDER

By: _____
Its: _____
Date: _____

STATE OF _____)

COUNTY OF _____)

This instrument was acknowledged before me on the ____ day of _____, 20____, by

_____.

, Notary Public

County, _____
My Commission Expires: _____
Acting in the County of: _____

**TRAVERSE CITY LIGHT & POWER
AERO PARK UNDERGROUND
NEW CONSTRUCTION UNIT LIST**

UNIT ITEM DESCRIPTION	UNIT	QUANTITY	UNIT LABOR	EXTENDED TOTAL
C5-3	EA	3		
C7A-10	EA	1		
E2-3Fi	EA	1		
M5-26	EA	6		
M5-5	EA	1		
UC5-1U	EA	1		
#336.4 18/1 ACSR, "Merlin"	LFT	948		
3Ø 15kV Sectionalizing Cabinet Box Pad ²	EA	6		
3Ø Sectionalizing Cabinet (200A/600A)	EA	7		
600A Switchgear (PSE-9/10/11)	EA	11		
200A 3, 4 or 5-Point Junction	EA	21		
200A Feed-Through Parking Stand	EA	24		
200A Insulating Cap	EA	55		
200A Elbow Surge Arresters	EA	2		
200A 15kV Loadbreak Elbow #2	EA	22		
200A 15kV Loadbreak Elbow #1/0	EA	15		
200A 15kV Loadbreak Elbow #4/0	EA	108		
600A 15kV Deadbreak Elbow 750kCM	EA	84		
15kV Terminator #4/0	EA	30		
#2 15kV Splice	EA	1		
15kV Sectionalizing Cabinet Grounding	EA	7		
Switchgear Grounding	EA	11		
Integral Fault Sensor w/ LED Light	EA	87		
#2 AL 15kV EPR Full C.N.	LFT	410		
#4/0 AL, 15kV 133% EPR, 1/3 CN	LFT	12,960		
#750kCM CU, 15kV 133% EPR, 1/3 CN	LFT	18,180		
Site Restoration ¹	LS	1		
Outages Allowance	LS	1	\$65,000.00	\$65,000.00
Traffic Control & Signage ¹	LS	1		
Mobilization, Insurance & Bonding	LS	1		
NEW CONSTRUCTION TOTAL:				

¹All material required to be supplied by Contractor.

²Pea stone to be supplied by Contractor.

**TRAVERSE CITY LIGHT & POWER
AERO PARK UNDERGROUND
NEW CONSTRUCTION UNIT LIST**

BID ALTERNATE #1 - CIRCUIT PC20 INSTALLATION

UNIT ITEM DESCRIPTION	UNIT	QUANTITY	UNIT LABOR & MATERIAL	EXTENDED TOTAL
600A Switchgear (PSE-9/10/11)	EA	1		
600A 15kV Deadbreak Elbow 750kCM	EA	9		
15kV Terminator 750kCM	EA	3		
Integral Fault Sensor w/ LED Light	EA	9		
#750kCM CU, 15kV 133% EPR, 1/3 CN	LFT	3,165		
Substation Recloser Foundation & Conduits	LS	1		
Substation Recloser Installation	LS	1		
Substation Recloser Grounding & Wiring	LS	1		
Substation Riser Stand & Connections	LS	1		
BID ALTERNATE #1 BID PRICE:				

NEW CONSTRUCTION: _____
 REMOVAL: _____
 BID ALTERNATE #1 BID PRICE: _____
 CONTRACTOR TOTAL BASE BID PRICE: _____
 OWNER-FURNISHED MATERIAL: \$560,000.00
 TOTAL PROJECT COST: _____

**TRAVERSE CITY LIGHT & POWER
AERO PARK UNDERGROUND
REMOVAL UNIT LIST**

UNIT ITEM DESCRIPTION	UNIT	QUANTITY	UNIT LABOR	EXTENDED TOTAL
C5-3	EA	2		
C7	EA	1		
C7A-10	EA	1		
E2-3Fi	EA	1		
M3-15	EA	2		
M5-9	EA	3		
UC2	EA	1		
#1/0 6/1 ACSR, "Raven"	LFT	948		
Padmount Switchgear (All Types)	EA	5		
Padmount Sectionalizing Cabinets (All Types)	EA	16		
Elbows, Terminations, Junctions, Caps	LS	1		
			REMOVAL TOTAL:	

**TRAVERSE CITY LIGHT & POWER
AERO PARK UNDERGROUND
CONSTRUCTION UNIT DESCRIPTIONS**

1. **Pole Assembly Units.** Consists of the installation of one (1) pole including all labor and equipment to excavate the pole hole, set the pole plumb, backfill and compact to grade. The first two digits indicate the length of the pole; the third digit shows the classification per A.S.A. (Example: 40-4 means a pole 40 feet long, class 4). This unit includes all labor and equipment, including hand digging, required to complete proper “Miss Dig” procedures.
2. **Primary/Pole Top Assembly Units.** Consists of the installation of one (1) primary/pole top assembly unit consisting of the installation of the hardware, crossarms and their appurtenances, insulators, etc., including tie wire, required to support the primary conductors.
3. **Guy Assembly Units.** Consists of the installation of the hardware and wire, guy marker, and guy insulator where necessary for one (1) guy assembly unit. An overhead guy assembly unit does not include the associated pole and anchor, each of which are included in separate units.
4. **Anchor Assembly Units.** Consists of the installation of one (1) anchor with rod and eye complete, ready for attaching the guy wire including backfill and compaction around the anchor rod. These units include all labor and equipment, including hand digging, required to complete proper “Miss Dig” procedures. TA-2H anchor assembly units include one 5.0’ extension. All additional extensions will be paid as separate units.
5. **Polemount Transformer Assembly Units.** Consists of the installation of one (1) polemount transformer including the transformer and its hardware and leads with their connectors and supporting insulators and pins. These units include the labor and equipment necessary to install jumpers, hot line clamps, compression tap saddles, service connection compression sleeves, all mounting hardware, and any miscellaneous material necessary for a complete transformer installation. This unit does not include the installation of the pole top, secondary, service, grounding or protection device assemblies.
6. **Miscellaneous & Riser Assembly Units.** Consists of the installation of one (1) assembly as shown in the referenced drawings, complete and ready for use.
7. **Transfer Assembly Units.** Consists of all labor and equipment necessary to remove the complete assembly unit from an existing pole to a new pole. These units include all necessary conductor handling to complete the transfer including temporary means to maintain an energized system (e.g. installation of insulated jumpers “macks”) and reconnection on the new pole.
8. **Conductor Assembly Units.** Consists of the installation of one (1) lineal foot of primary or secondary conductor, measured between structures or installed ends of underground conductors. These units include all labor and equipment necessary to install pull ropes, pre-lubricate conduits, and pull conductors/cables of the size, quantity and type noted overhead or through conduits. These units include all labor necessary to record cable reel information, installed cable footages, and maximum pulling tension for underground cables. Installation of primary top assemblies, conduit and all connections, terminations and elbows are included in separate units.
9. **Grounding Assembly Units.** Consists of the installation of one (1) ground rod, one (1) lineal foot of copper ground wire, or one (1) exothermic weld of the size and type noted including all excavation, backfill and compaction to rough grade. Ground rod units include all labor and equipment necessary to install one (1) ground rod to the specified depth below grade, plus coupling. Exothermic weld units consist of the labor, material and equipment necessary to exothermically weld copper ground wire to ground rods or to weld to other copper ground wire.
10. **Padmount Transformer Assembly Units.** Consists of the installation of one (1) padmount transformer including the transformer and its associated hardware including bushing well inserts, and secondary spades. This unit does not include the installation of primary elbows or terminations, secondary or service conductor connections, grounding or protection device assemblies.

11. **Padmount Fused Cabinet, Sectionalizing Cabinet, and Switchgear Assembly Units.** Consists of the installation of one (1) padmount fused cabinet, one (1) padmount sectionalizing cabinet, or one (1) padmount switchgear including all associated hardware including fault indicator mounting plates. These units include all labor and equipment necessary to set the cabinets, level and anchor to box pads, and affix all warning and danger labels and equipment numbers. These units do not include the installation of primary elbows or terminations, junctions, fault indicators, or grounding assemblies.
12. **Underground Primary Assembly Units.** Consists of the installation of one (1) primary junction, elbow, termination, surge arrester, terminator, or splice assembly unit. These units include all labor and equipment necessary to properly prepare 15kV cable for terminations, installation of elbows and terminations and connection to equipment, concentric neutral connections, and drain wire installation and connections. Installation of primary underground cable is included in separate units.
13. **Padmount Equipment Grounding Units.** Consists of the labor and equipment necessary for the installation of a continuous loop of ground conductor and connectors in padmount equipment from ground rod(s) to ALL equipment/tank grounds, concentric neutrals, secondary bars, and then back to the ground rod(s). Exothermic welds at ground rods and grounding conductor tap points are included in separate units.
14. **Fault Indicator Assembly Units.** Consists of the installation of one (1) fault indicator or one (1) LED light assembly complete, tested and operational. These units include all labor and equipment necessary for the installation of fault indicators on the underground cables, mounting and wiring of remote flag units, and mounting and wiring of remote LED battery and light assemblies including drilling of equipment enclosures. All equipment mounting hardware will be stainless steel and all fault indicator wiring connections will be silicone filled.
15. **Secondary Connection Assembly Units.** Consists of the installation of one (1) secondary pedestal, one (1) secondary or street lighting connection block, or one (1) street lighting fused or non-fused connection. These units include all necessary labor and equipment for excavation, backfill and compaction for secondary pedestals, all 600V conductor preparation and installation of secondary connections, fused and non-fused street lighting connections.
16. **Service Conversion Assembly Units.** Consists of the conversion of one (1) overhead building service to underground. These units include all labor, material and equipment necessary to install conduit, raceways, meter sockets, disconnects and weatherheads, and to make conduit and conductor connections to existing equipment. These units also include all labor and equipment necessary to remove conduit, conductors and equipment associated with the overhead service. ALL work on these units must be completed in accordance with the National Electrical Code (NEC) and under the direct supervision of a licensed master electrician.
17. **Removal Assembly Units.** Consists of the removal of one (1) assembly unit consisting of the hardware, crossarms, appurtenances, insulators, etc. or one (1) lineal foot of conductor or cable. Padmount equipment removals include the equipment, pad, connections, and cutting cable and conduit below grade. Removal units include all labor and equipment necessary to remove the stated unit, disassemble all units and organizing removed material into salvageable, recyclable, and disposable parts, hauling to the TCL&P's service center and placing the material in the proper bins and/or storage locations. Units include all costs for dumpsters and disposal of items scheduled to be discarded.
18. **Traffic Control & Signage.** Consists of the labor, equipment and material necessary for the installation of all traffic control and signage for all road and lane closures that the Contractor requires to complete the Project. All required signage must be in accordance with the latest edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD.) Drawings provided with the bid documents may not show all required road or lane closures.

CONTRACT AGREEMENT
TRAVERSE CITY LIGHT & POWER DEPARTMENT
AERO PARK UNDERGROUND
ELECTRICAL CABLE & EQUIPMENT INSTALLATION

THIS AGREEMENT is by and between Traverse City Light & Power Department (“Owner”) and
_____ (“Contractor”).

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

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

The overall scope of the project consists of the installation of 10,380 feet of underground three-phase 13.8kV line in conduit installed via directional boring (by others) in the Aero Park Industrial Park. Work covered under this contract includes cable, termination, and padmount equipment installation, system testing and energization, and removal of the existing padmount equipment in the project area. A bid alternate for a new substation exit including recloser foundation, recloser installation, grounding and wiring, substation riser stand and connections, 1,055’ of cable, padmount switchgear and site restoration is being requested. The project is being undertaken to replace and upgrade the existing underground electrical system in the Aero Park Industrial Park. The Contractor will be required to closely coordinate all construction activities with the Conduit Installation Contractor and TCL&P crews.

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:
Aero Park Underground – Electrical Cable & Equipment Installation

ARTICLE 3 – ENGINEER

3.01 The part of the Project that pertains to the Work has been designed by:

GRP Engineering
459 Bay Street
Petoskey, MI 49770

3.02 The Owner has retained GRP Engineering, Inc. 459 Bay St. Petoskey, MI 49770 (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

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

4.02 *Contract Times: Dates*

A. The Work will be substantially completed on or before November 15, 2020, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before December 1, 2020.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. Substantial Completion: Contractor shall pay Owner \$1,000.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
 2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$1,000.00 or each day that expires after such time until the Work is completed and ready for final payment.
 3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.
 4. Milestones: Contractor shall pay Owner \$1,000.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for achievement of Milestone 1, until Milestone 1 is achieved.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Document amounts that follow, subject to adjustment under the Contract:
- A. 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) less the value of Owner Furnished Material.
 - B. 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:

(words)

(numerals)

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 account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 3rd 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. Ninety percent of Work completed (with the balance being retainage). If the Work has been 80 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, the Owner may reduce the retainage to 5%; and
 - b. ninety percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to ninety-five percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less one-hundred percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

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

ARTICLE 7 – INTEREST

- 7.01 All amounts not paid when due shall bear interest at the rate of six percent per annum.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
 - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
 - E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.
 - F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the

performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 1 to 6, inclusive).
 - 2. Bid Form (pages 1 to 5, inclusive).
 - 3. Performance bond (pages 1 to 2, inclusive).
 - 4. Payment bond (pages 1 to 2, inclusive).
 - 5. General Conditions (pages 1 to 67, inclusive).
 - 6. Supplementary Conditions (pages 1 to 6, inclusive).
 - 7. Specifications as listed in the table of contents of the Project Manual dated January 2020.
 - 8. Drawings (not attached but incorporated by reference) consisting of the Drawings listed on the attached sheet index.
 - 9. Addenda (numbers 1 to __, inclusive).
 - 10. Iran Economic Sanctions Act (page 1, inclusive)
 - 11. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages 1 to __, inclusive).
 - 12. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
- B. The documents listed in Paragraph 9.01.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 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

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

10.02 *Assignment of Contract*

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

10.03 *Successors and Assigns*

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

10.04 *Severability*

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

10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 1. “corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 *Other Provisions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or “track changes” (redline/strikeout), or in the Supplementary Conditions.

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

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

OWNER:

CONTRACTOR:

Traverse City Light & Power

By: _____

By: _____

Title: Chairman

Title: _____

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

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

Attest: _____

Attest: _____

Title: Secretary

Title: _____

Address for giving notices:

Address for giving notices:

1131 Hastings Street

Traverse City, MI 49686

Approved as to substance:

Timothy J. Arends, Executive Director

Approved as to form:

W. Peter Doren, Counsel

PERFORMANCE BOND

CONTRACTOR *(name and address)*:

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

OWNER *(name and address)*: Traverse City Light & Power Department
1131 Hastings Street
Traverse City, MI 49686

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*: Aero Park Underground – Electrical Cable & Equipment Installation

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: None See Paragraph 16

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

CONTRACTOR AS PRINCIPAL

SURETY

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

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

By: _____
Signature

By: _____
Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

14. Definitions

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

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

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

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

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

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

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

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR *(name and address)*:

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

OWNER *(name and address)*: Traverse City Light & Power Department
1131 Hastings Street
Traverse City, MI 49686

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*: Aero Park Underground – Electrical Cable & Equipment Installation

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: None See Paragraph 18

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

CONTRACTOR AS PRINCIPAL

SURETY

(seal)
Contractor's Name and Corporate Seal

(seal)
Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

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

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



Copyright © 2013:

National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314-2794
(703) 684-2882
www.nspe.org

American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
(202) 347-7474
www.acec.org

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400
(800) 548-2723
www.asce.org

The copyright for this document is owned jointly by the three sponsoring organizations listed above. The National Society of Professional Engineers is the Copyright Administrator for the EJCDC documents; please direct all inquiries regarding EJCDC copyrights to NSPE.

NOTE: EJCDC publications may be purchased at www.ejcdc.org, or from any of the sponsoring organizations above.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

Article 1 – Definitions and Terminology	6
1.01 Defined Terms	6
1.02 Terminology	9
Article 2 – Preliminary Matters	11
2.01 Delivery of Bonds and Evidence of Insurance	11
2.02 Copies of Documents	11
2.03 Before Starting Construction	11
2.04 Preconstruction Conference; Designation of Authorized Representatives	11
2.05 Initial Acceptance of Schedules.....	12
2.06 Electronic Transmittals	12
Article 3 – Documents: Intent, Requirements, Reuse	12
3.01 Intent.....	12
3.02 Reference Standards	13
3.03 Reporting and Resolving Discrepancies	13
3.04 Requirements of the Contract Documents	14
3.05 Reuse of Documents	14
Article 4 – Commencement and Progress of the Work	14
4.01 Commencement of Contract Times; Notice to Proceed	14
4.02 Starting the Work.....	15
4.03 Reference Points	15
4.04 Progress Schedule.....	15
4.05 Delays in Contractor’s Progress.....	15
Article 5 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions	16
5.01 Availability of Lands.....	16
5.02 Use of Site and Other Areas.....	16
5.03 Subsurface and Physical Conditions	17
5.04 Differing Subsurface or Physical Conditions	18
5.05 Underground Facilities.....	19
5.06 Hazardous Environmental Conditions at Site	21
Article 6 – Bonds and Insurance.....	22

6.01	Performance, Payment, and Other Bonds	22
6.02	Insurance—General Provisions	23
6.03	Contractor’s Insurance.....	24
6.04	Owner’s Liability Insurance	26
6.05	Property Insurance	26
6.06	Waiver of Rights	28
6.07	Receipt and Application of Property Insurance Proceeds.....	29
Article 7 – Contractor’s Responsibilities		29
7.01	Supervision and Superintendence.....	29
7.02	Labor; Working Hours.....	29
7.03	Services, Materials, and Equipment	30
7.04	“Or Equals”	30
7.05	Substitutes	31
7.06	Concerning Subcontractors, Suppliers, and Others	32
7.07	Patent Fees and Royalties	34
7.08	Permits.....	34
7.09	Taxes	35
7.10	Laws and Regulations	35
7.11	Record Documents	35
7.12	Safety and Protection	35
7.13	Safety Representative	36
7.14	Hazard Communication Programs	36
7.15	Emergencies.....	36
7.16	Shop Drawings, Samples, and Other Submittals	37
7.17	Contractor’s General Warranty and Guarantee	39
7.18	Indemnification	39
7.19	Delegation of Professional Design Services	40
Article 8 – Other Work at the Site.....		41
8.01	Other Work.....	41
8.02	Coordination	41
8.03	Legal Relationships	41
Article 9 – Owner’s Responsibilities		42
9.01	Communications to Contractor	42
9.02	Replacement of Engineer	42
9.03	Furnish Data.....	43

9.04	Pay When Due	43
9.05	Lands and Easements; Reports, Tests, and Drawings	43
9.06	Insurance	43
9.07	Change Orders.....	43
9.08	Inspections, Tests, and Approvals	43
9.09	Limitations on Owner’s Responsibilities	43
9.10	Undisclosed Hazardous Environmental Condition	43
9.11	Evidence of Financial Arrangements	43
9.12	Safety Programs	43
Article 10 – Engineer’s Status During Construction		44
10.01	Owner’s Representative	44
10.02	Visits to Site.....	44
10.03	Project Representative	44
10.04	Rejecting Defective Work.....	44
10.05	Shop Drawings, Change Orders and Payments	44
10.06	Determinations for Unit Price Work.....	45
10.07	Decisions on Requirements of Contract Documents and Acceptability of Work	45
10.08	Limitations on Engineer’s Authority and Responsibilities	45
10.09	Compliance with Safety Program.....	45
Article 11 – Amending the Contract Documents; Changes in the Work		45
11.01	Amending and Supplementing Contract Documents	45
11.02	Owner-Authorized Changes in the Work.....	46
11.03	Unauthorized Changes in the Work	46
11.04	Change of Contract Price	47
11.05	Change of Contract Times	48
11.06	Change Proposals.....	48
11.07	Execution of Change Orders	49
11.08	Notification to Surety.....	49
Article 12 – Claims		49
12.01	Claims	49
Article 13 – Cost of the Work; Allowances; Unit Price Work		50
13.01	Cost of the Work	50
13.02	Allowances	53
13.03	Unit Price Work	53
Article 14 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....		54

14.01	Access to Work.....	54
14.02	Tests, Inspections, and Approvals.....	54
14.03	Defective Work.....	55
14.04	Acceptance of Defective Work.....	55
14.05	Uncovering Work.....	55
14.06	Owner May Stop the Work.....	56
14.07	Owner May Correct Defective Work.....	56
Article 15 – Payments to Contractor; Set-Offs; Completion; Correction Period.....		57
15.01	Progress Payments.....	57
15.02	Contractor’s Warranty of Title.....	60
15.03	Substantial Completion.....	60
15.04	Partial Use or Occupancy.....	61
15.05	Final Inspection.....	61
15.06	Final Payment.....	61
15.07	Waiver of Claims.....	62
15.08	Correction Period.....	62
Article 16 – Suspension of Work and Termination.....		63
16.01	Owner May Suspend Work.....	63
16.02	Owner May Terminate for Cause.....	64
16.03	Owner May Terminate For Convenience.....	65
16.04	Contractor May Stop Work or Terminate.....	65
Article 17 – Final Resolution of Disputes.....		65
17.01	Methods and Procedures.....	65
Article 18 – Miscellaneous.....		66
18.01	Giving Notice.....	66
18.02	Computation of Times.....	66
18.03	Cumulative Remedies.....	66
18.04	Limitation of Damages.....	66
18.05	No Waiver.....	66
18.06	Survival of Obligations.....	66
18.07	Controlling Law.....	67
18.08	Headings.....	67

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

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

26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part

thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
 1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,”

“satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

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

2.02 *Copies of Documents*

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

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

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

2.06 *Electronic Transmittals*

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

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

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

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

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

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

- a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
- b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

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

3.05 *Reuse of Documents*

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

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

4.03 *Reference Points*

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

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give

rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. abnormal weather conditions;
 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.
- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

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

5.01 *Availability of Lands*

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

5.02 *Use of Site and Other Areas*

- A. *Limitation on Use of Site and Other Areas:*
1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of

any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
2. is of such a nature as to require a change in the Drawings or Specifications; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

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

B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments:*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

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

- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

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

written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

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

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary

Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

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

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured

retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
 - 4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
 - 1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 - 2. claims for damages insured by reasonably available personal injury liability coverage.
 - 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

- C. *Commercial General Liability—Form and Content*: Contractor’s commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor’s contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, “Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured” or its equivalent.
- D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability*: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer’s liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor’s pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor’s operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
- G. *Additional insureds*: The Contractor’s commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor’s professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then

Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

- I. *General provisions:* The policies of insurance required by this Paragraph 6.03 shall:
 1. include at least the specific coverages provided in this Article.
 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

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

6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."

