

Project Manual

Lewis and Clark County

Fueling and MG/CL Systems

November 2024

Prepared by:



Set No.: _____
Project # 1-18132 TO15

PROJECT MANUAL

Fueling and MG/CL Systems

LEWIS AND CLARK COUNTY

November 2024

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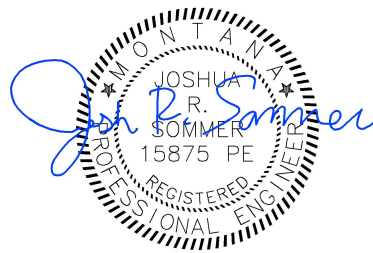


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INVITATION TO BID

SECTION 00100

INVITATION TO BID

The Board of County Commissioners of Lewis and Clark County is soliciting competitive bids for the construction of the Lewis & Clark County – Fueling and Mg/Cl Systems. The project is divided into a Base Bid and three additive alternates and generally consists of demolition work, a new fueling facility, a new Mg/Cl facility, concrete foundations and slabs, fencing, gates and electrical work, in Lewis and Clark County, Montana.

All Bids must be in accordance with the contract documents. Complete details of the solicitation may be examined or obtained online at <https://www.lccountymt.gov/Government/Grants-and-Purchasing/Bids-and-Proposals-Current> or by contacting the designated point of contact in accordance with Article 2.01 of Instructions to Bidders. Contractors are encouraged to check for any addenda issued prior to submitting a bid. The designated point of contact for all communication regarding this solicitation is Josh Sommer, jsommer@greatwesteng.com or by calling (406) 604-7547. A cone of silence is established for this solicitation which prohibits any bidder, or entity with financial interest in the bid award, from communicating regarding the solicitation with any Lewis and Clark County elected official, employee, or agent other than the designated point of contact.

Sealed bids must be delivered to the Lewis and Clark County Commissioner's Office, 316 N. Park Ave., Room 345, Helena, MT 59623 on or before 4:00 PM local time on Wednesday, December 4, 2024. The envelope containing the sealed bids must be labeled, "Fueling and Mg/Cl Systems", Bid Enclosed." Responsive bids will be unsealed publicly and read aloud on Thursday, December 5, 2024 at 9:00 am in Room 330 of the City-County Administrative Building, 316 N. Park Avenue, Helena, MT.

There will be a Pre-Bid Conference on Thursday, November 21, 2024, at 11:00 a.m. in the Public Works Weed District Conference Room, located at 3402 Cooney Drive, Helena, MT. Interested bidders are encouraged to attend.

Contractor and any of the Contractor's Subcontractors bidding or doing work on this project will be required to be registered with the Montana Department of Labor and Industry (DLI). Forms for registration are available from the Department of Labor and Industry, PO Box 8011, 1805 Prospect, Helena MT 59604-8011. Information on registration can be obtained by calling (406) 444-7734. All laborers and mechanics employed by Contractor or Subcontractors in performance of the construction work shall be paid wages at rates as required by Montana Prevailing Wage Rates for Highway Construction Services 2024. The Contractor must ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex or national origin.

Each bid or proposal must be accompanied by a Certified Check, Cashier's Check, or Bid Bond payable to Lewis & Clark County, in an amount not less than ten percent (10%) of the total amount of the bid. Successful Bidders shall furnish an approved Performance Bond and a Labor and Materials Payment Bond, each in the amount of one hundred percent (100%) of the contract amount. Insurance, as required, shall be provided by the successful Bidder(s) and a certificate(s) of that insurance shall be provided.

This project is funded in whole or in part with a grant from the American Rescue Plan Act (ARPA). Award

of the project will be contingent upon the Contractor providing or establishing a Unique Entity Identification (UEI) and passing a suspension and debarment verification per the requirements of Section 00900 Funding Agency Special Provisions.

Bids may only be withdrawn as provided in Section 16.02 of the Instructions to Bidders after the scheduled time for the public opening of bids. The right is reserved to reject any or all proposals received, to waive informalities, to postpone the award of the contract for a period not to exceed sixty (60) days, and to accept the lowest responsive and responsible bid that is in the best interest of the Owner.

Lewis & Clark County is an Equal Opportunity Employer.

Legal Ad: Published in the Helena Independent Record.

Publication Dates:

- Saturday, November 9, 2024
- Saturday November 16, 2024

END OF SECTION

INSTRUCTIONS TO BIDDERS

SECTION 00200 INSTRUCTIONS TO BIDDERS

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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.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.

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 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid, if requested by the Owner and within five (5) days of Owner's such request, Bidder shall submit (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:

A. Evidence of Bidder's authority to do business in the state where the Project is located.

B. Bidder's state or other contractor license number, if applicable.

C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."

~~D. [Other required information regarding qualifications]~~

3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

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~~ Special Provisions 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 or Special Provisions 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 and compact 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 and Special Provisions 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 including but not limited to those general and local conditions affecting transportation, disposal, handling and storage facilities, availability of labor, utilities, roads, climatic conditions and seasons, physical conditions at the Site and project area a whole, Site topography and ground conditions, equipment and facilities needed prior to and during execution 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~~ Special Provisions, 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~~ Special Provisions, 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 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.
- 7.03 Any addenda issued during the time of bidding must be covered in the Bid and included in the Contract Price in the Agreement. Receipt of each addendum must be acknowledged in the Bid. Any Bid in which all issued addenda are not acknowledged may be considered incomplete.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of ten percent (10%) of Bidder’s maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety authorized to do business in the State of Montana 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, the Work is to be substantially completed, and completed and ready for final payment, are set forth in the Agreement.

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, and those “or-equal” or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer’s decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.
- 11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as

supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

- 11.03 Substitutes and “or-equal” materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.04 and 7.05 of the General Conditions 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 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed ~~for the following portions of the Work to be utilized for work on the project.~~

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 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~~ current Montana Contractor's Registration number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Unit Price and/or Lump Sum*

- A. Bidders shall submit a Bid on a unit price and/or lump sum basis for each item of Work listed in the ~~unit price section of~~ bid schedule included in the Bid Form.
- B. The Bid will not be considered unless the Bid Form is complete, containing all unit prices and/or lump sum prices for each Bid item included in the Bid Form, and Bids and totals are shown legibly in their proper locations. The total amount of the Bid shall be legibly written and numerically presented in the proper place, and the Bid Form shall be manually signed.
- C. 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.
- D. 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. Discrepancies between words and figures will be resolved in the favor of words.

14.02 Allowances

- A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

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." A mailed Bid shall be addressed to the address shown in the invitation or advertisement to bid.
 - A. A Bid will not be considered unless accompanied by the proper Bid Security in accordance with Article 8 of these Instructions to Bidders.
 - B. Bids, Bid Securities, or bid modifications submitted by electronic transmission (such as fax or e-mail) will not be considered.
- 15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location 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~~ the bids are due. 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~~ the date and time the bids are due, 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~~ bids are due.
- 16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

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.

B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

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.

19.06 The project has a finite budget and has therefore been separated into a base bid and three additive alternates based upon priority. The bid will be awarded based upon one of four scenarios, either Base Bid only, Base Bid and Additive Alternate No. 1 combined, Base Bid and Additive Alternate No. 1 and Additive Alternate No. 2 combined or Base Bid and Additive Alternate No. 1, Additive Alternate No. 2 and Additive Alternate No. 3 combined. The award will be based upon the base bid or the combined bid for for the base bid and the additive alternates awarded within the available funding. In any of the possible scenarios, all awarded work will be awarded to a single bidder.

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 – STATE LAWS AND REGULATIONS

22.01 All applicable laws, ordinances and the rules and regulations of authorities having jurisdiction over construction of the project shall apply to the Contract throughout. State laws and ordinances which the Contractor must comply with, include but are not limited to, those involving workmen’s compensation insurance, Contractor registration, and gross receipts tax.

22.02 Construction Contractors shall be registered in order to bid this project. Registration shall be per Montana Code Annotated 39-9-201. All Subcontractors whose portion of the work is over \$2,500 will be required to submit proof of registration with Department of Labor and Industry (DOLI).

22.03 Pursuant to Section 15-50-205, Montana Code Annotated, the Owner is required to withhold one (1) percent of all payments due the Contractor and is required to transmit such monies to the State Board of Equalization as part of the Public Contractor’s Fee. In like fashion, the Contractor is required to withhold one (1) percent from payments to Subcontractors. Under the statute, these Public Contractor’s Fees may be used as credits against income tax and corporation license tax paid or due in Montana.

22.04 Pursuant to Section 15-70-403, Montana Code Annotated, fuels used for construction projects awarded by public agencies shall be undyed fuel on which Montana fuel tax has been paid.

22.05 Pursuant to Section 30-20-301, Montana Code Annotated, Contracts with a value of at least \$100,000 with companies that have at least 10 full-time employees require the Contractor to certify that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association and will not discriminate during the term of the Contract against a firearm entity or firearm trade association.

ARTICLE 23 – WAGE REQUIREMENTS

23.01 In accordance with MCA 18-2-401 and 18-2-402, the Contractor and all Subcontractors must pay, as a minimum, the rate of wages as provided in the Montana Prevailing Wage Rates including fringe benefits and applicable zone pay. A copy of the current wage determination is included in the Project Manual.

23.02 In accordance with MCA 18-2-422, the Contractor and all Subcontractors must maintain certified payrolls for a period of not less than 3 years from the completion of work and post a statement of all wages and fringe benefits at the site of the work.

23.03 The Contractor must submit certified payrolls for all employees and employees of Subcontractors to the Engineer within one week of issuing each respective payroll.

**BID FORM
BID BOND
CERTIFICATIONS**

BID FORM

LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Lewis and Clark County Board of Commissioners
City County Building, Room 345, 316 N. Park Ave.
Helena, MT 59623

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 Invitation to Bid and 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~~ Special Provisions, 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~~ Special Provisions, 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.

- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this 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. Bidder 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 Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and 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 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 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;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid 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.

4.02 Bidder certifies that no official of the Owner, Engineer, or any member of such official's immediate family has direct or indirect interest in the pecuniary profits or Contracts of the Bidder.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BASE BID – FUELING AND MG/CL SYSTEMS

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
100	Mobilization	LS	1		
101	Existing Fuel System Demolition	LS	1		
102	Existing Mg/Cl System Demolition	LS	1		
103	Dual Fuel Tank System	LS	1		
104	D.E.F. System	LS	1		
105	Fueling Area Concrete Slab	SY	330		
106	Fuel Piping Trench and Drain Line	LS	1		
107	Fueling Area Bollard	EA	34		
108	Fueling Area Island	LS	1		
109	Relocation of Existing Fuel Dispenser	EA	2		
110	Relocation of Existing Fuel Controls	LS	1		
111	Mg/Cl Concrete Containment Basin	LS	1		
112	Mg/Cl Basin Modular Stairs	LS	1		
113	Mg/Cl 4" Concrete Slab	SY	48		
114	Mg/Cl 6" Concrete Slab	SY	69		
115	10,300 Gallon Mg/Cl Tank	EA	2		
116	Mg/Cl Pumps and Controls	LS	1		
117	Mg/Cl PVC Piping, Fittings, Valves and Supports	LS	1		
118	Mg/Cl Overhead Filling Station	LS	1		
119	Mg/Cl Area Bollard	EA	2		
120	Electrical Work	LS	1		
Total of All Unit Price Bid Items (Base Bid)					\$
Total of All Unit Price Bid Items in Words (Base Bid)					

ADDITIVE ALTERNATE NO. 1 – STAINLESS STEEL MG/CL PIPING AND VALVES

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
200	Change Mg/Cl Piping, Fittings and Valves to Stainless Steel	LS	1		
Total of All Unit Price Bid Items (Additive Alternate No. 1)					\$
Total of All Unit Price Bid Items in Words (Additive Alternate No. 1)					

ADDITIVE ALTERNATE NO. 2 – SECURITY FENCING

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
300	6 ft Chain Link Fencing	LF	306		
301	20 ft Automatic Sliding Gate	EA	2		
302	Electrical Work for Gates	LS	1		
Total of All Unit Price Bid Items (Additive Alternate No. 2)					\$
Total of All Unit Price Bid Items in Words (Additive Alternate No. 2)					

ADDITIVE ALTERNATE NO. 3 – FUEL TANK MONITORING SYSTEM

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
400	Fuel Tank Monitoring System	LS	1		
Total of All Unit Price Bid Items (Additive Alternate No. 3)					\$
Total of All Unit Price Bid Items in Words (Additive Alternate No. 3)					

TOTAL BID PRICE SUMMARY (LUMP SUM AND UNIT PRICES)

Description	Bid Price
Total Base Bid Price	\$
Total Additive Alternate No. 1 Bid Price	\$
Total Additive Alternate No. 2 Bid Price	\$
Total Additive Alternate No. 3 Bid Price	\$
Total of Base Bid + Add Alternate No. 1 + Add Alternate No. 2 + Add Alternate No. 3	\$
Total Bid Price in Words (Base Bid + Add Alternate No. 1 + Add Alternate No. 2 + Additive Alternate No. 3)	

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities 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 and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages and payments to Owner for Unscheduled Employment of the Engineer.

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 Suppliers;

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 entity submitting this bid]

Contact Name: _____ Address for giving notices: _____

Email Address: _____ _____

Telephone Number: _____ _____

Fax Number: _____ _____

Contactor’s Registration No.: _____

Tax ID No.: _____

UEI No.: _____

By:

Printed Name: _____

Title: _____

Signature: _____

Authorized Company Official Signature

Submittal Date: _____

State of Montana
County of _____

This instrument was acknowledged before me on _____ [date] by _____
_____ [printed name of authorized company official] as _____
[title] of _____ [printed company name].

[Seal] _____
Notary Signature

Reminder to Notary: When notarizing a signature on behalf of a corporation, the notary should determine (1) the identity of the person who is actually signing the document, (2) the capacity of the person to sign on behalf of the entity, and (3) the authority to sign for that entity in this particular transaction. If you have questions or are unsure of how to notarize a document in which the signature is in a representative capacity, please contact the Montana Secretary of State at (406) 444-5379.

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*): Lewis and Clark County
316 N. Park Ave.
Helena, MT 59623

BID

Bid Due Date:

Description (*Project Name— Include Location*):

BOND

Bond Number:

Date:

Penal sum

\$

(Words)

(Figures)

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

BIDDER

SURETY

(Seal)

(Seal)

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By:

Signature

By:

Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest:

Signature

Attest:

Signature

Title

Title

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

31 CFR Part 21 – New Restrictions on Lobbying - CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of their knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit [Standard Form-LLL](#), "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all contractors shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Ch. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature

Date

Print Name and Title of Person Signing Above

Print Name of Organization



Lewis and Clark County Grants and Purchasing Department

Nondiscrimination Against Firearms Entities/Trade Associations.

The contractor shall not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, and the Contractor shall not discriminate during the term of the contract against a firearm entity or firearm trade association. This section shall be construed in accordance with HB 356, Ch. 193, Mont. L. 2023.

Verification of Nondiscrimination Against Firearms Entities/Trade Associations.

1. By selecting 'Yes,' the Contractor certifies and affirms:
 - a. Contractor does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association during the term of this contract; and
 - b. Contractor will not discriminate against a firearm entity or firearm trade association during the term of this contract.
2. By selecting 'No,' the Contractor certifies and affirms that the Contractor is unable to make both of the certifications in part 1, during the anticipated term of the contract.

The contractor's certification is made in compliance with and in reference to HB 356, Ch. 193, Mont. L. 2023 (HB 356) and the terms defined therein. If the Contractor determines the provisions of HB 356 do not apply to the contract, the Contractor shall submit a statement setting forth in detail the basis for such determination.

Yes. I confirm that we do not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association.

No. I cannot confirm.

Signature

Date

Print Name and Title of Person Signing Above

Print Name of Organization

AGREEMENT FORM

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

THIS AGREEMENT is by and between Lewis and Clark County, Montana (“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: **Demolition work, a new fueling facility, a new Mg/Cl facility, concrete foundations and slabs, security fencing, gates and electrical work**

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Lewis and Clark County – Fueling and Mg/Cl Systems.**

ARTICLE 3 – ENGINEER

3.01 The part of the Project that pertains to the Work has been designed by Great West Engineering.

3.02 The Owner has retained _____ (“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: Days*

A. The Work will be substantially completed within 60 days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 30 days after the date when the Contract Times commence to run.

B. If Additive Bid Item No. 2 for the security fencing is awarded, an additional 14 days of contract time will be included.

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 \$ 500 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$ 500 for each day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

4.04 *Special Damages*

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

ARTICLE 5 – CONTRACT PRICE

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

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

Unit Price Work					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price

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

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

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 Tenth day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
 - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract
 - a. 95% percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
 - b. 95% 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 100% percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200% percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work 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 0% 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 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 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.
 - E. 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.
 - F. 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.
 - G. 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.
 - H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
 - I. 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 7, inclusive).
 2. Performance bond (pages 1 to 3, inclusive).
 3. Payment bond (pages 1 to 3, inclusive).
 4. General Conditions (pages 1 to 65, inclusive).
 5. Supplementary Conditions (pages 1 to 18, inclusive).
 6. Special Provisions (pages 1 to 7, inclusive).
 7. Funding Agency Special Provisions (pages 1 to 5, inclusive).
 8. Montana Prevailing Wage Rates for Heavy Construction (pages 1 to 14, inclusive).
 9. Specifications as listed in the table of contents of the Project Manual.
 10. Drawings (not attached but incorporated by reference) consisting of 19 sheets with each sheet bearing the following general title: Lewis and Clark County Fueling and Mg/Cl Systems
 11. Addenda (numbers to , inclusive).
 12. Exhibits to this Agreement (enumerated as follows):
 - a. Notice of Award (pages 1 to 1, inclusive).
 13. 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.
 14. The Montana Public Works Standard Specifications, Seventh Edition, April 2021, collectively referred to as MPWSS as may be modified by above Contract Documents.
- 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.

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

This Agreement will be effective as of the date of the last signature (which is the Effective Date of the Contract).

OWNER:

CONTRACTOR:

Date
By: Andy Hunthausen
Title: Chair, Board of County Commissioners

Date
By: _____
Title: _____

Attest: _____
Title: _____

State of Montana
County of _____
This Instrument was Acknowledged before me on _____ [date] by
_____ [printed
name of authorized company official]
as _____ [title]
of _____
_____ [printed company name].

Notary Signature _____

[seal]

Tax ID No. _____

Contractor's
Registration No. _____

Address for giving notices:

3402 Cooney Drive
Helena, MT 59602

Address for giving notices:

STANDARD FORMS

NOTICE OF AWARD

Date of Issuance:

Owner:

Owner's Contract No.:

Engineer:

Engineer's Project No.:

Project:

Contract Name:

Bidder:

Bidder's Address:

TO BIDDER:

You are notified that Owner has accepted your Bid dated [_____] for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

_____ .
[describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is: \$ _____ *[note if subject to unit prices, or cost-plus]*

unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically. *[revise if multiple copies accompany the Notice of Award]*

a set of the Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of this Notice of Award:

1. Deliver to Owner [_____] counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security *[e.g., performance and payment bonds]* and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner:

Authorized Signature

By:

Title:

Copy: Engineer

NOTICE TO PROCEED

Owner: _____ Owner's Contract No.: _____
Contractor: _____ Contractor's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Project: _____ Contract Name: _____
Effective Date of Contract: _____

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [_____, 20__]. [see Paragraph 4.01 of the General Conditions]

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, [the date of Substantial Completion is _____, and the date of readiness for final payment is _____] *or* [the number of days to achieve Substantial Completion is _____, and the number of days to achieve readiness for final payment is _____].

Before starting any Work at the Site, Contractor must comply with the following:
[Note any access limitations, security procedures, or other restrictions]

Owner:

Authorized Signature

By:

Title:

Date Issued:

Copy: Engineer

PERFORMANCE BOND

CONTRACTOR *(name and address):*

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

OWNER *(name and address):* Lewis and Clark County
316 N. Park Ave.
Helena, MT 59623

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: None See Paragraph 16

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

CONTRACTOR AS PRINCIPAL

SURETY

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

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

By: _____
Signature

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

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

14. Definitions

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

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

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

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

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

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

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

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR *(name and address)*:

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

OWNER *(name and address)*: Lewis and Clark County
 316 N. Park Ave.
 Helena, MT 59623

CONSTRUCTION CONTRACT

Effective Date of the Agreement:
 Amount:
 Description *(name and location)*:

BOND

Bond Number:
 Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
 Amount:
 Modifications to this Bond Form: None See Paragraph 18

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

CONTRACTOR AS PRINCIPAL

SURETY

(seal)
 Contractor's Name and Corporate Seal

(seal)
 Surety's Name and Corporate Seal

By: _____
 Signature

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

 Print Name

 Print Name

 Title

 Title

Attest: _____
 Signature

Attest: _____
 Signature

 Title

 Title

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.
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:
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

Work Change Directive No.

Date of Issuance: _____ Effective Date: _____
Owner: Lewis and Clark County Owner's Contract No.: _____
Contractor: _____ Contractor's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Project: _____ Contract Name: _____

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments: *[List documents supporting change]*

Purpose for Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to changes on Contract Price and Contract Time, is issued due to: *[check one or both of the following]*

- Non-agreement on pricing of proposed change.
- Necessity to proceed for schedule or other Project reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price \$ _____ [increase] [decrease].
Contract Time _____ days [increase] [decrease].

Basis of estimated change in Contract Price:

- Lump Sum Unit Price
- Cost of the Work Other

RECOMMENDED:

AUTHORIZED BY:

RECEIVED:

By: _____ Engineer (Authorized Signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date: _____
Title: _____

Date of Issuance:
 Owner: Lewis and Clark County
 Contractor:
 Engineer:
 Project:

Effective Date:
 Owner's Contract No.:
 Contractor's Project No.:
 Engineer's Project No.:
 Contract Name:

The Contract is modified as follows upon execution of this Change Order:

Description:

Attachments: [List documents supporting change]

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES <i>[note changes in Milestones if applicable]</i>
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: \$ _____	[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: Substantial Completion: _____ Ready for Final Payment: _____ days
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: \$ _____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: _____ Engineer (if required)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date: _____
 Title: _____

Date of Issuance: _____ Effective Date: _____
Owner: Lewis and Clark County Owner's Contract No.: _____
Contractor: _____ Contractor's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Project: _____ Contract Name: _____

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with General Conditions Paragraph 11.01, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference: _____
Specification(s) Drawing(s) / Detail(s)

Description:

Attachments:

ISSUED: RECEIVED:
By: _____ By: _____
Engineer (Authorized Signature) Contractor (Authorized Signature)
Title: _____ Title: _____
Date: _____ Date: _____

Copy to: Owner

STANDARD GENERAL CONDITIONS

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



Endorsed by



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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

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

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

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

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

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

1.02 Terminology

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

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

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

2.02 *Copies of Documents*

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

2.03 *Before Starting Construction*

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

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

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

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

2.05 *Initial Acceptance of Schedules*

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

2.06 *Electronic Transmittals*

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

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

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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

3.02 *Reference Standards*

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

3.03 *Reporting and Resolving Discrepancies*

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

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

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

B. *Resolving Discrepancies:*

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

3.04 *Requirements of the Contract Documents*

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

3.05 *Reuse of Documents*

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

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

4.03 *Reference Points*

- A. 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 consider 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 TO THE GENERAL CONDITIONS

SECTION 00800
SUPPLEMENTARY CONDITIONS TO THE STANDARD GENERAL CONDITIONS OF
THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 *Defined Terms*

SC-1.01.A Add to the list of definitions in Paragraph 1.01.A by inserting the following as numbered items in their proper alphabetical positions:

Abnormal Weather Conditions – Conditions of extreme or unusual weather for a given region, elevation, or season as determined by Engineer. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered Abnormal Weather Conditions.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.01 *Delivery of Bonds and Evidence of Insurance*

A. Paragraph 2.01.B of the General Conditions requires that Contractor furnish certificates of insurance. Paragraph 6.02.C states that upon request by Owner or other named or additional insureds, Contractor must provide evidence of insurance such as copies of required policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Parallel provisions apply to Owner and the insurance that Owner is required to provide. Rather than relying on this two-step process (delivery of certificates of insurance at the outset; subsequent requests for additional evidence of insurance), some contract drafters may elect to require from the outset that copies of the insurance policies, rather than certificates of insurance, be delivered to the other party. If exchange of copies of insurance policies is required, the following should be used:

SC-2.01 Delete Paragraphs 2.01 B. and C. in their entirety and insert the following in their place:

- A. *Bonds*: Owner shall furnish to Contractor three (3) copies of the Agreement and other Contract Documents bound therewith. Contractor shall execute the Agreement, attach executed copies of the required Bonds and Power of Attorney and submit all copies to Owner. Owner shall execute all copies and return two copies to the Contractor and retain two copies.
- B. *Evidence of Contractor's Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies of insurance (including all endorsements, and identification of applicable self-insured retentions and deductibles) required to be provided by Contractor in Article 6. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- C. *Evidence of Owner's Insurance*: After receipt from Contractor of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner under Article 6 (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

SC-2.02 Copies of Documents

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

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

SC-2.03 Before Starting Construction

SC-2.03.A Add the following new paragraph immediately after Paragraph 2.03.A.3:

4. a preliminary list of construction equipment with hourly rates, owned or rented by the Contractor and all Subcontractors that will be used in the performance of the Work. The equipment list will include information necessary to confirm the hourly rates per the General Conditions and SC-13.01.B.5.c, including make, model, and year of manufacture as well as the horse power, capacity or weight, and accessories.

SC-2.05 Initial Acceptance of Schedules

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

- A. Prior to the first application for payment all schedules and documents identified in paragraph 2.03.A shall be finalized and acceptable to the Engineer and Owner. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer and Owner as provided below. Acceptance of these schedules and documents by either Engineer or Owner will neither impose on Engineer or Owner responsibility for the sequencing, scheduling or progress of the Work and will not interfere with or relieve Contractor from Contractor's full responsibility therefore.

SC-2.05.A Add the following new paragraph immediately after Paragraph 2.05.A.3:

4. Contractor's Schedule of Construction Equipment will be acceptable to Engineer as to form and substance if it provides the necessary information to reference the equipment and establish the hourly rates in accordance with the General Conditions and SC-13.01.B.5.c.

SC-2.06 Electronic Submittals

SC-2.06.A Add the following new paragraph immediately after Paragraph 2.06.A:

1. Electronic data for Shop Drawings and other submittals may be relied upon if done in accordance with Section 01300.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01 Commencement of Contract Times; Notice to Proceed

SC-4.01.A Amend the first sentence of Paragraph 4.01.A to read as follows:

Following the execution of the Agreement by the Owner and the Contractor, written Notice to Proceed with the Work shall be given by the Owner to the Contractor. The Contract Time will commence to run on the day indicated in the Notice to Proceed.

SC-4.04 *Progress Schedule*

SC-4.04.A Delete Paragraph 4.04.A.1 in its entirety and insert the following in its place:

1. Contractor shall submit to Engineer with each application for payment an updated progress schedule reflecting the amount of work completed and adjustments to future work. Such adjustments will be acceptable to Engineer as providing an orderly progression of the Work to completion within any specified milestones and the Contract Time. No progress payment will be made to Contractor until the updated schedules are submitted to and acceptable to Engineer and Owner. Review and acceptance of progress schedules by the Engineer will neither impose on Engineer responsibility for the sequencing, scheduling or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefore.

SC-4.05 *Delays in Contractors' Progress*

SC-4.05.C.2 Amend Paragraph 4.05.C.2 by striking out the following words "abnormal weather conditions" and inserting the following words "Abnormal Weather Conditions".