2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
 5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the

purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

- C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

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

- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

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

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the

Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 Services, Materials, and Equipment

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and

- 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
 - C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
 - D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
 - E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

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

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

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

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

- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.
- O. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

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

7.08 *Permits*

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

7.09 *Taxes*

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

7.10 *Laws and Regulations*

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

7.11 *Record Documents*

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

7.12 *Safety and Protection*

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

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

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are

required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

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

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

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
 5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.
 8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.
- E. *Resubmittal Procedures:*
1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
 2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

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

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or

entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

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

8.02 *Coordination*

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

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking

an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.
- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

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

- 9.03 *Furnish Data*
- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.
- 9.04 *Pay When Due*
- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.
- 9.05 *Lands and Easements; Reports, Tests, and Drawings*
- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 9.06 *Insurance*
- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.
- 9.07 *Change Orders*
- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 *Inspections, Tests, and Approvals*
- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 *Limitations on Owner's Responsibilities*
- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- 9.10 *Undisclosed Hazardous Environmental Condition*
- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 *Evidence of Financial Arrangements*
- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).
- 9.12 *Safety Programs*
- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

10.01 *Owner’s Representative*

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

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor’s executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer’s efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer’s visits and observations are subject to all the limitations on Engineer’s authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer’s visits or observations of Contractor’s Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

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

10.04 *Rejecting Defective Work*

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

10.05 *Shop Drawings, Change Orders and Payments*

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

10.06 *Determinations for Unit Price Work*

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

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

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

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

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

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

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.
3. *Field Orders:* Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

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

11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as

amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or
 - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

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

11.06 *Change Proposals*

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

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 - 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

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

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*:
1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.
 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

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

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
 5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:
- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.
- E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally

accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

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

13.03 Unit Price Work

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

3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

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

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

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

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

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

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

14.04 *Acceptance of Defective Work*

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

14.05 *Uncovering Work*

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

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

14.06 *Owner May Stop the Work*

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

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

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

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

15.01 Progress Payments

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

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

D. *Payment Becomes Due:*

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

E. *Reductions in Payment by Owner:*

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

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

15.02 *Contractor's Warranty of Title*

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

15.03 *Substantial Completion*

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

15.04 *Partial Use or Occupancy*

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

15.05 *Final Inspection*

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

15.06 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and

- e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Application and Acceptance:*
1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

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

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or

by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;
 2. correct such defective Work;
 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

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

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

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

16.04 *Contractor May Stop Work or Terminate*

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

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or
3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

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

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

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

18.05 *No Waiver*

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

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Headings*

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

SUPPLEMENTARY CONDITIONS
TRAVERSE CITY LIGHT & POWER DEPARTMENT
AERO PARK UNDERGROUND
ELECTRICAL CABLE & EQUIPMENT INSTALLATION

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions will have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions will remain in effect.

Article XVI. ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC 1.01.A.35 Delete paragraph GC 1.01.A.35 in its entirety and insert the following in its place:

35. *Schedule of Values* – That part of the Project Manual which submitted by the Contractor to provide a unit price cost breakdown to be utilized by the Contractor and Engineer to determine partial payment request during the construction period and final payment period.

SC 1.01.A.49 Add the following new paragraphs immediately after paragraph GC1.01A.48.

49. *Construction Unit Descriptions* – That part of the Project Manual which provides general descriptions of the work covered under individual construction units.
50. *Electrical Contractor* – The Contractor as defined in Article GC1.01A.15 of the Project Manual, dated January 2020.

Article XVII. ARTICLE 2 – PRELIMINARY MATTERS

SC 2.03.A.3 Add the following language to the end of paragraph GC2.03.A.3:

Schedule of Values will be as provided in this Project Manual.

Article IV. ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC 4.01A Delete paragraph GC4.01A in its entirety and insert the following in its place:

- A. The Contract Times will commence to run on the Effective Date of the Contract Agreement.

SC 4.04.C Add the following new paragraphs immediately after paragraph GC4.04B:

- B. Should the Contractor abandon the Project for greater than five working days, the Contractor must leave the Project in a safe and reliable state. This includes but is not limited to:
1. All conductors removed from hot or temporary arms and secured to insulators and pole.
 2. Poles and associated material moved to a safe zone approved by the Owner.
 3. All leaned poles shall be secured.
 4. Secure all temporary jumpers and apparatuses and obtain Owner approval on method used to secure.

5. All Contractor owned vehicles and equipment removed from the project site and moved to an area approved by the Owner.
- C. Should the Contractor leave the project and not comply with the items above, the Owner retains the right to complete those incomplete items and charge the Contractor for all labor and equipment time and material utilized. This includes payment to outside contractors to complete the required work.

Article V. ARTICLE 5 –AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC 5.02.A3 Add the following new paragraph after paragraph GC5.02.A.2:

Contractor shall assist Owner with addressing complaints from owners of property adjacent to the Project site arising out of the progress of the Work.

Article VI. ARTICLE 6 – BONDS AND INSURANCE

SC 6.01.A Delete paragraph GC6.01.A in its entirety and insert the following in its place:

- A. Contractor will furnish performance and payment Bonds, each in an amount at least equal to the Total Project Cost (including Owner-furnished material) as security for the faithful performance and payment of all Contractor's obligations under the Contract Documents. These Bonds will remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor will also furnish such other Bonds as are required by the Contract Documents

SC 6.01.D Amend the time period stated in paragraph GC5.01.D from 20 days to 5 days.

SC 6.03 Delete paragraph GC6.03 in its entirety and insert the following in its place:

A. *General Requirements*

The Contractor shall secure and maintain throughout the duration of this Contract, insurance of such types and in such amounts as may be necessary to protect itself and the interests of the Owner and other interested parties against all hazards, risks of loss, and liability as hereinafter specified. The form, content and limits of such insurance, together with the insurer thereof in each case, will be acceptable to the Owner (Best rating of A or better). Notwithstanding the provisions of this paragraph and regardless of the Owner's acceptance of the Contractor's insurance, it will be the responsibility of the Contractor to maintain adequate coverage at all times. Failure of the Contractor to maintain adequate coverage will not relieve the Contractor of any contractual responsibility or obligation.

The Contractor will file with the Owner satisfactory certificates of insurance at least thirty (30) days prior to starting any work under the Contract Documents, provided that if transportation insurance is required hereunder, satisfactory certificates covering such insurance will be filed at least thirty (30) days before the scheduled shipping date of equipment or materials. Each certificate will state that thirty (30) days advance written notice will be given to the Owner before any material modification, cancellation, or expiration of any policy covered thereby. Notice of policy material modification, cancellation, or expiration will be made by certified mail to the Owner. The Owner may, prior to the start of work, or any time thereafter, require the Contractor to file with the Owner certified copies of the insurance policies required hereunder. All certificates will list any exclusions which are nonstandard within the industry as they appear on the policy.

All correspondence regarding insurance will be addressed to the Owner at the address given on page 5 of the Contract Agreement.

The worker's compensation, automobile liability, and general liability insurance specified will apply to all contractors and subcontractors.

For insurance purposes, the title of ownership of the goods, if any, furnished by the Contractor will remain with the Contractor until official acceptance of the work by the Owner.

Contractor will list Owner, Traverse City Light & Power Department, City of Traverse City, its officers, agents, directors, and employees (including the Engineer) as additional insureds with the broad form endorsement for ongoing operations and completed operations on the insurance policies for general liability, excess liability, railroad protective liability, and contractor liability. Contractor shall deliver to Owner an Additional Insured Endorsement (CG 20330413) with the certificate of insurance. The issuing company for comprehensive general liability and excess liability will waive subrogation of all claims against parties named as additional insureds.

B. *Worker's Compensation and Employer's Liability*

The Contractor will secure and maintain in force worker's compensation and employer's liability insurance. This insurance will protect the Contractor against all claims under applicable state worker's compensation laws. The Contractor will also be protected against claims for injury, disease (including occupational disease), or death of employees which, for any reason, may not fall within the provisions of a worker's compensation law under a voluntary compensation endorsement. This policy will include a "Broad Form All States" endorsement.

The liability limits will not be less than:

Worker's Compensation – Statutory, Michigan	
Employer's Liability	\$100,000 each person
	\$500,000 disease, policy limit
	\$100,000 disease, each employee

C. *Business Automobile Liability*

The Contractor will secure and maintain in force business automobile liability insurance. This insurance will be written in comprehensive form and will protect the Contractor and the Traverse City Light & Power Department, and the other additional named insureds referenced above against all claims for personal and bodily injuries to members of the public damage to property of others arising from the ownership or use of any motor vehicles.

The liability limits will not be less than:

Bodily Injury and Property Damage	\$1,000,000 - Combined single limit (each occurrence)
Michigan Automobile Insurance Reparation Benefits (No-Fault)	Statutory Limits to Apply.

D. *Comprehensive General Liability*

The Contractor will secure and maintain in force comprehensive general liability insurance. This insurance will be written in comprehensive form and will protect the Contractor and the Traverse City Light & Power Department, and the other additional named insureds referenced above against all claims arising from personal or bodily injuries to members of the public or damage to property of others arising out of any act or omission of the Contractor or his agents, employees, or subcontractors. This policy shall specifically include coverage for: Personal injury liability, independent contractors and broad form property damage, including completed operations, and explosion, collapse, and underground (XCU).

Unless the Owner consents in writing to lower liability limits, the liability limits shall not be less than:

Personal Injury and Property damage	\$1,000,000 combined single limit (each occurrence) and \$1,000,000 aggregate
-------------------------------------	---

E. *Railroad Protective Liability*

Contractor will carry a Railroad Protective Liability Insurance Policy and keep it in effect for one year following the date the work is accepted by the Owner, Engineer, and the Michigan Department of Transportation (MDOT). The policy will have limits of liability in the amount of Two Million Dollars (\$2,000,000) combined single limit per occurrence for bodily injury, death, and property damage with an aggregate limit of Six Million Dollars (\$6,000,000). The insurance policy specified in this section will be with a company authorized to do business in the State of Michigan.

Contractor will list the Owner, Traverse City Light & Power Department, City of Traverse City, its officers, agents, directors, and employees (including the Engineer), Great Lakes Central Railroad, including employees and affiliates, the Michigan Department of Transportation (MDOT), Michigan State Transportation Commission (STC), and the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents, are named additional insured waiver of subrogation in their favor for commercial general liability, worker's compensation and employer's liability insurance. Coverage shall not have exclusions or limitations related to work within 50-feet of a railroad track (CG 24 17 1001 endorsement). Umbrella liability insurance follows form.

F. *Umbrella Coverage*

An umbrella policy with a limit of five million dollars (\$5,000,000.00) naming the Traverse City Light & Power Department, and the other named insureds referenced above as additional named insureds will supplement the primary coverages described in Section B, C, and D above. Lower limits will only be acceptable if approved in writing in advance by the Owner.

G. *Cancellation*

The Contractor agrees not to change all required insurance and agrees to maintain such insurance throughout the period of performance of the Work. If any of the required insurance is not renewed or canceled, the Contractor and all subcontractors shall cease operations, and shall not resume until new insurance is obtained. Contractor shall obtain Third Party Notice Endorsement IL 79901010 for each required policy requiring the insurer to give Owner 30 days' notice of non-renewal or cancellation.

Article VII. ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC 7.02.B Delete paragraph GC7.02.B in its entirety and insert the following in its place:

- B. Every effort shall be made by the Contractor shall complete all work within normal working hours adopted by the local governing authority. Portions of the work will be required outside of normal working hours as specifically stated within the Contract Agreement. Furthermore, the Contractor may request to work outside normal working hours or the Owner and Engineer may request work be completed outside normal working hours to meet required Project completion date and milestones, and to effectively coordinate with projects as listed in Division 1. All work outside normal working hours will be completed without additional compensation to the Contractor.

SC 7.06.P Add the following new paragraph immediately after paragraph GC7.06P:

- P. Contractor must supply a list of subcontractors with the Bid Form at the time of bidding.

SC 7.08.B Add the following new paragraph after paragraph GC7.08.A:

- B. Permits required include, but are not limited to:
1. City of Traverse City – Right-of-Way Permit

Article XII. ARTICLE 12 – CLAIMS

SC 12.01D– Delete GC Article 12 12.01D and replace with the following language:

SC 12.01D *Methods and Procedures*

- A. If any party has a dispute with another regarding the meaning, operation, or enforcement of any provision of this Agreement, the disputing parties agree to meet and confer to negotiate a resolution of the dispute. They further agree as follows:
 - 1. **Mediation.** If they are unable to resolve the dispute themselves, and before formally instituting any other dispute mechanism, they shall utilize the services of a mutually acceptable neutral mediator, who meets the qualifications of MCR 2.411, to bring them together in at least one mediation session.
 - 2. **Venue.** All meetings, hearings and actions to resolve the dispute shall be in Grand Traverse County.
 - 3. **Notice.** Written notice of a dispute shall be given to the other parties not later than 90 days after the occurrence giving rise to the dispute becomes known or should have become known. Negotiations and mediation shall occur within 60 days after such notice.

Article XV. ARTICLE 15 – PAYMENTS TO CONTRACTOR AND COMPLETION

SC 15.01.B1 Add the following language to the end of paragraph GC15.01.B1:

Application for payment will be made on EJCDC Form No. C-620 (2007 Edition) or equivalent.

Article XVIII. ARTICLE 18 – MISCELLANEOUS

SC 18.09 *Compliance with Regulations*

- A. The contractor shall comply with all applicable statutes, rules and regulations of all federal, state and local governments and agencies having jurisdiction, and bears the risk of any such authorities or changes thereto.

SC 18.10 *Non-Discrimination*

- A. The parties agree not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions or privileges of employment, or a matter directly or indirectly related to employment because of perceived race, color, religion, national origin, age, sex, height, weight, marital status, physical or mental disability, family status, sexual orientation, or gender identity. Breach of this covenant may be regarded as a material breach of this Agreement.

SC 18.11 *Third Party Beneficiaries*

- A. The Contract Agreement confers no rights or remedies on any third party, other than the parties to this Agreement and their respective successors and permitted assigns.

SC 18.12 *No Joint Venture or Partnership*

- A. The Contract Agreement does not and is not intended to create a joint venture or partnership between the parties. The rights and obligations of the parties are entirely contained within the Agreement.

SC 18.13 *State of Limitations*

- A. Nothing in the Contract Documents is intended to shorten or extend any statute of limitations on actions which may apply to this project.

SC 18.14 *Separate Legal Entities*

- A. The Traverse City Light & Power Department is a separate legal entity from the City of Traverse City. The Owner is not responsible for actions of the City of Traverse City, its officials, or employees.

SC 18.15 *Silence of Specifications*

- A. The apparent silence of the contract documents or specifications and any supplemental specifications as to any detail, or the omission from them of a detailed description or concerning any point, shall be regarded as meaning only that the best commercial practices are to prevail and only new materials of the first quality and correct type, size and design are to be used. All workmanship is to be first quality. All interpretations of these specifications will be made upon the basis of this statement.

PART 1 – GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

The work covered by this Contract embraces the construction of a complete and operable facility as specified, any omissions or discrepancies notwithstanding. All material furnished by the Contractor shall be new and in conformance with the Specifications for Construction. All construction work shall be done in a thorough and workmanlike manner in accordance with Drawings and Specifications.

The overall scope of the project consists of the installation of 10,380 feet of underground three-phase 13.8kV line in conduit installed via directional boring (by others) in the Aero Park Industrial Park. Work covered under this contract includes cable, termination, and padmount equipment installation, system testing and energization, and removal of the existing padmount equipment in the project area. A bid alternate for a new substation exit including recloser foundation, recloser installation, grounding and wiring, substation riser stand and connections, 1,055' of cable, padmount switchgear and site restoration is being requested. The project is being undertaken to replace and upgrade the existing underground electrical system in the Aero Park Industrial Park. The Contractor will be required to closely coordinate all construction activities with the Conduit Installation Contractor and TCL&P crews.

1.02 PROJECT LOCATION

The Project is located in the Aero Park Industrial Park along Aero Park Drive, West Aero Park Ct, and North Aero Park Ct all within the City of Traverse City, Grand Traverse County, Michigan within both road right-of-way, easement areas, and on private property as more explicitly shown in the Drawings.

1.03 COORDINATION & RELATED WORK AT THE SITE

Contractor shall coordinate all construction as required by Article 7 of the General Conditions. Concurrent projects in the area include, but are not limited to:

- A. TCL&P Aero Park Underground – Conduit Installation Contractor.

1.04 SITE CONTAMINATION

No known areas of site contamination exist at the Project Location.

1.05 SHUTDOWN & OVERTIME

Traverse City Light & Power's 13.8kV distribution system must remain energized as much as possible; however, some outages or shutdowns will be required to do the work as required by the Contract. Such outages will be limited, will be scheduled a minimum of seven (7) days ahead of time by the Owner, Contractor & Engineer. The Owner will complete all necessary switching of the 13.8kV distribution system. The Contractor shall utilize their own lock-out/tag-out procedure in addition to the Owner's tagging.

If any overtime or premium pay is required for work to occur during outages, this premium pay will be paid for under the specified Outages allowance unit. This allowance includes all labor and equipment charges for the duration of outage work occurring during premium time only. The Contractor is encouraged to work with the Owner and Engineer to minimize the number and lengths of all electrical system outages. The Owner will work with the industrial customers affected by this project to schedule outages simultaneously.

The Owner or the Engineer may, at their own discretion, postpone a planned outage or shutdown for any of the following reasons:

- A. Failure of the Contractor to have planned a sufficient amount of work during each outage or shutdown so that the number of outages or shutdowns can be held to a minimum.
- B. Failure of the Contractor to have made all possible preliminary preparations so as to hold the outage or shutdown time to a minimum.
- C. Failure of the Contractor to have a sufficient number of men on the job to hold the outage or shutdown time to a minimum.
- D. Projected system loads during the outage time that would overload backup circuits and transformer.
- E. Any weather condition or other reason which the Owner believes may jeopardize the integrity of the Traverse City Light & Power's electrical system.

1.06 CODES AND STANDARDS

- A. The electrical work shall be performed in compliance with all applicable laws, building and construction codes, and requirements of governmental agencies under whose jurisdiction the work is being performed.

All equipment and material shall be furnished and installed in conformance with and tested in accordance with the applicable section of latest revisions of codes and standards listed below, and all others specifically referred to in succeeding sections of the Specifications.

- A. American National Standards Institute, Inc. (ANSI).
 - B. American Society for Testing and Materials (ASTM).
 - C. Edison Electric Institute (EEI).
 - D. Institute of Electrical and Electronic Engineers, Inc. (IEEE).
 - E. Insulated Cable Engineers Association (ICEA).
 - F. National Electrical Safety Code (NESC).
 - G. National Electrical Manufacturers' Association (NEMA).
 - H. International Electrical Testing Association (NETA).
 - I. National Fire Protection Association, National Electrical Code (NEC).
 - J. Occupational Safety and Health Act (OSHA).
 - K. Underwriters' Laboratories, Inc. (UL).
 - L. Rural Utilities Service (RUS).
- B. Where conflicts occur between codes and standards or between codes and standards and Specifications and Drawings, the one establishing the more stringent requirements shall be followed.

PART 2 – CONTRACT MODIFICATION PROCEDURES

2.01 SUMMARY

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

2.02 MINOR CHANGES IN THE WORK

- A. Engineer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

2.03 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by Engineer are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 10 days after receipt of Proposal Requests, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
- B. Contractor-Initiated Proposal Requests: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made.
 - 3. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship.

2.03 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Engineer will issue a Change Order for signatures of Owner and Contractor.

2.04 CONSTRUCTION CHANGE DIRECTIVE

- A. Engineer may issue a Work/Construction Change Directive which instructs Contractor to immediately proceed with change in the Work which will be included in a future Contract Change Order. Work Change Directives will include a complete description of the change in the Work including the method to determine change in Total Project Cost and/or Contract Time.

PART 3 – SUBMITTAL PROCEDURES

3.01 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Approval Drawings, Final Drawings, and Instruction Manuals, Correspondence, etc.
- B. All submittals shall be sent to:

Mr. Michael P. McGeehan, P.E.
GRP Engineering, Inc.
459 Bay Street
Petoskey, MI 49770

3.02 TEST REPORTS

- A. Contractor shall supply one electronic copy of all test reports including cable pulling reports, cable test reports, etc.

3.03 SHOP DRAWINGS FOR APPROVAL

- A. Drawings and information as stated in other Divisions shall be submitted for Engineer's approval within thirty (30) days following the effective date of the Contract. Approval drawing submittal shall consist of four (4) paper copies and one (1) electronic copy in AUTOCAD.DWG format of all necessary drawings.
- B. Following review by Engineer, two (2) sets of drawings will be returned to the Contractor. Contractor shall resubmit the drawings for approval as required for Engineer's acceptance.

3.04 SHOP DRAWINGS FOR RECORD

- B. Following Approval by Engineer, drawings and information as stated in other Divisions shall be submitted for Record. Record drawing submittal shall consist of two (2) paper copies and one (1) electronic copy in AUTOCAD.DWG format of all necessary drawings.

3.05 CONTRACTOR'S RESPONSIBILITY

- A. The Contractor shall be responsible for checking shop drawings, prior to submittal, for errors, correctness of details, and conformance with the Contract; for coordination between suppliers and Subcontractors; and for internal coordination within the prime Contract.
- B. The Contractor shall be responsible for making corrections to materials and equipment as required to obtain conformance with Contract requirements, whether such corrections are required during review of shop drawings, subsequent to release of drawings, data, and information mentioned herein before, or after fabrication and shipment of materials and equipment.

3.06 ENGINEER'S REVIEW

- A. Review of shop drawings by the Engineer does not relieve the Contractor of responsibility for errors, correctness of details, or conformance with the Contract.

PART 4 – OWNER FURNISHED EQUIPMENT

- 4.01** The items provided by the Owner are listed in the attached Bill of Materials and will be stored at 1131 Hastings Street, Traverse City, Michigan.

The Contractor will be required to pickup and transport all material which is supplied from the Owner's warehouse to the project site and also be responsible for receipt and unloading of large material at the Project site.

PART 5 – NOTIFICATIONS

- 5.01** Contractor will notify the Owner and Engineer 48 hours prior to pulling, testing and terminating any conductor.

PART 6 – PROJECT CLOSEOUT

- 6.01** **RECORD DRAWINGS**

- A. Upon completion of the work, the Contractor shall furnish the Engineer, Two (2) copies of diagrams, maintenance, and operating instructions of equipment furnished. The contractor shall also furnish the engineer with one clean set of marked-up project drawings with all changes made during the course of the project.

6.02 SITE RESTORATION

- A. Upon completion of the work, the Contractor shall restore site to its original condition within practical limits.

6.03 DISPOSAL OF REMOVED MATERIAL

- B. The Contractor is responsible for all costs associated with dumpsters and disposal of removed material that will not be recycled. All recycled material is to be delivered to the Owner's warehouse and separated into the proper bins.

SECTION 01400

QUALITY REQUIREMENTS

PART 1. GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Refer to Divisions 2 through 16 Sections for specific test and inspection requirements.

1.02 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- E. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

- H. Installer/Applicator/Erector: Contractor(s) or another entity engaged by Contractor(s) as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- I. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.03 CONFLICTING REQUIREMENTS

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

1.04 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.
 - 6. Time schedule or time span for tests and inspections.
 - 7. Entity responsible for performing tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.

8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.05 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

1.06 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Tests and inspections not explicitly assigned to Owner are Contractors' responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as Contractors' responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractors' responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following.
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.

5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- G. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.
1. Distribution: Distribute schedule to Owner, Engineer, and testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 ACCEPTABLE TESTING AGENCIES

- A. Prepare a list firms, proposed by Contractor to perform designated tests and inspections required by Contract Documents, and submit to Owner and Engineer for approval.

3.02 TEST AND INSPECTION LOG

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

3.03 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
- B. Protect construction exposed by or for quality-control service activities.

- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01700

EXECUTION REQUIREMENTS

PART 1. GENERAL

1.01 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Field engineering & surveying.
 - 2. General installation of products.
 - 3. Progress cleaning.
 - 4. Protection of installed construction.
 - 5. Correction of the Work

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before commencing construction, field verify the location and invert elevations of all utilities including, but not limited to, storm sewer, sanitary sewer, water, gas, communications, and electric.
- B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

3.02 PREPARATION

- A. Existing Utility Information: Furnish information to local utilities that are necessary to adjust, move, relocate existing utility structures, poles, lines, services, or other utility appurtenance located in or affected by construction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.03 FIELD ENGINEERING AND SURVEYING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
- B. Benchmarks: Establish benchmarks on the Project Substation sites as required to complete the work.
- C. Owner and Engineer will complete all construction staking related to conduit centerlines and equipment placement.

3.04 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 - 2. Allow for movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.05 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
- D. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- E. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- F. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- G. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.06 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

3.07 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

END OF SECTION 01700

SECTION 02221

TRENCHING & BACKFILLING

PART 1. GENERAL

1.01 SUMMARY

- A. This Section includes the following:
 - 1. Trench excavation, backfill and compaction.
 - 2. Excavation support.
 - 3. Pipe & conduit bedding.
 - 4. Rough grading.
 - 5. Restoration of unpaved surfaces.

1.02 QUALITY ASSURANCE

- A. Testing Agency: Compaction testing shall be performed by an MDOT approved soils testing laboratory engaged and paid for by the Owner.
- B. Standards: Michigan Department of Transportation Standard Specifications for Construction, latest edition and including addendums.
- C. Compaction tests will be conducted along the trench centerline in areas scheduled to receive pavement
 - 1. Tests will be conducted during backfilling operations.
 - 2. Perform tests in accordance with ASTM D1556 or ASTM D2922.

PART 2. PRODUCTS

2.01 CONDUIT / DUCTBANK BEDDING

- A. MDOT Class II sand conforming to the MDOT Standard Specifications for Construction.

2.02 BACKFILL MATERIAL

- A. Suitable Backfill Material: Material excavated from the trench that is free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, organic materials, and other deleterious matter.
- B. MDOT Class II sand conforming to the MDOT Standard Specifications for Construction.
- C. Underground Warning Tap: Printed polyethylene tape, six inches wide, color coded red for electric, one inch minimum lettering, printed with caution and name of utility buried below and suitable for installation in all soil types.

PART 3. EXECUTION

3.01 MAINTENANCE AND PROTECTION OF TRAFFIC

- A. Coordinate work to minimize traffic inconvenience. Maintain traffic flow unless street closing is authorized by Owner.
- B. Maintain access to all streets and private drives.
- C. Provide and maintain signs, flashing warning lights, barricades, markers, etc. as required to maintain traffic flow and minimum restrictions.
- D. Comply with state and local regulations, permits and codes.
- E. No trenches shall be left open overnight.

3.02 CUTTING PAVED SURFACES

- A. Make cuts in paved surfaces in a neat uniform fashion forming straight lines parallel with the centerline of the trench. Cut offsets at right angles to the centerline of the trench. Saw cut concrete surfaces; saw cut other hard surfaces or make straight cuts with jackhammer. No paving shall be broken except that which has been previously cut.
- B. Protect edges of cut pavement during excavation to prevent raveling or breaking; square edges prior to pavement replacement.
- C. Concrete pavement shall be cut to the nearest joint, or where directed by the Owner.

3.03 TRENCH EXCAVATION

- A. Topsoil Stripping and Stockpiling.
 - 1. Strip topsoil encountered during trench excavation to its full depth and stockpile for reuse.
- B. Depth of Excavation:
 - 1. Excavate trenches to the depth and grade shown on the profile drawings for the invert of the conduit / ductbank plus that excavation necessary for placement of bedding material.
 - 2. Where the Contractor, by error or intent, excavates beyond the minimum required depth, backfill the trench to the required grade with bedding material at no additional cost to the Owner.
- C. Width of Excavation:
 - 1. Excavate trenches, including laterals, to a width necessary for placing and jointing the conduit system, form installation, concrete placing, and for placing and compacting bedding and backfill around conduit.
- D. Length of Open Trench:
 - 1. The Contractor shall keep conduit / duct bank installation operations as close to the excavation as possible during the prosecution of the work. The Owner and Engineer

reserve the right to stop the excavation at any time if and when, in their opinion, the trench is opened too far in advance of the conduit / duct bank installation.

3.04 SUPPORT OF EXCAVATION

- A. Support excavations with sheeting, shoring, and bracing or a "trench box" as required to comply with Federal and State laws and codes.
- B. Install adequate excavation supports to prevent ground movement or settlement to adjacent structures and utilities. Damage due to settlement because of failure to provide support or through negligence or fault of the Contractor in any other manner, shall be repaired at the Contractor's expense.
- C. Withdraw shoring, bracing, and sheeting as backfilling proceeds unless otherwise directed by the Engineer.

3.05 CONTROL OF EXCAVATED MATERIAL

- A. Keep the ground surface free of excavated material within a minimum of two feet of both sides of the excavation.
- B. Provide a temporary barricade to prevent excavated material from encroaching on private property, walks, gutters, and storm drains.
- C. Comply with all requirements of Erosion & Sedimentation Control permits.

3.06 DEWATERING

- A. Keep excavations dry and free of water. Dispose of rain and subsurface water clear of the work.
- B. Maintain trenches dry until conduit has been installed, inspected, and backfilled, and concrete work has been completed. Prevent trench water from entering conduit / ductbanks under construction.
- C. Intercept and divert surface drainage away from excavations. Maintain storm drainage facilities, gutters, and natural surface water courses open and in operation. Provide and install temporary facilities to maintain excavations free of water as required. Design surface drainage systems so that they do not cause erosion on or off the site, or cause unwanted flow of water. When mechanical equipment is utilized to control water conditions, provide and maintain sufficient standby units onsite.
- D. Comply with Federal, State and Local requirements for dewatering to any watercourse, prevention of stream degradation, and erosion and sediment control

3.07 PIPE BEDDING REQUIREMENTS

- A. Provide MDOT Class II bedding for conduit / ductbank installation in conformance with the Standard Specifications for Construction.

3.08 BACKFILL AND COMPACTION

- A. Contractor shall collect record drawing data in accordance with the General Requirements prior to backfilling.
- B. After conduit / ductbank installation and inspection, backfill trenches from trench bottom or from the top of bedding material, whichever is greater, to 12" above the pipe with specified backfill material hand placed and carefully compacted with hand-operated mechanical tampers in layers of suitable thickness to provide specified compaction around and under all conduits / ductbanks. Backfill and compact the remainder of the trench with specified backfill material.
- C. Flooding with water to achieve compaction shall not be permitted.
- D. Unsuitable Backfill Material: Where the Engineer deems backfill material to be unsuitable and rejects all or part thereof due to conditions prevailing at the time of construction, remove the unsuitable material and replace with select material stone backfill or suitable foreign backfill material.
- E. No further settlement of trenches shall occur following backfilling and compaction so that the roadway base or final ground cover may be placed immediately.
- F. When using mechanical tampers the Contractor shall exercise care to ensure that no conduit joints will be broken, damaged or disturbed through the use of the type of mechanical compacting equipment selected by the Contractor.

3.09 DISPOSAL OF EXCAVATED MATERIAL

- A. Excavated material remaining after completion of backfilling shall remain the property of the Contractor, removed from the construction area, and legally disposed of.

3.10 UTILITY MARKING TAPE

- A. Install 6" wide, red, printed polyethylene tape, 12" above top of highest conduit in trench.

END OF SECTION 02221

SECTION 02260

EXCAVATION & SLOPE PROTECTION

PART 1. GENERAL

1.01 SUMMARY

- A. This Section includes temporary excavation support and protection systems.

1.02 PERFORMANCE REQUIREMENTS

- A. Furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and have resisting soil and hydrostatic pressure and superimposed and construction loads.
 - 1. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 2. Install excavation support and protection systems without damaging existing buildings, pavements, and other improvements adjacent to excavation.

PART 2. PRODUCTS

2.01 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, OR ASTM A 690/A 690M; with continuous interlocks.
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of 3 inches.
- E. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.
- F. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

PART 3. EXECUTION

3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
- C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces is not impeded.

- D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
- E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.02 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.
 - 1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlying construction and abandon remainder.
 - 2. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION 02260

SECTION 02300

EARTHWORK

PART 1. GENERAL

1.01 SUMMARY

- A. This Section includes the following:
1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns and grasses.
 2. Excavating and backfilling for structures.
 3. Subbase course for concrete walk pavements.
 4. Subsurface drainage backfill for walls and trenches.
 5. Excavating and backfilling for utility trenches.

1.02 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
1. Initial Backfill: Backfill placed beside and over conduit in a trench, including haunches to support sides of conduit.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding Course: Course placed over the excavated subgrade in a trench before laying conduit.
- C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
- E. Fill: Soil materials used to raise existing grades.
- F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- G. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- H. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- I. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.03 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
- B. Notify Engineer not less than three days in advance of proposed utility interruptions.
- C. Do not proceed with utility interruptions without Engineer's written permission.
- D. Contact utility-locator service for area where Project is located before excavating.

PART 2. PRODUCTS

2.01 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material (Granular Material, Class II): Conforming to MDOT's standard. If existing material meets or exceeds Subbase requirements, the material may be left in place, if approved by the Engineer.
- E. Aggregate Surface Course (22A or 23A): Conforming to MDOT's standard.
- F. Bedding Course (Granular Material, Class II): Conforming to MDOT's standard.
- G. All subbase, aggregate and bedding soil materials supplied must have been tested to MDOT standards within the six month period prior to the Contract Date.

PART 3. EXECUTION

3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing."

- C. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.

3.02 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.03 EXCAVATION

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.04 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.05 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.06 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
 - 1. Clearance: 12 inches each side of conduit.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells,

joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches to the depth and grade shown on the profile drawings for the invert of the conduit / ductbank plus that excavation necessary for placement of bedding material.

3.07 SUBGRADE INSPECTION

- A. Notify Engineer when excavations have reached required subgrade.
- B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.08 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi may be used when approved by Engineer.
 1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

3.09 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 1. Construction below finish grade including, where applicable, subdrainage, dampproofing and manhole waterproofing.
 2. Surveying locations of underground utilities for Record Documents.
 3. Testing and inspecting underground utilities (where required.)
 4. Removing concrete formwork.

5. Removing trash and debris.
 6. Removing temporary shoring and bracing, and sheeting.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.11 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Place and compact initial backfill of subbase material, free of particles larger than 2 inches in any dimension, to a height of 12 inches over the utility pipe, conduit, or encasement.
- D. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Backfill voids with satisfactory soil while installing and removing shoring and bracing.
- F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

3.12 SOIL FILL

- A. Place and compact fill material in layers to required elevations as follows:
 1. Under grass and planted areas, use satisfactory soil material.
 2. Under walks and pavements, use satisfactory soil material.
 3. Under steps and ramps, use engineered fill.
 4. Under building slabs, use engineered fill.
 5. Under footings and foundations, use engineered fill.
- B. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.13 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Under structures and pavements compact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 - 2. Under walkways compact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
 - 3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
 - 4. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.15 GRADING

- A. Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Lawn or Unpaved Areas: Plus or minus 1 inch.
 - 2. Walks: Plus or minus 1 inch.
 - 3. Pavements: Plus or minus 1/2 inch.

3.16 SUBBASE AND BASE COURSES

- A. Place subbasecourse on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbasecourse under pavements and walks as follows:
 - 1. Shape subbasecourse to required crown elevations and cross-slope grades.
 - 2. Compact subbasecourse at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.17 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 200 feet (46 m) or less of trench length, but no fewer than 2 tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

SECTION 02920

LAWNS & GRASSES

PART 1. GENERAL

1.01 SUMMARY

- A. This Section includes lawn restoration and turf establishment.

1.02 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.
- E. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.03 SUBMITTALS

- A. Product Certificates: Seed, fertilizer, and mulch adhesive.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.06 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.07 MAINTENANCE SERVICE

- A. Initial Lawn Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods.

- 1. Seeded Lawns: 60 days from date of planting completion.

PART 2. PRODUCTS

2.01 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: State-certified seed of grass species, as outlined in the 2003 Michigan Department of Transportation Standard Specifications for Construction, Section 816 for Turf Establishment. See mixture shall be TUF.

2.02 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth.
 - 1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from bogs or marshes.
 - 2. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Surface soil may be supplemented with imported or manufactured topsoil from offsite sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from bogs or marshes.

2.03 FERTILIZER

- A. Chemical fertilizer shall be standard commercial grade with packaging clearly marked in accordance with applicable Federal Laws. Fertilizer shall conform to 2003 MDOT Standard Specifications for Construction, Section 816, Turf Establishment, and shall be Class A.
 - 1. Slow-release fertilizer: Granular or pelletized fertilizer consisting of 50 percent water insoluble nitrogen, phosphorus, and potassium in the following composition:
 - a. Composition: 20 percent nitrogen, 10 percent phosphorus, and 10 percent potassium, by weight.

2.04 MULCHES

- A. Mulches shall conform to 2003 MDOT Standard Specifications for Construction, Section 816, Turf Establishment.
- B. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- C. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.05 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
- B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd. with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.03 LAWN PREPARATION

- A. Limit lawn subgrade preparation to areas to be planted.

- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 3 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply fertilizer directly to subgrade before loosening.
- C. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
 - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 - 2. Loosen surface soil to a depth of at least 6 inches. Apply fertilizers according to planting soil mix proportions and mix thoroughly into top 3 inches of soil. Till soil to a homogeneous mixture of fine texture.
 - a. Apply fertilizer directly to surface soil before loosening.
 - 3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter
 - 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.04 PREPARATION FOR EROSION-CONTROL MATERIALS

- A. For erosion-control mats, install planting mix in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.
- B. Fill cells of erosion-control mat with planting mix and compact before planting.
- C. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- D. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.05 SEEDING

- A. Sow seed at a total rate of 7 lbs / 1000 sq ft.
- B. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

- C. Protect seeded areas with erosion-control mats where shown, installed and anchored according to manufacturer's written instructions.
- D. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment
 - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
 - 2. Bond straw mulch by spraying with asphalt emulsion at a rate of 10 to 13 gal./1000 sq. ft. Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.

3.06 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
 - 1. Mix slurry with nonasphaltic or fiber-mulch manufacturer's recommended tackifier.
 - 2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500 lb/acre dry weight, and seed component is deposited at not less than the specified seedsowing rate.

3.07 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris, created by lawn work, from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after lawn is established.
- C. Remove nondegradable erosion-control measures after grass establishment period

END OF SECTION 02920

SECTION 16061

UTILITY SYSTEM GROUNDING

PART 1. GENERAL

1.01 SUMMARY

- A. This section includes utility system grounding.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Stranded bare copper wire, sized per grounding installation details and duct bank drawings.
- B. Underground Connections
 - 1. Cadweld exothermically welded type, one-shot or molded for padmount equipment locations Mechanical grounding connections for at pole ground locations. Properly size all connections, molds, and weld metal.
- C. Above Ground Connections
 - 1. Mechanical set-screw pressure or compression type.
- D. Ground Rods
 - 1. Copper clad steel with high strength steel core and welded copper outer sheath 3/4 inch diameter by 10 feet at all manholes and three-phase padmount switchgear, sectionalizing cabinet, and riser pole locations.
 - 2. Copper clad steel with high strength steel core and welded copper outer sheath 5/8 inch diameter by 8 feet at all padmount transformer and pole locations.
- E. Counterpoise and Equipment Ground Grids
 - 1. Install stranded bare copper wire ground grids at all equipment locations per drawings.

PART 3. EXECUTION

3.01 UTILITY SYSTEM GROUNDING

- A. All structures shall be grounded as shown electrical layout and detail drawings.
- B. The pole ground wire shall be continuous and not spliced from top of pole to the grounding assembly. Should damage occur during erection of the structure, the pole ground wire may be spliced with the Engineer's approval.
- C. Pole line hardware shall be bonded to the pole ground wire as shown on the drawings. The ground wire shall clear any unbonded hardware by at least 3 inches.

- D. Connect all neutral conductors on pole directly to each other, and to pole ground wire if present. Ground connections in addition to ones required and specified herein are acceptable unless they add undue congestion on structure.
- E. Interconnect all equipment ground wires, neutral conductors, messenger wires, and surge protection ground wires and attach to common (pole) ground wire.
- F. Replace any exothermic weld which does not meet manufacturer's specifications. Labor, equipment and material required for welds not meeting specifications will be supplied at the Contractor's expense.
- G. Interconnect all grounding cables and driven rods with stranded bare copper conductor per drawings.
- H. Install ground rods in undisturbed earth to their total length. Top of ground rods shall be at least 12 inches below finished grade. Maintain minimum of eight foot (8.0') spacing between ground rods and 12" to face of poles.
- I. Relocate any improperly located ground rod caused by lack of Contractor preparation or coordination.
- J. Attach all ground wires to ground rods using exothermic connections.
- K. Provide sufficient ground wire from grounding grids and ground rods into equipment box pads for connection to ground lugs.
- L. Interconnect all grounding cables and driven rods with stranded bare copper conductor per drawings. Provide bare copper ground conductor from two (2) points on grounding grids to all padmount equipment.
- M. Provide all equipment with at least two (2) connections from frame, case, or tank to multigrounded system neutral conductor. Pole ground wire may be used for one or both of these connections. Provide all hardware, lugs, and connectors to bond equipment.
- N. Bond all individual plates in sectionalizing cabinets.
- O. Bond all metallic parts in manholes to grounding system.
- P. Repair all breaks in substation ground grid with like size bare copper conductor and exothermic welded connections.

END OF SECTION 16061

SECTION 16075

POWER AND CONTROL CIRCUIT TAGGING

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Conductor tagging.
- B. Equipment tagging.

1.02 SUBMITTALS

- A. Tag and Nameplate identification list.

PART 2. PRODUCTS

2.01 MATERIALS

A. Conductor Tags

- 1. 1/8 inch 5-ply Lamacoid tags with block lettering having white characters on a black background. Tags shall have a 3/16 inch diameter hole on the left edge for fastening to conductors.

B. Padmount Equipment

- 1. Hi-intensity reflective adhesive characters.

PART 3. EXECUTION

3.01 INSTALLATION

A. Primary Conductors (15 kV)

- 1. Identify cables at all termination and splice points with 1-inch by 3-inch black Lamacoid tags. Tags shall design substation name, circuit number, line/load, phase, and destination point of cable.
- 2. Secure tags to cables below skirts on live front terminations, around elbows on dead front terminations, and where cables both enter and exit manholes and handholes.
- 3. Secure tags to conductors with solid copper wire.
- 4. Engineer will provide a list of required tags.

B. Secondary Conductors (600V)

- 1. Identify cables at all termination points with 1-inch by 3-inch black Lamacoid tags. Tags shall designate service address or cabinet number, and destination point of cable.

2. Secure tags to conductors with solid copper wire.
3. Engineer will provide a list of required tags.

C. Padmount Switchgear

1. Identify all padmount switchgear with switchgear designation, switch numbers, and fuse numbers per the Drawings. Characters shall be 1.75 inch by 2.875 inch high intensity reflective adhesive characters having yellow numbers on a black background.
2. Locate switchgear number designation on center of cabinet on a side visible from roadway.
3. Locate switch bay numbers directly above switch handle door. Locate fuse bay number in a similar location.

D. Padmount Sectionalizing Cabinets

1. Identify all padmount sectionalizing cabinets with cabinet designation per the Drawings. Characters shall be 1.75 inch by 2.875 inch high intensity characters having yellow numbers on a black background.
2. Locate padmount sectionalizing cabinet designation on center of the front side of the cabinet.

E. Padmount Transformers

1. Identify all padmount transformers with transformer number (utility supplied or per the Drawings), kVA rating, and secondary voltage per the Drawings. Characters shall be 1.75 inch by 2.875 inch high intensity reflective adhesive characters having yellow numbers on a black background.
2. Locate the characters on the top left corner of the left door.

F. Install padmount equipment adhesive characters onto a clean, dry surface immediately following equipment placement, prior to energization.

G. Install conductor tags prior to conductor energization.

H. All conductors shall be identified with colored phase tape at all visible locations (including risers, handholes, pedestals, manholes, equipment box pads, terminations, and splices). Match Owner's standard color scheme for conductor phasing.

END OF SECTION 16075

SECTION 16111

CONDUIT

PART 1. GENERAL

1.01 SUMMARY

- A. This section includes conduit, elbows, sweeps, couplings, caps, spacers and other conduit fittings.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Rigid, non-metallic conduit shall be PVC schedule 40, 90°C, UL listed.
- B. Rigid metallic steel conduit shall be hot-dipped galvanized rigid metal conduit.
- C. Fiberglass conduit, sweeps and elbows shall be heavy-wall, suitable for direct burial installations, with factory installed long-style PVC couplings on each end.
- D. Rigid high-density polyethylene pipe for directional boring: HDPE, SDR 13.5, red in color full thickness of pipe.
- E. Conduit end caps/plugs shall include integral tab for securing pull strings.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Utilize rigid non-metallic conduit schedule 40 PVC for all conduit installed in concrete and installed in open trenches.
- B. Drawings are diagrammatic and indicate the general arrangement and intent of the conduit systems.
- C. Install caps or plugs on ends of conduit to prevent entry of foreign matter.
- D. Clean out conduit following complete installation of conduit section between equipment, handholes, or box pads utilizing appropriate sized brush.
- E. Install woven polyester pull tape with minimum average breaking strength of 2500 pounds in all conduits.
- F. Route conduit to avoid utility obstructions and to minimizing flattening or duct banks. Maintain a minimum 12 inch clearance to all other utilities (e.g. water, storm, sanitary, gas, etc.) Excavate sufficient trench distance ahead of conduit installation or dig pilot holes to determine existing utility depths. Adjust trench depths as required to maintain above stated clearances.
- G. Install sweeps and elbows as follows:

1. Horizontal elbows and sweeps on the primary electrical conduit system will be fiberglass, 60" radius, where connecting to PVC conduit unless specifically noted otherwise.
 2. Horizontal elbows and sweeps on the primary electrical conduit system will be contractor supplied and fused HDPE, 60" radius, where connecting to HDPE pipe unless specifically noted otherwise.
 3. Vertical elbows and sweeps on the primary and secondary electrical conduit system will be standard radius, material and angle as noted on the drawings.
- H. Install plug style caps and on all spare conduits. Duct tape not will not be allowed as a conduit cap or plug.
- I. Relocate any improperly located conduit caused by lack of Contractor preparation or coordination.
- J. Perform dewatering, excavation, backfilling, compaction and testing necessary to install the conduit, grounding and equipment foundations in accordance with Division 2.
- K. Install 6" wide, red warning tape 12" above all underground conduits and ductbanks. Warning tap shall be marked "Caution Buried Electrical Line Below."
- L. Verify conduits are terminated in equipment box pads, handholes and manholes to allow all cable pulling to occur without interference with sides or tops.

END OF SECTION 16111

SECTION 16117 UNDERGROUND POWER DISTRIBUTION

PART 1. GENERAL

1.01 WORK INCLUDED

- A. Installation of underground power distribution facilities by pulling cables in conduit or duct.

1.02 TESTS

- A. Refer to Section 16124.

1.03 SUBMITTALS

- A. Medium & high voltage cable pulling plans & reports.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Not applicable. Refer to other sections.

PART 3. EXECUTION

3.01 CABLE HANDLING

- A. Handle cable carefully at all times to avoid damage, and do not drag across the ground, fences, or sharp projections.
- B. Avoid excessive bending of the cable.
- C. Seal cable ends at all times against moisture with suitable end caps. Where it is necessary to cut cable, terminate or seal ends immediately after cutting.

3.02 MINIMUM BENDING RADIUS OF CABLE

- A. Provide minimum cable bending radius of 12 times overall cable diameter. Do not bend cables within 12 inches of cable terminals.

3.03 INSTALLATION IN CONDUIT OR DUCT

- A. Pull cable through circuit or duct such that cable will not be damaged from strain or dragging. Lubricate cable with suitable cable lubricant prior to pulling into conduit or duct.
- B. Monitor the cable tension at all times during pulling operations with a dynamometer connected directly to the pulling equipment.
- C. In pulling cables, do not exceed any of the following stresses:
 - 1. Pulling Eye Attached to Conductor: Pulling strain in pounds shall not exceed .006 times circular mil area for aluminum or .008 times circular mil area for copper.

2. Basket Grip Placed Over Cable: Pulling strain shall not exceed lesser of 1) that circulated in 1. above; or 2) 1000 pounds. In all cases, severe and discard cable under cable grip and 1 foot following it.
 3. Maximum pulling tension shall not exceed that recommended by the specific cable manufacturer.
 4. At bends, do not exceed maximum sidewall pressure recommended by cable manufacturer.
- D. Submit cable pulling plans to Engineer prior to installing any medium voltage cable.
 - E. Submit cable pulling reports to Engineer following the installation of all medium voltage cable.
 - F. Install plastic cable protectors on the end of each conduit in equipment bases.

3.04 TAGGING OF CABLES AT TERMINATION POINTS

- A. Identify and tag cables as required by Section 16075. Attach securely to cable with solid copper wire. Paper or cloth tags are not acceptable.

3.05 CABLE TERMINATIONS

- A. Install terminations in accordance with manufacturer's instructions at all cable terminations which are suitable for size and type of cable used with and for environment in which they will operate.
- B. Bond outer conductive surface of termination to system neutral. Install heat-shrink or cold-shrink sleeve to seal between body of termination and cable jacket.

3.10 SPECIAL PRECAUTIONS FOR CABLE SPLICES AND TERMINATIONS

- A. Provide portable covering or shelter with heat for use when splices or terminations are being prepared to keep rain, snow, and windblown dust off insulating surfaces.
- B. Since cleanliness is essential in preparation and installation of cable fittings, exercise care to prevent transfer of conducting particles from hands to insulating surfaces.
- C. Wipe mating surfaces with solvent such as denatured alcohol to remove any possible accumulation of dirt, moisture, or other conducting materials.
- D. Apply silicone grease or similar lubricant afterwards in accordance with manufacturer's recommendations.
- E. Whenever prefabricated cable devices are opened, lubricate unenergized mating surfaces with silicone grease before fittings are reconnected.

3.12 CABLE ACCEPTANCE TESTS

- A. Provide cable acceptance tests as specified in Sections 16124.

END OF SECTION 16117

SECTION 16124

MEDIUM VOLTAGE CABLE

PART 1. GENERAL

1.01 WORK INCLUDED

- A. Cable.

1.02 SUBMITTALS

- A. Approved field test reports.
- B. Cable pulling plans and reports.

1.03 ACCEPTABLE MANUFACTURERS

- A. Okonite
- B. Kerite

PART 2. PRODUCTS

2.01 MATERIALS

- A. Concentric Neutral URD Cable (#4/0 AWG & 750kCM)
 - 1. 15 kV, shielded, two-conductor.
 - 2. Class B stranded aluminum (#4/0) or copper (750kCM) center conductor.
 - 3. 90°C continuous operating temperature. 130°C emergency rating.
 - 4. EPR insulated, 133% insulation level.
 - 5. Semi-conducting, extruded, strand and insulation screens.
 - 6. One-third capacity outer neutral conductor comprised of bare copper wires.
 - 7. Sunlight resistant polyethylene outer jacket.
 - 8. Cables shall have a footage marker printed on cable jacket.
 - 9. Conductors sized as shown on drawings.

PART 3. EXECUTION

3.01 INSTALLATION – GENERAL

- A. Make conductor length for parallel feeders identical.
- B. Use manufacturer approved cable pulling lubricant for pulling conductors.

- C. Splice only where specifically stated on the Drawings.
- D. Tag each cable per Section 16075.
- E. Refer to Section 16117 for additional requirements.

3.02 TEST REQUIREMENTS

- A. Conduct tests on all new cable by qualified and competent personnel, fully experienced on particular types of test, and done in presence of Engineer's and Owner's representative, unless waived by Engineer and/or Owner.
- B. Conform to ASTM D-470 for test equipment.
- C. Schedule all tests and obtain clearance from the Engineer's and Owner's representative. No testing shall be done without this clearance.
- D. Visually inspect equipment immediately prior to tests.
- E. Directly supervise all testing provided by testing agency.
- F. Test each cable run after installation, but prior to energization as follows:
 - 1. Completely install each cable, including splices and terminations. Do not connect to equipment terminals or to any existing cables prior to testing new cables.
 - 2. Conduct high potential test on each cable.
- G. Perform high potential test in following manner:
 - 1. Apply D-C potential for 15 minutes between conductor and ground with all other conductors and shields connected to same ground.
 - 2. Comply with the test voltage specified in applicable NEMA/ICEA tables for standard test on completed cables, except limit test voltage on cables having dead-front, elbow-type, terminations to the levels indicated below. Use following test voltages for ethylene-propylene rubber (EPR) insulated power cables:

Rated Cable Voltage Phase to Phase, Volts	Conductor Size AWG or MCM	D-C Test Voltage, kV		
		100 Percent Insulation Level	133 Percent Insulation Level	Dead-Front Terminations
2001-5000	8-1000	25	25	25
5001-8000	6-1000	35	35	35
8001-15000	2-1000	55	65	45
15001-25000	1-1000	80	100	65
25001-28000	1-1000	85	---	---
28001-35000	1/0-1000	100	---	---

3. Limit initially applied voltage to no greater than 3.0 times rated alternating-current voltage of cable (or dead-front terminator). Apply uniform rate of increase from initially applied voltage to specified test voltage which is not more than 1 kV per second.
 4. Record applied potential and associated leakage current every 15 seconds during first two (2) minutes and every minute thereafter during remainder of test. Plot test data on graph paper with current on ordinate and time on abscissa.
 5. If, after first minute, leakage current increases, tests may be stopped; further tests will be at Contractor's discretion only.
 6. No test will be accepted where there is continual increase in leakage current throughout test.
- H. Submit two (2) copies of approved test reports. Include all test data and results, ambient temperature at time of test, signature of person who made tests, and approval of Engineer's representative.

END OF SECTION 16124

SECTION 16128

MEDIUM VOLTAGE CABLE TERMINATIONS AND SPLICES

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Terminations.
- B. Elbows.
- C. Splices.

1.02 REFERENCES

- A. ANSI.
- B. NEMA.
- C. IEEE.

1.03 SUBMITTALS

- A. Warranty certificates stating date of energization and expiration.
- B. References for personnel performing cable termination and splicing.

1.04 WARRANTY

- A. Warrant 15 kV cable termination and splicing for a period of one (1) year from date of energization

PART 2. PRODUCTS

2.01 DISTRIBUTION (15 kV) TERMINATIONS

- A. Terminations shall consist of a one-piece, hot or cold shrink, skirted, silicone rubber insulator suitable for use on a single conductor, 15 kV copper tape shielded or concentric neutral, extruded dielectric cable, sized as shown on the Drawings.
- B. Termination shall be rated Class 1, 15 kV, 110 kV BIL, and shall have a current carrying capacity greater than, or equal to, the cable being terminated at a maximum continuous operating temperature of 90°C for concentric neutral cable and 105°C for shielded power cable.
- C. Insulator shall be self-cleaning, fire and UV resistant.
- D. Supply terminator with the following connector:

1. #2 - #250 MCM – Pin.
 2. #350 - #1000MCM – Tinned-copper 2-hole NEMA lug.
- E. Meet or exceed electrical and physical requirements of IEEE 48 for Class 1 termination.

2.02 DISTRIBUTION (15 kV) ELBOWS

- A. Elbows shall be factory molded, EPDM rubber insulation for use on a single conductor, 15 kV copper tape shielded or concentric neutral extruded dielectric cable, sized as shown on the Drawings. Elbows shall provide for a dead front, fully shielded, fully submersible cable connection.
- B. Elbows shall be rated 15 kV, 95 kV BIL, and shall have a current carrying capacity of 200A for separable connectors and 600A for non-separable connectors.
- C. Meet or exceed electrical and physical requirements of ANSI/IEEE 386.
- D. Bond drain wires to equipment ground bus. Utilize mechanical connectors so individual elbows and drain wires can be removed without breaking the bond to energized elbows' drain wires.
- E. Do not use one strand of the concentric neutral as the drain wire. Install a separate piece of wire from the elbow to the concentric neutral or ground.

2.03 DISTRIBUTION (15 kV) SPLICES

- A. Splice shall be factory molded, EPDM rubber insulation for use on a single conductor, 15 kV copper tape shielded or concentric neutral extruded dielectric cable, sized as shown on the Drawings. Splice shall provide for a permanent, fully shielded, fully submersible cable joint.
- B. Termination shall be rated 15 kV, 95 kV BIL, and shall have a current carrying capacity greater than, or equal to, the cable being terminated at a maximum continuous operating temperature of 90°C for concentric neutral cable and 105°C for shielded power cable.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Primary Conductors (15 kV)
 1. Install all terminations and splices in strict accordance with cable and termination manufacturer's recommendations.
 2. Use only tools recommended by cable manufacturer to install terminations and splices.
 3. Install 15 kV cable terminations and splices using only journeymen experienced in medium voltage installations.

END OF SECTION 16128

SECTION 16135

HANDHOLES & MANHOLES

PART 1. GENERAL

1.01 SUMMARY

- A. This section includes electric, street lighting and communications handholes and manholes.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Composite, polymer concrete, fiberglass reinforced, open bottom, handholes, sized as indicated on Drawings, designed for light vehicular traffic loading, heavy duty cover (where noted), gasket, cover, stainless steel hex head cover bolts and inserts.
- B. High-density polyethylene handholes will not be allowed.
- C. Handhole covers shall be labeled "ELECTRIC," "STREET LIGHTING," "FIBER OPTIC," or other lettering as required by type of cables being installed and noted on the drawings.
- D. Precast reinforced concrete manholes, 12' long by 6' wide by 7' high (inside dimensions) designed for H-20 loading, with cable rack arms and supports, pulling irons, knockouts, duct terminators, ladder, grade rings with steps, 30" or 36" diameter solid cover (stamped ELECTRIC) and cast iron frame.
 - 1. Locate cover, knockouts, and duct terminators where shown on the drawings.
 - 2. Located pulling irons opposite all conduit entrances.
 - 3. Provide 14" diameter sump with cover.
 - 4. Provide cable racks and supports on walls and in corners.
 - 5. Provide factory installed Bituthene 3000 waterproof membrane.

2.02 ACCEPTABLE MANUFACTURERS

- B. Fibercrete Handholes
 - 1. Stongwell/Quazite.
- C. Manholes
 - 1. Advance Concrete
 - 2. Hartford Concrete

PART 3. EXECUTION

3.01 INSTALLATION

- A. Street Lighting Handholes
 - a. Install composite handholes in all lawn, gravel and paved areas.
- B. Electrical & Communication Handholes
 - a. Install composite handholes in all lawn, gravel and paved areas.
- C. Set composite handholes on tamped and leveled pea rock gravel bed.
- D. Install conduit plugs on all spare conduits in manholes to prevent water infiltration.
- E. Core drill side of handholes as required for conduit installation.
- F. Where handholes are to be set in concrete, cover handholes with plastic sheeting prior to concrete pouring. Following concrete curing, remove plastic sheeting and fully clean handhole cover.
- G. Secure lids of all handholes and manholes with OEM stainless steel fasteners at completion of project. Contractor shall replace all bolts and washers that are lost during the course of construction.
- H. Install ladders, racks, supports, insulators, and grounding systems in all manholes with maximum 3 foot spacing. Tie cable to insulators with nylon ties.

END OF SECTION 16135

SECTION 16292

FAULT INDICATORS

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Fault Indicators.

1.02 REFERENCES

- A. American National Standards Institute.
- B. IEEE Standard 495-1986

1.03 SUBMITTALS

- A. Product data sheets and drawings.

PART 2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. Power Delivery Products.

2.02 MATERIALS

- A. Fault indicators will be rugged units designed and tested for installation on both overhead and underground 15kV utility systems.
- B. Indicator circuitry shall be contained in a Lexan housing.
- C. Sensor units shall be epoxy coated and a minimum of 2-3/16" depth to accommodate 750MCM 15kV copper EPR insulated concentric neutral cable.
- D. Fault indicators will have adaptive trip circuitry which automatically adjusts for line currents ranging from 1 amp to 800 amps. Trip levels will not be based on a set current level. Fault indicators will indicate a line fault when the line current increases by 100 amps or more with a 3 cycle time frame and then loss of line current within 60 seconds.
- E. The fault indicators will have an inrush restraint to avoid false indication on cold load pickup. Inrush restraint will be active for 85 second delay period after line current restoration.
- F. Flag-type fault indicator displays will incorporate a black display for normal operations and an orange display for fault indication. The flags will be rugged and magnetically latching to reduce the effects of mechanical shock or vibration on the display status.
- G. Flag-type displays will be either be integrally mounted or separately mounted with 10 feet of leads based on the installation requirements shown on the drawings.
- H. Fault indicators will include a normally open output contact and 10 feet of wire leads connected to the contact. The contact will remained closed while the display indicates a fault.

- I. Following the indication of a fault, the displays will not reset for a time period of 4 hours following the return of line current greater than 1.5A.
- J. LED style displays will include a battery power LED light mounted separate from the battery unit. LED style displays will be driven by the closing of a contact on the fault indicator sensor units.
- K. The LED display battery will be a Lithium cell with a rated 10 year life.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Install per manufacturer's instructions.
- B. All mounting hardware will be stainless steel.
- C. Install fault indicators each cable for all phases in padmount switchgear, all source and load cables in 600A sectionalizing cabinets, all load cables in 200A sectionalizing cabinets, and all load cables in step-down transformers, and where shown on the one-line diagram.
- D. Install integral display style fault indicators in fuse bays of padmount switchgear, all sectionalizing cabinets, and step-down transformers.
- E. Locate fault indicator sensors below termination or elbow. Neatly route concentric neutral conductors on outside of cable jacket, inside fault indicator sensor. Do not group or twist concentric neutral conductors in the sensor.
- F. Install LED display battery pack in padmount switchgear in a manner than battery can be replaced without removing the LED unit. Install plastic shims as required for mounting hardware.
- G. Secure all LED display units to equipment base in sectionalizing cabinets.
- H. Drill 1/4" holes in the sides of the padmount switchgear and sectionalizing cabinets for LED installation. Touch up paint prior to installing the LED light with OEM paint.
- I. Route all remote display and LED display leads in a neat and orderly fashion in padmount switchgear and sectionalizing cabinets. Do not route leads near exposed energized parts.
- J. Connect all leads for remote display units and LED displays with silicone-filled wire nuts.

3.02 ADJUSTMENT AND TESTING

- A. Test all fault indicators and LED units prior to energizing 15kV distribution system.
- B. Verify all flag-type and LED units reset following current reset.

END OF SECTION 16292

SECTION 16315

MEDIUM & HIGH VOLTAGE OVERHEAD LINES

PART 1. GENERAL

1.01 WORK INCLUDED

- A. Installation of overhead transmission & distribution facilities

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. National Electrical Safety Code
- B. Rural Utilities Service (RUS)

PART 2. PRODUCTS

2.01 LINE HARDWARE

- A. Hot-dipped galvanized, as manufactured by Anderson, Hughes, Ohio Brass, MacLean, Chance, or approved equal.
- B. Use pre-formed conductor ties for all tangent construction, chance, "Super Top-Tie" or performed products "Wraplock," properly sized for conductors and insulators (distribution only)
- C. Use pistol grip type aluminum quadrant deadend strain clamps for ACSR conductor and high-temperature compression deadends for ACSS conductor. All high-temperature compression connectors require joint compound rated for 250°C.

2.02 WOOD POLES

- A. Install kind, length and A.S.A. class as indicated.
- B. Species
 - 1. Southern Yellow Pine ($\leq 55'$ pole height)
 - 2. Douglas Fir ($\geq 60'$ pole height)
 - 3. Pentachlorophenol preservative required.
- C. Poles will be of physical characteristics and dimension, method of treatment, type of preservative, instructions on inspection, and general procedure applying to all wood poles in accordance with latest provision of RUS Specification for Wood Poles (Specification No. DT-5C)
- D. Wood poles will meet requirements of RUS-WQC Quality Assurance Plan.

2.03 GUY WIRE

- A. Use pre-formed grips to deadend guy wire.
- B. Use 10M high strength steel guy wire for distribution guying and 7/16" Extra-high strength steel guy wire for transmission guying.

- C. Anchor rods shall be in line with the strain and so installed that approximately 12 inches of the rod shall remain out of the ground. Under no circumstances shall the eye of the rod be covered.

2.04 ANCHORS

- A. Utilize screw type anchors of type and size as shown on Drawings. Engineer may modify anchor size, number of anchors, or combination of anchor and extension shafts as necessary to meet field conditions.

2.05 CONDUCTORS AND GROUND WIRES

- A. Utilize type and size as conductors and ground wires as shown on Drawings.
- B. Acceptable Manufacturers
 - 1. Southwire, Alcoa, or approved equal

2.06 POLE TOP ASSEMBLIES

- A. Construct as shown in top assembly detail drawings.

PART 3. EXECUTION

3.01 WOOD POLES

- A. Reserve extra heavy, choice, close grained poles for angles, crossings and deadends.
- B. Provide minimum setting depths for poles as follows:

<u>Pole Length Feet</u>	<u>Setting Depth Feet</u>
35	5.5
40	6.0
45	6.5

- C. Dig non-tapered pole holes approximately 8 inches larger than butt diameter of pole.
- D. The Contractor will set all poles in the locations marked by the Engineer and will not be shifted for the Contractor's convenience. All pole location revisions must be approved by the Owner or Engineer.
- E. Set all poles in alignment, except on line angles, and plumb. Plumb all poles after conductors are strung except for "rake" where specified on structure unit drawings. Deadend and corner poles will be raked 1/4" per foot of pole exposed above grade in a direction away from the line tension.
- F. Thoroughly backfill and tamp full depth all pole holes. Bank up earth around each pole except in residential areas where poles are located in finished lawn areas. After completion of job, inspect holes, and refill any settlement.
- G. Additional payment will not be made for poles required to be set in wet areas utilizing the "wet hole" method. The Contractor will familiarize himself with each project section to determine if the "wet hole" method" will be required.
- H. Provide alternate backfill material as specified herein where excavated material is unsuitable for backfill, as determined by the Engineer.

- I. Paint new gains or holes in poles, with preservative compound and treat holes with preservative compound.
- G. Contact "Miss Dig" prior to any setting of poles or anchors, including guard poles.
- H. Utilize coal tar epoxy on the top of all poles that are cut down in length.
- I. Contractor will transfer all communication cables to new poles at tangent and small angle locations. Communication companies will be required to transfer at locations with deadends, risers, and equipment such as power supplies. The intent of this project is to transfer as many attachments as possible. Contractor will cut the pole tops of poles with communications cables directly above the top communications attachment if not able to transfer. In the event the communications cables are not transferred prior to the Contractor demobilizing, the Contractor will invoice the Owner on a Cut Pole Top unit and not a full pole removal unit.

3.02 POLE TOP ASSEMBLIES

- A. A pole top assembly unit consists of the installation of the hardware, crossarms and their appurtenances, insulators, etc., including tie wire, required to support the primary conductors.
- B. The Contractor will install M5-5 jumper supports as necessary on deadend and corner poles to adequately hold jumpers from contacting grounded surfaces.
- C. Maintain a minimum of 2" between all ungrounded pole hardware and the pole ground downlead.
- D. All bolts will extend a minimum of ½" but not more than 2-1/2" beyond the nuts. Any bolt cut will be rethreaded by the Contractor.
- E. Utilize polymer insulators on all Hendrix aerial cable system conductors.

3.03 GUYS AND ANCHORS

- A. Install guys in locations specified.
- B. Attach guys to poles as shown on construction drawings.
- C. Install guys before conductors or overhead ground wires are strung.
- D. Install square shaft screw anchors power with 1-½ inch square shafts with installation force applied directly to shaft or shaft extension.
- E. Anchor rods will be in line with the strain and so installed that approximately 12 inches of the rod will remain out of the ground. Under no circumstances shall the eye of the rod be covered.
- F. Amount of installing torque is a factor in determining holding strength of installed anchor in various soil conditions. Use methods of installation which are capable of determining installing torque to insure desired holding strengths are obtained. Acceptable methods to accomplish this include:

1. Direct reading hydraulic torque indicator whereby installing torque may be constantly monitored.
 2. Mechanical torque indicator which utilizes shear-in method of metering maximum installing torque.
- G. Do not exceed maximum rated torque in ft. lbs. As designed by anchor manufacturer.
- H. Guy markers will be 8 feet length, 1 ¼ inch diameter, PVC, yellow.

3.04 CONDUCTORS AND OVERHEAD GROUND WIRES

- A. A conductor assembly unit consists of the installation of 1.0 foot of conductor or cable for primaries, secondaries or services. The Bill of Materials lists conductor footage based on the horizontal distance between poles plus an additional 3% for sag.
- B. Exercise care to avoid kinking, twisting, or abrading conductor or overhead ground wire in any manner. Do not be tramp on, run over by vehicles, or drag over the conductors or overhead ground wires ground.
- C. Inspect wire on each reel for cuts, kinks, or other injuries. Cut out injured portions or crooked or imperfect splices in either conductor or overhead ground wire and resplice wire.
- D. Pull conductors and overhead ground wires over suitable rollers or stringing blocks properly mounted to prevent binding while stringing.
- E. Install conductors and accessories in accordance with manufacturer's recommendations.
- F. Do not install more than one splice per conductor in any span.
- G. Do not locate any splice within 10 feet of conductor supports.
- H. Exercise utmost care in installing conductor splices. Insure contact surface of wire is clean and bright using steel brush.
- I. Sag conductors and overhead ground wires in accordance with sag and tension charts or tables furnished by Engineer in accordance with conductor manufacturer's recommendations, except that maximum increase of 2 inches of specified sag in any span will be acceptable provided, however, that required clearances are obtained; under no circumstances will a decrease in specified sag be allowed.
- J. Determine air temperature at time and place of stringing by certified etched-glass thermometer. Measure recorded temperature at which conductor is sagged and the spans in which sags are and give to Engineer.
- K. Install neutral conductor below transformers.
- L. All Hendrix aerial spacer cable systems must be installed according to the manufacturers' instructions.
- M. Transfer units include all labor necessary to remove the complete assembly unit from an existing pole to a new pole. This includes all necessary conductor handling to complete the transfer including temporary means to maintain an energized system (e.g. installation of insulated jumpers "macks") and reconnection on the new pole. All transfer and splice units for underground construction include excavation necessary to complete the work.