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

SC-5.01 *Availability of Lands*

SC-5.01 Add the following new paragraph at the end of Paragraph 5.01.C:

If it is necessary or desirable that the Contractor use land outside of the Owner's easement or right-of-way, the Contractor shall obtain consent from the property owner and tenant of the land. The Contractor shall not enter for materials delivery or occupy for any other purpose with men, tools, equipment, construction materials, or with materials excavated from the site, any private property outside the designated construction easement boundaries or right-of-way without written permission from the property owner and tenant.

SC 5.03 Delete Paragraphs 5.03.A and 5.03.B in their entirety and insert the following:

- A. No reports of explorations or tests of subsurface conditions at or adjacent to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

SC-5.04.A Add the following new paragraphs at the end of Paragraph 5.04.A:

Contractor to notify Owner and Engineer in writing about differing subsurface or physical conditions within 15 days of discovery and before disturbing the subsurface as stated above.

No claim for an adjustment in the contract price or contract times (or Milestones) will be valid for differing subsurface or physical conditions if procedures of this Paragraph 5.04 are not followed.

SC-5.05 *Underground Facilities*

SC-5.05.A Add the following new paragraph immediately after Paragraph 5.05.A.2.d:

3. At least 2 but not more than 10 business days before beginning any excavation, the Contractor shall, in accordance with MCA 69-4-502, notify all owners of

underground facilities and coordinate the Work with the owners of such underground facilities. The information shown or indicated in the Contract Documents with respect to existing underground facilities is based on information and data obtained from the owners of the facilities without field exploration, and as such, Owner and Engineer are not responsible for the accuracy or completeness of such information or data.

SC-5.06 Hazardous Environmental Conditions

SC-5.06.A Amend the first sentence of Paragraph 5.06.A to read as follows:

A. *Reports and Drawings:* The Special Provisions identify:

SC-5.06.B Amend the first sentence of Paragraph 5.06.B to read as follows:

B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Special Provisions with respect to such reports and drawings, but such reports and drawings are not Contract Documents.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.02 Insurance—General Provisions

SC-6.02.B Delete Paragraph 6.02.B in its entirety and insert the following in its place:

B. Without limiting any of the other obligations or liabilities of the Contractor, Contractor shall secure and maintain such insurance from an insurance company (or companies) authorized to write insurance in the State of Montana, with minimum “A.M. Best Rating” of A-VI, as will protect the Contractor, the vicarious acts of subcontractors, the Owner and the Engineer and their agents and employees from claims for bodily injury, or property damage which may arise from operations and completed operations under this Agreement. Contractor shall not commence work under this Agreement until such insurance has been obtained and certificates of insurance, with binders, or certified copies of the insurance policy shall have been filed with the Owner and the Engineer.

All insurance coverages shall remain in effect throughout the life of the Agreement, except that the Contractor shall maintain the Commercial General Liability Policy including product and completed operations coverage for a period of at least one year following the substantial completion date for property damage resulting from occurrences during the agreement period.

SC-6.03 Contractor’s Liability Insurance

SC-6.03.G Add the following new paragraph at the end of Paragraph 6.03.G:

The Contractor’s insurance coverage shall name the Owner, Engineer and Engineer’s Consultants, the State, its officers, officials, employees and volunteers as an additional insured under Commercial General Liability, Automobile Liability, Excess or Umbrella policies.

SC-6.03.I Amend Paragraph 6.03.I.3 by striking out the words “10 days” and replacing them with the words “45 days”, and as so amended, Paragraph 6.03.I.3 remains in effect.

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

State: Statutory

Federal, if applicable (e.g., Longshoreman's): Statutory

Employer's Liability: \$ 1,000,000

Bodily injury, each accident \$ 1,000,000

Bodily injury by disease, each employee \$ 1,000,000

Bodily injury/disease aggregate \$ 1,000,000

Employer's Liability Insurance under Paragraph 6.03.A of the General Conditions may be satisfied by primary insurance or a combination of primary and excess or umbrella insurance. The same excess or umbrella insurance may also be used to satisfy the limits of Automobile Liability Insurance and/or Commercial General Liability Insurance. Primary occurrence limit cannot be less than \$500,000.

For work performed in monopolistic states, stop-gap liability coverage shall be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of: \$ 1,000,000

Foreign voluntary worker compensation Statutory

2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:

General Aggregate \$ 2,000,000

Products - Completed Operations Aggregate \$ 2,000,000

Personal and Advertising Injury \$ 1,000,000

Each Occurrence (Bodily Injury and Property Damage) \$ 1,000,000

Contractor's General Liability Insurance under Paragraphs 6.03.B and 6.03.C of the General Conditions may be satisfied by primary insurance or a combination of primary and excess or umbrella insurance. The same excess or umbrella insurance may also be used to satisfy the limits of Automobile Liability Insurance and/or Employer's Liability Insurance under Workers'

Compensation. Primary occurrence limit cannot be less than \$1,000,000. The deductible, if any, may not exceed \$5,000 per occurrence.

- 3. In addition to other requirements in the General Conditions, Coverage will include at a minimum:
 - A. Premises – Operations
 - B. Operations of Independent Contractor
 - C. Contractual Liability
 - D. Personal Injury
 - E. Products and Completed Operations
 - F. Per Project Aggregate
 - G. NO Additional Exclusions that modify the standard ISO Commercial General Liability Policy form 1996 (or later) ISO commercial General Liability Form in regard to explosion, collapse, blasting, underground property damage, subsidence, or work performed by subcontractors will be acceptable.

- 4. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

Bodily Injury:

Each person	\$ <u>1,000,000</u>
Each accident	\$ <u>1,000,000</u>

Property Damage:

Each accident	\$ <u>1,000,000</u>
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[or]

Combined Single Limit of	\$ <u>1,000,000</u>
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Coverage to include:

- a. All Owned Autos
- b. All Hired Autos
- c. All Non-Owned Autos

Contractor’s Automobile Liability Insurance under Paragraphs 6.03.D of the General Conditions may be satisfied by primary insurance or a combination of primary and excess or umbrella insurance. The same excess or umbrella insurance may also be used to satisfy the limits of General Liability Insurance and/or Employer’s Liability Insurance under Workers’ Compensation. Primary occurrence limit cannot be less than \$1,000,000. The deductible, if any, may not exceed \$5,000 per occurrence.

- 5. OWNERS and CONTRACTORS Protective Policy (OCP) - Purchased By CONTRACTOR:

If box is checked, Contractor is not required to provide Owners and Contractors Protective Policy (OCP) under this contract

Delete Article 6.04 A of the General Conditions in its entirety and insert the

following in its place:

In addition to the insurance required to be provided by Contractor under Paragraphs 6.03 inclusive, Contractor shall purchase and maintain a separate Owners and Contractors Protective Policy (OCP) to protect Owner against claims which may arise from operations under the Contract Documents, with limits of liability as specified below. The policy must be in the name of the Owner. This liability insurance shall include as additional insureds the Engineer and the Engineer's Consultants, and include coverage for the respective directors, officers, partners, employees, agents and other consultants and subcontractors of all such additional insureds.

- a. General Aggregate \$2,000,000
- b. Each Occurrence \$1,000,000

(Bodily Injury and Property Damage)

The OCP policy shall remain in effect until completion of the project and final payment is made to the Contractor and all times thereafter when the Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 14.07 of the General Conditions.

The insurance policy will contain a provision or endorsement that the coverage afforded will not be cancelled, materially changed or renewal refused until at least forty-five (45) days prior written notice (10 day exception for non-payment) has been given to Owner and to each other additional insured (and the certificates of insurance furnished to Owner and each other additional insured will so provide).

6. Contractor's Pollution Liability:

If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract

Each Occurrence	\$ <u>3,000,000</u>
General Aggregate	\$ <u>5,000,000</u>

7. Additional Insureds: In addition to Owner and Engineer, include as additional insureds the following: adjacent landowners *to be included on the commercial general liability, automobile liability, and umbrella or excess policies as additional insureds*

SC-6.05 Property Insurance

SC-6.05.A Delete Paragraph 6.05.A in its entirety and insert the following in its place:

- A. Contractor shall purchase and maintain property insurance upon the work at the site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in these Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. Include the interests of Owner, Contractor, Subcontractors, Sub-Subcontractors, Engineer, Engineer's Consultants, and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;
 2. Be written on a Builder's Risk "all risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss and damage to the Work, temporary buildings, false work and materials and equipment in transit and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than caused by floods), and other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. Include expenses incurred in the repair or replacement of any insured property (including but not limited to the fees and charges of engineers and architects);
 4. Cover materials and equipment in transit for incorporation in the Work or stored at the site or at another location prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer; and
 5. Be endorsed to allow occupancy and partial utilization of the Work by Owner;
 6. Include testing and start-up; and
 7. Be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with thirty days written notice to each other additional insured to whom a certificate of insurance has been issued.
- B. Contractor shall be responsible for any deductible or self-insured retention.
- C. The policies of insurance required to be purchased and maintained by Contractor in accordance with this paragraph shall comply with the requirements of Paragraph 6.05.B of the General Conditions.
- D. The qualifications of the insurance company shall comply with the requirements of SC-6.02.B.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.02 Labor; Working Hours

- SC-7.02.B. Add the following new subparagraphs immediately after Paragraph 7.02.B:
1. Regular working hours will be from 7 a.m. and 5 p.m.
 2. Owner's legal holidays are all federal holidays.

SC-7.06 Concerning Subcontractors, Suppliers, and Others

- SC-7.06.D Amend the first sentence of Paragraph 7.06.D to read as follows:

Within five (5) days of Owner's request, Contractor shall identify Subcontractors, Suppliers, or other individuals or entities as may be called for in the Special Provisions.

SC-7.12 Safety and Protection

SC-7.12.C Amend the second sentence of Paragraph 7.12.C by striking out the words "Supplementary Conditions" and replacing them with the words "Special Provisions".

SC-7.12.F Add following new paragraphs immediately after Paragraph 7.12.G:

- H. It is expressly understood by the parties to this Agreement that the Contractor is solely responsible for initiating, maintaining, and supervising safety precautions and programs in connection with the Work. The right of the Owner and Engineer to observe or otherwise review the Work and operations shall not relieve the Contractor from any of his covenants and obligations hereunder. Contractor shall incorporate all safety requirements into his construction progress and work schedules including preconstruction and scheduled monthly safety meetings, posted safety rules, tailgate meetings, and site inspections by safety and other inspectors employed by the Contractor.
- I. The Contractor shall be responsible for and shall take necessary precautions and provide all material and equipment to protect, shore, brace, support and maintain all underground pipes, conduits, drains, sewers, water mains, gas mains, cables, etc., and other underground construction uncovered in the proximity, or otherwise affected by the construction work performed by him. All pavement, surfacing, driveways, curbs, walks, buildings, grass areas, trees, utility poles or guy wires damaged by the Contractor's operations in the performance of this work shall be repaired and/or replaced to the satisfaction of the Owner, Engineer, and effected property owner at the Contractor's expense. The Contractor shall also be responsible for all damage to streets, roads, highways, shoulders, ditches, embankments, culverts, bridges, or other public or private property or facility, regardless of location or character, which may be caused by moving, hauling, or otherwise transporting equipment, materials, or men to and from the work or any part of site thereof; whether by him or his subcontractors. The Contractor shall make satisfactory and acceptable arrangements with owner of, or the agency or authority having jurisdiction over, the damaged property or facility concerning its repair or replacement or payment of costs incurred in connection with said damage.
- J. The Contractor shall conduct his work so as to interfere as little as possible with public travel, whether vehicular or pedestrian. Whenever it is necessary to cross, obstruct, or close roads, driveways, and walks, whether public or private, the Contractor shall obtain approval from the governing party and shall, at his own expense, provide and maintain suitable and safe bridges, detours, and other temporary expedients for the accommodation of public and private drives before interfering with them. The provisions for temporary expedients will not be required when the Contractor has obtained permission from the owner and tenant of the private property, or from the authority having jurisdiction over public property involved, to obstruct traffic at the designated point.
- K. Safety provisions must be entirely adequate and meet with City or State and Federal regulations to protect the public on these streets and roads.

SC-7.18 Indemnification

SC-7.18.A Add the following new paragraph at the end of Paragraph 7.18.A:

While Owner and Engineer may have the right under this Contract to observe or otherwise review the work, progress and operations of the Contractor, it is expressly understood and agreed that such observation shall not relieve the Contractor from any of its covenants and obligations hereunder.

ARTICLE 8 – OTHER WORK AT THE SITE

SC-8.02 Coordination

SC-8.02 Delete Paragraph 8.02 in its entirety and replace with the following:

- 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 Special Provisions 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 Special Provisions, Owner shall have sole authority and responsibility for such coordination.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03 Project Representative

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.A:

- B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
 - 1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
 - 2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
 - 3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.

4. Liaison:
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
6. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
8. Review of Work and Rejection of Defective Work:
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
9. Inspections, Tests, and System Start-ups:
 - a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

- b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.
10. Records:
- a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
 - b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
 - c. Maintain records for use in preparing Project documentation.
11. Reports:
- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
 - b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
 - c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.
12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.
13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.
14. Completion:
- a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.
 - b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.

- c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.
- C. The RPR shall not:
1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items).
 2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.
 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor’s work.
 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
 7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
 8. Authorize Owner to occupy the Project in whole or in part.

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

SC-13.01 Cost of the Work

- A. Equipment rental charges, particularly with respect to Contractor-owned equipment, can sometimes lead to disagreements. To reduce the possibility of such disagreements, the following Supplementary Condition may be used. Note that it requires a published reference or method for determining the costs.

SC-13.01.B.5.c Delete paragraph 13.01.B.5.c in its entirety and insert the following in its place:

- c. The rental of all construction equipment and machinery and parts thereof whether rented from contractor or rented from others. The cost shall be calculated as follows and will include the costs of transportation, loading, unloading, assembly, dismantling and removal thereof for equipment involved only in the changed portion of the work covered under the cost of the Work method. Transportation, loading and assembly costs will not be included for equipment already on the site which is being used for other portions of the Work. The cost of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work. Hourly equipment and machinery rates shall be calculated from the Rental Rate Blue Book for Construction Equipment, and the Equipment List submitted according to SC-2.03 and SC-2.05, and as follows:
 1. for working equipment, the hourly rate shall be the monthly rental rate divided by 176 hours per month plus the hourly operating cost.

2. for equipment on standby, the hourly rate shall be 50% of the monthly rental rate divided by 176 hours per month, and the hourly operating cost shall not be applied.
3. for specialized equipment rented for a short duration used for change order work or additional work not part of the scope of work bid, the equipment rental rates will be negotiated prior to the work being performed.

SC-13.03 Unit Price Work

SC 13.03.E Delete Paragraph 13.03.E in its entirety and insert the following in its place:

- E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:
1. if the extended price of a particular item of Unit Price Work amounts to ten percent (10%) or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than twenty five percent (25%) from the estimated quantity of such item indicated in the Agreement; and
 2. if there is no corresponding adjustment with respect to any other item of Work; and
 3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

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

SC-15.01 Progress Payments

SC-15.01.B.1 Add the following new paragraph at the end of Paragraph 15.01.B.1:

Payments for materials in storage shall be based only upon the actual cost of the materials and equipment to Contractor and shall not include any overhead or profit. Bill of Sale, invoice or other document warranting clear title for materials in storage will be waived for the material in storage included in the first progress payment application. However, proof of payment and clear title must be submitted with Application No. 2 for all material included in Application No. 1. Without such documentation amounts paid for materials in storage will be deducted from subsequent payments. Beginning with the second application, all requests for payment for materials in storage shall be accompanied by Bill of Sale, invoice or other document warranting clear title as required above.

SC-15.01.B.3 Add the following new paragraphs at the end of Paragraph 15.01.B.3:

Retainage may be used by the Owner to offset costs for any of the losses enumerated in Paragraphs 15.01.C.6.a through 15.01.C.6.e inclusive, 15.01.E.1.a through 15.01.E.1.l inclusive, 15.03.B.1 or 16.02.E. In addition retainage may be used by the Owner to protect against loss from failure by the Contractor to complete necessary work and to offset any liquidated damages due Owner.

SC-15.01.B.4 Add the following new paragraph after Paragraph 15.01.B.3:

4. Each application for progress payment shall be accompanied by Contractor's updated progress schedule, shop drawing schedule, procurement schedule, and other data specified herein or reasonably required by Owner or Engineer. The Owner reserves the right to require submission of monthly certified payrolls by the Contractor.

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

1. The Owner will, upon presentation of the Contractor's Application for Payment with Engineer's recommendation, review and act upon said payment request once each month on or about the day of each month stipulated by the Owner at the preconstruction conference. Payment will become due when Owner approves the application for payment and when due, will be paid by Owner to Contractor.

SC-15.01.E.I Add the following language at the end of the first sentence of Paragraph 15.01.E.I:

, including liquidated damages.

SC-15.02 Contractor's Warranty of Title

SC-15.02.B Add the following new paragraph immediately after Paragraph 15.02.A:

- B. Neither recommendation of any progress payment by Engineer nor payment by the Owner to Contractor, nor any use or occupancy of the Work or any part thereof will release the Contractor from complying with the Contract Documents. Specifically the Contractor shall maintain in accordance with Article 6, property insurance on all Work, materials, and equipment whether incorporated in the project or not and whether included in an application for payment or not, for the full insurable value thereof. Passing title to Owner for materials and equipment included in an application for payment does not relieve the Contractor of the Contractor's obligation to provide insurance (including property insurance) as required in Article 6 of the General Conditions and these Supplementary Conditions. All insurance shall remain in effect as provided in Article 6.

SC-15.03 Substantial Completion

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

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

SC-15.04 Partial Use or Occupancy

SC-15.04 Add the following new paragraph immediately after Paragraph 15.04.A.4:

- B. Owner has the right to take possession of or use any completed or substantially completed portions of the work at any time, but such taking possession or use will not be deemed an acceptance of any work not completed in accordance with the Contract Documents. Owner's use of any facilities so identified in the Contract Documents will not be grounds for extension of the contract time or change in the

contract price. Owner's use of any facilities not specifically identified in the Contract Documents will be in accordance with conditions agreed to prior to such use, and any extra costs or delays in completion incurred and properly claimed by Contractor will be equitably adjusted with a Change Order. Facilities substantially completed in accordance with the Contract Documents which are occupied or used by Owner prior to substantial completion of the entire work will be done in accordance with General Conditions 15.03. Guarantee periods for accepted or substantially completed work including mechanical and electrical equipment will commence upon the start of continuous use by Owner. All tests and instruction of Owner's personnel must be satisfactorily completed, and Owner shall assume responsibility for and operation of all facilities occupied or used except as may arise through portions of work not yet completed by Contractor. If the work has been substantially completed and the Engineer certifies that full completion thereof is materially delayed through no fault of the Contractor, the Owner shall, without terminating the Agreement, make payment of the balance due for the portion of the work fully completed and accepted.

SC-15.05 Final Inspection

SC-15.05 Add the following new paragraph immediately after Paragraph 15.05.A:

- B. After Contractor has remedied all deficiencies to the satisfaction of the Engineer and delivered all construction records, maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, and other documents (all as required by the Contract Documents), Owner and Contractor shall be promptly notified in writing by Engineer that the work is acceptable.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

- A. Paragraph 17.01.B of the General Conditions provides that for any dispute subject to final resolution under Article 17, Owner or Contractor may invoke the dispute resolution procedure called for in the Supplementary Conditions. Paragraph SC-17.02 is the location to identify any such primary dispute resolution procedure. If no procedure is identified here in the Supplementary Conditions, and the parties do not agree to a specific procedure, then the default resolution procedure will be litigation—the pursuit of rights in a court of competent jurisdiction. Note that before reaching the point of final resolution of disputes, in most cases the Owner and Contractor will already have engaged in the Claim process described in Article 12 of the General Conditions. That process allows for mediation of the dispute.

As an alternative to litigation, there are many other possible dispute resolution procedures, or combinations of procedures. One of the most common is arbitration; wording for an arbitration clause follows. A discussion of the pros and cons of the arbitration process (and there are many advocates on both sides) is beyond the scope of this Guide. Owner should consult with its legal counsel when considering the inclusion of an arbitration clause, or of any other dispute resolution procedure or combination of procedures.

The arbitration option is as follows:

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

SC-17.02 Arbitration

- A. All matters subject to final resolution under this Article will be decided by arbitration in accordance with the rules of *[insert name of selected arbitration*

agency], subject to the conditions and limitations of this paragraph. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in this Article, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations. The demand for arbitration should include specific reference to Paragraph SC-17.02.D below.
- C. No arbitration arising out of or relating to the Contract shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
 - 1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
 - 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.
- D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include a concise breakdown of the award, and a written explanation of the award specifically citing the Contract provisions deemed applicable and relied on in making the award.
- E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

SC-17.03 Attorneys' Fees

- A. In most jurisdictions in the United States, as a general matter each party to a dispute is responsible for its own attorneys' fees, unless an express agreement provides to the contrary. Some legal authorities believe that this general rule encourages claims and disputes, because claimants have little concern that they will be forced to pay for the opposing party's fees if the claim fails. Other authorities take the opposite view—that the enticing prospect of not only prevailing but also of having one's own fees paid by the opponent would encourage overly aggressive pursuit of claims (or overzealous defense against valid claims).

If an exception to the general American rule is preferred for disputes subject to final resolution under Article 17, then add the following express agreement:

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02. *[Note: If there is no Paragraph 17.02, because neither arbitration nor any other dispute resolution process has been specified here in the Supplementary Conditions, then revise this to state "Add the following new paragraph immediately after Paragraph 17.01" and revise the numbering accordingly.]*

SC-17.03 Attorneys' Fees: For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18 – MISCELLANEOUS

SC-18.01 Giving Notice

SC-18.01 Add the following new paragraph immediately after Paragraph 18.01.A:

- B. The mailing address for giving notices to Contractor given in the Agreement is hereby designated as the place to which all notices, letters, and other communication to Contractor will be mailed or delivered. The mailing address for giving notices to Owner given in the Agreement is hereby designated as the place to which all notices, letters, and other communication to Owner shall be mailed or delivered. Either party may change his address at any time by an instrument in writing delivered to Engineer and to other party.

FUNDING AGENCY SPECIAL PROVISIONS

SECTION 00900

FUNDING AGENCY SPECIAL PROVISIONS

The contract to which these special provisions apply is made using federal assistance provided to Lewis and Clark County by the US Department of Treasury under the American Rescue Plan Act (“ARPA”), Sections 602(b) and 603(b) of the Social Security Act, Pub. L. No. 117-2 (March 11, 2021).

The following terms and conditions apply to the CONTRACTOR, as a contractor of Lewis and Clark County, according to the County’s Award Terms and Conditions signed on June 15, 2021; by ARPA and its implementing regulations; and as established by the Treasury Department.

1. **Equal Opportunity.** CONTRACTOR shall comply with Executive Order 11246, “Equal Employment Opportunity,” as amended by EO 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and as supplemented by regulations at 41 CFR part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.”
2. **Minority and Women Business Enterprises.** CONTRACTOR hereby agrees to comply with the following when applicable: The requirements of Executive Orders 11625 and 12432 (concerning Minority Business Enterprise), and 12138 (concerning Women's Business Enterprise), *when applicable*. Accordingly, CONTRACTOR hereby agrees to take affirmative steps to assure that women and minority businesses are utilized when possible as sources of supplies, equipment, construction and services. Affirmative steps shall include the following:
 - a. Including qualified women’s business enterprises and small and minority businesses on solicitation lists;
 - b. Assuring that women’s enterprises and small and minority businesses are solicited whenever they are potential sources;
 - c. When economically feasible, dividing total requirements into smaller tasks or quantities so as to permit maximum participation by small and minority business, and women’s business enterprises;
 - d. Where the requirement permits, establishing delivery schedules which will encourage participation by women’s business enterprises and small and minority business;
 - e. Using the services and assistance of the Small Business Administration, and the U.S. Office of Minority Business Development Agency of the Department of Commerce; and
 - f. If any subcontracts are to be let, requiring the prime Contractor to take the affirmative steps in a through e above.

For the purposes of these requirements, a Minority Business Enterprise (MBE) is defined as an enterprise that is at least 51 percent owned and controlled in its daily operation by members of the following groups: Black, Hispanic, Asian or Pacific Islander, American Indian, or Alaskan Natives. A Women Business Enterprise (WBE) is defined as an enterprise that is at least 51 percent owned and controlled in its daily operation by women.

3. **Suspension and Debarment.** This contract is a covered transaction for purposes of 2 CFR pt. 180 and 2 CFR pt. 3000. As such, the CONTRACTOR is required to verify that none of CONTRACTOR’s principals (defined at 2 CFR § 180.995) or its affiliates (defined at 2 CFR § 180.905) are excluded (defined at 2 CFR § 180.940) or disqualified (defined at 2 CFR § 180.935).

The CONTRACTOR must comply with 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

This certification is a material representation of fact relied upon by Lewis and Clark County. If it is later determined that the CONTRACTOR did not comply with 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C, in addition to remedies available to the County, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

The CONTRACTOR agrees to comply with the requirements of 2 CFR pt. 180, subpart C and 2 CFR pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The CONTRACTOR further agrees to include a provision requiring such compliance in its lower tier covered transactions.

4. **Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352, as amended***. CONTRACTOR certifies that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. CONTRACTOR shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

*Purchases over \$100,000 - CONTRACTOR must sign the certification on the last page of this exhibit.

5. **Access to Records**. The CONTRACTOR agrees to provide the Lewis and Clark County, the U.S. Department of Treasury, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the CONTRACTOR which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions. The CONTRACTOR agrees to permit any of the foregoing parties to reproduce by any means or to copy excerpts and transcriptions as reasonably needed and agrees to cooperate with all such requests.

The CONTRACTOR agrees to provide the Treasury Department or authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

No language in this contract is intended to prohibit audits or internal reviews by the Treasury Department or the Comptroller General of the United States.

6. **Rights to Inventions Made Under a Contract or Agreement**. Contracts or agreements for the performance of experimental, developmental, or research work shall provide for the rights of the Federal Government and the recipient in any resulting invention in accordance with 37 CFR part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any applicable implementing regulations.
7. **Contract Work Hours and Safety Standards Act (40 U.S.C. 327 through 333)**. (Applies

only to purchases over \$100,000, when laborers or mechanics are used.) Where applicable, all contracts in excess of \$100,000 that involve the employment of mechanics or laborers shall include a provision for compliance with 40 U.S.C. 3702 and 3704 of the Contract Work Hours and Safety Standards Act, as supplemented by Department of Labor regulations (29 CFR part 5). Under Section 3702 of the Act, each contractor shall be required to compute the wages of every mechanic and laborer on the basis of a standard workweek of 40 hours. Work in excess of the standard workweek is permissible provided that the worker is compensated at a rate of not less than 1 1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the workweek. The requirements of 40 U.S.C. 3704 are applicable to construction work and provides that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

8. **Clean Air Act & Federal Water Pollution Control Act. (applies to purchases of more than \$150,000.)** The CONTRACTOR agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

The CONTRACTOR agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

The CONTRACTOR agrees to report each violation of the Clean Air Act and the Water Pollution Control Act to the Lewis and Clark County and understands and agrees that the County will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

CONTRACTOR agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance.

9. **Prohibition on certain telecommunications and video surveillance services or equipment (Huawei and ZTE)**. CONTRACTOR is prohibited from obligating or expending loan or grant funds to:
- a. Procure or obtain;
 - b. Extend or renew a contract to procure or obtain; or
 - c. Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115–232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
 - i. For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

- ii. Telecommunications or video surveillance services provided by such entities or using such equipment.
- iii. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

10. **Procurement of Recovered Materials: (applies only if the work involves the use of materials).** In the performance of this contract, the CONTRACTOR shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired:
- a. Competitively within a timeframe providing for compliance with the contract performance schedule;
 - b. Meeting contract performance requirements; or
 - c. At a reasonable price.

Information about this requirement, along with the list of EPA- designated items, is available at EPA’s Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

The CONTRACTOR also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

11. **Publications.** Any publications produced with funds from this award must display the following language: “This project [is being] [was] supported, in whole or in part, by federal award number SLFRP4035 awarded to Lewis and Clark County by the U.S. Department of the Treasury.”
12. **Increasing Seat Belt Use in the United States.** Pursuant to Executive Order 13043, 62 FR 19217 (Apr. 18, 1997), CONTRACTOR is encouraged to adopt and enforce on-the-job seat belt policies and programs for your employees when operating company-owned, rented or personally owned vehicles.
13. **Reducing Text Messaging While Driving.** Pursuant to Executive Order 13513, 74 FR 51225 (Oct. 6, 2009), CONTRACTOR is encouraged to adopt and enforce policies that ban text messaging while driving and establish workplace safety policies to decrease accidents caused by distracted drivers.
14. **Title VI of the Civil Rights Act of 1964 – Protections to persons with Limited English Proficiency.** The CONTRACTOR and any of the CONTRACTOR’s sub-grantees, contractors, subcontractors, successors, transferees, and assignees shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by the Department of the Treasury’s Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this contract (or agreement). Title VI also includes protection to persons with “Limited English Proficiency” in any program or activity receiving federal financial assistance, 42 U.S.C. § 2000d et seq., as implemented by the Department of the Treasury’s Title VI regulations, 31 CFR Part 22,

which are herein incorporated by reference and made a part of this contract or agreement.

15. **Drug-Free Workplace.** The Drug-Free Workplace Act of 1988 (41 U.S.C. § 701 et seq.) requires that all organizations receiving grants from any Federal agency agree to maintain a drug-free workplace. You as the recipient must comply with drug-free workplace requirements in Subpart B (or Subpart C, if the recipient is an individual) of part 382, which adopts the Governmentwide implementation (2 CFR §182) of sec. 5152-5158 of the Drug-Free Workplace Act of 1988 (Pub. L. 100-690, Title V, Subtitle D; 41 U.S.C. 701-707). By signing the application, the AOR agrees that the recipient will provide a drug-free workplace and will comply with the requirement to notify SAMHSA if an employee is convicted of violating a criminal drug statute. Failure to comply with these requirements may be cause for debarment. Government wide requirements for Drug-Free Workplace for Financial Assistance are found in 2 CFR § 182; HHS implementing regulations are set forth in 2 CFR § 382.400.

16. **Mandatory Disclosures.** Consistent with 45 CFR § 75.113, applicants and recipients must disclose in a timely manner, in writing to the COUNTY, all information related to violations, or suspected violations, of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award. Subrecipients must disclose, in a timely manner, in writing to the COUNTY all information related to violations, or suspected violations, of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award. Failure to make required disclosures can result in any of the remedies described in 45 CFR § 75.371 – Remedies for noncompliance, including suspension or debarment (see 2 CFR §§ 180 & 376 and 31 U.S.C. 3321).

17. **Trafficking Victims Protection Act of 2000 (22 U.S.C. 7104(G)), as amended, and 2 CFR § 175.** The Trafficking Victims Protection Act of 2000 authorizes termination of financial assistance provided to a private entity, without penalty to the Federal government, if the recipient or subrecipient engages in certain activities related to trafficking in persons. SAMHSA may unilaterally terminate this award, without penalty, if a private entity recipient, or a private entity subrecipient, or their employees:
 - a) Engage in severe forms of trafficking in persons during the period of time that the award is in effect;
 - b) Procure a commercial sex act during the period of time that the award is in effect;or,
 - c) Use forced labor in the performance of the award or subawards under the award.

- This form is required only for purchases of more than \$100,000 -

31 CFR Part 21 – New Restrictions on Lobbying - CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of their knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit [Standard Form-LLL](#), “Disclosure Form to Report Lobbying,” in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all contractors shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The CONTRACTOR certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the CONTRACTOR understands and agrees that the provisions of 31 U.S.C. Ch. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of CONTRACTOR’s
authorized official

Date: _____

(Print name of person signing above)

(Print title of person signing above)

SPECIAL PROVISIONS

SECTION 00910

SPECIAL PROVISIONS

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SP-01 INCORPORATION OF THE MPWSS

All provisions of the Montana Public Works Standard Specifications, Seventh Edition, April 2021, hereafter collectively referred to as the MPWSS, apply to the project, except where portions of the MPWSS are modified or replaced by the Contract Documents. Each Section of the MPWSS that has been modified is listed in the Table of Contents of Section 00950 Standard Modifications to MPWSS. The entire Section from the MPWS has not been rewritten for these modifications. Instead, modifications are indicated for a specific subsection, paragraph, sentence or drawing.

Where a Standard Modification to MPWSS does not exist for a particular Section of MPWSS it shall be assumed the work is to be completed in accordance with the appropriate MPWSS Section. When a Standard Modification to MPWSS does exist the requirements of that modification supersede the related MPWSS requirement. Where paragraphs are specifically deleted or modified, or new paragraphs added, all other parts of the MPWSS will remain in effect unless otherwise modified by the Project Manual in accordance with the order of governance as specified in "Summary of Work". Forms included in the Project Manual will be used in lieu of similarly titled forms in the MPWSS. Where Technical Specifications follow the Modifications in later Divisions of the Project Manual, those Specifications replace same numbered specifications in the MPWSS.

Delete Part 4: MEASUREMENT AND PAYMENT in all sections of the MPWSS. Payment for an item will only be made if that item is listed as a Bid Item in the Bid Form. If an item is listed as a Bid Item, administrative and procedural requirements will be listed in Section 01275: Measurement and Payment. If an item is not listed as a Bid Item, the item is not required or is considered an incidental cost to other Bid Items.

SP-02 QUALIFICATIONS OF CONTRACTORS, SUBCONTRACTORS, SUPPLIERS, AND OTHERS

Provide qualifications for the Contractor and all Subcontractors, Suppliers, or other persons or organizations identified in Technical Specifications per the guidelines in the respective specification sections.

Submit the evidence of qualifications listed in Article 3.01 of the Instructions to Bidders as well as the following additional information.

- A list of at least three (3) jobs successfully completed within the last five (5) years by the Bidder similar in size and scope to the Work, including references for each project;
- The proposed Superintendent's name and resume; and
- The general availability of the Bidder to complete the Work within a reasonable timeframe.
- A list of at least five (5) projects successfully completed within the last ten (10) years by the Bidder similar in size and scope to the Work, including references for each project.
- For each Subcontractor, Supplier, or other person or organization listed, include the primary contact and phone number, approximate anticipated monetary value of Work, and a list of similar projects over the past three (3) years.

SP-03 PREBID EXPLORATION/SITE INFORMATION

All Bidders are strongly encouraged to visit the site of the work and conduct all field investigations at their disposal to become acquainted with the nature of the work. Obtain written authorization from the Owner, and others who may be directly affected prior to entering the property, conducting field tests, drilling, boring, excavating, or test pumping.

If potential Bidders wish to excavate test pits, the excavations will be limited to the vicinity of those areas that appear on the Drawings to be excavated. Excavations in paved areas will not be allowed without written permission from the Owner. Excavations must be backfilled in a reasonably uniform manner and graded to the original ground surface line and grade. Backfill in unpaved streets, parking areas, or alleys must be compacted as specified in the Contract Documents and surfaced with four inches of new or existing gravel.

SP-04 PETROLEUM CONTAMINATED SOILS

There is a possibility of encountering petroleum contaminated soils and petroleum contaminated groundwater within the work area. If this occurs during construction, cease work in the area where contamination is discovered until a time and materials change order for the extra work can be agreed upon by the Contractor, Owner, Engineer and the Montana DEQ Underground Storage Tank Program. Proceed with other elements of the project at no additional cost to the Owner in such an event. The work in the affected area will again proceed after a change order is processed. No shutdown time or associated additional costs will be awarded other than those agreed upon in the change order.

SP-05 SPOIL

Unless otherwise indicated on the Drawings or elsewhere in these specifications, place spoil in the confines of the existing property, easements or right-of-ways. In areas where confines limit the placement of spoil, the Contractor may have to haul the spoil out of the area until he is ready to backfill. The locations of spoil placement will be discussed at the preconstruction conference and will be subject to approval by the Engineer. The Contractor will be responsible for the disposal of all excess spoil.

No additional payment will be allowed the Contractor for this work. Refer to Section 01275: Measurement and Payment for more information.

SP-06 BEST MANAGEMENT PRACTICES

Dust Control – Dust control is to be considered an integral part of the Work. Dust Control shall be provided from the start of construction until the Work is complete. Fugitive dust as a result of construction shall be controlled at all times within the subject property. The Contractor shall have a water truck available for dust control prior to beginning any construction tasks. Wetting shall be done a minimum of twice per day in dry conditions or at the direction of the Engineer or Owner as required until the final construction activities are completed. Contractor shall be prepared to provide dust control until the final surface restoration is completed. All costs incurred to meet dust control requirements are incidental to other items of the contract and no separate payment shall be made.

Road and Parking Lot Cleaning – It shall be the sole responsibility of the contractor to keep all roads and parking lots free from mud, gravel, cobbles or other contaminants generated as a result of construction activities. It shall be the responsibility of the contractor clean all foreign matter from roads and parking areas in a reasonable amount of time as determined by the Owner & Engineer. All costs

incurred to meet road and parking lot cleaning requirements are incidental to other items of the contract and no separate payment shall be made.

Erosion Control Measures – Temporary erosion and sediment control measures includes the installation and maintenance of temporary structural control measures to reduce or eliminate the erosion of soil and transport of sediment offsite as result of construction activities. This may include, but not be limited to, silt fences, ditch checks, sediment basins, erosion control mats, stabilized construction entrance, temporary diversions, inlet protection, sediment traps, and slope drains. If erosion control measures are required, it shall be the responsibility of the contractor to install and maintain them throughout the construction. All costs incurred to meet erosion control requirements are incidental to other items of the contract and no separate payment shall be made.

Noxious Weed Control – Comply with the County Noxious Weed Management Act, Title 7, Chapter 22, Part 21 and all county and contract noxious weed control requirements. Determine the specific noxious weed control requirements of each county where the project is located before submitting a bid. Equipment and vehicles will be washed prior to entering the project site to remove vegetation to avoid the spread of weeds. All costs incurred to meet noxious weed control requirements are incidental to other items of the contract and no separate payment shall be made.

Failure to Provide Service – If the contractor fails to provide adequate service on the above listed items, the Owner reserves the right to contract these activities to a third party, the cost of which will be deducted from the contract amount at the time of the next pay request.

SP-07 WATER FOR CONSTRUCTION

The Contractor will be responsible for providing water for construction purposes.

SP-08 SITE RESTORATION

Site Restoration is an important part of this project. Site Restoration is replacement or reconstruction of site improvements to rights-of-way, easements, public property, and private property that are affected or altered by construction operations, with improvements restored to condition which is equal to, or better than, that which existed prior to construction operations. These Site Restoration items include but are not limited to; concrete curb and gutter replacement, sidewalk replacement, concrete surfaces, asphalt replacement, gravel restoration, seeding, sod, and irrigation system repair.

If site restoration is not completed, the Contractor's partial payment request may be denied or additional retainage may be withheld.

SP-09 STAGING AREA

The Contractor must coordinate the staging area location(s) with the Owner. Take care to protect, preserve and/or replace objects and structures encountered within the confines of the staging areas and restore all disturbed areas as close as possible to original condition as possible unless otherwise dictated in these specifications.

Storage of construction materials, equipment, and other items pertinent to the construction of the project will be allowed in the staging areas. However, bulk storage of petroleum based products stored in tanks will not be allowed. At all times, spill kits must be available on-site for any accidental spills of petroleum.

No payment will be allowed to the Contractor for any work, including restoration, with regards to the staging areas.

SP-10 CONFLICTS WITH UTILITIES

Utility locations are based on the available information which has been provided to or discovered by the Engineer. There is no guarantee as to the accuracy and completeness thereof is expressly disclaimed. As outlined in SC-5.05.A.3, the Contractor must check with the Utilities Underground Location Center (800-424-5555) at least two full working days in advance of the planned work date so that all utilities are located prior to digging.

The Contractor shall coordinate work with all utility companies or private entities that may be affected by the project. For utilities shown on the Drawings, the Contractor shall be responsible for any charges associated with crossing, working around, and supporting as required for construction operations. If a utility must be relocated, as determined by the Owner and Engineer, the Owner will pay for charges associated with the relocation of the utility directly to the utility owner. The contractor shall pay for any charges to relocate, remove, or replace utilities if it is requested by the Contractor for his own means and methods. For underground utilities not shown on the Drawings, the contractor shall follow procedures outlined in Article 5.05: Underground Facilities of the General Conditions.

Unless identified as a bid item in the Bid Form, no separate payment will be made for this work, and the Contractor shall figure the cost of such work into other applicable bid items.

SP-11 QUALITY CONTROL TESTING OF SOIL AND BASE COURSE

This Special Provision only applies to soil and base course materials. Refer to other applicable sections of the specifications for quality control testing requirements of other materials.

Complete testing of all components of the project will be required to the satisfaction of the Owner and the Engineer. The Contractor is solely responsible for quality control (QC) testing.

The following table outlines the minimum frequency of quality control testing. All testing is the responsibility of the Contractor and must be conducted by an approved, certified testing laboratory or individual.

Contractor must remedy all defects and performance problems revealed by the testing to the satisfaction of the Engineer at no additional expense to the Owner. The Owner may conduct quality assurance testing in addition to the Contractor’s quality control testing, and in the case of a conflict between quality control and quality assurance testing, the quality assurance testing will govern.

Minimum Quality Control Testing Frequency Table

SECTION	ITEM DESCRIPTION	TEST OR SUBMITTAL	FREQUENCY
TRENCH BACKFILL			
02221	Type ‘A’ Trench Backfill	Field Density/Moisture Content	1 test / 200 LF / lift
02221	Type ‘B’ Trench Backfill	Field Density/Moisture Content	1 test / 300 LF / lift
02221	Type ‘C’ Trench Backfill	Field Density/Moisture Content	1 test / 400 LF / lift

MISCELLANEOUS CONCRETE SURFACING AND SIDEWALK EARTHWORK			
02230	Subgrade Preparation	Field Density/Moisture Content	1 test / 1,000 SF / lift
02230	Embankment Placement	Field Density/Moisture Content	1 test / 1,000 SF / lift
02230	Subexcavation Replacement	Field Density/Moisture Content	1 test / 1,000 SF / lift
02234	Sub-Base Course(s)	Field Density/Moisture Content	1 test / 1,000 SF / lift
02235	Base Course(s)	Field Density/Moisture Content	1 test / 1,000 SF / lift

SP-12 CONSTRUCTION STAKING

All construction staking is the responsibility of the contractor. This item covers survey work required to set specific horizontal and vertical stringlines, stakes, and/or bluetops to ensure location specific compliance with the Plans and Specifications for each stage of construction. Contractor is responsible for the preservation of said stringlines, stakes, and/or bluetops until such time that they are no longer required for construction activities. Contractor is responsible for coordination efforts which will limit the amount of exposure to said stringlines, stakes, and/or bluetops. The Contractor will not be reimbursed for any additional survey work, including rental late fees or additional rental time that is required due to sequence of operations, operator error, or negligence. This item includes all labor, equipment (including rental fees), supplies, and incidentals associated with this work. Consider all costs associated with this provision incidental to performance of the work. Include the cost in the cost of other items.

SP-13 CONTRACTOR EMERGENCY CONTACT

Provide a primary and secondary 24-hour, 7-day a week emergency contact.

SP-14 NOXIOUS WEEDS

Comply with the County Noxious Weed Management Act, Title 7, Chapter 22, Part 21 and all county and contract noxious weed control requirements. Determine the specific noxious weed control requirements of each county where the project is located before submitting a bid. Equipment and vehicles will be washed prior to entering the project site to remove vegetation to avoid the spread of weeds. All costs incurred to meet noxious weed control requirements are incidental to other items of the contract.

SP-15 M-4500 CONCRETE

For this project, all concrete shall be M-4500 as specified in Section 03310.2.1 of the Montana Public Works Standard Specifications (7th Edition). Air content shall be between 5% and 8% as specified in Section 03310.2.2.B.4 of the Montana Public Works Standard Specifications (7th Edition).

SP-16 ACCEPTANCE OF M-4500 CONCRETE

Each lot of concrete is accepted or rejected based on the lot acceptance test strength and air content testing.

PAY FACTORS M-4000 CONCRETE LOT ACCEPTANCE STRENGTH, x psi	
STRENGTH, x (psi)	Strength Pay factor, PF
$x \geq 4500$	PF = 1.0
$4500 > x \geq 3500$	$PF = 1.0 - \frac{0.15 (4000 - x)}{500}$
$3500 > x \geq 2800$	$PF = 0.85 - \frac{0.85 (3500 - x)}{700}$
$2800 > x$	PF = 0, Remove and Replace

PAY FACTORS M-4000 CONCRETE LOT ACCEPTANCE AIR CONTENT, X (%)	
Air Content, X (%)	Air Content Pay Factor, PF
$x \geq 5.0\%$	PF = 1.0
$5.0\% > x \geq 3.0\%$	$PF = 1.0 - 0.25 (5.0 - x)$
$3.0 > x$	Remove and Replace

The Contractor may request acceptance of a lot at strength pay factors equal to or greater than 0.95 in lieu of approved corrective work or removal and replacement. Acceptance at strength pay factors lower than 0.95 instead of approved corrective work or removal and replacement will be on the Engineer's determination of the effects the defective lot will have on structural integrity and durability.

Concrete air content will be determined on the same sample used to make the compression test cylinders for acceptance. The lot acceptance air content is the average of the test results for the lot. The pay factor for each lot based on air content is determined by the table above. In addition to the air content pay factor, coating concrete with an approved penetrating epoxy sealer at no cost to the Owner will be required any time concrete having air content less than 3.5% for M-4500 concrete is allowed to remain in place.

Application of Multiple Pay Factors: The total Pay Factor for any lot will be the product of all of the individual pay factors. All pay factors will be rounded to the nearest hundredth.

SP-17 PROGRESS MEETINGS

The Engineer will schedule and conduct progress meetings at regular intervals to discuss the status of the project. The meetings will be conducted at the project site, unless otherwise indicated.

In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

SP-18 ZONE PAY

For the purposes of calculating zone pay for prevailing wage rates, it should be noted that the center of the project site is less than 4 miles from the Lewis and Clark County Courthouse in Helena one-way, over the shortest practical maintained route.

END OF SECTION

STANDARD MODIFICATIONS TO MPWSS

SECTION 00950

STANDARD MODIFICATIONS to MPWSS (7th EDITION)

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SM-00001 GENERAL

These Standard Modifications apply changes, deletions, and additions to the Montana Public Works Standard Specifications Seventh Edition, April 2021, referred to as the MPWSS. Each Section of the MPWSS that has been modified is listed in the Table of Contents of Section 00950 Standard Modifications to MPWSS. The entire Section from the MPWS has not been rewritten for these modifications. Instead, modifications are indicated for a specific subsection, paragraph, sentence or drawing.

Where a Standard Modification to MPWSS does not exist for a particular Section of MPWSS it shall be assumed the work is to be completed in accordance with the appropriate MPWSS Section. When a Standard Modification to MPWSS does exist the requirements of that modification supersede the related MPWSS requirement. Where paragraphs are specifically deleted or modified, or new paragraphs added, all other parts of the MPWSS will remain in effect unless otherwise modified by the Project Manual in accordance with the order of governance as specified in "Summary of Work".

Forms included in the Project Manual will be used in lieu of similarly titled forms in the MPWSS. Where Technical Specifications follow these Modifications in later Divisions of the Project Manual, those Specifications replace same numbered specifications in the MPWSS.

Delete Part 4: MEASUREMENT AND PAYMENT in all sections of the MPWSS. Payment for an item will only be made if that item is listed as a Bid Item in Section 00400: Bid Form. If an item is listed as a Bid Item, administrative and procedural requirements will be listed in Section 01275: Measurement and Payment. If an item is not listed as a Bid Item, the item is not required or is considered an incidental cost to other Bid Items.

SM-01010 SUMMARY OF WORK

Delete Section 01010.1.2.D and replace with the following:

- D. The various portions of the Contract documents, of which these specifications are a part, are essential parts of the Agreement, and a requirement occurring in one is as binding as though occurring in all. All portions are intended to be complementary and to describe and provide for complete work as referenced in Article 3, General Conditions. Unless specifically noted otherwise, in the case of discrepancy, the following precedence will govern.
1. Permits from Town/City/County Departments and other agencies as may be required by law, which will govern over;
 2. Change Orders, which will govern over;
 3. Executed Agreement, which will govern over;
 4. Addenda, which will govern over;
 5. Special Provisions, which will govern over;
 6. Divisions 1 through Division 16 Technical Specifications, which will govern over;
 7. Funding Agency Special Provisions for Montana Public Facility Projects, which will govern over;
 8. Standard Modifications to the Montana Public Works Standard Specifications, which will govern over;
 9. Supplementary Conditions to the General Conditions, which will govern over;
 10. General Conditions, which will govern over;
 11. Drawings, which will govern over;

12. Contractor's Bid, which will govern over;
13. Montana Public Works Standard Specifications Seventh Edition, April 2021, which will govern over;
14. Montana Department of Transportation Standard Specifications for Road and Bridge Construction, which will govern over;
15. Reference Specifications, which will govern over;

With reference to Drawings, the order of precedence is as follows:

1. Addenda/Change Order Drawings govern over any other Drawings.
2. Figures govern over scaled dimensions.
3. Contract Detail Drawings govern over Contract General Drawings.
4. Contract Drawings govern over Standard Drawings.

SM-01041 PROJECT COORDINATION

Delete Section 01041 in its entirety.

SM-01050 FIELD ENGINEERING

Delete Section 01050 in its entirety and replace with Section 01050: Field Engineering contained in the Project Manual.

SM-01300 SUBMITTALS

Delete Section 01300 in its entirety and replace with Section 01300: SUBMITTALS contained in the Project Manual.

SM-01400 CONTRACTOR QUALITY CONTROL AND OWNER QUALITY ASSURANCE

Delete Section 01400 in its entirety and replace with Section 01400: Quality Control and Quality Assurance contained in the Project Manual.

SM-01500 CONSTRUCTION AND TEMPORARY FACILITIES

If Section 01500: CONSTRUCTION AND TEMPORARY FACILITIES is contained in the Project Manual, delete MPWSS Section 01500 in its entirety and replace with Section 01500: CONSTRUCTION AND TEMPORARY FACILITIES contained in the Project Manual. If Section 01500: CONSTRUCTION AND TEMPORARY FACILITIES is not contained in the Project Manual, refer to MPWSS Section 01500.

SM-01570 CONSTRUCTION TRAFFIC CONTROL

Delete Sections 01570.1.3.B and C and replace with the following:

- B. Prepare traffic control Drawings and submit to the Owner for review at least 14 days prior to the beginning of construction or change in a zone of work. Do not start work until the traffic control plan is reviewed and approved by the Owner.
- C. Cooperate with the Engineer and the Owner to adjust traffic control Drawings as required to fit specific field conditions. Modifications to construction timing based upon field adjustments to the traffic control plan will not constitute a claim for additional payment to the Contractor.
- D. The traffic plan will be subject to review and approval by the Montana Department of Transportation for roads under their jurisdiction, by the local County for county roads, by the local municipalities for municipal roads, and by the U.S. Forest Service or Bureau of Land Management for roads under their control. No work may commence until all approvals of the traffic plan have been secured.
- E. Notify all impacted parties (including but not limited to landowners, businesses, and residents adjacent to the work, local utilities, City and County personnel, emergency services, school district transportation directors, and the postal service) regarding the type and duration of the construction.
- F. For project sites involving a through street, provide the Owner with a news release when submitting the traffic control Drawings. Include in the release, as a minimum, the work activity and duration. Once approved, furnish the news release to the local media at least 2 weeks before starting work.

Add Section 01570.1.4.

1.4 TRAFFIC CONTROL OFFICER

- A. Name one employee responsible to coordinate traffic control for the entirety of the project. Assure the individual responsible for traffic control remains on-site whenever construction activity is taking place.

Delete Section 01570.3.1.B and replace with the following.

- B. Inspect the work area at least twice a day during construction, including weekends, holidays, and other non-working days. Correct all deficiencies discovered during inspections and assure traffic control is appropriate to the work. Maintain records of traffic control devices used and their location and daily checklists, signed by the traffic control officer, for each inspection.

Delete Section 01570.3.2.C and replace with the following.

- C. The Contractor is solely responsible for the construction traffic control system including removing, repairing, or replacing any traffic control device not providing its intended function. The Owner will periodically observe the traffic control for compliance with the

approved traffic control Drawings and inform the Contractor of any discovered non-compliance.

SM-01700 CONTRACT CLOSEOUT

Delete Section 01700 in its entirety and replace with Section 01700: CONTRACT CLOSEOUT contained in the Project Manual.

SM-02113 ADJUSTING EXISTING MANHOLES, LAMPHOLES, INLETS, WATER VALVE BOXES, WATER SERVICES, AND FIRE HYDRANTS TO GRADE

In Section 02113.3.1.A change the maximum rings under the casting from 12-inch (30 cm) to 6-inch (15 cm).

SM-02221 TRENCH EXCAVATION AND BACKFILL FOR PIPELINES & APPURTENANT STRUCTURES

Delete Section 02221.1.4.A.1 replace with the following.

1. Meet the testing requirements of Special Provisions and Section 01400: Contractor Quality Control and Owner Quality Assurance.

SM-02230 STREET EXCAVATION, BACKFILL, AND COMPACTION

Delete Section 02230.1.3.A and replace with the following.

- A. Field Density Testing
 2. Assure in-place field density tests meet ASTM D1556 (AASHTO T191) Sand Cone Method or ASTM D2922 and D3017 (AASHTO T238 and T239) Nuclear Densometer Methods. Quality assurance field density testing frequency is at the Engineer's discretion.

SM-02510 ASPHALT CONCRETE PAVEMENT

Add the following to Table 1 in Section 02510.2.2.1.

Percent by Weight Passing	
Sieve Size	Type B-Modified
1" (25 mm)	---
3/4" (19 mm)	100
1/2" (12.5 mm)	82 - 95
3/8" (9.5 mm)	70 - 90
No. 4 (4.75 mm)	45 - 65
No. 10 (2.00 mm)	32 - 45
No. 40 (0.425 mm)	15 - 25
No. 200 (0.075 mm)	4 - 8

Add the following to Section 02510.2.5.B.2:

All type B-modified asphaltic concrete surfacing shall meet the following Marshall Design criteria as determined by ASTM D1559.

- a. Number of Compaction Blows, Each End of Specimen..... 75
- b. Stability, Minimum..... 1500 lbs.
- c. Flow..... 8 – 16
- d. Air Voids, Percent..... 3 % - 5%
- e. Percent Air Voids Filled with Bitumen.. 65-75

Delete Section 02510.3.9 and replace with the following.

- A. Sampling and testing of the aggregates and other constituent materials will meet the requirements of Special Provisions and Section 01400: Contractor Quality Control and Owner Quality Assurance.

Delete Section 02510.3.29.A and replace with the following.

- A. Owner or Owner’s representative may perform field density testing of the pavement through the use of a nuclear densometer and/or by providing 4 inch diameter core samples of the asphalt surface courses.

Add the following Section 02510.3.29.G.

- G. Correct all pavement composition and field density deficiencies at Contractor’s expense. Areas found deficient in thickness by more than the allowable deviation will be evaluated by the Engineer. If the Engineer determines the deficient areas warrant removal, remove

and replace the areas with asphaltic concrete of the thickness shown on the Drawings at the Contractor's expense.

SM-02529 CONCRETE SIDEWALKS, DRIVEWAYS, APPROACHES, CURB TURN FILLETS, VALLEY GUTTERS, AND MISCELLANEOUS NEW CONCRETE CONSTRUCTION

Delete Standard Drawing 02529-6, Retrofit Drive Approach, from the list in Section 02529.1.2.A and the drawing in its entirety from Appendix A.