3.05 TRANSFORMERS

- A. A transformer assembly unit consists of the installation of the transformer and its hardware and leads with their connectors and supporting insulators and pins. This unit does not include the installation of the pole top, secondary, service, grounding or protection device assemblies.
- B. All transformer units include the necessary jumpers, hot line clamps, compression tap saddles, service connection compression sleeves, all mounting hardware, and any miscellaneous material necessary for a complete transformer installation.

3.06 GROUNDING AND BONDING

- A. Provide grounding materials, taps and jumpers as required.
- B. Drive ground rods full length in undisturbed earth in accordance with drawings. Install rods minimum of 2 feet from pole face.
- C. Install top of ground rods at least 12 inches below surface of earth.
- D. Attach ground wire attached to rod with appropriate ground rod clamp secured to pole with staples. Space staples on ground wire 2 feet apart, except use 6 inch spacing 8 feet above ground and 8 feet down from top of pole.
- E. Provide one continuous piece of ground wire for connection between ground rod system neutral, installed in shortest and most direct path according to drawings. If splice is required, use compression type connector. Connect pole ground wire to system neutral using compression type connector.
- F. Provide all equipment with at least two (2) connections from frame, case, or tank to multi-grounded system neutral conductor. Pole ground wire may be used for one or both of these connections.
- G. Connect all neutral conductors on pole directly to each other, and to pole ground wire if present. Ground connections in addition to ones required and specified herein are acceptable unless they add undue congestion on structure.
- H. Interconnect all equipment ground wires, neutral conductors, downguys, messenger wires, and surge protection ground wires and attach to common (pole) ground wire in accordance with requirements of, or exempted by, National Electrical Safety Code.
- I. All material and equipment required to complete exothermic welding will be supplied by the Contractor. This includes molds, handles, weld metals, strikers, and all other equipment necessary to complete the required exothermic welds.

3.07 TAPS AND JUMPERS

- A. Connect jumpers and other leads to line conductors with sufficient slack to allow free movement of conductors. Where slack is not shown on Drawings, provide by at least two (2) bends in vertical plane, or one (1) in horizontal plane, or equivalent. In areas where Aeolian vibration occurs, use special measures to minimize effects of jumper breaks.
- B. Provide minimum size equipment leads of #6 copper conductivity.

- C. Where aluminum jumpers are used, connection to unplated bronze terminal by splicing short stub of copper to aluminum jumpers using compression connector suitable for bimetallic connection.
- D. Install tap saddle and hot-line clamp for taps to equipment.
- E. It may be necessary, and is permissible, to lower neutral attachment on standard construction pole top assemblies additional distance not exceeding 2 feet to provide adequate clearance between cutout and single phase, conventional distribution transformers.

3.08 MISCELLANEOUS ASSEMBLY UNITS

- A. A miscellaneous assembly unit consists of the installation of an additional unit needed in the Project for new line construction. This section includes the installation of grounding assemblies, fuse cutouts, switches, capacitors, regulators, metering and other assembly units.
- B. Jumpers from mainline to mainline will be of the same ampacity at the mainline conductor. Utilize mechanical connectors on all mainline jumpers.

3.09 REMOVAL OF EXISTING POLES, CONDUCTOR, AND ASSEMBLIES

- A. Remove assembly units cover furnishing all labor for removal of existing units of construction from existing lines, disassembling into material items, and all labor and transportation for returning of all materials to warehouse of Owner in an orderly manner.
- B. Remove all poles from ground. Ground wire of cut below grade and abandoned.
- C. Removal of pole-top assemblies includes completely disassembly of material components.
- D. Conductor removal unit covers removal of conductor or cable and reeling or coiling it in workmanlike manner such that it can be reused by Owner. Owner will furnish Contractor reels it is to be returned to Owner's warehouse on reels.
- E. Remove anchors and rods if possible. If rod cannot be unscrewed, end of rod shall either be cut off or bent down so that rod will be at least 18 inches below ground.

END OF SECTION 16315

SECTION 16345

MEDIUM VOLTAGE SECTIONALIZING CABINETS

PART 1. GENERAL

1.01 SUMMARY

- A. All medium voltage sectionalizing cabinets will be furnished by Owner.

PART 2. PRODUCTS

PART 3. EXECUTION

3.01 INSTALLATION

- A. Follow manufacturer's recommendations for lifting and handling cabinets.
- B. Install per manufacturer's instructions.
- C. Install cabinets on precast box pads. Secure to box pad at four (4) separate locations with ½ inch bolts and galvanized angled anchor brackets. Verify cabinet has not become twisted due after securing to box pad.
- D. Ground cabinet at a minimum of two (2) separate locations. Connect to grounding system per Section 16061.
- E. Install 15 kV 4-point dead front style junctions. Refer to Drawings for amperage rating of junctions.
- F. Terminate cables on dead front style junctions. Cap all unused junction points with 15 kV insulated caps 200A or 600A as required.
- G. Install cables on the junctions in an organized fashion so that cables of like circuits are on the same point for all phases.
- H. Refer to Section 16292 for fault indicator installation.

3.02 ADJUSTMENT AND CLEANING

- A. Tighten all connections and mechanical fasteners.
- B. Touch-up scratched or marred surfaces to match original finish.
- C. Clean interior and exterior.

END OF SECTION 16345

SECTION 16346

MEDIUM VOLTAGE PAD-MOUNTED SWITCHGEAR

PART 1. GENERAL

1.01 DESCRIPTION

- A. Pad-mounted, outdoor, medium voltage switchgear units designed, manufactured, and tested in accordance with NEMA and ANSI Standards.

1.02 QUALITY ASSURANCE

A. Reference Standards

- 1. ANSI
- 2. NEMA
- 3. NFPA 70

B. Source Quality Control

- 1. Test to meet ANSI C37 requirements.

1.03 LABELING

- A. Label equipment with WARNING – HIGH VOLTAGE labels on each door.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver switchgear to the Owner's warehouse:

Traverse City Light & Power
1131 Hastings St
Traverse City, MI 49686

Attn: Mr. Kevin Bartz
231.9332.4556

Provide forty-eight (48) hours notice to Owner prior to delivery.

- B. The Owner reserves the right to inspect all switchgear upon delivery and reject any which do not meet this specification.

PART 2. PRODUCTS

2.01 MANUFACTURER

- A. S&C Electric Type PME
- B. Federal Pacific Type PSE

2.02 HOUSING

- A. Factory assembled, free-standing weatherproof, pad-mounted switchgear enclosure, forming integral switchgear unit consisting of multiple compartments within single enclosure with each switch or set of fuses in isolated compartment as listed on the drawings or on the request for quotation.
- B. Hinged style top for increased access to cable termination bays.

2.03 HIGH DURABILITY FINISH

- A. Chemically clean, hot phosphate, treat, and rinse framework and panels. Then prime with rust inhibiting a phosphate primer and electrostatically apply one (1) coat of polyester baking enamel paint. Apply one (1) coat of ANSI 70 dark green, modified alkyd enamel paint to all exterior surfaces.
- B. Switchgear shall withstand 4000 hour salt-spray test.

2.04 RATINGS

- A. Rated Voltage: 14.4 kV nominal, 17.0 kV maximum.
- B. System Operating Voltage: 13.8 kV, 3-phase, grounded wye.
- C. Frequency: 60 Hertz.
- D. Insulation Level: 95 kV BIL.
- E. 600A deadbreak bushing wells and bushings for each switch way.
- F. 200A loadbreak bushing wells and bushings for each fuse way.
- G. Switch Compartments: Three-pole, single throw, externally operated switches, rated 600 amp continuous, 600 amp load break. Store removable switch operating handles in an external lockable compartment.
- H. Fuse Compartments: Three (3) indoor type power fuses, S&C SML-20 holders rated 200 amp continuous, 600 amp load break. Store removable switch operating handles in an external lockable compartment.
- I. Switch Fault-closing Rating: 14,000 amperes RMS symmetrical.
- J. Fuse Interrupting Rating: 14,000 amperes RMS symmetrical.

2.05 ACCESSORIES REQUIRED

- A. One (1) set of spare fuses and fuse holders for each size complete with all hardware, clips, etc.
- B. Provide mounting provisions for fault indicators in each switch compartment with viewing window.
- C. Three metal-oxide polymer distribution class lightning arresters for switch compartment with MCOV rating compatible with system operating voltage, complete with connections.
- D. Provisions for padlocking of door and switch operating handles.
- E. Pentahead latch mechanisms on all doors.

- F. Grounding provisions in each compartment for attachment of cable grounds and for ready means to ground-out terminal cables.
- G. Space for three S&C SMU-20 fuses in each fuse compartment door.

PART 3. EXECUTION

3.01 INSPECTION

- A. Examine area to receive switchgear to assure adequate clearance for installation, including move in.
- B. Check that box pads are level and free of irregularities.
- C. Start work only after unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Install and test per manufacturer's instructions.
- B. Install switchgear on properly sized box pads. Secure to box pad at four (4) separate location with ½ inch bolts and galvanized angle brackets.
- C. Coordinate installation of conduits prior to start of any work to assure proper locations.
- D. Install grounding, per Section 16061.
- E. Refer to Section 16292 for fault indicator installation.
- F. Install cable and ground conductor terminations.

3.03 FIELD QUALITY CONTROL

- A. Field tests prior to energization:
 - 1. Megger all phase to phase to phase to ground insulation levels.
 - 2. Continuity.
- B. Perform tests according to manufacturer's instructions.

3.04 ADJUSTMENT AND CLEANING

- A. Adjust operating mechanisms for free mechanical movement.
- B. Tighten bus connections and mechanical fasteners.
- C. Tough-up scratched or marred surfaces to match original finish.
- D. Clean interior and exterior.

END OF SECTION 16346

DISTRIBUTION LINE

STAKING SHEETS

NEW CONSTRUCTION STAKING SHEET

Aero Park Underground

Voltage: 7.9/13.8kV Lead: PC22



Petoskey

459 Bay Street
Petoskey, MI 49770
231.439.9683

Traverse City Light & Power

1131 Hastings Street
Traverse City, MI 49686
231.922.4940

Conductor

Qty Size Type
4 #336.4 ACSR

Area

County: Grand Travers Town: T 27 N
Township: Range: R 10 W
Municipality/City: Traverse City Section: 07

Work Order #:

Project#: 19-1026.01

Sheet 1 of 2

Pole No.	Back Span	Pole Height Class	Pri Units	A n g l e	Guy			Anchor		Transformer	Secondary/Service			Ground	Miscellaneous/ Comments											
					No.	Unit	Lead	No.	Unit		Span	Conductor	Unit													
54D		EX 55-2	2 EX C9-3N EX C7A-10 C5-3								3 EX #6 DX	3 EX K14		EX M5-5 EX Street Light Fiber Optic 19.0' Install 350 MCM CU Jumpers. Install Neutral on Crossarm. Utilize #4/0 Str CU Overhead Neutral to C/N's.												
54D1	102	EX 50-3	C7A-10		1	E2-3Fi								UC5-1U 3 M5-26 Riser #1 Install Neutral on Crossarm. Utilize #4/0 Str CU Overhead Neutral to C/N's.												
58D3		EX 45	EX C9-3N EX C7A-10											If circuit PC20 is constructed, remove all but conductor crossing railroad. ALL WORK THIS POLE BY TCL&P												
58D4		EX 40-4	EX C7A-10											Riser #2 If circuit PC20 is constructed, remove all but conductor crossing railroad. ALL WORK THIS POLE BY TCL&P												
<table style="width: 100%; border: none;"> <tr> <td style="border: none; width: 15%;"></td> <td style="border: none; width: 15%; text-align: center;">102</td> <td style="border: none; width: 15%; text-align: center;">Span Total</td> <td style="border: none; width: 15%;"></td> <td style="border: none; width: 15%;"></td> <td style="border: none; width: 15%; text-align: center;">Designed: 08/27/2019</td> <td style="border: none; width: 15%;"></td> <td style="border: none; width: 15%; text-align: center;">Revised:</td> <td style="border: none; width: 15%;"></td> <td style="border: none; width: 15%; text-align: center;">As Built:</td> <td style="border: none; width: 15%;"></td> <td style="border: none; width: 15%; text-align: center;">Printed: 01/31/2020 10:04:59AM</td> </tr> </table>																102	Span Total			Designed: 08/27/2019		Revised:		As Built:		Printed: 01/31/2020 10:04:59AM
	102	Span Total			Designed: 08/27/2019		Revised:		As Built:		Printed: 01/31/2020 10:04:59AM															

NEW CONSTRUCTION STAKING SHEET

Aero Park Underground

Voltage: 7.9/13.8kV Lead: PC23



Petoskey

459 Bay Street
Petoskey, MI 49770
231.439.9683

Traverse City Light & Power

1131 Hastings Street
Traverse City, MI 49686
231.922.4940

Conductor

Qty Size Type
4 #336.4 ACSR

Area

County: Grand Travers Town: T 27 N
Township: Range: R 10 W
Municipality/City: Traverse City Section: 07

Work Order #:

Project#: 19-1026.01 Sheet 2 of 2

Pole No.	Back Span	Pole Height Class	Pri Units	Angle	Guy			Anchor		Transformer	Secondary/Service			Ground	Miscellaneous/ Comments									
					No.	Unit	Lead	No.	Unit		Span	Conductor	Unit											
14D		EX 50-3	EX C9-3N EX C7A-10		1	EX E1-3Fi		1	EX TA-2H		1	EX #6 DX	EX K14		3 EX M5-6 3 EX M5-9 3 100K Fuse Install #2 Str CU Jumpers ALL WORK THIS POLE BY TCL&P									
14D1		EX 45-4	EX C7A-10		1	EX E1-3Fi		1	EX TA-2H						UC2C 3 M5-9SB 3 M5-26 Riser #3 ALL WORK THIS POLE BY TCL&P									
21D		EX 50-3	EX C9-1P (CE) EX C9-3N EX C7A-10 C5-3		1	EX E1-3FPE		1	EX TA-2H						M5-5 2 EX M5-5 Install Neutral on Crossarm. Utilize #4/0 Str CU Overhead Neutral to C/N's. Install New 350 MCM CU Jumpers.									
21D1	135	EX 40-4	EX C7A-10 C5-3		1	EX E1-3FPE		1	EX TA-2H						EX UC5-1 3 M5-26 Riser #4 Install Neutral on Crossarm. Utilize #4/0 Str CU Overhead Neutral to C/N's.									
		135	Span Total																					
					Designed: 08/27/2019					Revised:					As Built:					Printed: 01/31/2020 10:05:01AM				

REMOVAL OVERHEAD STAKING SHEET

Aero Park Underground

Voltage: 7.9/13.8kV Lead: PC22



Petoskey

459 Bay Street
Petoskey, MI 49770
231.439.9683

Traverse City Light & Power

1131 Hastings Street
Traverse City, MI 49686
231.922.4940

Conductor
Qty Size Type
4 #1/0 ACSR

Area
County: Grand Travers Town: T 27 N
Township: Range: R 10 W
Municipality/City: Traverse City Section: 07

Work Order #:

Project#: 19-1026.01 Sheet 1 of 2

Pole No.	Back Span	Pole Height Class	Pri Units	Angle	Guy			Anchor		Transformer	Secondary/Service			Ground	Miscellaneous/ Comments
					No.	Unit	Lead	No.	Unit		Span	Conductor	Unit		
54D		EX 55	2 EX C9-3N EX C7A-10 C5-3		1	EX E1-3Fi		1	EX TA-2H		3	EX #6 DX	3	EX K14	EX M5-5 EX Street Light Fiber Optic 19.0'
54D1	102	EX 50	C7		1	E2-3Fi									UC2 M3-15 Riser #1
58D3		EX 45	EX C9-3N EX C7A-10												If circuit PC20 is constructed, remove all but conductor crossing railroad. ALL WORK THIS POLE BY TCL&P
58D4		EX 40	EX C7A-10												UC2 Riser #2 If circuit PC20 is constructed, remove all but conductor crossing railroad. ALL WORK THIS POLE BY TCL&P

102 Span Total

Designed: 08/27/2019

Revised:

As Built:

Printed: 01/31/2020 10:05:44AM

REMOVAL OVERHEAD STAKING SHEET

Aero Park Underground

Voltage: 7.9/13.8kV Lead: PC23



Petoskey

459 Bay Street
Petoskey, MI 49770
231.439.9683

Traverse City Light & Power

1131 Hastings Street
Traverse City, MI 49686
231.922.4940

Conductor
Qty Size Type
4 #1/0 ACSR

Area
County: Grand Travers Town: T 27 N
Township: Range: R 10 W
Municipality/City: Traverse City Section: 07

Work Order #:

Project#: 19-1026.01

Sheet 2 of 2

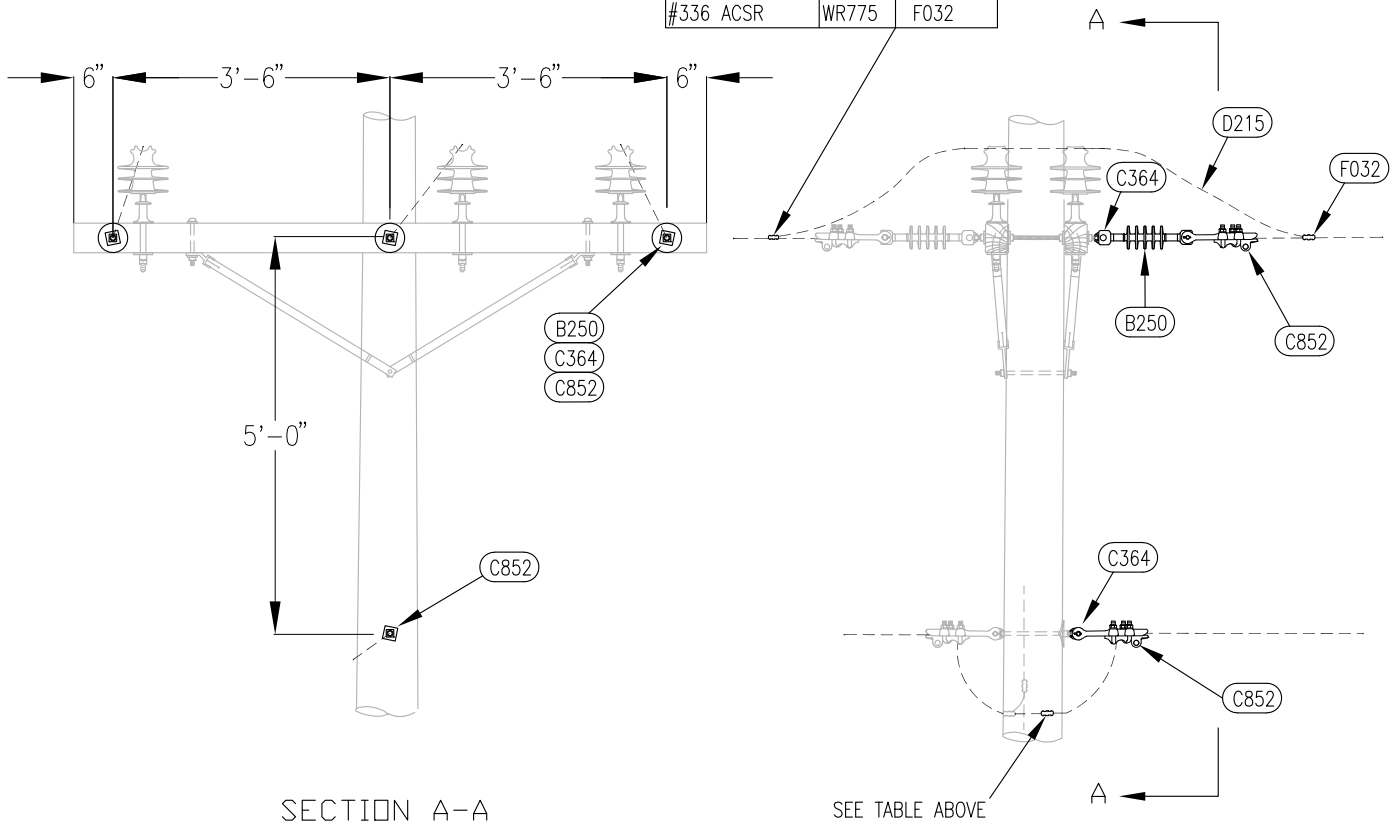
Pole No.	Back Span	Pole Height Class	Pri Units	Angle	Guy			Anchor		Transformer	Secondary/Service			Ground	Miscellaneous/ Comments	
					No.	Unit	Lead	No.	Unit		Span	Conductor	Unit			
14D		EX 50	EX C9-3N EX C7A-10		1	EX E1-3Fi		1	EX TA-2H		1	EX #6 DX	EX K14		3 EX M5-6 3 EX M5-9 M3-15 ALL WORK THIS POLE BY TCL&P	
14D1		EX 45	EX C7A-10		1	EX E1-3Fi		1	EX TA-2H						UC2 Riser #3 ALL WORK THIS POLE BY TCL&P	
21D		EX 50	EX C9-1P (CE) EX C9-3N EX C7A-10 C5-3		1	EX E1-3FPE		1	EX TA-2H						3 M5-9 2 EX M5-5 M3-15	
21D1	135	EX 40	C7A-10		1	EX E		1	EX F						EX UC5-1 Riser #4	
		135	Span Total													
					Designed: 08/27/2019			Revised:			As Built:			Printed: 01/31/2020 10:05:46AM		

DISTRIBUTION LINE
ASSEMBLY DRAWINGS

BILL OF MATERIALS

DWG REF	QTY.	DESCRIPTION	DWG REF	QTY.	DESCRIPTION
B250	3	Insulator, Susp, Poly, 15kV, 15k, Clevis-eye	D207	35'	Wire, #2 CU Strand, Bare, Annealed
C852	4	Clamp, Straight Line DE, Side Opening, 9,000#	F032	8	Connector, Compression, #336.4 ACSR to #336.4 ACSR
C364	4	Nut, Eye, 5/8"	FXXX	4	See Table Below