SM-02720 STORM DRAIN SYSTEMS

Delete Sections 02720.2.2.B and C

In Section 02720.3.2.A.3 change total ring height from 12-inch (30 cm) maximum to 6-inch (15 cm) maximum.

SM-02730 SANITARY SEWER COLLECTION SYSTEMS

Delete Sections 02730.2.2.C and D and replace with the following.

- A. If HDPE pipe is included in the work, refer to the "High Density Polyethylene (HDPE) Pipe" technical specification.

- B. Ductile Iron Pipe (DIP)
 - 1. General
 - a. Furnish ductile iron pipe with a Class 52 wall thickness and a minimum operating pressure of 150 psi (10 Bar) that meets AWWA C151.
 - b. Assure the pipe interior is coated with a fusion bonded epoxy, a 40 mil polyethylene liner, or another coating rated for wastewater applications, as approved by Engineer.
 - c. Polyethylene encasement installation shall be per the Ductile Iron Pipe Research Association (DIPRA) Polyethylene Encasement Installation Guide.

In Section 02730.3.2.A.3 change total ring height from 12-inch (30 cm) maximum to 6-inch (15 cm) maximum.

Delete Sections 02730.3.4.G.1 - 2 and replace with the following.

- 1. Before final acceptance, Owner will require all sewers to be inspected using a television camera after leakage tests. Dewatering equipment must be shut down a minimum of 24 hours prior to the television inspection to allow groundwater to return to typical levels. Adequately flush the sewer lines prior to each television inspection. Television inspection of dry sewer lines is not acceptable. A sewer line is deficient and unacceptable if (1) the alignment is outside the specified limits, (2) water ponds in any section are equal to or greater than 2 times the grade tolerances specified herein under Section 02730.3.E.1, or (3) the pipe has visible defects such as open joints, pinched gaskets, cracked barrels or bells, or similar defects. Correct any deficiencies and re-inspect using a television camera. Sanitary

sewer service lines may be subject to the same television inspection requirements as sanitary sewer mains at the discretion of the Engineer and Owner.

2. As with all other testing, the cost for televising the sewer line for final acceptance will be considered incidental to the Contractor's bid price per lineal foot of pipe, and no additional payment will be made for such work. All costs incurred in any television inspection performed solely for the Contractor's benefit will be the responsibility of the Contractor.

In Section 02730.3.4.G.3 change "Record all television inspections." to "Record all television inspections in a format acceptable to the Owner."

SM-03210 REINFORCING STEEL

Delete Section 03210.2.1.A and replace with the following.

- A. Furnish the specified deformed reinforcement steel meeting ASTM A615, (AASHTO M31) or ASTM A705, Grade 60. If epoxy-coated reinforcement steel is specified on the plans or special provisions supply from a CRSI certified epoxy-coated reinforcement steel manufacturer.

Delete Section 03210.3.3.G and replace with the following.

- G. Follow the minimum concrete protective covering for reinforcement below, unless noted otherwise on the Drawings.
 1. Concrete deposited against ground: 3 inches
 2. Formed surfaces exposed to weather or in contact with ground:
 - a. #5 bars or larger 2 inches
 - b. Smaller than #5 bars 1-1/2 inches
 3. Walls exposed to weather: 2 inches
 4. Interior surfaces:
 - a. Beams, girders and columns 1-1/2 inches
 - b. Slabs, wall and joists: 1-1/2 inches

SM-03310 STRUCTURAL CONCRETE

Add Section 03310.2.4 as follows:

2.4 SILANE SEALER

- A. Furnish high performance clear, penetrating silane sealer listed on the Montana Department of Transportation Qualified Products List section 717.

Delete Section 03310.3.6.A. and replace with the following.

- A. All concrete must be tested by an ACI Grade I or equivalent certified testing technician. Unless otherwise specified, the Contractor shall be responsible for all acceptance testing during the on-site placement of the concrete.

Delete Section 03310.3.6.A.2.a and replace with the following.

- a. During each day's pour, check the consistency of the concrete by slump test. Also perform a slump test each time a test cylinder is made. Assure slump tests meet ASTM C143 "Method of Test for the Slump of Portland Cement Concrete."

Delete Section 03310.3.6.A.3.a and replace with the following.

- a. During each strength test, check the air content by either ASTM C231 "Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method, ASTM C173 "Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method", or ASTM C138 "Method of Test for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete."

Delete Section 03310.3.6.A.4.h and replace with the following.

- h. When concrete fails to meet the requirements above or when tests of field cured cylinders indicate deficiencies in protection and curing, the Contractor may order tests on the hardened concrete in accordance with ACI-301 for that portion of the structure where the questionable concrete has been placed. In the event the load or core tests also indicate that the structure is unsatisfactory, make all modifications as directed by the Engineer to make the structure sound.

Add Section 03310.3.7 as follows:

3.7 SILANE SEALER APPLICATION

- A. Apply silane sealer to all surfaces of concrete that could potentially be exposed to magnesium chloride per the manufacturer's recommendations.

END OF SECTION

WAGE RATES

MONTANA
PREVAILING WAGE RATES FOR HEAVY CONSTRUCTION SERVICES 2024

Effective: January 13, 2024

Greg Gianforte, Governor
State of Montana

Sarah Swanson, Commissioner
Department of Labor & Industry

To obtain copies of prevailing wage rate schedules, or for information relating to public works projects and payment of prevailing wage rates, visit ERD at erd.dli.mt.gov/labor-standards or contact:

Employment Relations Division
Montana Department of Labor and Industry
P. O. Box 8011
Helena, MT 59620-1503
Phone 406-444-6543

The department welcomes questions, comments, and suggestions from the public. In addition, we'll do our best to provide information in an accessible format, upon request, in compliance with the Americans with Disabilities Act.

MONTANA PREVAILING WAGE REQUIREMENTS

The Commissioner of the Department of Labor and Industry, in accordance with Sections 18-2-401 and 18-2-402 of the Montana Code Annotated (MCA), has determined the standard prevailing rate of wages for the occupations listed in this publication.

The wages specified herein control the prevailing rate of wages for the purposes of Section 18-2-401, et seq., MCA. It is required each employer pay (as a minimum) the rate of wages, including fringe benefits, travel allowance, zone pay and per diem applicable to the district in which the work is being performed as provided in the attached wage determinations.

All Montana Prevailing Wage Rates are available on the internet at erd.dli.mt.gov/labor-standards or by contacting the department at (406) 444-6543.

In addition, this publication provides general information concerning compliance with Montana's Prevailing Wage Law and the payment of prevailing wages. For detailed compliance information relating to public works contracts and payment of prevailing wage rates, please consult the regulations on the internet at erd.dli.mt.gov/labor-standards or contact the department at (406) 444-6543.

SARAH SWANSON
Commissioner
Department of Labor and Industry
State of Montana

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A. Date of January 13, 2024

B. Definition of Heavy Construction

The Administrative Rules of Montana (ARM), 24.17.501(4) – (4)(a), states “Heavy construction projects include, but are not limited to, those projects that are not properly classified as either ‘building construction’, or ‘highway construction.’”

Heavy construction projects include, but are not limited to, antenna towers, bridges (major bridges designed for commercial navigation), breakwaters, caissons (other than building or highway), canals, channels, channel cut-offs, chemical complexes or facilities (other than buildings), cofferdams, coke ovens, dams, demolition (not incidental to construction), dikes, docks, drainage projects, dredging projects, electrification projects (outdoor), fish hatcheries, flood control projects, industrial incinerators (other than building), irrigation projects, jetties, kilns, land drainage (not incidental to other construction), land leveling (not incidental to other construction), land reclamation, levees, locks and waterways, oil refineries (other than buildings), pipe lines, ponds, pumping stations (prefabricated drop-in units – not buildings), railroad construction, reservoirs, revetments, sewage collection and disposal lines, sewers (sanitary, storm, etc.), shoreline maintenance, ski tows, storage tanks, swimming pools (outdoor), subways (other than buildings), tipples, tunnels, unsheltered piers and wharves, viaducts (other than highway), water mains, waterway construction, water supply lines (not incidental to building), water and sewage treatment plants (other than buildings) and wells.”

C. Definition of Public Works Contract

Section 18-2-401(11)(a), MCA defines “public works contract” as “...a contract for construction services let by the state, county, municipality, school district, or political subdivision or for nonconstruction services let by the state, county, municipality, or political subdivision in which the total cost of the contract is in excess of \$25,000...”.

D. Prevailing Wage Schedule

This publication covers only Heavy Construction occupations and rates in the specific localities mentioned herein. These rates will remain in effect until superseded by a more current publication. Current prevailing wage rate schedules for Building Construction, Highway Construction and Nonconstruction Services occupations can be found on the internet at www.mtwagehourbopa.com or by contacting the department at (406) 444-6543.

E. Rates to Use for Projects

ARM, 24.17.127(1)(c), states “The wage rates applicable to a particular public works project are those in effect at the time the bid specifications are advertised.”

F. Wage Rate Adjustments for Multiyear Contracts

Section 18-2-417, MCA states:

“(1) Any public works contract that by the terms of the original contract calls for more than 30 months to fully perform must include a provision to adjust, as provided in subsection (2), the standard prevailing rate of wages to be paid to the workers performing the contract.

(2) The standard prevailing rate of wages paid to workers under a contract subject to this section must be adjusted 12 months after the date of the award of the public works contract. The amount of the adjustment must be a 3% increase. The adjustment must be made and applied every 12 months for the term of the contract.

(3) Any increase in the standard rate of prevailing wages for workers under this section is the sole responsibility of the contractor and any subcontractors and not the contracting agency.”

G. Fringe Benefits

Section 18-2-412, MCA states:

“(1) To fulfill the obligation...a contractor or subcontractor may:

(a) pay the amount of fringe benefits and the basic hourly rate of pay that is part of the standard prevailing rate of wages directly to the worker or employee in cash;

(b) make an irrevocable contribution to a trustee or a third person pursuant to a fringe benefit fund, plan, or program that meets the requirements of the Employee Retirement Income Security Act of 1974 or that is a bona fide program approved by the U. S. department of labor; or

(c) make payments using any combination of methods set forth in subsections (1)(a) and (1)(b) so that the aggregate of payments and contributions is not less than the standard prevailing rate of wages, including fringe benefits and travel allowances, applicable to the district for the particular type of work being performed.

(2) The fringe benefit fund, plan, or program described in subsection (1)(b) must provide benefits to workers or employees for health care, pensions on retirement or death, life insurance, disability and sickness insurance, or bona fide programs that meet the requirements of the Employee Retirement Income Security Act of 1974 or that are approved by the U. S. department of labor.”

Fringe benefits are paid for all hours worked (straight time and overtime hours). However, fringe benefits are not to be considered a part of the hourly rate of pay for calculating overtime, unless there is a collectively bargained agreement in effect that specifies otherwise.

H. Dispatch City

ARM, 24.17.103(11), defines dispatch city as *“...the courthouse in the city from the following list which is closest to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Miles City, Missoula and Sidney.”*

I. Zone Pay

Zone pay is not travel pay. ARM, 24.17.103(24), defines zone pay as *“...an amount added to the base pay; the combined sum then becomes the new base wage rate to be paid for all hours worked on the project. Zone pay must be determined by measuring the road miles one way over the shortest practical maintained route from the dispatch city to the center of the job.”* See section H above for a list of dispatch cities.

J. Computing Travel Benefits

ARM, 24.17.103(22), states *“‘Travel pay,’ also referred to as ‘travel allowance,’ is and must be paid for travel both to and from the job site, except those with special provisions listed under the classification. The rate is determined by measuring the road miles one direction over the shortest practical maintained route from the dispatch city or the employee’s home, whichever is closer, to the center of the job.”* See section H above for a list of dispatch cities.

K. Per Diem

ARM, 24.17.103(19), states *“‘Per diem’ typically covers costs associated with board and lodging expenses. Per diem is paid when an employee is required to work at a location outside the daily commuting distance and is required to stay at that location overnight or longer.”*

L. Apprentices

Wage rates for apprentices registered in approved federal or state apprenticeship programs are contained in those programs. Additionally, Section 18-2-416(2), MCA states, *“...The full amount of any applicable fringe benefits must be paid to the apprentice while the apprentice is working on the public works contract.”* Apprentices not registered in approved federal or state apprenticeship programs will be paid the appropriate journey level prevailing wage rate when working on a public works contract.

M. Posting Notice of Prevailing Wages

Section 18-2-406, MCA, provides that contractors, subcontractors, and employers who are “...performing work or providing construction services under public works contracts, as provided in this part, shall post in a prominent and accessible site on the project or staging area, not later than the first day of work and continuing for the entire duration of the project, a legible statement of all wages and fringe benefits to be paid to the employees.”

N. Employment Preference

Sections 18-2-403 and 18-2-409, MCA require contractors to give preference to the employment of bona fide Montana residents in the performance of work on public works contracts.

O. Projects of a Mixed Nature

Section 18-2-408, MCA states:

“(1) The contracting agency shall determine, based on the preponderance of labor hours to be worked, whether the public works construction services project is classified as a highway construction project, a heavy construction project, or a building construction project.

“(2) Once the project has been classified, employees in each trade classification who are working on that project must be paid at the rate for that project classification”

P. Occupations Definitions

You can find definitions for these occupations on the following Bureau of Labor Statistics website:

http://www.bls.gov/oes/current/oes_stru.htm

Q. Welder Rates

Welders receive the rate prescribed for the craft performing an operation to which welding is incidental.

R. Foreman Rates

Rates are no longer set for foremen. However, if a foreman performs journey level work, the foreman must be paid at least the journey level rate.

S. Proper Classification for Pipefitter and Laborer/Pipelayer Work on Water and Waste Water Treatment Plants The proper classification for the following work is Pipefitter, when it is performed inside a building structure or performed at a location which will later be inside of a building: Joining steel pipe larger than 12 inches in diameter with bolted flange connections that has been pre-fabricated off site and does not require any modification such as cutting, grinding, welding, or other fabrication in order to be installed. All other work previously classified as pipefitter remains in that classification. The proper classification for that work when it is at a location that will always be outside a building is Pipelayer, which is under the Laborer Group 3 classification.

WAGE RATES

BOILERMAKERS

Wage	Benefit
\$35.30	\$30.94

Duties Include:

Construct, assemble, maintain, and repair stationary steam boilers, boiler house auxiliaries, process vessels, pressure vessels and penstocks. Bulk storage tanks and bolted steel tanks.

Travel and Per Diem:

No travel or per diem established.

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BRICK, BLOCK, AND STONE MASONS

Wage	Benefit
\$32.32	\$16.78

Travel:

0-70 mi. free zone
>70-90 mi. \$60.00/day
>90 mi. \$80.00/day

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CARPENTERS

Wage	Benefit
\$34.50	\$14.07

Zone Pay:

0-30 mi. free zone
>30-60 mi. base pay + \$4.00/hr.
>60 mi. base pay + \$6.00/hr.

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CEMENT MASONS AND CONCRETE FINISHERS

No Rate Established

Duties Include:

Smooth and finish surfaces of poured concrete, such as floors, walks, sidewalks, or curbs. Align forms for sidewalks, curbs, or gutters.

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CONSTRUCTION EQUIPMENT OPERATORS GROUP 1

Wage	Benefit
\$30.76	\$14.40

This group includes but is not limited to:

Air Compressor; Auto Fine Grader; Belt Finishing; Boring Machine (Small); Cement Silo; Crane, A-Frame Truck Crane; Crusher Conveyor; DW-10, 15, and 20 Tractor Roller; Farm Tractor; Forklift; Form Grader; Front-End Loader, under 1 cu. yd; Oiler, Herman Nelson Heater; Mucking Machine; Oiler, All Except Cranes/Shovels; Pumpman.

Zone Pay:

0-30 mi. free zone
>30-60 mi. base pay + \$3.50/hr.
>60 mi. base pay + \$5.50/hr.

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CONSTRUCTION EQUIPMENT OPERATORS GROUP 2

Wage	Benefit
\$31.55	\$14.10

This group includes but is not limited to:

Air Doctor; Backhoe\Excavator\Shovel, up to and incl. 3 cu. yds; Bit Grinder; Bituminous Paving Travel Plant; Boring Machine, Large; Broom, Self-Propelled; Concrete Travel Batch; Concrete Float & Spreader; Concrete Bucket Dispatcher; Concrete Finish Machine; Concrete Conveyor; Distributor; Dozer, Rubber-Tired, Push, & Side Boom; Elevating Grader\Gradall; Field Equipment Serviceman; Front-End Loader, 1 cu. yd up to and incl. 5 cu. yds; Grade Setter; Heavy Duty Drills, All Types; Hoist\Tugger, All; Hydralift Forklifts & Similar; Industrial Locomotive; Motor Patrol (except finish); Mountain Skidder; Oiler, Cranes\Shovels; Pavement Breaker, EMSCO; Power Saw, Self-Propelled; Pugmill; Pumpcrete\Grout Machine; Punch Truck; Roller, other than Asphalt; Roller, Sheepsfoot (Self-Propelled); Roller, 25 tons and over; Ross Carrier; Rotomill, under 6 ft; Trenching Machine; Washing /Screening Plant

Zone Pay:

0-30 mi. free zone
>30-60 mi. base pay + \$3.50/hr.
>60 mi. base pay + \$5.50/hr.

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CONSTRUCTION EQUIPMENT OPERATORS GROUP 3

Wage	Benefit
\$37.00	\$15.93

Per Diem:
0-75 mi. free zone
>75 mi. \$110.00/Day

This group includes but is not limited to:

Asphalt Paving Machine; Asphalt Screed; Backhoe\Excavator\Shovel, over 3 cu. yds; Cableway Highline; Concrete Batch Plant; Concrete Curing Machine; Concrete Pump; Cranes, Creter; Cranes, Electric Overhead; Cranes, 24 tons and under; Curb Machine\Slip Form Paver; Finish Dozer; Front-End Loader, over 5 cu. yds; Mechanic\Welder; Pioneer Dozer; Roller Asphalt (Breakdown & Finish); Rotomill, over 6 ft; Scraper, Single, Twin, or Pulling Belly-Dump; YO-YO Cat Haul Truck, Articulating Trucks, Vac Truck.

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CONSTRUCTION EQUIPMENT OPERATORS GROUP 4

Wage	Benefit
\$37.00	\$15.93

Per Diem:
0-75 mi. free zone
>75 mi. \$110.00/Day

This group includes but is not limited to:

Asphalt\Hot Plant Operator; Cranes, 25 tons up to and incl. 44 tons; Crusher Operator; Finish Motor Patrol; Finish Scraper.

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CONSTRUCTION EQUIPMENT OPERATORS GROUP 5

Wage	Benefit
\$37.00	\$15.93

Per Diem:
0-75 mi. free zone
>75 mi. \$110.00/Day

This group includes but is not limited to:

Cranes, 45 tons up to and incl. 74 tons.

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CONSTRUCTION EQUIPMENT OPERATORS GROUP 6

Wage	Benefit
\$38.00	\$15.93

Per Diem:
0-75 mi. free zone
>75 mi. \$110.00/Day

This group includes but is not limited to:

Cranes, 75 tons up to and incl. 149 tons; Cranes, Whirley (All).

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CONSTRUCTION EQUIPMENT OPERATORS GROUP 7

Wage	Benefit
\$39.00	\$15.93

Per Diem:
0-75 mi. free zone
>75 mi. \$110.00/Day

This group includes but is not limited to:

Cranes, 150 tons up to and incl. 250 tons; Cranes, over 250 tons—add \$1.00 for every 100 tons over 250 tons; Crane, Tower (All); Crane Stiff-Leg or Derrick; Helicopter Hoist.

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CONSTRUCTION LABORERS GROUP 1/FLAG PERSON FOR TRAFFIC CONTROL

Wage	Benefit
\$23.08	\$11.82

Zone Pay:
0-30 mi. free zone
>30-60 mi. base pay + \$3.05/hr.
>60 mi. base pay + \$4.85/hr.

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CONSTRUCTION LABORERS GROUP 2

Wage	Benefit
\$26.57	\$11.82

Zone Pay:
0-30 mi. free zone
>30-60 mi. base pay + \$3.05/hr.
>60 mi. base pay + \$4.85/hr.

This group includes but is not limited to:

General Labor; Asbestos Removal; Burning Bar; Bucket Man; Carpenter Tender; Caisson Worker; Cement Mason Tender; Cement Handler (dry); Chuck Tender; Choker Setter; Concrete Worker; Curb Machine-lay Down; Crusher and Batch Worker; Heater Tender; Fence Erector; Landscape Laborer; Landscaper; Lawn Sprinkler Installer; Pipe Wrapper; Pot Tender; Powderman Tender; Rail and Truck Loaders and Unloaders; Riprapper; Sign Erection; Guardrail and Jersey Rail; Spike Driver; Stake Jumper; Signalman; Tail Hoseman; Tool Checker and Houseman and Traffic Control Worker.

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CONSTRUCTION LABORERS GROUP 3

Wage	Benefit
\$26.07	\$11.82

This group includes but is not limited to:

Concrete Vibrator; Dumpman (Grademan); Equipment Handler; Geotextile and Liners; High-Pressure Nozzleman; Jackhammer (Pavement Breaker) Non-Riding Rollers; Pipelayer; Posthole Digger (Power); Power Driven Wheelbarrow; Rigger; Sandblaster; Sod Cutter-Power and Tamper.

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Zone Pay:

0-30 mi. free zone
>30-60 mi. base pay + \$3.05/hr.
>60 mi. base pay + \$4.85/hr.

CONSTRUCTION LABORERS GROUP 4

Wage	Benefit
\$26.76	\$11.82

This group includes but is not limited to:

Hod Carrier***; Water Well Laborer; Blaster; Wagon Driller; Asphalt Raker; Cutting Torch; Grade Setter; High-Scaler; Power Saws (Faller & Concrete); Powderman; Rock & Core Drill; Track or Truck Mounted Wagon Drill and Welder incl. Air Arc

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Zone Pay:

0-30 mi. free zone
>30-60 mi. base pay + \$3.05/hr.
>60 mi. base pay + \$4.85/hr.

***Hod Carriers will receive the same amount of travel and/or subsistence pay as bricklayers when requested to travel.

DIVERS

	Wage	Benefit
Stand-By	\$48.51	\$16.05
Diving	\$97.52	\$16.05

Depth Pay (Surface Diving)

0-20 ft.	free zone
>20-100 ft.	\$2.00 per ft.
>100-150 ft.	\$3.00 per ft.
>150-220 ft.	\$4.00 per ft.
>220 ft.	\$5.00 per ft.

Diving In Enclosures

0-25 ft.	free zone
>25-300 ft.	\$1.00 per ft.

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Zone Pay:

0-30 mi. free zone
>30-60 mi. base pay + \$4.00/hr.
>60 mi. base pay + \$6.00/hr.

DIVER TENDERS

Wage	Benefit
\$47.55	\$16.05

The tender shall receive 2 hours at the straight time pay rate per shift for dressing and/or undressing a Diver when work is done under hyperbaric conditions.

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Zone Pay:
0-30 mi. free zone
>30-60 mi. base pay + \$4.00/hr.
>60 mi. base pay + \$6.00/hr.

ELECTRICIANS

Wage	Benefit
\$38.86	\$17.75

Travel:
No mileage due when traveling in employer's vehicle.

The following travel allowance is applicable when traveling in employee's vehicle:

0-18 mi. free zone
>18-60 mi. federal mileage rate/mi.

Per Diem
District 4
>60 mi. \$80.00/day
Per Diem in Big Sky and West Yellowstone \$125/day.

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INSULATION WORKERS - MECHANICAL (HEAT AND FROST)

Wage	Benefit
\$42.26	\$21.99

Duties Include:
Insulate pipes, ductwork or other mechanical systems.

Travel:
0-30 mi. free zone
>30-40 mi. \$25.00/day
>40-50 mi. \$35.00/day
>50-60 mi. \$45.00/day
>60 mi. \$130.00/day plus
▪ \$0.56/mi. if transportation is not provided.
▪ \$0.20/mi. if in company vehicle.

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IRONWORKERS – REINFORCING IRON AND REBAR WORKERS

Wage	Benefit
\$33.95	\$24.50

Travel:
All Districts
0-45 mi. free zone
>45-85 mi. \$100.00/day
>85 mi. \$150.00/day

Duties Include:

Structural steel erection; assemble prefabricated metal buildings; cut, bend, tie, and place rebar; energy producing windmill type towers; metal bleacher seating; handrail fabrication and ornamental steel.

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IRONWORKERS – STRUCTURAL IRON AND STEEL WORKERS

Wage	Benefit
\$33.95	\$24.50

Travel:
All Districts
0-45 mi. free zone
>45-85 mi. \$100.00/day
>85 mi. \$150.00/day

Duties Include:

Structural steel erection; assemble prefabricated metal buildings; cut, bend, tie, and place rebar; energy producing windmill type towers; metal bleacher seating; handrail fabrication and ornamental steel.

LINE CONSTRUCTION – EQUIPMENT OPERATORS

Wage	Benefit
\$38.56	\$17.93

Travel:
No Free Zone
\$60.00/day

Duties Include:

All work on substations

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LINE CONSTRUCTION – GROUNDMAN

Wage	Benefit
\$30.11	\$17.44

Travel:
No Free Zone
\$60.00/day

Duties Include:

All work on substations

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LINE CONSTRUCTION – LINEMAN

Wage	Benefit
\$50.35	\$19.54

Travel:
No Free Zone
\$60.00/day

Duties Include:

All work on substations

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MILLWRIGHTS

Wage	Benefit
\$40.49	\$18.84

Zone Pay:
0-30 mi. free zone
>30-60 mi. base pay + \$4.00/hr.
>60 mi. base pay + \$6.00/hr.

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PAINTERS

Wage	Benefit
\$25.00	\$0.00

Travel and Per Diem:
No travel or per diem established.

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PILE BUCKS

Wage	Benefit
\$34.50	\$14.07

Duties Include:

Set up crane; set up hammer; weld tips on piles; set leads; insure piles are driven straight with the use of level or plum bob. Give direction to crane operator as to speed, and direction of swing. Cut piles to grade.

Zone Pay:
0-30 mi. free zone
>30-60 mi. base pay + \$4.00/hr.
>60 mi. base pay + \$6.00/hr.

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PLUMBERS, PIPEFITTERS, AND STEAMFITTERS

Wage	Benefit
\$40.06	\$20.71

Duties Include:

Assemble, install, alter, and repair pipe-lines or pipe systems that carry water, steam, air, other liquids or gases. Testing of piping systems, commissioning and retro-commissioning. Workers in this occupation may also install heating and cooling equipment and mechanical control systems.

Travel:
District 4
0-70 free zone
>70 mi.

- On jobs when employees do not work consecutive days: \$0.55/mi. if employer doesn't provide transportation. Not to exceed two trips.
- On jobs when employees work any number of consecutive days: \$110.00/day.

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SPRINKLER FITTERS

Wage	Benefit
\$39.06	\$25.39

Duties Include:

Duties Include but not limited to any and all fire protection systems: Installation, dismantling, inspection, testing, maintenance, repairs, adjustments, and corrections of all fire protection and fire control systems, including both overhead and underground water mains, all piping, fire hydrants, standpipes, air lines, tanks, and pumps used in connection with sprinkler and alarm systems.

Travel

The following travel allowance is applicable when traveling in employee's vehicle.

- 0-60 mi. free zone
- >60-80 mi. \$23.00/day
- >80-100 mi. \$33.00/day
- >100 mi. \$125.00/day + the IRS rate per mile and \$8.92 for every 15 miles traveled for one trip out and one trip back

No travel allowance required when in employer's vehicle except when staying the night.

- >100 mi. \$125.00/day

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TRUCK DRIVERS

Pilot Car Driver	No Rate Established	
	Wage	Benefit
Truck Driver	\$31.00	\$9.37

Truck drivers include but are not limited to:

Combination Truck and Concrete Mixer and Transit Mixer; Dry Batch Trucks; Distributor Driver; Dumpman; Dump Trucks and similar equipment; Dumpster; Flat Trucks; Lumber Carriers; Lowboys; Pickup; Powder Truck Driver; Power Boom; Serviceman; Service Truck/Fuel Truck/Tireperson; Truck Mechanic; Trucks with Power Equipment; Warehouseman, Partsman, Cardex and Warehouse Expeditor; Water Trucks.

Zone Pay:

All Districts

- 0-30 mi. free zone
- >30-60 mi. base pay + \$3.05/hr.
- >60 mi. base pay + \$.485/hr.

Special Provision:

Zone pay only applies to the Truck Driver classification. No zone pay was established for Pilot Car Driver.

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DIVISION 1

GENERAL REQUIREMENTS

SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Special Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittals" for submitting surveys.
 - 2. Division 1 Section "Contract Closeout" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.
 - 5. Notify Engineer when deviations from required lines and levels exceed allowable tolerances.
 - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

3.2 FIELD ENGINEERING

- A. Identification: Owner and Engineer will identify existing benchmarks, control points, and property corners to the best of his knowledge. The Contractor will have the ultimate responsibility to locate, recognize and preserve all of these that are encountered.
- B. Retain a licensed land surveyor, at the Contractor's expense, to replace any survey corners, property pins, or highway right-of-way monuments removed or damaged during construction.
- C. 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.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Engineer before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- D. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

PART 4 - MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION

SECTION 01275

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Special Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for measurement and payment.

1.3 DEFINITIONS

- A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, and profit.
- B. Measurement and Payment: The Measurement and Payment sections do not necessarily name all incidental items required to complete the work. The cost of all such incidentals shall be included in the various related items of work. All estimated quantities stipulated in the Bid Forms or other Contract Documents are approximate and are to be used only as a basis for estimating the probable cost of the work and for the purpose of comparing the proposals submitted for the work. It is understood and agreed that the actual amounts of work performed and materials furnished under unit price items may differ from such estimated quantities and the payment for such work and materials shall be based on the actual amount of work done and materials furnished in each case.
- C. Engineer will determine the actual quantities and classifications of Unit Price Work performed by the Contractor.
- D. List of Bid Items: A list of unit Bid Items is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each Bid Item.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST BID ITEMS

A. Bid Items No. 100 - MOBILIZATION

1. Description: This item covers the costs of preparatory work and operations. **Any bids that contain a lump sum bid price for mobilization greater than 10% of the bid price for the respective schedule or additive alternative may be rejected at the option of the Owner.**
2. Work Required: Work required under this section includes but is not limited to the following.
 - a. The movement of personnel, equipment, supplies and incidentals to the project site
 - b. The establishment of all facilities necessary for the work on the project;
 - c. The costs of obtaining the required permits, bonds, and insurance; and
 - d. All other work and operations which must be performed, or costs incurred prior to beginning work on the various items of the project.
3. Unit of Measurement: Lump Sum
4. Measurement: Measurement for MOBILIZATION will be made as a percentage completed of the lump sum. 50% of the lump sum will be credited to the first progress payment, with the second 50% being credited to subsequent progress payments in proportion to total construction completed as a percentage of the contract unit price.
5. Payment: Payment for MOBILIZATION will be made at the contract unit price bid as a lump sum.

B. Bid Items No. 101 – EXISTING FUEL SYSTEM DEMOLITION

1. Description: This item includes demolition and salvage work associated with the existing fueling system as indicated on the Drawings and in the Contract Documents.
2. Work Required: Work required under this section includes but is not limited to the following.
 - a. De-energizing the electrical service to the fuel pumps, controls, dispensers and lights;
 - b. Removal and salvage of two existing fuel dispensers;
 - c. Removal and salvage of two existing light poles and luminaires;
 - d. Removal and salvage of the existing fuel management system controls;
 - e. Removal of existing bollards (approximately 30 each) flush with the existing concrete slab;
 - f. Transfer any remaining fuel in the existing tanks to the new fuel tanks;
 - g. Remove and legally dispose of sediment from the bottoms of the existing fuel tanks;
 - h. Remove and dispose of fuel system piping;
 - i. Salvage and relocate the two existing fuel tanks to a location on the facility as directed by the owner.
 - j. All incidental tools, equipment, hauling, offsite disposal and labor for the completion of this item.
3. Unit of Measurement: Lump Sum
4. Measurement: Measurement for EXISTING FUEL SYSTEM DEMOLITION will be made as a percentage completed of the lump sum.

5. Payment: Payment for EXISTING FUEL SYSTEM DEMOLITION will be made at the contract unit price bid as a lump sum.
- C. Bid Items No. 102 – EXISTING MG/CL SYSTEM DEMOLITION
1. Description: This item includes demolition work associated with the existing Mg/Cl system as indicated on the Drawings and in the Contract Documents.
 2. Work Required: Work required under this section includes but is not limited to the following.
 - a. De-energizing the electrical connections to the Mg/Cl pumps, controls, and sheds;
 - b. Remove and dispose of the two existing 10,000 gallon poly storage tanks;
 - c. Remove and dispose of all Mg/Cl system piping, fittings, valves and supports;
 - d. Remove and dispose of two existing Mg/Cl pump, controls and miscellaneous electrical equipment;
 - e. Remove and dispose of two Mg/Cl sheds;
 - f. Remove and dispose of concrete slab/foundation;
 - g. Regrade site level with surrounding terrain;
 - h. All incidental tools, equipment, hauling, offsite disposal and labor for the completion of this item.
 3. Unit of Measurement: Lump Sum
 4. Measurement: Measurement for EXISTING MG/CL SYSTEM DEMOLITION will be made as a percentage completed of the lump sum.
 5. Payment: Payment for EXISTING MG/CL SYSTEM DEMOLITION will be made at the contract unit price bid as a lump sum.
- D. Bid Items No. 103 – DUAL FUEL TANK SYSTEM
1. Description: This item includes furnishing and installing a complete 10,000 gallon dual compartment, double walled, steel above ground fuel storage tank. The tank will include 5,000 gallons of diesel fuel storage and 5,000 gallons of gasoline storage.
 2. Work Required: Work required under this section includes but is not limited to the following.
 - a. Design and construction of a concrete foundation system for the tank;
 - b. Furnishing and installing the dual compartment 10,000 gallon tank on the foundation;
 - c. Furnishing and installing two turbine fuel pumps;
 - d. Tank accessories, including vents, sensor ports, a fuel offload station with spill containment, emergency fuel shutoffs (2 each) and signage;
 - e. All fuel system piping between the tank and the two fuel dispensers, including painting of the pipe, fittings and supports;
 - f. Furnishing, installing and programming a tank monitoring system;
 - g. Reinstalling the existing fuel management system controls and making electronic and software upgrades as specified to provide for a fully integrated fueling and D.E.F. system;
 - h. Furnishing of operation and maintenance manuals and warranties to the owner;
 - i. All incidental tools, equipment, materials and labor for the completion of this item.
 3. Unit of Measurement: Lump Sum

4. Measurement: Measurement for DUAL FUEL TANK SYSTEM will be made as a percentage completed of the lump sum
 5. Payment: Payment for DUAL FUEL TANK SYSTEM will be made at the contract unit price bid as a lump sum.
- E. Bid Items No. 104 – D.E.F. SYSTEM:
1. Description: This item includes furnishing and installing a complete self-contained Diesel Exhaust Fluid (D.E.F.) storage and dispensing system. Work required under this section shall include but not be limited to the following:
 - a. Furnishing the D.E.F. unit as specified;
 - b. Mounting the unit to the concrete fuel island as recommended by the manufacturer;
 - c. Integrate the D.E.F. system with the fuel system management controls to allow for monitoring of D.E.F. usage;
 - d. Supply of operation and maintenance manuals to the owner;
 - e. All labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.
 - f. Electrical work will be measured and paid for separately.
 2. Unit of Measurement: Lump Sum.
 3. Measurement: D.E.F. SYSTEM will be measured as a percentage completed of the lump sum as indicated in the bid form.
 4. Payment: Payment will be made at the contract unit price bid as a lump sum for D.E.F. SYSTEM as indicated in the Bid Form.
- F. Bid Items No. 105 – FUELING AREA CONCRETE SLAB:
1. Description: This item includes construction of the new concrete slab for the fueling area as indicated on the Drawings and in the Contract Documents.
 2. Work Required: Work required under this section includes but is not limited to the following.
 - a. Earthwork to prepare subgrade;
 - b. Furnishing, placing and compacting base course;
 - c. Form work;
 - d. Furnishing and installing concrete and reinforcing steel;
 - e. Finishing and curing concrete;
 - f. Saw cutting and sealing of contraction joints;
 - g. Required concrete testing; and
 - h. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 - i. The concrete foundation for the fueling tank and the concrete fuel island will be paid for separately.
 3. Unit of Measurement: Square Yard.
 4. Measurement: Measurement for FUELING AREA CONCRETE SLAB will be made by the square yard, as measured in the field.
 5. Payment: Payment for FUELING AREA CONCRETE SLAB will be made at the contract unit price bid per square yard.
- G. Bid Items No. 106 – FUEL PIPING TRENCH AND DRAIN LINE:
1. Description: This item includes furnishing and installing the prefabricated steel trench for fuel piping within the fueling area concrete slab. The work also includes one steel catch basin and the PVC drain line extending to the south side swale.

2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Furnishing 22 feet of prefabricated steel trench and one steel catch basin;
 - b. Setting and anchoring the trench and catch basin in place to accommodate the designed surface elevations of the concrete slab;
 - c. Furnishing and installing grates/covers for the trench and catch basin as specified;
 - d. Furnishing and installing approximately 77 feet of 4-inch, schedule 40 PVC drain line from the catch basin to the south side swale, including excavation, bedding and backfill;
 - e. Constructing the concrete discharge structure where the PVC drain line daylight into the southside swale;
 - f. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 - g. The concrete slab to be placed around the trench system is paid for separately.
 - h. The fuel piping that will be placed in the trench is paid for as part of the Dual Fuel Tank System.
3. Unit of Measurement: Lump Sum.
4. Measurement: FUEL PIPING TRENCH AND DRAIN LINE will be measured as a percentage completed of the lump sum as indicated in the bid form.
5. Payment: Payment will be made at the contract unit price bid as a lump sum for FUEL PIPING TRENCH AND DRAIN LINE as indicated in the Bid Form.

H. Bid Items No. 107 – FUELING AREA BOLLARD:

1. Description: Includes pipe bollards around the fuel tank as indicated on the drawings and in the contract documents.
2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Excavation of holes to accommodate bollard base concrete;
 - b. Furnishing and installing schedule 40 steel pipe;
 - c. Furnishing, placing and finishing concrete for the bollard base and inside the steel pipe;
 - d. Required concrete testing;
 - e. Painting of the steel pipe;
 - f. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Per Each.
4. Measurement: FUELING AREA BOLLARD will be measured per each.
5. Payment: Payment will be made at the contract unit price bid per each FUELING AREA BOLLARD as specified in the Bid Form.

I. Bid Items No. 108 – FUELING AREA ISLAND:

1. Description: This work is for construction of the fueling island as shown on the drawings.
2. Work Required under this section shall include but not be limited to the following:
 - a. Earthwork to prepare subgrade;
 - b. Furnishing, placing and compacting base course;
 - c. Furnishing, assembling and setting the steel island forms;
 - d. Furnishing and setting two u-shaped bollards;

- e. Coordination with the electrician for construction of the light pole base;
 - f. Furnishing and installing concrete and reinforcing steel;
 - g. Finishing and curing concrete;
 - h. Required concrete testing;
 - i. Painting of the steel bollards and steel island forms, and
 - j. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
- 3. Unit of Measurement: Lump Sum.
 - 4. Measurement: FUELING AREA ISLAND will be measured as a percentage completed of the lump sum as indicated in the bid form.
 - 5. Payment: Payment will be made at the contract unit price bid lump sum for FUELING AREA ISLAND as indicated in the Bid Form.

J. Bid Item No. 109 – RELOCATION OF EXISTING FUEL DISPENSER:

- 1. Description: This item includes work to reinstall the existing fuel dispensers at the new fueling area.
- 2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Cleaning the exterior surfaces of the existing fuel dispenser;
 - b. Mounting the fuel dispenser on the concrete surfacing as recommended by the manufacturer and at the location shown on the drawings;
 - c. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 - d. Electrical work for the fuel dispensers will be paid for separately.
 - e. Fuel piping and associated connections to the fuel dispensers will be included in the Dual Fuel Tank System work.
- 3. Unit of Measurement: Per Each.
- 4. Measurement: RELOCATION OF EXISTING FUEL DISPENSER will be measured per each.
- 5. Payment: Payment will be made at the contract unit price bid per each for RELOCATION OF EXISITNG FUEL DISPENSER as specified in the Bid Form.

K. Bid Item No. 110 – RELOCATION OF EXISTING FUEL CONTROLS:

- 1. Description: This item includes work to reinstall the existing fuel management system controls at the new fueling area.
- 2. Work Required: Work required under this section shall include, but not be limited to the following:
 - a. Mounting the fuel management system controls as recommended by the manufacturer and at the location show on the drawings;
 - b. Any necessary electronics or software updates to integrate the controls with the new fueling system and the D.E.F. system;
 - c. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 - d. Electrical work and communications cabling for the fuel controls will be paid for separately.
- 3. Unit of Measurement: Lump Sum.
- 4. Measurement: RELOCATION OF EXISTING FUEL CONTROLS will be measured as a percentage completed of the lump sum as indicated in the bid form.

5. Payment: Payment will be made at the contract unit price bid per lump sum for RELOCATION OF EXISTING FUEL CONTROLS as indicated in the Bid Form.
- L. Bid Item No. 111 – MG/CL CONCRETE CONTAINMENT BASIN:
1. Description: This item is for the Mg/Cl system concrete spill containment basin as shown on the drawings.
 2. Work Required under this section shall include but not be limited to the following:
 - a. Earthwork to prepare subgrade;
 - b. Furnishing, placing and compacting base course;
 - c. Furnishing, assembling and setting the concrete formwork;
 - d. Furnishing and setting reinforcing steel;
 - e. Furnishing and placing waterstops and expansion joints;
 - f. Furnishing, placing, finishing and curing concrete;
 - g. Application of silane sealer;
 - h. Required concrete testing;
 - i. Furnishing and installing modular stair with handrail;
 - j. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 3. Unit of Measurement: Lump Sum.
 4. Measurement: MG/CL CONCRETE CONTAINMENT BASIN will be measured as a percentage completed of the lump sum as indicated in the bid form.
 5. Payment: Payment will be made at the contract unit price bid lump sum for MG/CL CONCRETE CONTAINMENT BASIN as indicated in the Bid Form.
- M. Bid Items No. 112 – MG/CL BASIN MODULAR STAIRS:
1. Description: This item is for one set of modular stairs with handrail in the Mg/Cl containment basin as shown and specified in the contract documents.
 2. Work Required under this section shall include but not be limited to the following:
 - a. Furnishing and installing modular stair with handrail in accordance with the manufacturer's recommendations;
 - b. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 3. Unit of Measurement: Lump Sum.
 4. Measurement: MG/CL BASIN MODULAR STAIRS will be measured as a percentage completed of the lump sum as indicated in the bid form.
 5. Payment: Payment will be made at the contract unit price bid lump sum for MG/CL BASIN MODULAR STAIRS as indicated in the Bid Form.
- N. Bid Items No. 113 – MG/CL 4" CONCRETE SLAB:
1. Description: This item includes the construction of 4-inch thick concrete sidewalks around the west, south and east sides of the Mg/Cl containment basin as indicated on the Drawings and in the Contract Documents.
 2. Work Required: Work required under this section includes but is not limited to the following.
 - a. Earthwork to prepare subgrade;
 - b. Furnishing, placing and compacting base course;
 - c. Form work;
 - d. Furnishing and installing concrete and reinforcing steel;

- e. Finishing and curing concrete;
 - f. Tooling of contraction joints;
 - g. Required concrete testing;
 - h. Application of silane sealer on the concrete surface; and
 - i. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
- 3. Unit of Measurement: Square Yard.
 - 4. Measurement: Measurement for MG/CL 4" CONCETE SLAB will be made by the square yard, as measured in the field.
 - 5. Payment: Payment for MG/CL 4" CONCETE SLAB will be made at the contract unit price bid per square yard.
- O. Bid Item No. 114 – MG/CL 6" CONCRETE SLAB
- 1. Description: This item includes construction of the new 6-inch thick concrete slab for the Mg/Cl loading/offloading area as indicated on the drawings and in the contract documents.
 - 2. Work Required: Work required under this section includes but is not limited to the following.
 - a. Earthwork to prepare subgrade;
 - b. Furnishing, placing and compacting base course;
 - c. Form work;
 - d. Furnishing and installing concrete and reinforcing steel;
 - e. Finishing and curing concrete;
 - f. Saw cutting and sealing of contraction joints;
 - g. Required concrete testing;
 - h. Application of silane sealer on the concrete surface; and
 - i. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 - 3. Unit of Measurement: Square Yard.
 - 4. Measurement: Measurement for MG/CL 6" CONCETE SLAB will be made by the square yard, as measured in the field.
 - 5. Payment: Payment for MG/CL 6" CONCRETE SLAB will be made at the contract unit price bid per square yard.
- P. Bid Items No. 115 – 10,300 GALLON MG/CL TANK
- 1. Description: This item shall include the new polyethylene Mg/Cl storage tanks and level gauges as indicated on the drawings and in the contract documents.
 - 2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Furnishing, hauling, delivery and installation of the 10,300 gallon cross-linked polyethylene tank within the concrete containment basin.
 - b. Furnishing and installing a reverse float sight gauge to monitor tank fluid levels;
 - c. Tank cleaning and leakage testing; and
 - d. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 - 3. Unit of Measurement: Per Each.
 - 4. Measurement: 10,300 GALLON MG/CL TANK will be measured per each and shall include all work and materials needed for installation.
 - 5. Payment: Payment will be made at the contract unit price bid per each for 10,300 GALLON MG/CL TANK.

- Q. Bid Items No. 116 – MG/CL PUMPS AND CONTROLS
1. Description: This section shall include the two new pumps and the associated control panel for the Mg/Cl system.
 2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Furnishing and installing two centrifugal end suction pumps;
 - b. Mounting pump bases to the concrete surfacing as recommended by the manufacturer;
 - c. Connections of the pumps to the Mg/Cl piping;
 - d. Furnishing and mounting the pump control panel as specified; and
 - e. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 - f. Electrical work for the pumps and control panel will be paid for separately.
 3. Unit of Measurement: Per Lump Sum.
 4. Measurement: MG/CL PUMPS AND CONTROLS will be measured as a percentage completed of the lump sum as indicated in the bid form.
 5. Payment: Payment will be made at the contract unit price bid per lump sum for MG/CL PUMPS AND CONTROLS.
- R. Bid Items No. 117 –MG/CL PIPING, FITTINGS, VALVES AND SUPPORTS
1. Description: This item includes the construction of the piping system for the Mg/Cl system.
 2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Furnishing and installing 3-inch schedule 40 PVC, fittings and unions, including the piping on the overhead filling station;
 - b. Furnishing and installing the 3-inch polyethylene filling hose on the overhead filling station;
 - c. Connections to the Mg/Cl storage tanks (4 connections);
 - d. Furnishing and installing 3-inch expansion fittings near tank connections (4 each);
 - e. Furnishing, installing and painting steel pipe supports (13 each);
 - f. Furnishing and installing reinforced polypropylene ball valves (13 each);
 - g. Furnishing and installing PVC check valves at the Mg/Cl pumps (2 each)
 - h. Furnishing and installing camlocks (2 each); and
 - i. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 3. Unit of Measurement: Per Lump Sum.
 4. Measurement: MG/CL PIPING, FITTINGS, VALVES AND SUPPORTS will be measured as a percentage completed of the lump sum as indicated in the bid form.
 5. Payment: Payment will be made at the contract price bid per lump sum for MG/CL PIPING, FITTINGS, VALVES AND SUPPORTS as indicated in the Bid Form.
- S. Bid Items No. 118 – MG/CL OVERHEAD FILLING STATION
1. Description: This item includes the construction of the Mg/Cl overhead fill station as shown on the drawings.

2. Work Required under this section shall include but not be limited to the following:
 - a. Excavation for the concrete base/foundation;
 - b. Furnishing and installing reinforcing steel for the concrete base/foundation;
 - c. Furnishing, placing and finishing concrete for the base/foundation;
 - d. Required concrete testing;
 - e. Fabrication and installation of the structural steel overhead fill station column, beam and bracing, including anchoring to the concrete base/foundation;
 - f. Painting of the structural steel members;
 - g. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lump Sum.
4. Measurement: OVERHEAD FILLING STATION will be measured as a percentage completed of the lump sum as indicated in the bid form.
5. Payment: Payment will be made at the contract unit price bid lump sum for OVERHEAD FILLING STATION as indicated in the Bid Form.

T. Bid Items No. 119 – MG/CL AREA BOLLARD

1. Description: Includes pipe bollards at the Mg/Cl filling station as indicated on the drawings and in the contract documents.
2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Excavation of holes to accommodate bollard base concrete;
 - b. Furnishing and installing schedule 40 steel pipe;
 - c. Furnishing, placing and finishing concrete for the bollard base and inside the steel pipe;
 - d. Required concrete testing;
 - e. Painting of the steel pipe;
 - f. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Per Each.
4. Measurement: MG/CL AREA BOLLARD will be measured per each.
5. Payment: Payment will be made at the contract unit price bid per each MG/CL AREA BOLLARD as specified in the Bid Form.

U. Bid Items No. 120 – ELECTRICAL WORK

1. Description: This item includes all electrical work for the new fueling and Mg/Cl items as shown on the drawings.
2. Work Required under this section shall include but not be limited to the following:
 - a. Electrical permitting;
 - b. Coordination with the power company;
 - c. A new 3 phase service and meter main for the Mg/Cl pumps;
 - d. Reinstallation of two salvaged light poles/fixtures at the new fueling area;
 - e. Electrical connections for the fuel tank turbine pumps, fuel management system controls, two fuel dispensers, two emergency shutoffs, and the D.E.F. system;

- f. Communications cabling and connections for the fuel management system controls;
 - g. Electrical connections for the two Mg/Cl pumps;
 - h. New fueling electrical panel;
 - i. Modifications to two existing electrical panels;
 - j. All electrical conduit, cabling and grounding; and
 - k. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
- 3. Unit of Measurement: Lump Sum.
 - 4. Measurement: ELECTRIC WORK will be measured as a percentage completed of the lump sum as indicated in the bid form.
 - 5. Payment: Payment will be made at the contract unit price bid lump sum for ELECTRIC WORK as indicated in the Bid Form.

V. Bid Items No. 200 – CHANGE MG/CL PIPING AND VALVES TO STAINLESS STEEL

- 1. Description: This is an additive bid item to upgrade all Mg/Cl system piping, fittings and valves to 316 stainless steel.
- 2. Work Required under this section shall include but not be limited to the following:
 - a. The work for this item is the same as Bid Item No. 117. However, the components will be stainless steel and connections will be threaded instead of solvent welded/glued;
 - b. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
- 3. Unit of Measurement: Lump Sum.
- 4. Measurement: CHANGE MG/CL PIPING AND VALVES TO STAINLESS STEEL will be measured as a percentage completed of the lump sum as indicated in the bid form.
 Payment: Payment will be made at the contract unit price bid lump sum for CHANGE MG/CL PIPING AND VALVES TO STAINLESS STEEL as indicated in the Bid Form. This item shall only include the additional costs to utilize stainless steel for the Mg/Cl system instead of PVC. If this additive bid item is awarded, the costs will be added to Bid Item No. 117 to provide complete payment for the Mg/Cl piping system.

W. Bid Item No. 300 – 6 FT CHAIN LINK FENCING:

- 1. Description: This is an additive bid item for new chain link fencing as shown in the drawings.
- 2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Fenceline staking and layout;
 - b. Excavation for fence post foundations;
 - c. Furnishing, placing, finishing and testing concrete for fence posts;
 - d. Furnishing and installing fence posts, brace rails and top rails;
 - e. Furnishing and installing chain link fabric on the posts;
 - f. Furnishing and installing barbed wire and associated angle brackets;
 - g. Furnishing and installing all bottom tension wire, stretcher bars, truss rods, top caps and miscellaneous fittings
 - h. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.

3. Unit of Measurement: Per Lineal Foot.
4. Measurement: 6 FT CHAIN LINK FENCING will be measured per lineal foot along the fencing route as indicated in the Bid Form.
5. Payment: Payment will be made at the contract price bid per lineal foot of 6 FT CHAIN LINK FENCING indicated in the Bid Form.

X. Bid Items No. 301 – 20 FT AUTOMATIC SLIDING GATE

1. Description: This item is an additive bid item for new chain link automatic sliding gates.
2. Work Required: Work required under this section shall include but not be limited to the following:
 - a. Fabricating, furnishing and installing the gate frame;
 - b. Furnishing and installing new chain link fabric and barbed wire on the gate frame;
 - c. Furnishing and installing rollers, guide wheels and other appurtenances necessary to provide for a smooth sliding operation of the gate;
 - d. Furnishing and installing any miscellaneous fittings and appurtenances;
 - e. Furnishing and installing the gate operator and chain, including an equipment pad;
 - f. Furnishing and installing buried detection loops and connections to the gate operator;
 - g. Furnishing and installing gate photo eye for obstruction detection on each gate;
 - h. Furnishing and installing a keypad/intercom with associated mounting post at each gate;
 - i. Furnishing six remote “garage door” style gate operators;
 - j. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 - k. All electrical work and connections associated with the automatic gates will be paid for separately.
3. Unit of Measurement: Per Each.
4. Measurement: 20 FT AUTOMATIC SLIDING GATE will be measured per each.
5. Payment: Payment will be made at the contract unit price bid per each for 20 FT AUTOMATIC SLIDING GATE as specified in the Bid Form.

Y. Bid Items No. 302 – ELECTRICAL WORK FOR GATES

1. Description: This item is an additive bid item for electrical work associated with two new chain link automatic sliding gates.
2. Work Required under this section shall include but not be limited to the following:
 - a. Trenching, conduit, cable, backfill and wiring connections for two sliding gate operators and two keypads/intercoms;
 - b. Connections of detection loops to the gate operators; and
 - c. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lump Sum.
4. Measurement: ELECTRIC WORK FOR GATES will be measured as a percentage completed of the lump sum as indicated in the bid form.
5. Payment: Payment will be made at the contract unit price bid lump sum for ELECTRIC WORK FOR GATES as indicated in the Bid Form.