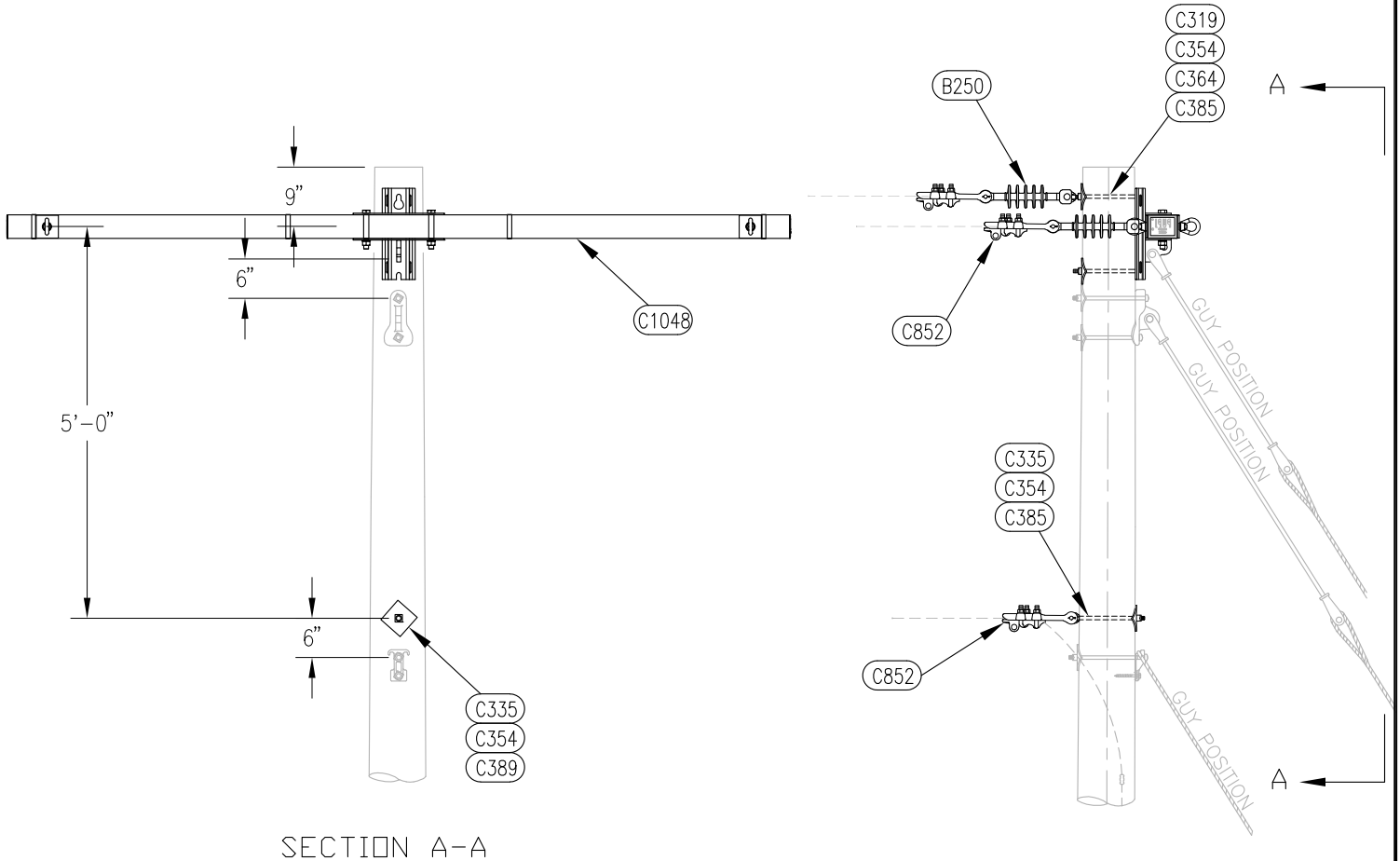
EX CONDUCTOR	PART #	CONNECTOR
#2 OR #4 ACSR	WR715	F031
#1/0 ACSR	WR815	F033
#2/0 ACSR	WR815	F033
#3/0 ACSR	WR835	F034
#4/0 ACSR	WR835	F034
#336 ACSR	WR775	F032



	TITLE	DATE	PROJECT NO.
	C5-3 #336.4 ACSR ASSEMBLY DETAIL	01-23-2020	19-1026.01
	GRAND RAPIDS, MICHIGAN, 616-942-7183 PETOSKEY, MICHIGAN, 231-439-9683	DR. KMW ENG. MPM	DRAWING
			C5-3

BILL OF MATERIALS

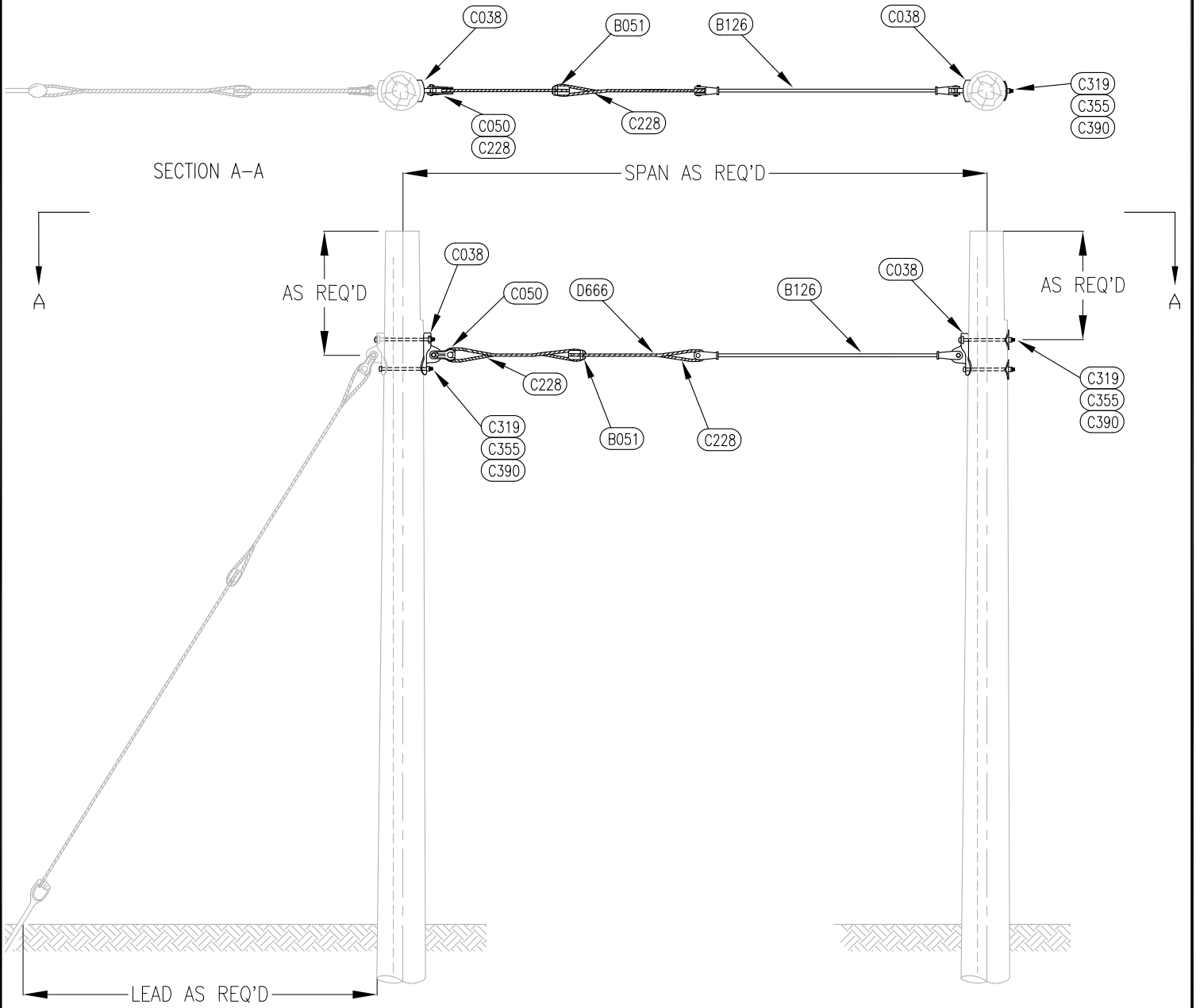
DWG REF	QTY.	DESCRIPTION	DWG REF	QTY.	DESCRIPTION
B250	3	Insulator, Susp, Poly, 15kV, 15k, Clevis-eye	C364	1	Nut, Eye, 5/8"
C319	2	Bolt, Machine, 3/4" x Req'd Length w/ Nut	C385	3	Washer, 3"x3"x1/4" Sq. Curved Washer, 11/16" Hole
C335	1	Bolt, Eye, 5/8" X Req'd Length w/ Nut	C390	3	Washer, Cast, 4"x4"x1/4" Sq. Crvd Washer, 13/16" Hole
C354	1	Nut, Locknut, 5/8"	C852	4	Clamp, Straight Line DE, Side Opening, 9,000#
C355	2	Nut, Locknut, 3/4"	C1048	1	Crossarm, DE, Braceless, 7,500#, 10' Composite



	TITLE	DATE	PROJECT NO.
	C7A-10 #336.4 ACSR ASSEMBLY DETAIL	01-23-2020	19-1026.01
	GRAND RAPIDS, MICHIGAN, 616-942-7183 PETOSKEY, MICHIGAN, 231-439-9683	DR. KMW ENG. MPM	DRAWING C7A-10

BILL OF MATERIALS

DWG REF	QTY.	DESCRIPTION	DWG REF	QTY.	DESCRIPTION
B051	1	Insulator, Guy Strain, Porc, 12,000#, ANSI 54-2	C319	4	Bolt, Machine, 3/4" x Req'd Length w/ Nut
B126	1	Insulator, Fiberglass, Clevis-Roller, 54", 21,000#	C355	4	Nut, Locknut, 3/4"
C038	2	Pole Eye Plate, 4-5", 21,000#	C390	4	Washer, 4"x4"x1/4" Square Curved, 13/16" Hole
C050	1	Clevis, Thimble, Dead-end, 20,000#	D666	100'	Cable, Guy Strand, 10M Alumoweld
C228	4	Grip, Guy Dead-End, 10M Alumoweld			



GRP
Engineering, Inc.

TITLE
E2-3Fi ASSEMBLY DETAIL (10M AW)

GRAND RAPIDS, MICHIGAN, 616-942-7183
PETOSKEY, MICHIGAN, 231-439-9683

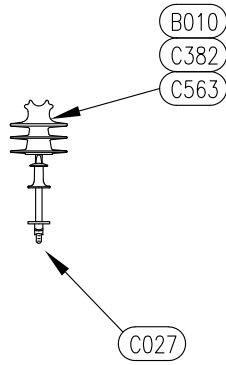
DATE
01-23-2020
DR.
KMW
ENG.
MPM

PROJECT NO.
19-1026.01

DRAWING
E2-3Fi

BILL OF MATERIALS

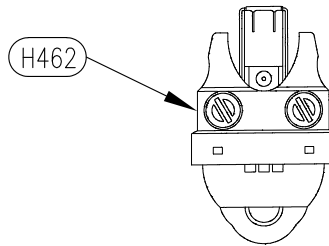
DWG REF	QTY.	DESCRIPTION	DWG REF	QTY.	DESCRIPTION
B010	1	Insulator, Pin, Polymer, 15kV, F-Neck, ANSI 55-4	C382	1	Washer, 2-1/4" X 2-1/4" X 3/16" Square, 11/16" Hole
C027	1	Pin, Crossarm, Steel, 5/8" X 10 3/4"	C563	1	Pre-Formed Ties, Wraplock, #336 ACSR, F-Neck



	TITLE	DATE	PROJECT NO.
	M5-5 #336.4 ACSR ASSEMBLY DETAIL	01-23-2020	19-1026.01
	GRAND RAPIDS, MICHIGAN, 616-942-7183 PETOSKEY, MICHIGAN, 231-439-9683	DR. KMW ENG. MPM	DRAWING M5-5

BILL OF MATERIALS

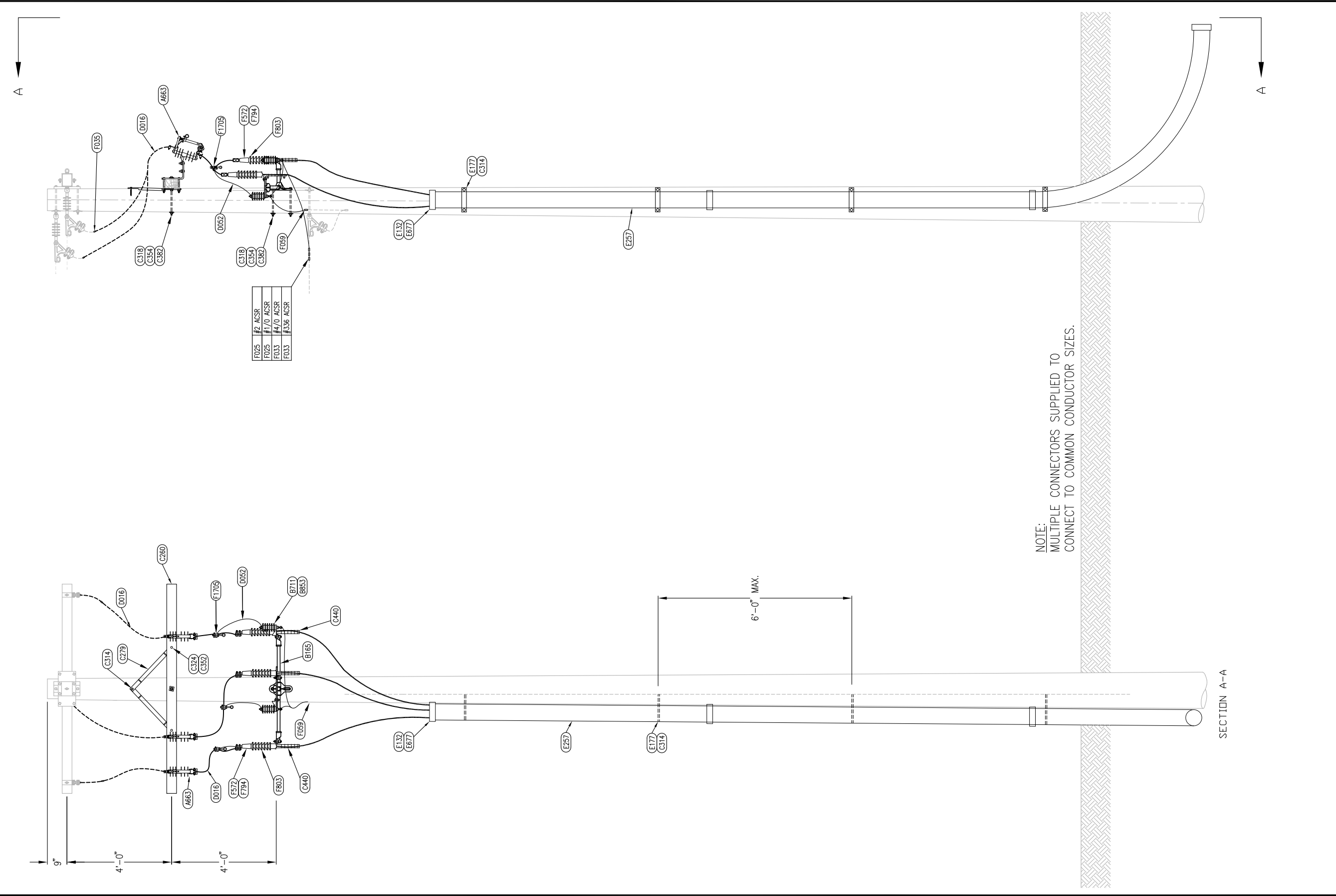
DWG REF	QTY.	DESCRIPTION
H462	1	Fault Indicator, OH, Current/Normal Reset, 100A Trip, 12 Hr. Reset



	TITLE	DATE	PROJECT NO.
	M5-26 ASSEMBLY DETAIL	01-23-2020	19-1026.01
	GRAND RAPIDS, MICHIGAN, 616-942-7183 PETOSKEY, MICHIGAN, 231-439-9683	DR. KMW ENG. MPM	DRAWING M5-26

BILL OF MATERIALS

REF	QTY.	DESCRIPTION	DWG REF	QTY.	DESCRIPTION
A663	3	Cutout, 200A, 7.2kV, 95kV, BIL, Type XS, HD	D016	45	Cable, #2/0 CU, 7-Strand, Bare, Soft Drawn
B165	1	Bracket, 0' Extension, 3-Phase, 3-Holes per Phase, 48" x 13"	D052	15'	Cable, #6 CU, Solid, Covered Line Wire
B711	3	Arrester, Riser Pole Class, 8.4kV MCOV, Polymer	E132	1	Duct Seal
B853	3	Guard, Bushing, Animal Guard, Distribution Transformer	E177	8	Conduit Support Strap, 4"
C260	1	Crossarm, Wood, 3-3/4" X 4-3/4" X 8", DF, Penta,	E257	30'	Conduit, 4" PVC SCH 40
C279	2	Brace, Wood Crossarm, 38" Span, 18" Drop	E677	1	End Bell, 4" PVC
C314	9	Screw, Lag 1/2" X 4"	F025	3	Connector, Compression, #1/0.2 ACSR to #2,4,6 CU
C324	3	Bolt, Machine, 5/8" x Req'd Length w/ Nut	F033	3	Connector, Compression, #477.336,4/0 ACSR to #336 ACSR
C352	2	Nut, Locknut, 3/8"	F059	3	Connector, Compression, Crimp-It, #6 CU to #6 CU
C354	3	Nut, Locknut, 5/8"	F572	3	Connector, Bolted, #8 Sol - #2/0 Str Cable to Flat, Double, Bronze
C382	4	Washer, 2-1/4" X 2-1/4" X 3/16" Square, 11/16" Hole	F794	3	Connector, 2-Hole, UG Cable Termination, #4/0 AWG Str.
C440	3	Bracket, Cable Positioner	F803	3	Terminator, #4/0 AL/CU 15kV Polymer, Cold Shrink, Stem
D001	20'	Wire, #6 CU Solid, Bare, Soft Drawn	F1705	3	Connector, Power Grip, #4/0 - #4 ACSR to #2/0 - #8



NOTE:
MULTIPLE CONNECTORS SUPPLIED TO
CONNECT TO COMMON CONDUCTOR SIZES.



PROJECT NAME
AERO PARK UNDERGROUND
CLIENT
TRAVERSE CITY LIGHT & POWER

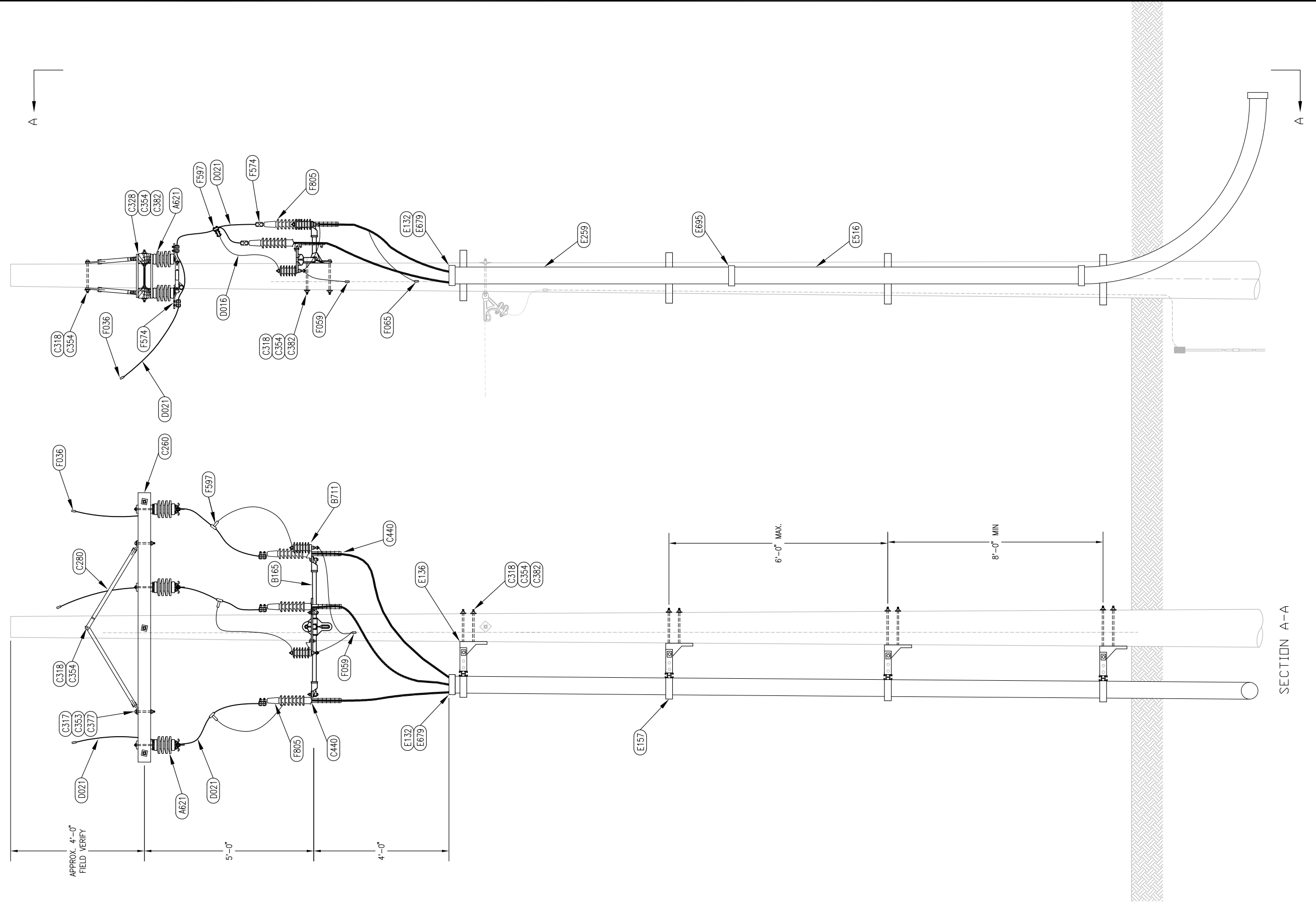
UC2 #4/0 UG ASSEMBLY DETAIL

GRP ENGINEERING, INC., GRAND RAPIDS / PETOSKEY, MI., 231-439-9683

DATE 01-23-2020	PROJECT NO. 19-1026.01
ENG. MPM	DRAWING
DR. KMW	UC2

BILL OF MATERIALS

REF	QTY.	DESCRIPTION	DWG	QTY.	DESCRIPTION
A621	3	Switch, Distl., 12" Blade, 600A, 14.4kV w/ Back Pl.	D016	15'	Wire, #2 CU Strand, Bare, Soft Drawn
B165	1	Bracket, 0" Extension, 3-Phase, 3-Holes per Phase, 48" x 13"	D021	45'	Cable, 350 MCM CU Strand, Bare, Soft Drawn
B711	3	Arrester, Riser Pole Class, 8.4kV MCOV, Polymer	E132	1	Duct Seal
C260	2	Crossarm, Wood, 3-3/4" X 4-3/4" X 8", Type 03	E136	6	Bracket, Conduit 6" Stand-off w/ 12" 4-way T-Slot Rail
C280	2 pr	Brace, Wood Crossarm, 60" Span, 18" Drop (pair)	E157	6	Conduit Support Strap Kit, 6"
C314	18	Screw, Lag, 1/2" x 4"	E259	2	Conduit, 6" PVC SCH 40, 10' Length
C317	2	Bolt, Machine, 1/2" x 6" w/ Nut	E516	1	Conduit, 6" Rigid Galvanized Steel, 10' Length
C318	1	Bolt, Machine, 5/8" x Req'd Length w/ Nut	E679	1	End Bell, 6" PVC
C318	1	Bolt, Machine, 5/8" x Req'd Length w/ Nut	E695	1	Conduit, Female Threaded Adapter, 6" PVC
C328	3	Bolt, Double Arming 5/8" x Req'd Length w/ Nut	F034	3	Connector, Compression, OH Neutral to #750kCM 15kV C/N
C353	2	Nut, Locknut, 1/2"	F036	3	Connector, Compression, OH Phase to #350 CU
C354	12	Nut, Locknut, 5/8"	F059	3	Connector, Compression, #6 CU - #6 CU
C377	4	Washer, Round 1 3/8" Dia, 9/16" Hole	F574	9	Connector, Bolted, #1/0 Sol - #500 Cable to Flat, Double, Bronze
C382	11	Washer, 2 1/4" x 2 1/4" x 3/16" Sq., 11/16" Hole	F597	3	Connector, Bolted, Cable T-Tap, Bronze
C440	3	Bracket, Cable Positioner	F805	3	Terminator, #750 AL/CU 15kV Polymer, Cold Shrink, Stem
D001	20'	Wire, #6 CU Solid, Bare, Annealed			