- Z. Bid Items No. 400 – FUEL TANK MONITORING SYSTEM
1. Description: This item is an additive bid item for a new fuel tank monitoring system as specified.
 2. Work Required under this section shall include but not be limited to the following:
 - a. Furnishing and installing monitoring equipment in the two new fuel tanks;
 - b. Furnishing and installing a monitoring system control panel and screen at a location selected by the owner;
 - c. Furnishing software necessary to operation the monitoring system, and
 - d. All labor, tools, equipment, materials, royalties, and incidentals necessary to complete the work as specified.
 3. Unit of Measurement: Lump Sum.
 4. Measurement: FUEL TANK MONITORING SYSTEM will be measured as a percentage completed of the lump sum as indicated in the bid form.
 5. Payment: Payment will be made at the contract unit price bid lump sum for FUEL TANK MONITORING SYSTEM as indicated in the Bid Form.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Special Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting all submittals, including but not limited to, Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. Related Sections include the following:
 - 1. Division 1 Section "Quality Control and Quality Assurance" for submitting test and inspection reports and Delegated-Design Submittals.
 - 2. Division 1 Section "Contract Closeout" for submitting final pay applications and O&M Manual
- C. Submittals are categorized into two types: Action Submittals and Informational Submittals, as follows:
 - 1. Action Submittals: Written and graphic information submitted by the Contractor that requires Engineer's responsive action. The following are examples of action submittals:
 - a. Shop drawings
 - b. Product data
 - c. Samples
 - d. Operation and Maintenance Manuals
 - e. Site Usage Plan (Contractor's staging – including trailer sitting and material laydown area)
 - f. Payment application
 - g. Other requirements found within the technical specifications
- D. Informational Submittal: Information submitted by the Contractor that does not require the Engineer's responsive action. Submittals may be rejected for not complying with requirements. The following are examples of informational submittals:
 - 1. Shop Drawing Schedule
 - 2. Progress Schedule
 - 3. Schedule of Submittals
 - 4. Statement of Qualifications
 - 5. Construction Photography and Videography
 - 6. Work Plans
 - 7. Traffic Plans

8. Outage Requests
9. Proposed Testing Procedures
10. Test Records and Reports
11. Vendor Training Outlines/Plans
12. Test and Start-Up Reports
13. Certifications
14. Design Data
15. Manufacturer(s) Instructions
16. Record Drawings
17. Record Shop Drawings
18. Submittals required by laws, regulations and governing agencies
19. Warranties, Insurance and Bonds
20. Contract Close-Out Documents
21. Material Data Safety Sheets
22. Other requirements found within the technical specifications

1.3 RELATED WORK

- A. Additional requirements may be specified in the General Conditions for the Contract.
- B. Additional submittal requirements may be specified in the respective technical Specification Sections.

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities in accordance with the General Conditions.
- C. Submittals Schedule: Submit per the General Conditions
- D. Direct Transmittal from Contractor: Engineer will not accept submittals from anyone but the Contractor.
- E. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal.
 1. Initial Review: Allow 21 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Allow 21 days for processing each resubmittal.
 3. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

- F. Contractor's Responsibilities
1. All submittals shall be clearly identified as follows:
 - a. Date of Submission
 - b. Project Number
 - c. Submittal Number
 - d. Project Name
 - e. Contractor Identification
 - 1) Contractor
 - 2) Supplier
 - 3) Manufacturer
 - 4) Manufacturer or supplier representative
 - f. Identification of Product
 - g. Reference to Contract Drawing
 - h. Reference to Specification Number, Page, and Paragraph
 - i. Reference to applicable standards, such as AWWA, ASTM, ASHTO, etc
 - j. Indication of Contractor's approval
 - k. Contractor's Certification statement
 - l. Identification of deviations or variances from the Contract Documents, if any
 - m. Reference to previous submittal (for resubmittals)
 - n. Made in America (when required by the Contract Documents)
 2. Submittals shall be clear and legible, and of sufficient size for legibility and clarity of the presented data
 3. Submittal Log. Maintain a log of all submittals. The submittal log shall be kept accurate and up to date. Provide the submittal log to the Engineer, if requested by the Owner or Engineer. This log should include the following items (as applicable):
 - a. Description
 - b. Submittal Number
 - c. Date transmitted to the Engineer
 - d. Date returned to Contractor (from Engineer)
 - e. Status of Submittal (Reviewed/Reviewed and Noted/etc)
 - f. Date of Resubmittal to Engineer and Return from Engineer (if applicable and repeat as necessary)
 - g. Distribution to subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as required.
 - h. Date material released for fabrication
 - i. Projected (or actual) delivery date
 4. Numbering System: Utilize the following submittal identification numbering system:
 - a. The first five digits shall be the applicable Specification Section Number.
 - b. The next three digits shall be the sequential number of each separate item or drawing submitted under each Specification Section, in the chronological order submitted, starting at 1.
 - c. The last character shall be the letter R followed by a digit, if a resubmittal is required, starting with 1 and continuing with sequential numbers. A typical submittal number would be as follows:
 - a) 03300-3-R2
 - b) 03300 = Specification section for Concrete.
 - c) 3 = the third different submittal under this Section.

- d) R2 = the third submission (second resubmission) of that particular submittal.
- 5. Variances
 - a. Notify the Engineer in writing, at the time of submittal, of any variations or deviations in the submittals from the requirements of the Contract Documents per the General Conditions.
 - b. Notify the Engineer in writing, at the time of re-submittal (resubmission), of all variations or deviations from previous submission of that particular shop drawing, except those deviations which are the specific result of prior comments from the Engineer.
- 6. Contractor's Certification
 - a. Each submittal shall have affixed to it the following Certification Statement:
 - 1) "Certification Statement: By this statement, I hereby represent that I have met the requirements of subsection 7.16.A of the General Conditions, satisfied the Contractor's obligations under the Contract Documents with respect to Contractor's review of submittals, and that (enter company name) approves the submittal."
 - b. Each submittal shall bear the above Certification Statement on the cover sheet.
 - c. Each certification statement shall be signed and dated by the individual that reviewed and approved the information prior to submitting the documents to the Engineer.
- G. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities.
- H. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
 - 1. Number of Copies: Submit five hard copies (paper) of each submittal, unless otherwise indicated. Engineer will return two copies. Mark up and retain one returned copy as a Project Record Document.
 - 2. Electronic Submittal: Contractor may, at their option, provide Action Submittals in an electronic format provided the following conditions are met:
 - a. The submittal contains no pages or sheets larger than 24 x 36 inches
 - b. The entire submittal is included in a single file.
 - c. Electronic files are PDF format (with printing enabled).

- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shop work manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 24 by 36 inches (610 by 915 mm).
- C. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operating and maintenance manuals.
 - k. Compliance with recognized trade association standards.
 - l. Compliance with recognized testing agency standards.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
- D. Samples: Furnish samples required by the Contract Documents for the Engineer's approval. Samples shall be delivered to the Engineer as specified or directed. Unless specified otherwise, provide at least two samples of each required item. Materials or equipment for which samples are required shall not be used in the work unless and until approved by Engineer.
1. Preparation: Include the following information, as applicable:

- a. Physical examples of the work
 - b. Small cuts or containers of materials
 - c. Complete units of repetitively used products
 - d. Color/texture/patterns swatches
 - e. Specimens for coordination of visual effects, graphic symbols, and other specified units of work
- E. Operation and Maintenance Manuals
- 1. Submit in assembled manuals as specified in Division 1 Section “Contract Closeout”. Such manuals shall include detailed instructions for Owner personnel on safe operation procedures, controls, start-up, shut-down, emergency procedures, storage, protection, lubrication, testing, trouble-shooting, adjustments, repair procedures, and other maintenance requirements.
- F. Site Usage Plan
- 1. Submit a proposed site staging plan, including but not limited to the location of office trailers, storage trailers and material laydown. Such plan shall be a graphic presentation (drawing) of the proposed locations; and, shall include on-site traffic modifications, and temporary utilities, as may be applicable.
- G. Schedule of Values
- 1. On projects consisting of lump sums (in whole or in part) submit a proposed schedule of values providing a breakdown of lump sum items in to reasonably small components –generally disaggregated by building, area, and/or discipline. The purpose of the schedule of values is for processing partial payment applications. If requested by the Engineer, provide sufficient substantiation for all or some items as necessary to determine the proposed schedule of values is a reasonable representation of the true cost breakdown of the Work. The schedule of values shall not be unbalanced to achieve early payment or over-payment in excess of the value of work or any other mis-distribution of the costs. If, in the opinion of the Engineer, the schedule of values is unbalanced, Contractor shall reallocate components to achieve a balanced schedule acceptable to Engineer.
- H. Payment Application
- 1. If an application form is included in the Contract Documents, use that form unless otherwise approved by the Engineer and Owner. If an application form is not included in the Contract Documents, Contractor may purpose a form for approval.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
- 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Engineer will not return copies.
 - 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Control and Quality Assurance."
 4. Electronic Submittal: Contractor may, at their option, provide Action Submittals in an electronic format provided the following conditions are met:
 - a. The submittal contains no pages or sheets larger than 24 x 36 inches
 - b. The entire submittal is included in a single file.
 - c. Electronic files are PDF format (with printing enabled).
- B. Shop Drawing Schedule
1. Prepare and submit a schedule indicating when shop drawings are required to be submitted to support the as-planned construction schedule. The submittal schedule shall allow sufficient time for preparation and submittal, review and response, and fabrication and delivery to support the construction schedule.
- C. Progress Schedule
1. Prepare and submit construction schedules and monthly status reports as specified.
- D. Schedule of Submittals
1. Prepare and submit schedule of submittals as specified in the General Conditions.
- E. Statements of Qualifications
1. Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Engineers and owners, and other information specified.
- F. Construction Photography and Videography
1. Provide periodic construction photographs and videography as specified – including but not limited to preconstruction photographs and/or video, monthly progress photos and/or video and post-construction photographs and/or video.
- G. Work Plans
1. Prepare and submit copies of all work plans needed to demonstrate to the Owner that Contractor has adequately thought-out the means and methods of construction and their interface with existing facilities. Work plans and follow-up preparatory meetings shall be conducted for all major work items. All parties involved in the construction of that work item shall attend preparatory meeting.
- H. Traffic Plans
1. Prepare traffic plans where and when required by the Contract Documents and local ordinances or regulations. If Contractor is not already knowledgeable about local ordinances and regulations regarding traffic requirements, become familiar with such requirements and include all costs for preparation and submittal of traffic management plan, as specified. In addition, unless a supplemental payment provision is provided in the bid form, include the cost of all police attendance, when required.
- I. Outage Requests
1. Provide sufficient notification of any outages required (electrical, flow process, etc.) as may be required to tie-in new work into the existing facilities. Unless

specified otherwise elsewhere, a minimum of seven calendar days notice shall be provided.

J. Proposed Testing Procedures

1. Prepare and submit testing procedures proposed to perform testing required by the various technical specifications.

K. Test Records and Reports

1. Provide copies of all test records and reports as specified in the various technical specifications.
2. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
3. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.
4. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
5. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
6. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
7. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
 - a. Name, address, and telephone number of factory-authorized service representative making report.
 - b. Statement on condition of substrates and their acceptability for installation of product.
 - c. Statement that products at Project site comply with requirements.
 - d. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - e. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - f. Statement whether conditions, products, and installation will affect warranty.
 - g. Other required items indicated in individual Specification Sections.

- L. Vendor Training Outlines/Plans
 - 1. At least two weeks before scheduled training of Owner’s personnel, provide lesson plans for vendor training in accordance with the specification for O&M manuals.

- M. Test and Start-up Reports
 - 1. Manufacturer(s) shall perform all pre-start-up installation inspection, calibrations, alignments, and performance testing as specified in the respective technical specifications. Provide copies of all such test and start-up reports.

- N. Certifications
 - 1. Provide various certifications as required by the technical specifications. Such certifications shall be signed by an officer (of the firm) or other individual authorized to sign documents of behalf of that entity.
 - 2. Certifications may include, but are not limited to:
 - a. Welding certifications and welders qualifications
 - b. Certifications of Installation, Testing and Training for all equipment
 - c. Material Testing reports furnished by an independent testing firm
 - d. Certifications from manufacturer(s) for specified factory testing
 - e. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
 - f. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
 - g. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
 - h. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

- O. Design Data
 - 1. Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

- P. Manufacturer(s) Instructions
 - 1. Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - a. Preparation of substrates.
 - b. Required substrate tolerances.
 - c. Sequence of installation or erection.
 - d. Required installation tolerances.
 - e. Required adjustments.
 - f. Recommendations for cleaning and protection.

- Q. Record Drawings
1. No later than Substantial Completion, submit a record of all changes during construction not already incorporated into drawings – in accordance with Division 1 Contract Closeout.
- R. Record Shop Drawings
1. Before final payment is made, furnish one set of record shop drawings to the Engineer. These record shop drawings shall be in conformance with the approved documents and should show any field conditions which may affect their accuracy.
- S. Submittals required by laws, regulations and governing agencies
1. Prepare and submit all documentation required by state or local law, regulation or government agency directly to the applicable agency. This includes, but is not limited to, notifications, reports, certifications, certified payroll (for projects subject to wage requirements) and other documentation required to satisfy all requirements. Provide to Engineer one hard copy or electronic copy of each submittal made in accordance with this paragraph.
- T. Warranties, Insurance Certificates and Bonds
1. Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
 2. Assemble a booklet or binder of all warranties and bonds as specified in the various technical specifications and in accordance with the Division 1 Contract Closeout. Provide two originals to the Engineer.
- U. Contract Close-Out Documents
1. Submit documentation as indicated in Division 1 Contract Closeout.
- V. Material Safety Data Sheets
1. Submit information directly to Owner. If submitted to Engineer, Engineer will not review this information but will return it with no action taken.
- W. Other requirements of the technical Specification Sections
1. Comply with all other requirements of the technical specification sections.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work or other related Sections, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required). Coordinate with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities.
- B. Before submission to the Engineer, review shop drawings as follows:

1. Make corrections and add field measurements, as required
2. Use any color for its notations except red (reserved for the Engineer's notations) and black (to be able to distinguish notations on black and white documents)
3. Include Contractor's Certification statement
4. Provide field measurements (as needed)
5. Coordinate with other submittals
6. Indicate relationships to other features of the work
7. Highlight information applicable to the work and/or delete information not applicable to the work

3.2 ENGINEER'S ACTION

- A. General: Engineer will not review submittals that do not bear required certification statement, signature, and date of the responsible person and will return them without action.
- B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 1. "Reviewed" – This code is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.
 2. "Reviewed and Noted" – This code is assigned when a confirmation of notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
 3. "Revise and Resubmit" – This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the entire package. This resubmittal is to address all comments, omissions and non-conforming items that were noted.
- C. Informational Submittals: Engineer will review each submittal and will not return it, or will reject and return it if it does not comply with requirements.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION

SECTION 01320

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Special Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Preliminary Construction Schedule.
 - 2. Contractor's Progress Schedule.
 - 3. Submittals Schedule.
 - 4. Daily construction reports.
- B. Related Sections include the following:
 - 1. Special Provisions "Progress Meetings" for submitting and distributing meeting and conference minutes.
 - 2. Division 1 Section "Submittals" for submitting schedules and reports.
 - 3. Division 1 Section "Quality Control and Quality Assurance" for submitting a schedule of tests and inspections.
 - 4. Division 1 Section "Contract Closeout" for submitting Project Record Documents at Project closeout.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor activity is an activity that must be completed before a given activity can be started.
- B. Event: The starting or ending point of an activity.
- C. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- D. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- E. Milestone: A key or critical point in time for reference or measurement.
- F. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

1.4 SUBMITTALS

- A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Engineers and owners, and other information specified.
- B. Preliminary Construction Schedule: Submit two printed copies; one a single sheet of reproducible media, and one a print.
- C. Contractor's Construction Schedule: Submit two printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.
- D. Daily Construction Reports: Submit 2 copies at monthly intervals.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Progress Schedule, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 1. Secure time commitments for performing critical elements of the Work from parties involved.
 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S PROGRESS SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
 - 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - 4. Startup and Testing Time: Include time for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
- B. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
- C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.2 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule at the preconstruction conference.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for construction. Include cash requirement prediction based on indicated activities.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.

3. Approximate count of personnel at Project site.
4. High and low temperatures and general weather conditions.
5. Accidents.
6. Meetings and significant decisions.
7. Daily work progress.
8. Unusual events (refer to special reports).
9. Stoppages, delays, shortages, and losses.
10. Meter readings and similar recordings.
11. Emergency procedures.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Work Change Directives received.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial Completions and occupancies.
18. Substantial Completions authorized.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Progress Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Progress schedule shall be submitted to the Engineer monthly with the progress payment.
 1. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 2. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01340

REQUESTS FOR INFORMATION (RFI)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section contains the procedures to be followed by Contractor for submitting a Request for Information (RFI) upon discovery of any apparent conflicts, omissions, or errors in the Contract Documents or Drawings or upon having any question concerning Information.
- B. RFI Administrative Requirements
- C. RFI Procedures
- D. RFI Execution
- E. RELATED SECTIONS
 - 1. Division 1 Section "Product Requirements" for product options, substitutions, omissions, and improper descriptions.

1.3 DEFINITIONS

- A. Request for Information: A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Description: Section provides procedure for Contractors to obtain interpretation or clarification of the Contract Documents, or identify apparent conflicts, omissions, or errors in the Contract Documents.
- B. Responsible Person for Contractor: Submit name of the individual authorized to receive Requests for Information documents, and who is responsible for forwarding Request.
- C. RFI Format: Submit all Requests for Information on the form attached at the back of this Section.

1.5 CONTRACTOR'S REQUESTS FOR INFORMATION (RFIs)

- A. Contractor's Requests for Information (RFIs): Should Contractor be unable to determine from the Contract Documents the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of Work is described differently at more than one place in the Contract Documents; the Contractor shall request that the Engineer make an interpretation of the requirements of the Contract Documents to resolve such matters. Contractor shall comply with procedures specified herein to make Requests for Information (RFIs).
- B. Submission of RFIs: RFIs shall be prepared and submitted on a form provided by the Engineer.
1. Forms shall be completely filled in, and if prepared by hand, shall be fully legible after scanning or photocopying.
 2. Each RFI shall be given a discrete, consecutive number starting with 1.
 3. Each page of the RFI and each attachment to the RFI shall bear the following:
 - a. Date of Submission
 - b. Project Number
 - c. Project Name
 - d. RFI Number
 - e. Descriptive Title
 4. Contractor shall sign all RFIs attesting to good faith effort to determine from the Contract Documents the information requested for Information. Frivolous RFIs shall be subject to reimbursement from Contractor to the Owner for fees charged by Engineer, Engineer's consultants and other design professions engaged by the Owner.
- C. Subcontractor-Initiated and Supplier-Initiated RFIs: RFIs from subcontractors and material suppliers shall be submitted through, be reviewed by and be attached to an RFI prepared, signed and submitted by Contractor. RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
1. Contractor shall review all subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing and layout of the Work.
 2. RFIs submitted to request clarification of issues related to means, methods, techniques and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without Information. Such issues are solely the Contractor's responsibility.
 3. Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.
- D. Unacceptable Uses for RFIs: RFIs shall not be used to request the following:
1. Approval of submittals (use procedure specified in Section 01300 - Submittals)
 2. Approval of substitutions (refer to 01600 - Product Requirements)
 3. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the General Conditions)
 4. Different methods of performing Work than those indicated in the Contract Drawings and Specifications (comply with provisions of the General Conditions).
- E. RFI Log: Contractor shall prepare and maintain a log of RFIs, and at any time requested by the Engineer or Owner, the Contractor shall furnish copies of the log showing all outstanding RFIs.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- 3.1 Submit per the General Conditions. Additionally, electronic RFI requests will be accepted. Notification time begins from the date stamp of the Engineer's mail or email received date.
- 3.2 Requested Information: Contractor shall carefully study the Contract Documents, in particular to ensure that information sufficient for Information of requirements of the Contract Documents is not included. RFIs that request Information of requirements clearly indicated in the Contract Documents will be returned without Information.
- A. In all cases in which RFIs are issued to request clarification of issues related to means, methods, techniques and sequences of construction, for example, pipe and duct routing, clearances, specific locations of Work shown diagrammatically, apparent interferences and similar items, the Contractor shall furnish all information required for the Engineer or Owner to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to how the Contractor shall proceed.
- B. If information included with this type RFI by the Contractor is insufficient, the RFI will be returned unanswered.
- 3.3 Response Time: Request clarifications or information immediately upon discovery of need. Submit RFI's in a timely manner allowing full response time to avoid impacting Progress Schedule.
- A. Engineer, whose decision will be final, shall resolve issues and respond to questions of Contractor, in most cases, within fourteen (14) days. Actual time may be lengthened for complex issues, or shortened for expedited situations, as mutually agreed in writing.
- B. After submission of an RFI by Contractor and prior to receipt of the RFI response from Engineer, the Contractor proceeds with affected Work at own risk. Any portion of the Work not constructed in accordance with Engineer interpretation, clarification, instruction or decision is subject to removal and replacement at Contractor expense.
- 3.4 Disputed Requirements: In the event the Contractor believes that a clarification by the Engineer results in additional cost or time, Contractor shall comply with the Contract General Conditions.

END OF SECTION

SECTION 01400

QUALITY CONTROL AND QUALITY ASSURANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract Documents including, but not limited to Drawings and Special Provisions, General and Supplementary Conditions, other Division 1 through 16 Specification Sections, and Appendices to the Contract Documents, apply to this Section.

1.2 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. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 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. 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. Ambient 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.
- C. 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.

1.5 QUALITY ASSURANCE

- A. 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.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. 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.
- D. 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.

- E. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
- F. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- G. Control of Installation
 - 1. Monitor quality control over suppliers, products, services, site conditions, and workmanship, to produce Work of specified quality.
 - 2. Comply with manufacturers' instructions, including each step in sequence.
 - 3. Examine the areas and conditions where Work is to be performed and notify the Owner of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Owner.
 - 4. Request clarification from Engineer should manufacturers' instructions conflict with Contract Documents. The clarification shall be received prior to proceeding.
 - 5. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
 - 6. Work shall be performed by persons qualified to produce workmanship of specified quality.

1.6 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency or Engineer to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the 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.
- B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
 - 1. Contractor shall, engage a qualified testing agency to perform these quality-control services.

- a. Contractor shall not employ the 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. Contractor shall, 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. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- D. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- E. **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. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.
- F. **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.
- G. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 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 Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
- 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

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Special Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following administrative and procedural requirements: selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
 - 1. Division 1 Section "Contract Closeout" for submitting warranties for contract closeout.
 - 2. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties,

appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form:
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - i. Cost information, including a proposal of change, if any, in the Contract Sum.
 - j. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - k. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
 - a. Form of Acceptance: Field Order or Change Order.
 - b. Use product specified if Engineer cannot make a decision on use of a proposed substitution within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 5. Store products to allow for inspection and measurement of quantity or counting of units.
 6. Store materials in a manner that will not endanger Project structure.
 7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 9. Protect stored products from damage.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 - 1. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures: Procedures for product selection include the following:
 - 1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
 - a. Substitutions may be considered.
 - 2. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
 - a. Substitutions may be considered, unless otherwise indicated.
 - 3. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
 - a. Substitutions may be considered, unless otherwise indicated.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received by the Engineer within 30 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Engineer.
- B. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 - 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - 2. Requested substitution does not require extensive revisions to the Contract Documents.
 - 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4. Substitution request is fully documented and properly submitted.
 - 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 - 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 7. Requested substitution is compatible with other portions of the Work.
 - 8. Requested substitution has been coordinated with other portions of the Work.
 - 9. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

- A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:
 - 1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners, if requested.
 - 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Special Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project record documents.
 - 3. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
 - 2. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following or list items below that are incomplete in request. Also refer to the General Conditions for additional submittals and procedures for Substantial Completion.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements in accordance with the General Conditions.
 - 3. Submit specific warranties, Performance bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and/or similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Submit test/adjust/balance records.
 8. Terminate and remove temporary facilities from Project site, construction tools, and similar elements.
 9. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 10. Complete final cleaning requirements, including touchup painting.
 11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Following the submittal of the preliminary documents described above, inspection of the Work shall be completed in accordance with the General Conditions.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment.
 2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit evidence that bonds shall be in effect until one year after the date when final payment becomes due or until completion of the correction period specified, whichever is later.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of areas in sequential order.
 2. Organize items applying to each area by major element.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Page number.

1.6 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Maintain Record Documents in accordance with the General Conditions.
- B. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, Subcontractor, or similar entity, to prepare the marked-up Record Prints. Record Prints shall, at a minimum, meet the following requirements:
 - 1. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - 2. Accurately record information in an understandable drawing technique.
 - 3. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - 4. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 - 5. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - 6. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 7. Note Work Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 - 8. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 2 - EXECUTION

2.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste

- material, litter, broken pipe, sheeting, worn-out parts, rejected materials, concrete, asphalt and other foreign substances.
- b. Remove excess piles of gravel or soil deposited throughout project.
 - c. Final grade in unpaved, graveled, and un-graveled areas with a motor grader.
 - d. Remove all loose rocks, boulders, and coarse gravel pushed into a berm by final grading.
 - e. Restore surface drainage to original condition unless otherwise detailed in the project plans and specifications.
 - f. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - g. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - h. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - i. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - j. Remove labels that are not permanent.
 - k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - l. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - m. Replace parts subject to unusual operating conditions.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 01730

EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Special Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. General installation of products.
 - 2. Coordination of Owner-installed products.
 - 3. Progress cleaning.
 - 4. Starting and adjusting.
 - 5. Protection of installed construction.
- B. Related Sections include the following:
 - 1. Division 1 Section "Contract Closeout" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.

- C. 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.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.2 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- 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 produce harmful noise levels.
- F. 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.
- G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.3 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Remove and properly dispose of excess material accumulated from demolition and construction (such as piles of gravel or soil, broken concrete, debris, papers, rejected materials, worn-out equipment parts, etc.) from the project site at the Contractor's expense. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
 1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- H. 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.
- I. 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.
- J. 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.
- K. 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.

3.4 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.5 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.

END OF SECTION

DIVISION 2

SITE CONSTRUCTION

SECTION 02115
SELECTIVE SITE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the following:
 - 1. Removal of existing bollards
 - 2. Removal and salvage of existing fuel tanks
 - 3. Remove and reinstall two existing fuel dispensers and controls
 - 4. Remove and reinstall two existing light poles and luminaires
 - 5. Removal of existing concrete surfacing
 - 6. Removal of existing Mg/Cl sheds, piping, pumps and tanks
 - 7. De-energizing existing electrical utilities

1.02 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and protect against damage.
- C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.
- D. Existing to Remain: Protect construction indicated to remain against damage during selective demolition. When permitted by the Engineer, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.03 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.
- B. Items indicated by the Engineer to remain the Owner's property. Carefully remove and salvage each item in a manner to prevent damage and deliver to the Owner.

1.04 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract.
- B. Schedule of selective demolition activities indicating the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
- C. Record drawings at Project closeout.
 - 1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.
- D. Landfill records indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.06 SCHEDULING

- A. Arrange selective demolition schedule so as not to interfere with the Owner's on-site operations. Arrange all demolition work as indicated on drawings with the Engineer.
 - 1. Arrange and schedule the removal and demolition of existing elements indicated.
 - 2. Sequence such to minimize open excavation time periods. Open excavation shall be temporarily protected/covered on daily basis until completion of installation.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Evaluate existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- B. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Engineer.
- D. Perform evaluation as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

- A. Existing utilities shall remain in service to the greatest extent possible and shall be protected against damage during selective demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or operating facilities without prior approval from the Engineer (72 hours minimum notice). Limit disruptions to no more than 8 hours in duration.
- B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services. Locate and verify all disrupted utilities.
 - 1. Utilities that are part of this project are limited to communications, electric, gas, storm drain, sanitary sewer and water. The Contractor is responsible for protecting all other utilities in vicinity of this project from damage. Repair of any damage to existing documented utilities will be the responsibility of the Contractor.
 - 2. Arrange to shut off indicated utilities.
 - 3. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to others before proceeding with selective demolition.
- C. Utility Requirements: Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.03 PREPARATION

- A. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets or other adjacent occupied or used facilities. Provide alternate routes around closed or obstructed traffic ways.

- B. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
 - 1. Coordinate temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required.
 - 2. Protect existing site improvements, appurtenances, and landscaping to remain.
- 3.04 POLLUTION CONTROLS
- A. Use water and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
 - 1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
 - B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.
- 3.05 SELECTIVE DEMOLITION
- A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations.
- 3.06 DISPOSAL OF DEMOLISHED MATERIALS
- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
 - B. Burning: Do not burn demolished materials.
 - C. Disposal: Transport demolished materials off property and legally dispose of them.

END OF SECTION

SECTION 02300

EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 1. Preparing subgrades for slabs-on-grade and lawns and grasses.
 2. Excavating and backfilling for slabs, buildings, structures and retaining walls.
 3. Base course for slabs-on-grade.
 4. Subsurface drainage backfill for walls.
- B. Related Sections include the following:
 1. Division 1 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities.
 2. Division 2 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
 3. Division 2 Section 02221 "Trench Excavation and Backfill for Pipelines & Appurtenant Structures.
 4. Division 2 Section 02230 "Street Excavation, Backfill and Compaction"
 5. Division 2 Section "Flowable Fill" for controlled low strength material.
 6. Division 3 Section "Structural Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
 7. Divisions 2, 15, and 16 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.

1.3 DEFINITIONS

- A. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- B. Base Course: Course supporting the slab-on-grade.
- C. 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 Section 01275 "Measurement and Payment or 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.

- D. Fill: Soil materials used to raise existing grades.
- E. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 1 cubic yard or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by an independent geotechnical testing agency, according to ASTM D 1586.
- 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. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base course, or topsoil materials.
- H. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
 - 2. Laboratory compaction curve according to ASTM D 698 for each on-site and borrow soil material proposed for fill and backfill.
- B. When, in the opinion of the Engineer, the field soil conditions differ from those represented by the material test reports, new samples shall be taken by the Contractor and delivered to the testing agency for classification and laboratory compaction curve testing. All testing shall be based on the appropriate soil test results.

1.5 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

1.6 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.
 - 1. Notify Engineer not less than two weeks in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.
 - 3. Contact utility-locator service for area where Project is located before excavating.

- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 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 (75 mm)] 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 according to ASTM D 2487, or a combination of these groups.
- D. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- E. Structural Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- G. Base Course: Narrowly graded mixture of crushed gravel; with 100 percent passing a 3/4-inch (37.5-mm) sieve per Section 02235.
- H. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.
- I. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.
- J. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

PART 3 - EXECUTION

3.1 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. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.
- C. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.2 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.
 - 2. If required, install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized regardless of the character of surface and subsurface conditions encountered.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
 - 2. If rock is encountered within excavations, cease work in the area where rock is discovered until a time and materials change order for the extra work can be agreed upon by the Contractor, Owner and Engineer. The work in the affected area will again proceed after a change order is processed, and no shutdown time or associated additional costs will be awarded other than those agreed upon in the change order.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). 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.

2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

3.6 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 the building slabs, exterior slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
 2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.7 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 (17.2 MPa), may be used when approved by Engineer.
 1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

3.8 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.

3.9 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, damp proofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under steps and ramps, use Structural Fill.
 - 3. Under building slabs, use Structural Fill.
 - 4. Under footings and foundations, use Structural Fill.
 - 5. Under and adjacent to retaining walls, use Structural Fill.
 - 6. In utility trenches within 5 feet of any retaining wall or foundation, use Structural Fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.11 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.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm)] in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) 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. Where backfill is to extend higher on one side than on the other, as indicated on the Plans, structural floor beams or other means of restraint shall be installed before such backfill is placed. Should any deflection of the foundation wall result from the Contractor's failure to provide adequate bracing, the Contractor shall remove the backfill or embankment to relieve the deflection, properly brace the wall, and replace the backfill at no additional cost to the Owner.
- D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Under structures, building slabs, exterior slabs and steps, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 97 percent.
 - 2. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.

3.13 GRADING

- A. General: 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 (25 mm)]
- C. Grading inside Building and Structure Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.14 SUBSURFACE DRAINAGE

- A. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch (150-mm) course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches (300 mm) of filter material, placed in compacted layers 6 inches (150 mm) thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).
 - 1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698

3.15 BASE COURSE

- A. Place base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact base course under cast-in-place concrete slabs-on-grade and under water storage reservoir floors as follows:
 - 1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

2. Place base course 8 inches (200 mm) or less in compacted thickness in a single layer.
3. Place base course that exceeds 8 inches (200 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 8 inches (200 mm) thick or less than 4 inches (75 mm) thick.
4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.16 FIELD QUALITY CONTROL

- A. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.
- B. 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. Paved, Exterior and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 1000 sq. ft. or less of slab or paved area, but in no case fewer than 3 tests.
 2. Foundation Wall Backfill: At each compacted backfill layer, at least 1 test for each [100 feet (30 m)] or less of wall length, but no fewer than 2 tests.
- C. When testing 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.

3.17 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.

3.18 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

SECTION 02821

CHAIN-LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Chain-Link Fences: Industrial
 - 2. Gates: Automatic Sliding, Including Operators

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations, components, materials, dimensions, sizes, weights, and finishes of components. Include plans, gate elevations, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. General: Height indicated on Drawings. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:
 - 1. Steel Wire Fabric: Metallic coated 9 gauge wire with a diameter of 0.148 inch (3.76 mm), galvanized before weaving (GBW).
 - a. Mesh Size: 2 inches (50 mm).
 - b. Metallic (Zinc) Coating: ASTM A 392, Type II.
 - 2. Selvage: Twisted top and knuckled bottom.

2.2 INDUSTRIAL FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, ASTM F 1083 for Group IC round pipe, and the following:
 - 1. Group: IC, round steel pipe, yield strength 50,000 psi (345 MPa)
 - 2. Coating for Steel Framing:
 - a. Metallic coating.
- B. Provide Pipe with the following diameters:
 - 1. Top Rail: 1.625-inch O.D. minimum.
 - 2. Mid Rail: 1.625-inch O.D. minimum.
 - 3. Brace Rail: 1.625-inch O.D. minimum.
 - 4. Corner, End, Double, and Panel Posts: 2.875-inch O.D. minimum.
 - 5. Line Posts: 2.375-inch O.D. minimum.
 - 6. Personnel Gate Posts: 4-inch O.D. minimum.
 - 7. Sliding Gate Posts: 4-inch O.D. minimum.

- C. Post Brace Rails: Match top rail for coating and strength and stiffness requirements. Provide brace rail with truss rod assembly for each gate, end, and pull post. Provide two brace rails extending in opposing directions, each with truss rod assembly, for each corner post and for pull posts. Provide rail ends and clamps for attaching rails to posts.
- D. Top Rails: Top rails shall be provided for the full length of fencing.

2.3 TENSION WIRE, STRETCHER BARS AND TRUSS RODS

- A. General: Provide horizontal tension wire at bottom of fence fabric.
- B. Metallic-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824.
 - 1. Metallic Coating: Type III, Zn-5-Al-MM alloy.
- C. Stretcher Bars: Hot-dip galvanized steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post. 1/4-inch by 3/4-inch minimum size.
- D. Truss Rods: Manufacturer standard galvanized coated 3/8-inch truss rod at lower panel at corner post locations

2.4 INDUSTRIAL SWING GATES

- A. General: Comply with ASTM F 900 for swing gate types.
 - 1. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F 1083 and ASTM F 1043 for materials and protective coatings.
- B. Frames and Bracing: Fabricate members from round, galvanized steel tubing with outside dimension and weight according to ASTM F 900 and the following:
 - 1. Gate Fabric Height: 2 inches (50 mm) less than adjacent fence height.
 - 2. Leaf Width: As indicated.
 - 3. Frame Members:
 - a. Tubular Steel: 1.66 inches (42 mm) round, full weight
- C. Frame Corner Construction:
 - 1. Welded and 5/16-inch diameter, adjustable truss rods for panels 5 feet (1.52 m) wide or wider].
- D. Extended Gate Posts and Frame Members: Extend gate posts and frame end members above top of chain-link fabric at both ends of gate frame 14 inches (300 mm) as required to attach barbed wire assemblies.
- E. Hardware: Latches permitting operation from both sides of gate, hinges, center gate stops and keepers for each gate leaf more than 5 feet (1.52 m) wide. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.
- F. Gate stops: Post and hardware to retain gate in open position.

2.5 AUTOMATIC SLIDING GATE

- A. General: Comply with ASTM F900 for sliding gates. Sliding gates shall be cantilever style.
- B. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F1083 and ASTM F1043 for materials and protective coatings.
- C. Frames and Bracing: Fabricate from round galvanized steel tubing with outside dimension and weight according to ASTM F900 for the following gate fabric height:
 - 1. Gate Fabric Height: See Plans.
- D. Frame Corner Construction: As follows:
 - 1. Welded assembly at all corners and accessory areas.
- E. Gate Posts: Fabricate members from round galvanized steel pipe with outside dimension and minimum weight according to ASTM F900 for the following gate fabric heights and leaf widths:
 - 1. Gate Fabric Height by Leaf Width: See Plans.
- F. Hardware: Provide manufacturer standard hardware unless noted otherwise. Hardware shall include the following:
 - 1. Hinges: Manufacturer standard.
 - 2. Guide Wheels: Nylon
 - 3. Double Wheel Carrier

2.6 OPERATORS FOR AUTOMATIC GATES

- A. Slide gate operators for galvanized gates shall be heavy duty gear-driven units. The motor shall be housed in a powder coated weather resistant steel enclosure.
- B. The slide gate operators shall include the following features:
 - 1. Continuous duty 1 horsepower, 120V, 1 phase motor with overload protection.
 - 2. External manual disconnect.
 - 3. Built-in radio receiver.
 - 4. Detection loop inputs.
 - 5. Detection for remote “garage door” style openers.
 - 6. UL325 compliant entrapment protection system.
 - 7. Heavy duty worm gear.
 - 8. Gate speed of 12 inches per second.
 - 9. Automatic braking system.
 - 10. #50 nickel plated chain.
 - 11. Cabinet lock.
 - 12. Heater.
- C. Provide six remote “garage door” style gate operators.
- D. Slide gate operators shall be LiftMaster Model CSL24UL or equal.

2.7 DETECTION LOOP AND PHOTO EYE

- A. Subsurface detection loops shall be installed at each automatic gate. Each gate shall include a safety loop on the exterior side of the gate and a safety loop and free exit loop on the interior side of the gate (3 loops total per gate). The free exit detection loop shall detect a vehicle exiting the secure area and must facilitate the automatic opening of the gate. The safety loops shall prevent a gate from inadvertently closing on a vehicle that has not fully cleared the gate opening. Detection loops shall be “BD Loops” or equal.
- B. Detection loops must be compatible with the gate operators.
- C. A photo eye shall be installed at each sliding gate to detect the presence of a pedestrian or other obstruction and prevent the closing of a gate if an obstruction is detected. The photo eyes shall be an EMX Industries, Inc. “EMXIRB” or equal.

2.8 FITTINGS

- A. General: Comply with ASTM F 626.
- B. Finish:
 - 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. (366 g /sq. m) zinc.
 - 2. Aluminum: Mill finish.

2.9 BARBED WIRE

- A. Zinc-Coated Steel Barbed Wire: Comply with ASTM A 121; 12.5 gauge 4-point round barbs spaced not more than 5 inches (127 mm) o.c..

2.10 FENCE GROUNDING

- A. Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.
 - 1. Material above Finished Grade: Copper.
 - 2. Material on or below Finished Grade: Copper.
 - 3. Bonding Jumpers: Braided copper tape, 1 inch (25 mm) wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
- B. Connectors and Grounding Rods: Comply with UL 467.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
- D. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment.
- E. Line Posts: Space line posts uniformly at 10 feet (3 m) o.c.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567. Install braces at end and gate posts and at both sides of corner and pull posts.
- G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing.
- H. Top Rail: Install according to ASTM F 567.
- I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches (50 mm) between finish grade or surface and bottom selvage, unless otherwise indicated.
- J. Tie Wires: Attach wire per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
- K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.
- L. Barbed Wire: Uniformly spaced, angled toward security side of fence. Pull wire taut and install securely to extension arms and secure to end post or terminal arms.

3.2 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.3 DETECTION LOOP INSTALLATION

- A. Install subsurface vehicle detection loops at each automatic sliding gate location. Each gate shall include a safety loop on the exterior side of the gate and a safety loop and free exit loop on the interior side of the gate (3 loops total per gate). Loops shall be installed with sufficient offsets from each other and the gate operator to avoid electrical interference.
- B. Follow the manufacturer's recommended installation.
- C. Install detection loops 6" to 8" below the surface.
- D. Detection loops shall be encased in sand within the gravel base course to avoid damage.
- E. Detection loops cannot come in direct contact with hot asphalt.
- F. Install loop lead-ins in ½-inch schedule 40 PVC conduit.

3.4 GROUNDING AND BONDING

- A. Fence Grounding: Install at maximum intervals of 1500 feet (450 m).
- B. Fences within 100 Feet (30 m) of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet (225 m).
 - 1. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches (150 mm) below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location.
- C. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
 - 1. Connections: Make connections so possibility of galvanic action or electrolysis is minimized.

PART 4 - MEASUREMENT AND PAYMENT

4.1 GENERAL

- A. See Section 01275: Measurement and Payment.

END OF SECTION

DIVISION 5

METALS

SECTION 05500

METAL FABRICATIONS & MISCELLANEOUS METAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section covers all anchor bolts, expansion anchors, items fabricated from metal shapes, plates, sheets, rods, bars, or castings and all other wrought or cast metal.

Fabricated metal items which are detailed on the Plans but not mentioned specifically shall be fabricated in accordance with the applicable requirements of this section.

1.2 SHOP DRAWINGS & SUBMITTALS

- A. The Contractor shall submit detailed shop drawings for each metal fabrication showing materials, dimensions, connecting and fabrication techniques in accordance with the General Conditions. Submittals shall be furnished for all manufactured items such as anchor bolts, expansion anchors, pipe supports, and gratings in accordance with the General Conditions.

1.3 REFERENCE SPECIFICATIONS

- A. All materials and work for miscellaneous metal work shall comply with applicable requirements of the AISC "Steel Construction Manual." Welded connections shall be in accordance with applicable requirements of the American Welding Society.

PART 2 - MATERIALS

2.1 BASIC MATERIALS

- A. All materials shall be new and undamaged and shall conform to pertinent ASTM or other industry standard specifications, including the following:
- B. Steel
- | | |
|-----------------------|---|
| Plates and Shapes | ASTM A36 |
| Sheets | ASTM A366 or A569, Zinc Coated |
| Pipe | ASTM A120 |
| Structural Tubing | ASTM A500 or A501 |
| Bolts - High Strength | ASTM A325 |
| Unfinished | ASTM A307 |
| Self-Locking Nuts | Prevailing torque type:
IFI-100, Grade A |
| Flat Washers | ANSI B18.22.1 |
| Lock Washers | Spring type ANSI B18.21.1 |

- | | | |
|----|--|--|
| C. | Cast Iron
Castings | ASTM A48, Class 25 or better |
| D. | Stainless Steel
Plates and Shapes
Bolts & Nuts | ASTM A167
IFI-104, Grade 303 or 305 |
| E. | Aluminum
Sheet and Plate
Roof Bar | ASTM B209, Alloy 6061-T1
ASTM B211, Alloy 6061-T6
or 2017-T4 |
| F. | Extrusions
Pipe | ASTM B211, Alloy 6063-T5 or T6
ASTM B429, Alloy 6061-T6 or
6063-T6 |
| G. | Castings | ASTM B26 or B85 |

2.2 MISCELLANEOUS FASTENERS

- | | | |
|----|--|--|
| A. | All fasteners shall be new and undamaged and shall be furnished with washers, lock washers and all accessories appropriate for the applications. This section shall not supersede specific fastener requirements made in other sections. | |
| B. | Anchor Bolts
Stainless Steel
Galvanized Steel

Carbon Steel
Flat Washers | IFI-104, Grade 303 or 305
ASTM A307 bolts and nuts; hot dip
galvanized ASTM
A153 and A385, or Zinc plated ASTM
A164 Type GS
ASTM A307
ANSI B18.22.1, of same material as
bolts and nuts |
| C. | Expansion Anchors
For Concrete | Fed Spec FF-S-325; wedge type, Group
II, Type 4,
Class I or 2; self- drilling type, Group
III, Type 1; or
nondrilling type, Group VIII, Type 1 or
2; Phillips,
Rawlplug, USM, or Wej-it |

2.3 FABRICATED METAL TRENCHES

- | | |
|----|---|
| A. | All trench channel shall be constructed of 13 ga. welded steel construction with open bottoms to allow for easy placements and on site sloping as required. All units shall be of modular length of 4', 5' or 6' and shall have flanged joints that bolt together for rigid, precise alignment throughout installation. |
|----|---|

- B. All trench channel sections shall be equipped with ¼” safety plate covers to allow for the safe passage of pedestrian traffic in addition to vehicles equipped with pneumatic tires inflated to a maximum of 35 lb. /sq. in.
- C. Metal trenches shall be RED-E-FORM drain system manufactured by Riverside Steel, Inc. or equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. Connections - All bolts shall be equipped with self-locking nuts or lock washers. Where welding is required or permitted, all butt and miter welds shall be continuous and where exposed to view shall be ground smooth. In addition, intermittent welds shall have an effective length of at least two inches and shall be spaced not more than six inches apart.
- B. Fabrication and Erection - Miscellaneous metal shall be fabricated in conformity with dimensions, arrangement, sizes and weights or thicknesses shown on the Plans or stipulated in the Specifications. All members and parts, as delivered and erected, shall be free of winds, warps, local deformations, and unauthorized bends. Holes and other provisions for field connections shall be accurate and shop checked so that proper fit will result when the units are assembled in the field. Erection drawings shall be prepared if required, and each separate piece shall be marked as indicated thereon. All field connection materials shall be furnished. Before assembly, surfaces to be in contact with each other shall be thoroughly cleaned. All parts shall be assembled accurately as shown on the Plans. Light drifting will be permitted to draw parts together, but drifting to match unfair holes will not be permitted. Any enlargement of holes necessary to make connections in the field, shall be done by reaming with twist drills. Enlarging holes by burning is absolutely prohibited.
- C. Storage - Miscellaneous metal shall be stored on blocking so that no metal touches the ground and water cannot collect thereon. The material shall be protected against bending under its own weight or superimposed loads.
- D. Edge Grinding - Sharp corners of cut or sheared edges shall be dulled by at least one pass of a power grinder to improve paint or galvanizing adherence.
- E. Aluminum - All aluminum that will be in direct contact with concrete shall be liberally coated with bituminous material in a manner approved by the Engineer prior to being installed.

3.2 FABRICATED METAL TRENCHES

- A. Installation should begin at the outlet end, where practical, and should proceed up stream in accordance with generally accepted procedures of the installation of below grade forms. Several sections may be jointed before being set to grade. All channel sections shall be firmly anchored to the sub-grade with rods through the anchor clips. All forms shall be surrounded with a minimum of 4-inches of concrete of the same strength and reinforcement as the adjacent slab.

3.3 ANCHOR BOLTS

- A. Anchor bolts shall conform to the material requirements for bolts and nuts in this section and to the placement requirements of the Plans. All anchor bolts shall be zinc-plated steel unless otherwise specified or indicated on the Plans.

3.4 EXPANSION ANCHORS

- A. Expansion anchors shall be installed in conformity with the manufacturer's recommendations for maximum holding power, but in no case shall the depth of the hole be less than four bolt hole diameters. Minimum distance between the center of any expansion anchor and an edge or exterior corner of concrete shall be at least 4 1/2 times the diameter of the hole in which the anchor is installed, unless otherwise indicated on the Plans. The minimum distance between the centers of expansion anchors shall be at least eight times the diameter of the hole in which the anchors are installed.

Nuts and washers for expansion anchors shall be as specified for anchor bolts. Expansion anchors shall be zinc-plated steel unless otherwise specified or indicated on the Plans.

END OF SECTION

DIVISION 9

FINISHES

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included. This section includes the painting and finishing of all exterior and interior exposed surfaces listed on the Painting Schedule in Part Three of this section.
- B. Work not included. This section does not include painting which is specified under other sections of this Specification.

Unless otherwise indicated, cosmetic painting is not required on surfaces in concealed areas and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces, and duct shafts.

Metal surfaces of anodized aluminum, stainless steel, A588 weathering steel, chromium plate, copper, bronze, and similar materials will not require painting under this section, except as may be specified herein.

Moving parts of operating units, mechanical or electrical parts such as valve operators, linkages, sinkages, sensing devices and motor shafts shall not be painted, unless otherwise indicated.

Required labels or equipment identification, performance rating, name, or nomenclature plates shall not be painted over.

- C. Definitions. The term "paint", as used herein, means all coating systems materials including primers, emulsions, epoxies, enamels, sealers, fillers, and other applied materials whether used as primer, intermediate or finish coats.

1.2 QUALITY ASSURANCE

- A. Qualifications of Workmanship. The Contractor shall provide at least one person who shall be present at all times during the execution of the work of this section who shall be thoroughly familiar with the specified requirements and the materials and methods needed for their execution, and who shall direct all work performed under this section.

In addition, the Contractor shall provide adequate numbers of workmen skilled in the necessary crafts and shall properly inform them of the methods and materials to be used.

In acceptance or rejection of the work of this section, the Engineer will make no allowance for lack of skill on the part of workmen.

- B. Paint coordination. The Contractor shall provide finish coats which are compatible with the prime coats used. In addition, he shall review other sections of the Specifications as required to verify the prime coats to be used and to assure compatibility of the total coating system for the various substrata.

Upon request, the Contractor shall furnish information on the characteristics of the specific finish materials to ensure that compatible prime coats are used. The Contractor shall provide barrier coats over noncompatible primers, or remove the primer and reprime as required.

The Contractor shall notify the Engineer in writing of any anticipated problems in using the specified coating systems over prime coating supplied under other sections.

1.3 SUBMITTALS

- A. The following submittals shall be required:
1. A complete materials list of all items proposed to be furnished and installed under this section;
 2. Color chips for each proposed coating;
 3. Manufacturers' specifications and other data required to demonstrate compliance with the specified requirements; and
 4. Two copies of manufacturers' specifications, including paint analysis and application instructions for each material for information only. In addition, the Contractor shall indicate by transmittal that a copy of each manufacturer's instructions has been distributed to the applicator.

1.4 PRODUCT HANDLING

- A. Delivery of materials. The Contractor shall deliver all materials to the job site in original, new and unopened containers bearing the manufacturer's name and label showing at least the following information:
1. Name or title of the material;
 2. Fed. Sec. number, if applicable;
 3. Manufacturer's stock number;
 4. Manufacturer's name;
 5. Contents by volume for major constituents;
 6. Thinning instructions; and
 7. Application instructions.
- B. Storage of materials. The Contractor shall provide proper storage to prevent damage to, and deterioration of, paint materials.
- C. Protection. The Contractor shall use all means necessary to protect the materials of this section before, during, and after installation and to protect the work and materials of all other trades.

- D. Replacements. In the event of damage, the Contractor shall immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

1.5 JOB CONDITIONS

- A. Surface Temperatures. The Contractor shall not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperature are below 45°F, unless otherwise permitted by the manufacturer's printed instructions and approved by the Engineer.
- B. Weather conditions. The Contractor shall not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces, unless otherwise permitted by the manufacturer's printed instructions as approved by the Engineer. Applications may be continued during inclement weather within the temperature limits specified by the paint manufacturer during applications and drying periods.

1.6 EXTRA STOCK

- A. Amount. Upon completion of the work of this section, the Contractor shall deliver to the Owner an extra stock equaling ten percent (10%) of each color, type and gloss of paint used on the work.
- B. Packaging. The Contractor shall tightly seal each container and clearly label it with the contents and location used.

1.7 MANUFACTURER'S RECOMMENDATIONS

- A. Unless otherwise specified herein, the coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, and protecting his coating materials, for preparation of surfaces for coating, and for all other procedures relative to coating shall be strictly observed. No substitutions or other deviations will be permitted without written authorization from the manufacturer.

PART 2 - MATERIALS

2.1 PAINT

- A. Design. The design is based on the use of paint products manufactured by Sinclair Paint Company, and the materials of that manufacturer are named in the Painting Schedule. Equal products of Tnemec, Sherwin-Williams, Columbia, Pratt & Lambert or other manufacturers approved by the Engineer may be substituted.
- B. General. The Contractor shall provide the best quality grade of the various types of coatings as regularly manufactured by paint materials manufacturers approved by the

Engineer. Materials not displaying the manufacturer's identification as a standard best-grade product will not be acceptable.

- C. Durability. The Contractor shall provide paints of durable and washable quality. Paint materials which will not withstand normal washing as required to remove pencil marks, ink, ordinary soil, and similar materials without showing discoloration, loss of gloss, staining, or other damage shall not be used.
- D. Colors and glosses. The Contractor shall submit color sample to be used in the various types of paints specified, to the Engineer for selection and/or approval.
- E. Undercoats and thinners. The Contractor shall provide undercoat paint produced by the same manufacturer as the finish coat. Only those thinners recommended by the paint manufacturer shall be used, and only to the recommended limits. Insofar as practicable, the Contractor shall use undercoat, finish coat and thinner material as parts of a unified system of paint finish.
- F. Standards. The Contractor shall provide paint materials which meet or exceed the standards listed for each application in the Painting Schedule in Part Three of this section.

2.2 APPLICATION EQUIPMENT

- A. General. For application of the approved paint, the Contractor shall use only such equipment as is recommended for application of the particular paint by the manufacturer of the paint, and as approved by the Engineer.
- B. Compatibility. Prior to the actual use of application equipment, the Contractor shall use all means necessary to verify that the proposed equipment is actually compatible with the material to be applied and that the integrity of the finish will not be jeopardized by use of the proposed application equipment.

2.3 OTHER MATERIALS

- A. All other materials not specifically described but required for a complete and proper installation of the work of this section shall be new, first quality of the respective kinds, and as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection. Prior to installation of the work of this section, the Contractor shall carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. The Contractor shall also verify that painting may be completed in strict accordance with the original design and with the manufacturer's recommendations, as approved by the Engineer.

- B. Discrepancies. The Contractor shall not proceed in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 MATERIALS PREPARATION

- A. General. The Contractor shall mix and prepare painting materials in strict accordance with the manufacturer's recommendations as approved by the Engineer. Materials not in actual use shall be stored in tightly covered containers. The Contractor shall maintain containers used in storage, mixing and application of paint in a clean condition, free from foreign materials and residue.
- B. Stirring. The Contractor shall stir all materials before application to produce a mixture of uniform density, and as required during the application of materials. Any surface film that may form shall not be stirred into the material, but shall be removed. If necessary, the material shall be strained before using.

3.3 SURFACE PREPARATION

- A. General. The Contractor shall perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's recommendations, as approved by the Engineer. The Contractor shall remove all removable items which are in place and are not scheduled to receive paint finish, or provide a surface- applied protection prior to surface preparation and painting operations. Following completion of painting in each space or area, the Contractor shall reinstall the removed items, using workmen skilled in the necessary trades.

The Contractor shall clean each surface to be painted before applying paint or surface treatment. Oil and grease shall be removed with clean cloths and cleaning solvents of low toxicity and a flash point in excess of 100° F prior to the start of mechanical cleaning. Cleaning and painting shall be scheduled so that dust and other contaminants from the cleaning process will not fall onto wet, newly painted surfaces.

Unless otherwise specified herein, the coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, and protecting his materials, for preparation of surfaces for coating, and for other procedures relative to coating shall be strictly observed. No substitutions or other deviations will be permitted without written authorization from the manufacturer.

- B. Preparation of wood surfaces. The Contractor shall clean all wood surfaces until they are free from dirt, oil, and all other foreign substances. All finish wood surfaces exposed to view shall then be smoothed, using the proper sandpaper. Where so required, the Contractor shall use varying degrees of coarseness in sandpaper to produce a uniformly smooth and unmarred wood surface. Unless specifically approved by the Engineer, the Contractor shall not proceed with painting of wood surfaces until the moisture content of the wood is 12 percent or less as measured by a moisture meter.
- C. Preparation of metal surfaces. The Contractor shall thoroughly clean all metal surfaces until they are completely free from dirt, oil and grease. On galvanized surfaces, solvent shall be used for the initial cleaning, and then the surface shall be thoroughly treated with

phosphoric acid etch. All etching solution shall be removed before proceeding. The metal surface shall be allowed to dry thoroughly before paint is applied.