PROJECT NAME
AERO PARK UNDERGROUND

CLIENT
TRAVERSE CITY LIGHT & POWER

3 PH. RISER - UNDERSLUNG DISC. #750 AL/CU

GRP ENGINEERING, INC., GRAND RAPIDS / PETOSKEY, MI., 231-439-9683

DATE 01-31-2020	PROJECT NO. 19-1026.01
ENG. MPM	DRAWING
DR. KMW	UC5-1U

TAG LISTS

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE FROM SUB RISER	D	1	PC20 A PHASE TO T-TAP #4557
SW #14618			FUSE #30685		
D	1	PC20 B PHASE FROM SUB RISER	D	1	PC20 B PHASE TO T-TAP #4557
SW #14618			FUSE #30685		
D	1	PC20 C PHASE FROM SUB RISER	D	1	PC20 C PHASE TO T-TAP #4557
SW #14618			FUSE #30685		
D	1	PC20 A PHASE TO SWITCH #14683	D	1	PC20 A PHASE FROM SWITCH #14682
SW #14682			SW #14683		
D	1	PC20 B PHASE TO SWITCH #14683	D	1	PC20 B PHASE FROM SWITCH #14682
SW #14682			SW #14683		
D	1	PC20 C PHASE TO SWITCH #14683	D	1	PC20 C PHASE FROM SWITCH #14682
SW #14682			SW #14683		
D	1	PC20 A PHASE TO T-TAP #47188	D	1	PC20 A PHASE FROM T-TAP #32312
FUSE #30686			SW #14685		
D	1	PC20 B PHASE TO T-TAP #47188	D	1	PC20 B PHASE FROM T-TAP #32312
FUSE #30686			SW #14685		
D	1	PC20 C PHASE TO T-TAP #47188	D	1	PC20 C PHASE FROM T-TAP #32312
FUSE #30686			SW #14685		
D	1	PC20 A PHASE FROM FUSE #30686	D	1	PC20 A PHASE TO T-TAP #37143
T-TAP #47188			T-TAP #47188		
D	1	PC20 B PHASE FROM FUSE #30686	D	1	PC20 B PHASE TO T-TAP #37143
T-TAP #47188			T-TAP #47188		
D	1	PC20 C PHASE FROM FUSE #30686	D	1	PC20 C PHASE TO T-TAP #37143
T-TAP #47188			T-TAP #47188		
D	1	PC20 A PHASE FROM T-TAP #47188	D	1	PC20 A PHASE TO XFMR (2440 AERO PARK DR)
T-TAP #37143			T-TAP #47188		
D	1	PC20 B PHASE FROM T-TAP #47188	D	1	PC20 B PHASE TO XFMR (2440 AERO PARK DR)
T-TAP #37143			T-TAP #47188		
D	1	PC20 C PHASE FROM T-TAP #47188	D	1	PC20 C PHASE TO XFMR (2440 AERO PARK DR)
T-TAP #37143			T-TAP #47188		

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE TO SWITCH #14664	D	1	PC20 A PHASE FROM SWITCH #14684
D	1	PC20 B PHASE TO SWITCH #14664	D	1	PC20 B PHASE FROM SWITCH #14684
D	1	PC20 C PHASE TO SWITCH #14664	D	1	PC20 C PHASE FROM SWITCH #14684
D	1	PC22 A PHASE FROM RISER POLE	D	1	PC20 A PHASE TO PRI MTR #430
D	1	PC22 B PHASE FROM RISER POLE	D	1	PC20 B PHASE TO PRI MTR #430
D	1	PC22 C PHASE FROM RISER POLE	D	1	PC20 C PHASE TO PRI MTR #430
D	1	PC20 A PHASE TO SWITCH #14665	D	1	PC20 A PHASE FROM FUSE #1753
D	1	PC20 B PHASE TO SWITCH #14665	D	1	PC20 B PHASE FROM FUSE #1753
D	1	PC20 C PHASE TO SWITCH #14665	D	1	PC20 C PHASE FROM FUSE #1753
D	1	PC20 A PHASE FROM SWITCH #14664	D	1	PC20 A PHASE FROM T-TAP #47188
D	1	PC20 B PHASE FROM SWITCH #14664	D	1	PC20 B PHASE FROM T-TAP #47188
D	1	PC20 C PHASE FROM SWITCH #14664	D	1	PC20 C PHASE FROM T-TAP #47188
D	1	PC20 A PHASE TO SWITCH #14667	D	1	PC20 A PHASE TO T-TAP #3412
D	1	PC20 B PHASE TO SWITCH #14667	D	1	PC20 B PHASE TO T-TAP #3412
D	1	PC20 C PHASE TO SWITCH #14667	D	1	PC20 C PHASE TO T-TAP #3412

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE FROM FUSE #30668	D	1	PC20 A PHASE TO PRI MTR #437
D	1	PC20 B PHASE FROM FUSE #30668	D	1	PC20 B PHASE TO PRI MTR #437
D	1	PC20 C PHASE FROM FUSE #30668	D	1	PC20 C PHASE TO PRI MTR #437
D	1	PC20 A PHASE FROM T-TAP #3412	D	1	PC20 A PHASE TO T-TAP #3414
D	1	PC20 B PHASE FROM T-TAP #3412	D	1	PC20 B PHASE TO T-TAP #3414
D	1	PC20 C PHASE FROM T-TAP #3412	D	1	PC20 C PHASE TO T-TAP #3414
D	1	PC20 A PHASE FROM FUSE #30669	D	1	PC20 A PHASE TO XFMR (2510 AERO PARK DR)
D	1	PC20 B PHASE FROM FUSE #30669	D	1	PC20 B PHASE TO XFMR (2510 AERO PARK DR)
D	1	PC20 C PHASE FROM FUSE #30669	D	1	PC20 C PHASE TO XFMR (2510 AERO PARK DR)
D	1	PC20 A PHASE TO T-TAP #4495	D	1	PC20 A PHASE FROM T-TAP #3414
D	1	PC20 B PHASE TO T-TAP #4495	D	1	PC20 B PHASE FROM T-TAP #3414
D	1	PC20 C PHASE TO T-TAP #4495	D	1	PC20 C PHASE FROM T-TAP #3414
D	1	PC20 A PHASE TO PRI MTR #438	D	1	PC20 A PHASE FROM T-TAP #4495
D	1	PC20 B PHASE TO PRI MTR #438	D	1	PC20 B PHASE FROM T-TAP #4495
D	1	PC20 C PHASE TO PRI MTR #438	D	1	PC20 C PHASE FROM T-TAP #4495

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE FROM SWITCH #14667	D	1	PC20 A PHASE TO SWITCH #15059
D	1	PC20 B PHASE FROM SWITCH #14666	D	1	PC20 B PHASE TO SWITCH #15059
D	1	PC20 C PHASE FROM SWITCH #14666	D	1	PC20 C PHASE TO SWITCH #15059
D	1	PC30 A PHASE FROM SWITCH #14669	D	1	PC20 A PHASE TO SWITCH #14670
D	1	PC30 B PHASE FROM SWITCH #14669	D	1	PC20 B PHASE TO SWITCH #14670
D	1	PC30 C PHASE FROM SWITCH #14669	D	1	PC20 C PHASE TO SWITCH #14670
D	1	PC20 A PHASE TO T-TAP #4430	D	1	PC20 A PHASE FROM FUSE #30678
D	1	PC20 B PHASE TO T-TAP #4430	D	1	PC20 B PHASE FROM FUSE #30678
D	1	PC20 C PHASE TO T-TAP #4430	D	1	PC20 C PHASE FROM FUSE #30678
D	1	PC20 A PHASE FROM T-TAP #3417	D	1	PC20 A PHASE TO T-TAP #4430
D	1	PC20 B PHASE FROM T-TAP #3417	D	1	PC20 B PHASE TO T-TAP #4430
D	1	PC20 C PHASE FROM T-TAP #3417	D	1	PC20 C PHASE TO T-TAP #4430
D	1	PC20 A PHASE FROM FUSE #30671	D	1	PC20 A PHASE TO T-TAP #4430
D	1	PC20 B PHASE FROM FUSE #30671	D	1	PC20 B PHASE TO T-TAP #4430
D	1	PC20 C PHASE FROM FUSE #30671	D	1	PC20 C PHASE TO T-TAP #4430

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE TO T-TAP #3415	D	1	PC20 A PHASE FROM SWITCH #14668
T-TAP #3417	O		SW #14670	O	
D	1	PC20 B PHASE TO T-TAP #3415	D	1	PC20 B PHASE FROM SWITCH #14668
T-TAP #3417	O		SW #14670	O	
D	1	PC20 C PHASE TO T-TAP #3415	D	1	PC20 C PHASE FROM SWITCH #14668
T-TAP #3417	O		SW #14670	O	
D	1	PC20 A PHASE TO SWITCH #6409	D	1	PC20 A PHASE TO T-TAP #620
SW #14671	O		FUSE #30672	O	
D	1	PC20 B PHASE TO SWITCH #6409	D	1	PC20 B PHASE TO T-TAP #620
SW #14671	O		FUSE #30672	O	
D	1	PC20 C PHASE TO SWITCH #6409	D	1	PC20 C PHASE TO T-TAP #620
SW #14671	O		FUSE #30672	O	
D	1	PC20 A PHASE FROM FUSE #30672	D	1	PC20 A PHASE TO XFMR (2550 AERO PARK DR)
T-TAP #620	O		T-TAP #620	O	
D	1	PC20 B PHASE FROM FUSE #30672	D	1	PC20 B PHASE TO XFMR (2550 AERO PARK DR)
T-TAP #620	O		T-TAP #620	O	
D	1	PC20 C PHASE FROM FUSE #30672	D	1	PC20 C PHASE TO XFMR (2550 AERO PARK DR)
T-TAP #620	O		T-TAP #620	O	
D	1	PC20 A PHASE TO XFMR (2531 AERO PARK DR)	D	1	PC20 A PHASE FROM T-TAP #620
T-TAP #620	O		XFMR #5797	O	
D	1	PC20 B PHASE TO XFMR (2531 AERO PARK DR)	D	1	PC20 B PHASE FROM T-TAP #620
T-TAP #620	O		XFMR #5797	O	
D	1	PC20 C PHASE TO XFMR (2531 AERO PARK DR)	D	1	PC20 C PHASE FROM T-TAP #620
T-TAP #620	O		XFMR #5797	O	
D	1	PC20 A PHASE FROM T-TAP #620	D	1	PC20 A PHASE FROM SWITCH #14671
XFMR #8823	O		SW #6409	O	
D	1	PC20 B PHASE FROM T-TAP #620	D	1	PC20 B PHASE FROM SWITCH #14671
XFMR #8823	O		SW #6409	O	
D	1	PC20 C PHASE FROM T-TAP #620	D	1	PC20 C PHASE FROM SWITCH #14671
XFMR #8823	O		SW #6409	O	

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE TO SWITCH #6412	D	1	PC20 A PHASE TO PRI MTR #80774
SW #14672			FUSE #30673		
D	1	PC20 B PHASE TO SWITCH #6412	D	1	PC20 B PHASE TO PRI MTR #80774
SW #14672			FUSE #30673		
D	1	PC20 C PHASE TO SWITCH #6412	D	1	PC20 C PHASE TO PRI MTR #80774
SW #14672			FUSE #30673		
D	1	PC20 A PHASE FROM FUSE #30673	D	1	PC20 A PHASE TO T-TAP #4502
PRI MTR #80774			FUSE #30674		
D	1	PC20 B PHASE FROM FUSE #30673	D	1	PC20 B PHASE TO T-TAP #4502
PRI MTR #80774			FUSE #30674		
D	1	PC20 C PHASE FROM FUSE #30673	D	1	PC20 C PHASE TO T-TAP #4502
PRI MTR #80774			FUSE #30674		
D	1	PC20 A PHASE FROM FUSE #30674	D	1	PC20 A PHASE TO T-TAP #4499
T-TAP #4502			T-TAP #4502		
D	1	PC20 B PHASE FROM FUSE #30674	D	1	PC20 B PHASE TO T-TAP #4499
T-TAP #4502			T-TAP #4502		
D	1	PC20 C PHASE FROM FUSE #30674	D	1	PC20 C PHASE TO T-TAP #4499
T-TAP #4502			T-TAP #4502		
D	1	PC20 A PHASE TO XFMR (2575 AERO PARK DR)	D	1	PC20 A PHASE FROM T-TAP #4502
T-TAP #4502			XFMR #2115		
D	1	PC20 B PHASE TO XFMR (2575 AERO PARK DR)	D	1	PC20 B PHASE FROM T-TAP #4502
T-TAP #4502			XFMR #2115		
D	1	PC20 C PHASE TO XFMR (2575 AERO PARK DR)	D	1	PC20 C PHASE FROM T-TAP #4502
T-TAP #4502			XFMR #2115		
D	1	PC20 A PHASE FROM T-TAP #4502	D	1	PC20 A PHASE TO XFMR (2651 AERO PARK DR)
T-TAP #4499			T-TAP #4499		
D	1	PC20 B PHASE FROM T-TAP #4502	D	1	PC20 B PHASE TO XFMR (2651 AERO PARK DR)
T-TAP #4499			T-TAP #4499		
D	1	PC20 C PHASE FROM T-TAP #4502	D	1	PC20 C PHASE TO XFMR (2651 AERO PARK DR)
T-TAP #4499			T-TAP #4499		

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE FROM T-TAP #4499	D	1	PC20 B PHASE TO XFMR (ST LT)
XFMR #13940			T-TAP #4499		
D	1	PC20 B PHASE FROM T-TAP #4499	D	1	PC20 B PHASE FROM T-TAP #4499
XFMR #13940			XFMR ST LT		
D	1	PC20 C PHASE FROM T-TAP #4499	D		
XFMR #13940					
D	1	PC20 A PHASE TO XFMR (2640 AERO PARK DR)	D	1	PC20 A PHASE FROM T-TAP #4499
T-TAP #4499			XFMR #2640		
D	1	PC20 B PHASE TO XFMR (2640 AERO PARK DR)	D	1	PC20 B PHASE FROM T-TAP #4499
T-TAP #4499			XFMR #2640		
D	1	PC20 C PHASE TO XFMR (2640 AERO PARK DR)	D	1	PC20 C PHASE FROM T-TAP #4499
T-TAP #4499			XFMR #2640		
D	1	PC20 A PHASE TO XFMR (2670 AERO PARK DR)	D	1	PC20 A PHASE FROM T-TAP #4499
T-TAP #4499			XFMR #2670		
D	1	PC20 B PHASE TO XFMR (2670 AERO PARK DR)	D	1	PC20 B PHASE FROM T-TAP #4499
T-TAP #4499			XFMR #2670		
D	1	PC20 C PHASE TO XFMR (2670 AERO PARK DR)	D	1	PC20 C PHASE FROM T-TAP #4499
T-TAP #4499			XFMR #2640		
D	1	PC20 A PHASE FROM SW #14672	D	1	PC20 A PHASE TO SWITCH #14674
SW #6410			SW #14673		
D	1	PC20 B PHASE FROM SW #14672	D	1	PC20 B PHASE TO SWITCH #14674
SW #6410			SW #14673		
D	1	PC20 C PHASE FROM SW #14672	D	1	PC20 C PHASE TO SWITCH #14674
SW #6410			SW #14673		
D	1	PC20 A PHASE TO T-TAP #4709	D	1	PC20 A PHASE FROM FUSE #30675
FUSE #30675			T-TAP #4709		
D	1	PC20 B PHASE TO T-TAP #4709	D	1	PC20 B PHASE FROM FUSE #30675
FUSE #30675			T-TAP #4709		
D	1	PC20 C PHASE TO T-TAP #4709	D	1	PC20 C PHASE FROM FUSE #30675
FUSE #30675			T-TAP #4709		

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE TO XFMR (2670 AERO PARK DR)	D	1	PC20 A PHASE FROM T-TAP #4709
T-TAP #4709			XFMR #2670		
D	1	PC20 B PHASE TO XFMR (2670 AERO PARK DR)	D	1	PC20 B PHASE FROM T-TAP #4709
T-TAP #4709			XFMR #2670		
D	1	PC20 C PHASE TO XFMR (2670 AERO PARK DR)	D	1	PC20 C PHASE FROM T-TAP #4709
T-TAP #4709			XFMR #2640		
D	1	PC20 A PHASE TO XFMR (727 FLY DON'T DR)	D	1	
T-TAP #4709					
D	1	PC20 A PHASE FROM T-TAP #4709	D	1	
XFMR #8816					
D	1	PC20 A PHASE TO T-TAP #4501	D	1	PC20 A PHASE FROM FUSE #30676
FUSE #30676			T-TAP #4501		
D	1	PC20 B PHASE TO T-TAP #4501	D	1	PC20 B PHASE FROM FUSE #30676
FUSE #30676			T-TAP #4501		
D	1	PC20 C PHASE TO T-TAP #4501	D	1	PC20 C PHASE FROM FUSE #30676
FUSE #30676			T-TAP #4501		
D	1	PC20 A PHASE TO PRI MTR #25	D	1	PC20 A PHASE FROM T-TAP #4501
T-TAP #4501			PRI MTR #25		
D	1	PC20 B PHASE TO PRI MTR #25	D	1	PC20 B PHASE FROM T-TAP #4501
T-TAP #4501			PRI MTR #25		
D	1	PC20 C PHASE TO PRI MTR #25	D	1	PC20 C PHASE FROM T-TAP #4501
T-TAP #4501			PRI MTR #25		
D	1	PC20 A PHASE TO T-TAP #4556	D	1	PC20 A PHASE FROM T-TAP #4501
T-TAP #4501			T-TAP #4556		
D	1	PC20 B PHASE TO T-TAP #4556	D	1	PC20 B PHASE FROM T-TAP #4501
T-TAP #4501			T-TAP #4556		
D	1	PC20 C PHASE TO T-TAP #4556	D	1	PC20 C PHASE FROM T-TAP #4501
T-TAP #4501			T-TAP #4556		

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC20 A PHASE FROM T-TAP #4556	D	1	PC20 A PHASE FROM FUSE #30685
D	1	PC20 B PHASE FROM T-TAP #4556	D	1	PC20 B PHASE FROM FUSE #30685
D	1	PC20 C PHASE FROM T-TAP #4556	D	1	PC20 C PHASE FROM FUSE #30685
D	1	PC20 A PHASE TO T-TAP #4557	D	1	PC20 A PHASE FROM SWITCH #14673
D	1	PC20 B PHASE TO T-TAP #4557	D	1	PC20 B PHASE FROM SWITCH #14673
D	1	PC20 C PHASE TO T-TAP #4557	D	1	PC20 C PHASE FROM SWITCH #14673
D	1	PC23 A PHASE TO SWITCH #14675	D	1	PC23 A PHASE TO PRI MTR #20
D	1	PC23 B PHASE TO SWITCH #14675	D	1	PC23 B PHASE TO PRI MTR #20
D	1	PC23 C PHASE TO SWITCH #14675	D	1	PC23 C PHASE TO PRI MTR #20
D	1	PC23 A PHASE TO T-TAP #4487	D	1	PC23 A PHASE FROM FUSE #30677
D	1	PC23 B PHASE TO T-TAP #4487	D	1	PC23 B PHASE FROM FUSE #30677
D	1	PC23 C PHASE TO T-TAP #4487	D	1	PC23 C PHASE FROM FUSE #30677
D	1	PC23 A PHASE FROM FUSE #30678	D	1	PC23 A PHASE TO T-TAP #4491
D	1	PC23 B PHASE FROM FUSE #30678	D	1	PC23 B PHASE TO T-TAP #4491
D	1	PC23 C PHASE FROM FUSE #30678	D	1	PC23 C PHASE TO T-TAP #4491

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC23 A PHASE TO XFMR (2749 AERO PARK DR)	D	1	PC23 A PHASE FROM T-TAP #4487
T-TAP #4487	O		TRANSCL #5789	O	
D	1	PC23 B PHASE TO XFMR (2749 AERO PARK DR)	D	1	PC23 B PHASE FROM T-TAP #4487
T-TAP #4487	O		TRANSCL #5789	O	
D	1	PC23 C PHASE TO XFMR (2749 AERO PARK DR)	D	1	PC23 C PHASE FROM T-TAP #4487
T-TAP #4487	O		TRANSCL #5789	O	
D	1	PC23 A PHASE FROM T-TAP #4487	D	1	PC23 A PHASE FROM T-TAP #4711
T-TAP #4491	O		T-TAP #4491	O	
D	1	PC23 B PHASE FROM T-TAP #4487	D	1	PC23 B PHASE FROM T-TAP #4711
T-TAP #4491	O		T-TAP #4491	O	
D	1	PC23 C PHASE FROM T-TAP #4487	D	1	PC23 C PHASE FROM T-TAP #4711
T-TAP #4491	O		T-TAP #4491	O	
D	1	PC23 A PHASE TO XFMR (2707 AERO PARK CT)	D	1	PC23 A PHASE FROM T-TAP #4491
T-TAP #4491	O		XFMR #5790	O	
D	1	PC23 B PHASE TO XFMR (2707 AERO PARK CT)	D	1	PC23 B PHASE FROM T-TAP #4491
T-TAP #4491	O		XFMR #5790	O	
D	1	PC23 C PHASE TO XFMR (2707 AERO PARK CT)	D	1	PC23 C PHASE FROM T-TAP #4491
T-TAP #4491	O		XFMR #5790	O	
D	1	PC23 A PHASE TO XFMR (2779 AERO PARK CT)	D	1	PC23 A PHASE FROM T-TAP #4491
T-TAP #4491	O		XFMR #8820	O	
D	1	PC23 B PHASE TO XFMR (2779 AERO PARK CT)	D	1	PC23 B PHASE FROM T-TAP #4491
T-TAP #4491	O		XFMR #8820	O	
D	1	PC23 C PHASE TO XFMR (2779 AERO PARK CT)	D	1	PC23 C PHASE FROM T-TAP #4491
T-TAP #4491	O		XFMR #8820	O	
D	1	PC23 A PHASE FROM RISER POLE	D	1	PC23 A PHASE TO T-TAP #30A
T-TAP #3410	O		T-TAP #3410	O	
D	1	PC23 B PHASE FROM RISER POLE	D	1	PC23 B PHASE TO T-TAP #30A
T-TAP #3410	O		T-TAP #3410	O	
D	1	PC23 C PHASE FROM RISER POLE	D	1	PC23 C PHASE TO T-TAP #30A
T-TAP #3410	O		T-TAP #3410	O	

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC23 A PHASE FROM T-TAP #3410	D	1	PC23 A PHASE TO T-TAP #4711
T-TAP #30A			T-TAP #3410		
D	1	PC23 B PHASE FROM T-TAP #3410	D	1	PC23 B PHASE TO T-TAP #4711
T-TAP #30A			T-TAP #3410		
D	1	PC23 C PHASE FROM T-TAP #3410	D	1	PC23 C PHASE TO T-TAP #4711
T-TAP #30A			T-TAP #3410		
D	1	PC23 A PHASE FROM T-TAP #3410	D	1	PC23 A PHASE TO T-TAP #4491
T-TAP #4711			T-TAP #4711		
D	1	PC23 B PHASE FROM T-TAP #3410	D	1	PC23 B PHASE TO T-TAP #4491
T-TAP #4711			T-TAP #4711		
D	1	PC23 C PHASE FROM T-TAP #3410	D	1	PC23 C PHASE TO T-TAP #4491
T-TAP #4711			T-TAP #4711		
D	1	PC23 A PHASE TO XFMR (2475 AERO PARK CT)	D	1	PC23 A PHASE FROM T-TAP #4711
T-TAP #4711			XFMR #8821		
D	1	PC23 B PHASE TO XFMR (2475 AERO PARK CT)	D	1	PC23 B PHASE FROM T-TAP #4711
T-TAP #4711			XFMR #8821		
D	1	PC23 C PHASE TO XFMR (2475 AERO PARK CT)	D	1	PC23 C PHASE FROM T-TAP #4711
T-TAP #4711			XFMR #8821		
D	1	PC23 A PHASE TO XFMR (2495 AERO PARK CT)	D	1	PC23 A PHASE FROM T-TAP #4711
T-TAP #4711			XFMR #5791		
D	1	PC23 B PHASE TO XFMR (2495 AERO PARK CT)	D	1	PC23 B PHASE FROM T-TAP #4711
T-TAP #4711			XFMR #5791		
D	1	PC23 C PHASE TO XFMR (2495 AERO PARK CT)	D	1	PC23 C PHASE FROM T-TAP #4711
T-TAP #4711			XFMR #5791		
D	1	PC23 A PHASE FROM SWITCH #14675	D	1	PC23 A PHASE TO SWITCH #14677
SW #14676			SW #6414		
D	1	PC23 B PHASE FROM SWITCH #14675	D	1	PC23 B PHASE TO SWITCH #14677
SW #14676			SW #6414		
D	1	PC23 C PHASE FROM SWITCH #14675	D	1	PC23 C PHASE TO SWITCH #14677
SW #14676			SW #6414		

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC23 A PHASE TO T-TAP #4485	D	1	PC23 A PHASE TO T-TAP #4484
FUSE #30679			FUSE #30680		
D	1	PC23 B PHASE TO T-TAP #4485	D	1	PC23 B PHASE TO T-TAP #4484
FUSE #30674			FUSE #30680		
D	1	PC23 C PHASE TO T-TAP #4485	D	1	PC23 C PHASE TO T-TAP #4484
FUSE #30674			FUSE #30680		
D	1	PC23 A PHASE FROM FUSE #30679	D	1	PC23 A PHASE TO XFMR (2800 AERO PARK DR)
T-TAP #4485			T-TAP #4485		
D	1	PC23 B PHASE FROM FUSE #30679	D	1	PC23 B PHASE TO XFMR (2800 AERO PARK DR)
T-TAP #4485			T-TAP #4485		
D	1	PC23 C PHASE FROM FUSE #30679	D	1	PC23 C PHASE TO XFMR (2800 AERO PARK DR)
T-TAP #4485			T-TAP #4485		
D	1	PC23 A PHASE FROM T-TAP #4485	D	1	PC23 A PHASE FROM FUSE #30680
XFMR #5788			T-TAP #4484		
D	1	PC23 B PHASE FROM T-TAP #4485	D	1	PC23 B PHASE FROM FUSE #30680
XFMR #5788			T-TAP #4484		
D	1	PC23 C PHASE FROM T-TAP #4485	D	1	PC23 C PHASE FROM FUSE #30680
XFMR #5788			T-TAP #4484		
D	1	PC23 A PHASE TO XFMR (2779 AERO PARK DR)	D	1	PC23 A PHASE FROM T-TAP #4484
T-TAP #4484			XFMR #X2		
D	1	PC23 B PHASE TO XFMR (2779 AERO PARK DR)	D	1	PC23 B PHASE FROM T-TAP #4484
T-TAP #4484			XFMR #X2		
D	1	PC23 C PHASE TO XFMR (2779 AERO PARK DR)	D	1	PC23 C PHASE FROM T-TAP #4484
T-TAP #4484			XFMR #X2		
D	1	PC23 A PHASE TO XFMR (2801 AERO PARK DR)	D	1	PC23 A PHASE FROM T-TAP #4484
T-TAP #4484			XFMR #2801		
D	1	PC23 B PHASE TO XFMR (2801 AERO PARK DR)	D	1	PC23 B PHASE FROM T-TAP #4484
T-TAP #4484			XFMR #2801		
D	1	PC23 C PHASE TO XFMR (2801 AERO PARK DR)	D	1	PC23 C PHASE FROM T-TAP #4484
T-TAP #4484			XFMR #2801		

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC23 A PHASE FROM SWITCH #6414	D	1	PC23 A PHASE TO SWITCH #14679
SW #14677	O		SW #14678	O	
D	1	PC23 B PHASE FROM SWITCH #6414	D	1	PC23 B PHASE TO SWITCH #14679
SW #14677	O		SW #14678	O	
D	1	PC23 C PHASE FROM SWITCH #6414	D	1	PC23 C PHASE TO SWITCH #14679
SW #14677	O		SW #14678	O	
D	1	PC23 A PHASE TO PRI MTR #82791	D	1	PC23 A PHASE FROM FUSE #30681
FUSE #30681	O		PRI. MTR. #82791	O	
D	1	PC23 B PHASE TO PRI MTR #82791	D	1	PC23 B PHASE FROM FUSE #30681
FUSE #30681	O		PRI. MTR. #82791	O	
D	1	PC23 C PHASE TO PRI MTR #82791	D	1	PC23 C PHASE FROM FUSE #30681
FUSE #30681	O		PRI. MTR. #82791	O	
D	1	PC23 A PHASE TO PRI MTR #82792	D	1	PC23 A PHASE FROM FUSE #30682
FUSE #30682	O		PRI. MTR. #82792	O	
D	1	PC23 B PHASE TO PRI MTR #82792	D	1	PC23 B PHASE FROM FUSE #30682
FUSE #30682	O		PRI. MTR. #82792	O	
D	1	PC23 C PHASE TO PRI MTR #82792	D	1	PC23 C PHASE FROM FUSE #30682
FUSE #30682	O		PRI. MTR. #82792	O	
D	1	PC23 A PHASE FROM SWITCH #14679	D	1	PC23 A PHASE TO SWITCH #15060
SW #14679	O		SW #14680	O	
D	1	PC23 B PHASE FROM SWITCH #14679	D	1	PC23 B PHASE TO SWITCH #15060
SW #14679	O		SW #14680	O	
D	1	PC23 C PHASE FROM SWITCH #14678	D	1	PC23 C PHASE TO SWITCH #15060
SW #14679	O		SW #14680	O	
D	1	PC23 A PHASE TO T-TAP #4481	D	1	PC23 A PHASE FROM FUSE #30683
FUSE #30683	O		T-TAP #4481	O	
D	1	PC23 B PHASE TO T-TAP #4481	D	1	PC23 B PHASE FROM FUSE #30683
FUSE #30683	O		T-TAP #4481	O	
D	1	PC23 C PHASE TO T-TAP #4481	D	1	PC23 C PHASE FROM FUSE #30683
FUSE #30683	O		T-TAP #4481	O	

BLACK LAMACOID TAG LIST FOR:
AERO PARK UNDERGROUND -- PRIMARY TAGS

TAG TYPE: A = 2" x 9" B = 4" x 6" C = 2" X 4" D = 1" X 3" E = 2" x 6"

TAG SIZE	# OF TAGS	TAG LETTERING	TAG SIZE	# OF TAGS	TAG LETTERING
D	1	PC23 A PHASE TO PRI MTR #17	D	1	PC23 A PHASE FROM T-TAP #4481
T-TAP #4481	O		PRI. MTR. #17	O	
D	1	PC23 B PHASE TO PRI MTR #17	D	1	PC23 B PHASE FROM T-TAP #4481
T-TAP #4481	O		PRI. MTR. #17	O	
D	1	PC23 C PHASE TO PRI MTR #17	D	1	PC23 C PHASE FROM T-TAP #4481
T-TAP #4481	O		PRI. MTR. #17	O	
D	1	PC23 A PHASE TO T-TAP #4479	D	1	PC23 A PHASE FROM FUSE #30684
FUSE #30684	O		T-TAP #4479	O	
D	1	PC23 B PHASE TO T-TAP #4479	D	1	PC23 B PHASE FROM FUSE #30684
FUSE #30684	O		T-TAP #4479	O	
D	1	PC23 C PHASE TO T-TAP #4479	D	1	PC23 C PHASE FROM FUSE #30684
FUSE #30684	O		T-TAP #4479	O	
D	1	PC23 A PHASE TO T-TAP #3931	D	1	PC23 A PHASE FROM T-TAP #4479
T-TAP #4479	O		T-TAP #3931	O	
D	1	PC23 B PHASE TO T-TAP #3931	D	1	PC23 B PHASE FROM T-TAP #4479
T-TAP #4479	O		T-TAP #3931	O	
D	1	PC23 C PHASE TO T-TAP #3931	D	1	PC23 C PHASE FROM T-TAP #4479
T-TAP #4479	O		T-TAP #3931	O	
D	1	PC23 A PHASE TO T-TAP #3883	D	1	PC23 A PHASE FROM T-TAP #4479
T-TAP #4479	O		T-TAP #3883	O	
D	1	PC23 B PHASE TO T-TAP #3883	D	1	PC23 B PHASE FROM T-TAP #4479
T-TAP #4479	O		T-TAP #3883	O	
D	1	PC23 C PHASE TO T-TAP #3883	D	1	PC23 C PHASE FROM T-TAP #4479
T-TAP #4479	O		T-TAP #3883	O	
D	1	PC23 A PHASE FROM SWITCH #14680	D		
SW #15060	O			O	
D	1	PC23 B PHASE FROM SWITCH #14680	D		
SW #15060	O			O	
D	1	PC23 C PHASE FROM SWITCH #14680	D		
SW #15060	O			O	

DISTRIBUTION LINE

MATERIAL LIST

**TRAVERSE CITY LIGHT & POWER
AERO PARK UNDERGROUND
ELECTRICAL CABLE & EQUIPMENT INSTALLATION -- MATERIAL LIST**

ITEM NO.	QUANTITY	OWNER FURNISHED	ITEM DESCRIPTION	UTILITY ITEM #	UTILITY CATALOG #
A-118	9	X	Switchgear Padmount, 15kV Dead Front, 600A, 2 Switch, 2 Fuse	Federal Pacific	PSE-9
A-120	3	X	Switchgear Padmount, 15kV Dead Front, 600A, 3 Switch, 1 Fuse	Federal Pacific	PSE-11
A-621	3	X	Switch, Distribution, 12" Blade, 600A, 14.4kV, 110kV BIL, Cypoxy Insulator	S&C	4942R10-E-D2
B-010	1	X	Insulator, Pin, Polymer, 15kV, F-Neck, ANSI 55-4	Hendrix	HPI-55-4
B-051	1	X	Insulator, Guy Strain, Porcelain, 1/2", 12,000#, ANSI 54-2	MacLean	L-504
B-126	1	X	Insulator, Guy Strain, Fiberglass, Clevis-Clevis Roller, 54", 21,000#	MacLean	GCC21-54R
B-165	1	X	Bracket, 0° Extension, Three-Phase, 3-Holes per Phase, 48" x 13"	MacLean	G3MA014813DDB
B-250	12	X	Suspension, Polymer, 15kV, SML 15,000#, Clevis-Eye, Type PDI-15	Ohio Brass	401015-0215
B-472	2	STOCK	Elbow Arrester, 15kV, 8.4kV MCOV	Elastimold	167ESA-10
B-711	3	X	Arrester, Riser Pole Class, 8.4kV MCOV, Polymer	MacLean	ZRP010-0000100
B-853	3	X	Guard, Bushing Animal Guard	Salisbury	21116
C-018	1	X	Anchor Shackle, 5/8"	Chance	5801
C-027	1	X	Pin, Crossarm, Steel, 5/8" X 10 3/4", 1" Thread	MacLean	J203Z
C-038	2	X	Pole Eye Plate, 4-5", 21,000#	MacLean	UGA-66-4
C-050	1	X	Clevis, Thimble, Dead-End, 20,000#	MacLean	CT-88
C-1048	1	X	Crossarm, Composite, Dead End, 3-5/8" X 4-5/8" X 10', 10,000#	Pupi	DA3000-120E4-B92
C-228	4	X	Grip, Guy Dead-End, 10M Alumoweld	Preformed	AWDE-4116
C-260	2	X	Crossarm, Wood, 3-3/4" X 4-3/4" X 8', DF, Penta, REA Spec, WQC, Type 03	Brooks	
C-280	2	X	Brace, Wood Crossarm, 60" Span, 18" Drop	Alumaform	RA6018
C-305	30	X	Bolt, SS Hex, 1/2" x 2"		
C-306	60	X	Washer, SS Flat, 1/2"		
C-308	30	X	Nut, SS Hex, 1/2"		
C-314	20	X	Screw, Lag 1/2" X 4"	Chance	508754
C-317_6	4	X	Bolt, Machine, 1/2" X 6" w/Nut	Chance	8706
C-318_10	2	X	Bolt, Machine, 5/8" X 10" w/Nut	Chance	8810
C-318_12	3	X	Bolt, Machine, 5/8" X 12" w/Nut	Chance	8812
C-318_14	3	X	Bolt, Machine, 5/8" X 14" w/Nut	Chance	8814
C-318_16	2	X	Bolt, Machine, 5/8" X 16" w/Nut	Chance	8816
C-319_14	6	X	Bolt, Machine, 3/4" X 14" w/Nut	Chance	8914
C-324_7	4	X	Bolt, Carriage, 3/8" X 7" w/Nut	Chance	8637
C-328_20	3	X	Bolt, Double Arming, 5/8" X 20" w/Nuts	Chance	8870
C-328_22	3	X	Bolt, Double Arming, 5/8" X 22" w/Nuts	Chance	8872
C-328_24	3	X	Bolt, Double Arming, 5/8" X 24" w/Nuts	Chance	8874
C-335_12	1	X	Bolt, Oval Eye, 5/8" X 12" w/ Nut	Chance	29962
C-353	4	X	Nut, Locknut, 1/2"	Chance	3511
C-354	13	X	Nut, Locknut, 5/8"	Chance	3512
C-355	6	X	Nut, Locknut, 3/4"	Chance	3513
C-364	14	X	Nut, Eye, 5/8"	Chance	6502
C-377	4	X	Washer, Round 1-3/8" Dia., 9/16" Hole	Hubbell	PS6803
C-382	13	X	Washer, 2-1/4" X 2-1/4" X 3/16" Square, 11/16" Hole	Hubbell	6813
C-385	3	X	Washer, 3" X 3" X 1/4" Square Curved Washer, 11/16" Hole	Chance	682312
C-390_C	6	X	Washer, Cast, 4" X 4" X 1/4" Square Curved Washer, 13/16" Hole	Chance	GCW41
C-440	3	X	Bracket, Cable Positioner	Alumaform	CS-820
C-563	1	X	Pre-Formed Ties, Wraplock, #336.4 ACSR 18/1, F-Neck, ANSI 55-4	Preformed	WTF-0221
C-852	16	X	Clamp, Straight Line Dead-End, Swing Away, Side Opening, #4 to #397.5 ACSR	Hubbell	GD-963A
D-001	20	X	Wire, #6 CU Solid, Bare, Soft Drawn	Southwire	
D-016	30	X	Cable, #2 CU 7-Strand, Bare, Soft Drawn	Southwire	

**TRAVERSE CITY LIGHT & POWER
AERO PARK UNDERGROUND
ELECTRICAL CABLE & EQUIPMENT INSTALLATION -- MATERIAL LIST**

ITEM NO.	QUANTITY	OWNER FURNISHED	ITEM DESCRIPTION	UTILITY ITEM #	UTILITY CATALOG #
D-019_1	80	X	Cable, #4/0 CU 19-Strand, Bare, Soft Drawn	Southwire	
D-021	135	X	Cable, 350 MCM CU 19-Strand, Bare, Soft Drawn	Southwire	
D-1047	3	X	Grip, Suspension, Offset Eye, Single Weave, 1-5/8" - 2-1/2", 5,000#	Lewis	OE-162-SW
D-215	948	X	Cable, 336.4 kcmil 18/1 ACSR, "Merlin"	Southwire	
D-413	21,345	PLS Order	Cable, Concentric Neutral, 750 MCM CU 133% EPR 15kV, 33% Neutral (3) 1,000', (3) 2,000', & (6) 2,200' Reels	Kerite/Okonite	
D-460	410	Stock	Cable, Concentric Neutral, #2 AL 133% EPR 15kV, 33% Neutral (1) Partial reel from stock	Kerite/Okonite	
D-464	12,960	PLS Order	Cable, Concentric Neutral, #4/0 AL 133% EPR 15kV, 33% Neutral (6) 2,500' Reels	Kerite/Okonite	
D-666	100	X	Cable, Guy Strand, 10M Alumoweld	Alumoweld	
D-1040	12	X	Lubricant, Cable Pulling, Water-based, Non-flammable, Summer-grade, 5 Gal Pail	Polywater	Polywater J, 5gal
E-091	35	X	Clamp, Cable - Tank Lug, #8-#2/0, Bronze	Anderson	GTCS-34A
E-104	140	X	Staples, Coppercoated, Down Lead, Rolled/Diamond Point, #4/0 CU Stranded	MacLean	J6496
E-132	1	X	Duct Seal	Duxseal	
E-178	8	X	Conduit Support Strap, 6"	Minerallac	HD298
E-259	30' (3 pcs)	X	Conduit, 6" PVC SCH 40, 10' Lengths (Total Footage Listed)	Prime Conduit	
E-516	1	X	Conduit, 6" Rigid Galvanized Steel, 10' Length		
E-679	1	X	End Bell, 6" PVC	Carlton	E997R
E-695	1	X	Female Threaded Adapter, 6" PVC	Carlton	E942R
F-032	10	X	Connector, Compression, #336,4/0 ACSR to #336,4/0 ACSR or #4/0 CU	Blackburn	WR775
F-033	18	X	Connector, Compression, #477,336,4/0 ACSR to #2/0,1/0,2,4 ACSR or #2/0,1/0,2,4,6CU	Blackburn	WR815
F-035	24	X	Connector, Compression, #477,336,4/0 ACSR to #336 ACSR	Blackburn	WR875
F-036	3	X	Connector, Compression, #477,336,4/0 ACSR to #477,336,4/0 ACSR or #4/0 CU	Blackburn	WR885
F-059	3	X	Connector, Compression, Crimp-It, #6 Sol, #4 Str CU to #6 Sol/Str CU	Burndy	YC4C6
F-172	119	X	Connector, Four Position, Set Screw, #10 - 250MCM	CMC	NA250-4I
F-173	76	X	Connector, Six Position, Set Screw, #10 - 250MCM	CMC	NA250-6I
F-193		X	Connector, Stem, UG Cable Termination, #2 AWG Str. & #1/0 AWG Sol	3M	SC0001
F-572	48	X	Connector, Bolted, #8 Sol - #2/0 Str Cable to Flat, Single, Bronze	Anderson	TLS32
F-574		X	Connector, Bolted, #1/0 Sol - #500 Cable to Flat, Double, Bronze	Anderson	TLD-62
F-580	9	X	Connector, Bolted, #1/0 CU Solid - #500 CU Str Cable to 2-Hole NEMA Pad, Bronze	Anderson	SWL-050-B
F-794	30	X	Connector, Compression, Terminal, CU/AL, #4/0 to 2 Hole NEMA PAD	3M	40145
F-797	6	X	Connector, Compression, Terminal, CU/AL, #750 to 2 Hole NEMA PAD	Burndy	YA39A5
F-803	30	X	Terminator, 15kV QT-III Silicone Rubber, #2-#4/0 JCN/CN	3M	7652-S-4
F-805	6	X	Terminator, 15kV QT-III Silicone Rubber, #500-#1000 JCN/CN	3M	7655-S-4
F-881	6	STOCK	Insulated Cap, 15kV, 600A	Elastimold	656DR
F-909	18	X	Junction, 4-Point, 15kV, 200A w/ U-Strap	Elastimold	164J4-5
F-916	3	X	Junction, 5-Point, 15kV, 200A w/ U-Strap	Elastimold	J5-22222-15
F-921	1	X	Splice, 15kV Molded Rubber, #2 Str JCN/CN w/ Connector	3M	5411-CI-2
F-1033	15	X	Elbow, w/ Jacket Seal, 200A Loadbreak, 15kV 133%, #1/0 AL/CU Strand	Elastimold	165LRJS-B5240
F-1041	22	X	Elbow, w/ Jacket Seal & Test Point, 200A Loadbreak, 15kV 133%, #2 AL/CU Strand	Elastimold	166LRJS-B-5220
F-1043	108	X	Elbow, w/ Jacket Seal & Test Point, 200A Loadbreak, 15kV 133%, #4/0 AL Strand	Elastimold	166LRJS-C5270
F-1052	55	X	Insulated Cap, 200A Loadbreak, w/ Ground, 15kV	Elastimold	160DRG
F-1101	93	X	Elbow, w/ Test Point, 600A Deadbreak, 15kV 133%, 750 AL/CU Strand	Elastimold	656CETP-MAC03-S
F-1139	24	X	Parking Bushing, Feed-Thru, 200A Loadbreak, 15kV	Elastimold	164FT
F-1380	80	X	Tape, Vinyl, Black, 3/4"	3M	33+SUPER-3/4X66F
F-1381	80	X	Tape, Vinyl, Blue, 3/4"	3M	35-Blue-3/4

**TRAVERSE CITY LIGHT & POWER
AERO PARK UNDERGROUND
ELECTRICAL CABLE & EQUIPMENT INSTALLATION -- MATERIAL LIST**

ITEM NO.	QUANTITY	OWNER FURNISHED	ITEM DESCRIPTION	UTILITY ITEM #	UTILITY CATALOG #
F-1386	80	X	Tape, Vinyl, Red, 3/4"	3M	35-Red-3/4
F-1706	3	X	Connector, Power Grip, #397 - #1/0 ACSR to #2/0 - #8	Utilco	SCH-3972
G-162	7	X	Primary Sectionalizing Enclosure, 3Ø, 15kV, 200A/600A, 4-way	Durham	AMSPR36421-0 (or e
H-434	3	X	Fault Indicator, UG, LED, Full Time Current Reset, <1.57" Dia., 4 Hr. Reset	Power Delivery	29-6114-004
H-436	31	X	Fault Indicator, UG, LED, Full Time Current Reset, 1.57" - 2.37" Dia., 4 Hr. Reset, Kit	Power Delivery	29-6115-3FO
H-462	6	X	Fault Indicator, OH, Current/Normal Reset, 100A Trip, 12 Hr. Reset	Power Delivery	41-20-01-103
H-1303	3	X	Fuse Unit, SMU-20, 14.4kV, Type K, 10A	S&C	702010
H-1305	3	X	Fuse Unit, SMU-20, 14.4kV, Type K, 15A	S&C	702015
H-1307	3	X	Fuse Unit, SMU-20, 14.4kV, Type K, 25A	S&C	702025
H-1309	3	X	Fuse Unit, SMU-20, 14.4kV, Type K, 40A	S&C	702040
H-1313	42	X	Fuse Unit, SMU-20, 14.4kV, Type K, 100A	S&C	702100
H-1314	3	X	Fuse Unit, SMU-20, 14.4kV, Type K, 140A	S&C	702140