- D. Preparation of concrete surfaces. New concrete surfaces, including floors, which are to be painted shall be prepared by removing all dirt, dust, efflorescence, oil or grease stains, or other foreign substances, by wire or fiber brushing or scrubbing, scraping, or other appropriate methods. Prior to mechanical cleaning, any oil or grease shall be removed with a solvent or detergent.

New concrete floors shall be flooded with muriatic acid solution mixed in the proportions of one part acid to four parts water, broomed, and then thoroughly rinsed with clean water. The floor surfaces shall be completely dry when painted.

3.4 PAINT APPLICATION

- A. General. The Contractor shall slightly vary the color of succeeding coats. No additional coats shall be applied until the complete coat has been inspected and approved. Only the inspected coats of paint will be considered in determining the number of coats applied.

The Contractor shall sand and dust between enamel coats to remove all defects visible to the unaided eye from a distance of five feet.

On all removable panels and all hinged panels, the Contractor shall paint the back sides to match the exposed sides.

- B. Drying. The Contractor shall allow sufficient drying time between coats. This drying period shall be modified as recommended by the material manufacturer to suit adverse weather conditions.

Oil-base and oleo-resinous solvent-type paints shall be considered dry for recoating when the paint feels firm, does not deform or feel sticky under moderate pressure of the thumb, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

- C. Brush Application. The Contractor shall brush out and work all brush coats onto the surfaces in an even film. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.
- D. Spray Application. The Contractor shall confine spray application to metal framework and similar surfaces where hand brush work would be inferior. Whenever spray application is used, the Contractor shall apply each coat to provide the equivalent hiding of brush-applied coats. Doubling back with spray equipment for the purpose of building up film thickness of two coats in one pass shall not be allowed.
- E. Completed work. The completed work shall match the approved samples for color, texture and coverage. The Contractor shall remove, refinish or repaint all work not in compliance with specified requirements.

3.5 MATERIALS

A. PRIMERS AND PRETREATMENTS

Rust-Inhibitive	Universal type; Cook "391-R-259 Clorocon Barrier Coat"; Koppers "No. 10 Inhibitive Primer"; Mobil "13-R-50 Chromox Q.D. Primer"; Tnemec "77 Chem-Prime"; or Rust- Oleum "1573 Rust-Inhibitive Primers"
Vinyl Wash	MIL-P-15328; Cook "900-Y-2 Vinyl Wash Primer"; Koppers "801 Wash Coat"; Mobil "13-Y-8 Vinyl Wash Primer"; or Tnemec "32-1210 Vino- line Wash Primer"
Acrylic Emulsion	Rust-Oleum "5700 Rust-O-Crylic"
Coal Tar	Koppers "Bitumastic Mill Undercoat" or Mobil "35-J-6 Bituminous Black"
Vinyl	Ameron "Amercoat 86"; Cook "900-R- 014 Vinicon Primer"; Koppers "25 Vinyl Primer"; Mobil "80-R-8 Vinyl Primer;" Tnemec "33-1211"; or Rust- Oleum "9000 High Build Vinyl:
Epoxy Primer	Tnemec "66-1211 Epoxiline Primer" Rust-Oleum "9369 Red Epoxy Primer"
Alkyd	Promar 200 Alkyd Enamel Undercoater
Wood Stain Penetrating Wood Stain	Pratt & Lambert "Tonetic" Wood Stain "Penta" Fortified Wood Stain"Olympic" Weather Screen
Zinc Rich (inorganic)	Ameron "Dimetcote 6", Carboline "Carbo Zinc 11"; Cook "411-A-101 Inorganic Zinc Coating"; Koopers "Inorganic Zinc No. 3"; Mobil "Mobilzinc 7"; Tnemec "92 Tneme- Zinc"; or Rust-Oleum "5686 Inorganic Zinc Rich"
Tie Coat (for Zinc Primer)	Koppers "25 Tie Coat"; Rich Latex Primer-Sealer Cook "Corovel Latex Primer"; Pratt & Lambert "Vapex Wall Primer"; Mobil "77-W-1 Primer and Sealer", Tnemec "51-792 PVA Sealer", Promar 200 Latex Wall Primer

B. INTERMEDIATE AND FINISH PAINTS

Semigloss Alkyd Enamel	Fed Spec TT-E-529; Cook "Shado- tone Satin Enamel"; Koppers "Gramortex Semi-Gloss"; Mobil "Series 31 Alkyd Satin Enamel"; Tnemec "Enduratone"; or
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Rust-Oleum "New Color Horizons" Semi-gloss; Promar 200 Semi-Gloss Enamel

Medium Consistency Koppers "Bitumastic Super Service

Coal Tar Black"; Mobil "High-Build Bituminous Coating 35-J-10"; Porter "Tar- mastic 103"; or Tnemec "46-450 Heavy Tnemecol"

Thixotropic Coal Tar MIL-C-18480; Koppers "Bitumastic No. 50"; Mobil "35-J-10 Hi-Build Bituminous Coating"; Tnemec "46-449 Heavy Duty Black"

Latex Emulsion Acrylic containing at least 50 per- cent by weight nonvolatile solids; Cook "827 Series Sulfide Fume Resistant Paint"; Koppers "600 Acrylic"; or Tnemec "Series 6 Tneme-Cryl"; Rust-Oleum "5900 Rust- O-Crylic"

Polyamide Epoxy Rust-Oleum "9500 High-Build Epoxy"; or Tnemec "#66 Hi-Build Expoyline"; DuPont Corlar 26P; Dupont Corlar 823HB

Urethane Rust-Oleum "9400 Rust-O-Trane"; Tnemec "Series 70 Endura Shield"

Semi Gloss Latex Acrylic containing at least 50 per- cent by weight nonvolatile solids; Cook "A-Kryl-X Satin Latex Paint"; or Glidden "3700 Spread Latex Semi- Gloss Enamel", Promar 200 Latex Semi-Gloss Enamel

Coal Tar Epoxy Cook "Corotar"; Koopers "300-M Bitumastic"; Mobil "Sovapon Tar Coat 64-J-2"; Porter "Tarsset Standard"; Tnemec "413 Coal Tar Epoxy; or Rust-Oleum "A-93-7908"

Concrete Floor Hardener Shake on application; L & M "Quartz Plate", Euclid "Surfhard"; Master Builders "Mastercron" sealed as per manufacturer's recommendation

Liquid application; Sonneborn "Lapidolith" sealed per manufacturer's recommendations

Vinyl Ameron "Amercoat 33"; Cook Vinicon MW"; Koppers "35 HB

Intermediate plus 401 Vinyl Finish"; Mobil "Series 80 Vinyl Enamel", Tnemec "Vinoline (Series 35)"; or Rust-Oleum "9000 High Build Vinyl

Clear Gloss Varnish Cook
"Timbretone Urethane"; Martin Senour "Astro-Var";
Pratt & Lambert "Varmor Clear Finish"; or Mobil
"38-V-23 Clear Urethane Gloss"

Clear Satin Varnish Cook
"Timbretone Satin Varnish"; Pratt & Lambert "38 Satin
Pale Trim Varnish"; or Martin Senour "Astro- Var"

Heat-Resistant Rust-Oleum "4115 Heat
Resistant

Aluminum Ready-Mixed
Aluminum"; Mobil "37-A- 10 Heat Resisting
Aluminum" or Tnemec "261 Hot Surface Aluminum

Epoxy Floor Coating 50 percent
solids epoxy floor covering with a slip-resistant surface;
Tnemec "Series 67 Tneme- Tread" with 50-mesh silica
for non- skid treatment

3.6 MANUFACTURER REFERENCE

- A. Coating materials herein specified by name and/or manufacturer are intended to demonstrate the design intent and define the type and quality of coating desired. Other coating of equal quality will be allowed only after appropriate submittals have been furnished and the written approval of the Engineer has been issued.

3.7 PAINTING SCHEDULE

- A. The following schedule lists paints for prime, intermediate and finish coats for surfaces to be painted. All exposed surfaces including sides and edges shall be painted. Painting systems shall conform to the finish schedules on the Drawings. All surfaces not scheduled on the Drawings shall conform to the Painting Schedule. Specific coating requirements listed in other sections of these specifications for equipment or structures shall take precedence over these schedules.

Surface to be Painted	Material
-----------------------	----------

B. Metal Surfaces

1. Exposed surface of shop-primed structural steel and steel framing members, motors, drives, pumps, equipment, and equipment enclosures, except galvanized surfaces, exterior locations.

Prime Coat	Epoxy Primer
Second Coat	Polyamide Epoxy
Third Coat	Polyamide Epoxy

2. Exposed surfaces of shop-primed structural steel, steel framing members, motors, drives, pumps, equipment, and equipment enclosures, except galvanized surfaces, interior locations.

Prime Coat	Rust Inhibitive
Second Coat	Gloss Alkyd Enamel

3. All exposed surfaces of cast iron and steel piping, hatches and miscellaneous accessories inside buildings and above grade outdoors, including valves, fittings, flanges, bolts, supports, guardposts, steel doors, and accessories therefore, railings, and including galvanized surfaces after proper priming.

Prime Coat	Rust Inhibitive
Second Coat:	Gloss Alkyd Enamel

4. All exposed surfaces of electrical conduit inside buildings, except banks of conduits in multiple layers hung from ceilings, including fittings, boxes, supports, and accessories therefore, after proper priming.

Prime Coat	Primer
Second Coat	Semi-Gloss Alk. Enam.

Or Semi-Gloss Latex

5. All metal surfaces, unless otherwise specified, which will be submerged or buried, all or in part, including valves, valve boxes, weir plates, and scum baffles, but excluding piping laid in the ground and similar locations.
All exterior surfaces of cast iron and steel piping exposed in manholes and similar locations.

Prime Coat	Self Priming
First Coat	Medium Consistency

Coal Tar,

6. All metal harness anchorage for buried piping and all aluminum surfaces in contact with concrete.

Prime Coat	Self Priming
First Coat	Thixotropic Coal Tar
Second Coat	Thixotropic Coal Tar

C. Concrete and Masonry Surfaces

1. Concrete surfaces below grade, outside surfaces.

		Prime Coat	Thixotropic Coal Tar
		Second Coat	Thixotropic Coal Tar
2.	Interior concrete floors		
	applied	Prime Coat	Floor hardener – spray
	manufacturer's recommendations	Second Coat	Sealer per
3.	Masonry Surface Above Grade.		
	Not Used		
D.	Miscellaneous Surfaces		
1.	Gypsum Wallboard.		
		Prime Coat	Latex Primer-Sealer
		Second Coat	Semi-Gloss Latex
		Third Coat	Semi-Gloss Latex
	or		
		Prime Coat	Latex Primer Sealer
		Second Coat	Semi-Gloss Alkyd
	Enamel		
		Third Coat	Semi-Gloss Alkyd
	Enamel		
2.	Interior wood trim.		
	Not Used		
3.	Exposed vent, misc. piping, etc.		
		Prime Coat	Rust Inhibitive
		First Coat	Gloss Alkyd Enamel
4.	Other		
	Other items requiring painting shall be coated as per the manufacturer's recommendations.		

3.8 SURFACES NOT TO BE COATED

- A. The following listed items will not require coating:
1. Finished hardware, except where primed for paint
 2. Prefinished heating units and electrical panels
 3. Prefinished siding
 4. Prefinished roofing
 5. Steel members constructed of A588 weathering steel
 6. Galvanized metal, except fasteners, piping and electrical conduit
 7. Anodized aluminum or aluminum
 8. All concrete surfaces except for outside surfaces of below grade walls.
 9. Stainless steel, brass, bronze and chrome plated items
 10. Items having factory finish other than prime coat only, conforming to these specifications.

11. Equipment nameplates
12. Exposed sections of machined shafts on motors, drives, etc.

END OF SECTION

DIVISION 13

SPECIAL CONSTRUCTION

SECTION 13215

CROSS LINKED POLYETHYLENE TANKS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cross-linked polyethylene (XLPE) tank for storage of magnesium chloride complete with top access manway, flanged nozzles, liquid level indicator, and accessories

1.2 RELATED SECTIONS

- A. Section 15060—Interior Pipe and Fittings

1.3 REFERENCES

- A. ASTM D1505—Density of Plastics by the Density-Gradient Technique
- B. ASTM D1693—Environmental Stress-Cracking of Ethylene Plastics
- C. ASTM D638—Tensile Properties of Plastics
- D. ASTM D883 – Standard Definitions of Terms Relating to Plastics
- E. ASTM D1525—Vicat Softening Temperature of Plastics
- F. ASTM D1998—Low Temperature Impact Testing

1.4 SUBMITTALS

- A. Provide under provisions of Section 01300
- B. Shop Drawings:
 - 1. Complete information on tank, fittings, gaskets, and liquid level indicator materials
 - 2. Sizes of all major tank components, wall thickness, dimensions
 - 3. Details on field assembly and installation, foundation mounting details
 - 4. Fitting and attachment locations
 - 5. Weight and center of gravity
- C. Product Data:
 - 1. Confirmation that tank material selected is suitable for continuous service with magnesium chloride.
- D. Factory Test Report
 - 1. Material, specific gravity rating

2. Wall thickness verification
3. Fitting placement verification
4. Visual inspection
5. Hydrostatic test

1.5 PERFORMANCE AND DESIGN REQUIREMENTS

A. Bulk storage tank size and dimensions:

1. Magnesium Chloride:
 - a. Number of tanks: 2
 - b. Nominal capacity: 10,300 gal
 - c. Approx diameter: 11'-11"
 - d. Approx height: 14'-2"

B. Service:

1. Magnesium Chloride:
 - a. Physical state: liquid with white, light grey, amber or yellowish color
 - b. Pressure: Atmospheric
 - c. Odor: Odorless
 - d. pH: 5.5 - 6.5
 - e. Specific gravity: 1.325
 - f. Density: 1.24 to 1.34 g/cm³ @ 68 degrees F
2. Chemical characteristics above may vary with manufacturer and actual type of product used. Consider above data as general information for characteristics of chemicals to be utilized

C. Additional design requirements:

1. Tank wall thicknesses for appropriate chemical based on specific gravity
2. XLPE tank with oxidation resistant low density polyethylene liner
3. Tank shall be UV stabilized
4. Interior Locations: Translucent such that liquid level in tanks is viewable from tank exterior
5. Vertical tank shape: Cylindrical with flat bottom and closed domed top
6. Interior: Flat bottom with integrally molded flanged outlet
7. Fittings: Integrally molded flanged outlet and bolted flange
8. Vent tank and store indicated chemicals at atmospheric pressure
9. Uniformly distribute roof load with all nozzles, manway, and opening locations designed for minimum of 250 lb. concentrated load
10. Rigidly and sufficiently reinforce for connection and operation of all accessories without vibration or structural deformation
11. No internal support members

1.6 QUALITY ASSURANCE

- A. Furnish by fabricator who is fully experienced, reputable, qualified and regularly engaged in fabrication (for a minimum of 5 years) of items to be furnished which have been used as required

herein. Provide all XLPE tanks of same type from one fabricator. Fabricator shall be ISO 9001 certified at all locations. Tanks to be manufactured to ASTM D 1998-97 Standards. Tanks to be NSF 61 certified for stated chemicals

- B. Quality control procedure: Ensure that all fabrication complies with these specifications. Include final inspection by Contractor and a written record of this final inspection. Objective of fabricator's quality control and inspection procedure is to have all tanks comply with these Contract Documents at time of Contractor's first inspection, thus eliminating any need for rework by fabricators

1.7 SYSTEM DESCRIPTION

- A. Chemical storage tanks manufactured of materials to resist corrosion from specific chemical being stored
- B. Provide all tanks with accessories specified herein and/or as shown on Drawings to ensure complete and workable systems

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle under provisions of Section 01600
- B. Prevent transit and handling damage to tanks
- C. Protect flange faces from damage: Cover all openings with securely bolted wooden or plastic blind flanges to prevent the entrance of dirt, water, and debris
- D. Mount tanks on skids or protective framework to provide easy handling with fork truck or similar device and/or provide with lifting lugs, cleats, etc., to permit handling by crane. Do not use nozzles, manways, or other fittings for handling
- E. Support tanks during shipment in a manner to prevent damage to tank and lining and/or coating
- F. Comply with manufacturer's instructions for unloading and storage of tanks

1.9 WARRANTY

- A. Provide a minimum 5-year warranty from tank manufacturer
- B. Cover complete cost of repair and replacement of tanks for five years from the date of Substantial Completion should leakage occur through tank or tank show signs of fatigue or failure. Cover complete cost of repair and replacement of tank fittings during first year, and prorated for next four years, should leakage occur through tank fittings, or tank fittings show signs of fatigue or failure

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Poly Processing Company or equal
- B. Or equal

2.2 MATERIALS

- A. Tanks shall be UV resistant, rotationally-molded, integrally molded flanged outlet, high density cross-linked polyethylene, one-piece seamless construction, cylindrical in cross-section and vertical with flat bottoms in axis.
- B. The top head shall be integrally molded with the cylindrical wall. Its minimum thickness shall be equal to the thickness of the top of the straight sidewall.
- C. The bottom head shall be integrally molded with the cylindrical wall. Knuckle radius shall be 1-1/2 inch for tanks with diameters greater than 6 feet.
- D. All tanks non-insulated suitable for vertical installation except where indicated otherwise.
- E. Fabricate to dimensions shown. Capacity of tanks is nominal only and dimensions shall govern
- F. Provide a 24 inch manway and cover in tank top made of polyethylene and equipped with combined manway and vent to prevent over pressurization of tank. Manway must be capable of relieving a volume flow rate of up to 2650 ACFM. Gaskets shall be closed cell, cross-linked polyethylene foam, Viton, or EPDM materials.
- G. Provide other openings and fittings as required in the construction documents.
- H. Gaskets: EPDM or Viton GF
- I. Except for manway and drain nozzle (integrally molded flanged outlet), provide tank fittings according to approved shop drawings. Use the following fittings:
 - 1. Type I: PVC bolted flange fitting with polyethylene encapsulated titanium donker bolts, 150 lb ANSI flat face style flange
 - 2. Type II: PVC bolted flange bulkhead fitting with polyethylene encapsulated titanium donker bolts, 150 lb ANSI Van Stone style flange ring
 - 3. Type III: Integrally molded flanged outlet with PVC companion flange. Seamless, one piece construction molded as an original of tank with oxidation-resistant low-density polyethylene liner.

2.3 REVERSE FLOAT LEVEL GUAGE

- A. The level guage shall allow for a visual indication of the fluid level in the tank without introducing fluid into a sight tube on the outside of the tank.
- B. The system includes a clear 2-inch schedule 40 UV resistant tube on the outside of the tank with a neon orange level indicator located inside the tube, a float inside of a perforated 4-inch PVC pipe placed on the inside of the tank and a 1/8-inch polypropylene rope connecting the float to the level indicator.
- C. The rope shall pass through the domed roof of the tank via two PVC elbows that contain interior pullies and a roof penetration fitting.
- D. Reverse fluid levels in 1-foot increments shall be marked on the exterior of the clear sight tube to allow for visual determination of the tank level through use of the level indicator.
- E. Reverse float level gauges shall be by Poly Processing or equal.

2.4 SHOP TESTING

- A. Factory test tanks for leaks. Engineer may request that this test be performed in the Engineer's presence at time of tank inspection. Otherwise, manufacturer shall perform test prior to time of inspection
- B. Inspection and testing procedures and reports (certified copies of test results) shall be made for each tank. Send these procedures and reports to Engineer for review and approval prior to tank shipment

2.5 ACCESSORIES

- A. Equip tanks as specified and shown on Drawings with the following items:
 - 1. Nozzles and openings as specified
 - 2. All necessary corrosion-resistant, coated steel hardware for installation of tank and accessories
 - 3. Lifting lugs
 - 4. Piping and supports (provided by Contractor)
 - 5. Flexible connectors or expansion joints to connect all tank outlets to piping
 - a. See Section 15060 – Pipe Fittings and Valves
- B. Bulk storage tank fitting size and locations.
 - 1. Details on fitting locations are provided on Drawings:
- C. Nameplates:
 - 1. Identify chemical stored
- D. Certification Plates

1. Certification plate is to be secured to tank in accordance with manufacturer's requirements
2. Provide the following data
 - a. Name of tank manufacturer
 - b. Date of manufacture, nominal tank capacity
 - c. Specific gravity, maximum allowable concentration and temperature of specified chemical for safe storage
 - d. Mechanical properties of the tank material
 - e. Resin designation

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install the tanks in accordance with Drawings and manufacturer's instructions. Construct concrete pad level and smooth to the tolerances required by tank manufacturer in accordance with Division 3
- B. Install tanks on three (3) layers of 30 lb. felt
- C. Make all pipe and level gauge connections to tanks to provide a complete operating system
- D. Install flexible connection, same diameter as pipe, between tank connections and pipe, as close to tank as possible but no more than 18 inches from exterior face of tank shell
- E. Provide pipe supports to prevent transmitting vibration to tank

3.2 CLEANING

- A. Clean all tank surfaces in accordance with manufacturer's instructions to the satisfaction of the Engineer when installation is complete and all connections made
- B. Do not use abrasive cleaning agents

3.3 FIELD TESTING

- A. After installation, field test each tank with potable water. Fill tank with water to the top access and allow to stand full for a period not less than 24 hours. The tank and fittings shall hold water without loss, evidence of weeping, or capillary action for a period of not less than 24 hours prior to acceptance
- B. Plug flanged connections with temporary blind flanges on the outside of the tank during testing. Do not block or plug connections on the inside
- C. Engineer may also inspect each tank for defects, damage, and conformance with Specifications
- D. After testing, thoroughly clean each tank

- E. Dispose of water used for testing as directed by the Engineer
- F. Should any defects become evident during inspection, testing, or within warranty period, repair or replace defective tank or fitting as approved by Engineer

END OF SECTION

DIVISION 15

MECHANICAL

SECTION 15060

PIPE, FITTINGS AND VALVES

PART 1: GENERAL

1.1 DESCRIPTION

- A. This work includes furnishing and installing piping, fittings and valves for the magnesium chloride system.

1.2 REFERENCES

- A. The current publications listed below form a part of this specification.

ASTM D-1785	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe
ASTM D-2467	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe Fittings
ASTM A403/A403M	Standard Specification for Wrought Austenitic Stainless Steel Pipe Fittings
ASTM A182	Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings and Valves and Parts for High-Temperature Service

1.3 SUBMITTALS

- A. Comply with MPWSS Section 01330: SUBMITTALS, as may be modified by these documents.
- B. Provide submittals of all pipe, valves and fittings, including manufacturer's literature sufficient to identify engineering properties of materials. Engineer shall review for general compliance only. Engineer shall not review for dimensioning.
- C. Provide a dimensioned layout drawing with the pipe and fitting submittals identifying the pipe and fittings being provided. The drawings shall show all fittings, tie-in points, and other critical areas. The coating and lining system should be identified on the drawing for each item.

1.4 SAFETY

- A. Contractor shall be familiar with all applicable OSHA standards and any other state or federal standards that may apply to safety of operation.

PART 2: PRODUCTS

2.1 GENERAL

- A. Furnish and install complete system of piping, valved as indicated or as necessary to completely control entire apparatus. Pipe drawings are diagrammatic and indicate general location and connections. Piping may have to be offset, lowered, or raised as

required or directed at site. This does not relieve the Contractor from responsibility for proper erection of systems of piping in every respect.

- B. Properly support piping and make adequate provisions for expansion, contraction, slope, and anchorage.
 - 1. Cut piping accurately for fabrication to measurements established at site and work into place without springing or forcing.
 - 2. Do not use pipe hooks, chains, or perforated metal for pipe support.
 - 3. Remove burr and cutting slag from pipes.
 - 4. Make changes in direction with proper fittings.
- C. Arrange piping to not interfere with removal of other equipment. Provide accessible, ground joint unions in piping and at connections to equipment.
- D. Make connections of dissimilar metals with insulating couplings.
- E. Cap or plug open ends of pipes and equipment to keep dirt and other foreign materials out of system. Do not use plugs of rags, wool, cotton waste, or similar materials.

2.2 PLASTIC PIPE

- A. Drain Pipe ASTM D-1785, Schedule 40 PVC unless otherwise noted
- B. Fittings: Schedule 40 PVC; ASTM D-2467 (solvent-weld), Schedule 40 PVC

2.3 STAINLESS STEEL PIPE

- A. Drain Pipe ASTM A312, Schedule 40, 316 stainless steel with threaded ends.
- B. Fittings: ASTM A182, Schedule 40, 316 stainless steel with threaded ends.

2.4 PIPE SUPPORTS

- A. Provide Pipe Hangers and Supports as shown on the plans and per minimum spacing as required by the plans.
- B. Pipe hangers and supports shall conform to ANSI/MSS SP-58.
- C. All supports are to be coated per Specification 09900 "Painting".
- D. Floor supports shall be per details provided in the drawings.

2.5 PTFE EXPANSION FITTINGS

- A. Expansion fittings shall be made of 100% virgin PTFE resin.
- B. Performance as follows:

1. Axial extension: ≥ 0.67 -inches
 2. Axial compression: ≥ 0.67 -inches
 3. Lateral deflection: ≥ 0.51 -inches
 4. Angular Deflection: $\geq 14^\circ$
 5. Torsional Rotation: $\geq 4^\circ$
- C. Bolts shall be 316 stainless steel.
- D. Expansion fittings shall be "Flexijoint" by Poly Processing or equal.

2.6 REINFORCED POLYPROPYLENE BALL VALVES

- A. Provide bolted ball valves made from glass reinforced polypropylene.
- B. Valves shall have a self-aligning ball that rotates against Teflon seats, vtion o-ring stem seals and EDM o-ring body seals.
- C. Valves shall have a lever style hand operator.
- D. Ball valves shall be by Norwesco or equal.

2.7 STAINLESS STEEL BALL VALVES

- A. Provide 3-piece stainless steel full port threaded ball valves.
- B. Valve body shall be 316 stainless steel.
- C. RTFE ball seats.
- D. PTFE/vtion o-ring stem seals.
- E. Valves shall have a $\frac{1}{4}$ turn lever style hand operator.
- F. Ball valves shall be by Valworx or equal.

2.8 PVC CHECK VALVES

- A. Provide PVC true union ball check valves made for horizontal or vertical installation, meeting ASTM D1784.
- B. Furnish sock type valves for solvent weld connection to piping.
- C. Seals shall be FPM or EPDM.

2.9 STAINLESS STEEL CHECK VALVES

- A. Provide swing check valves made for horizontal or vertical installation.
- B. Furnish threaded valves for connection to piping.
- C. Gaskets shall be PTFE.

2.10 CAMLOCKS

- A. Camlocks shall be constructed of 316 stainless steel.
- B. Provide 3" camlock male x 3" NPT male camlocks.
- C. Male ends shall be Type F.

2.11 UNIONS

- A. PVC Unions
 - 1. Unions shall match the connecting pipe diameter.
 - 2. Unions shall be constructed of schedule 40 PVC.
 - 3. Furnish socket type unions for solvent weld connections to piping.
 - 4. Unions shall meet ASTM D1784 and ASTM D2466.
- B. Stainless Steel Unions
 - 1. Unions shall match the connecting pipe diameter.
 - 2. Unions shall be constructed of 316 stainless steel.
 - 3. Furnish treaded type unions for connections to piping.

PART 3: EXECUTION

3.1 GENERAL

- A. All pipes, fittings and valves shall be installed to standards set forth in MPWSS, industry standards, and in strict accordance with manufacturer's recommendations.

PART 4: MEASUREMENT AND PAYMENT

See Section 01025: Measurement and Payment.

END OF SECTION

SECTION 15860

HORIZONTAL CENTRIFUGAL END SUCTION PUMPS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish ASME B73.1 latest edition horizontal frame-mounted, end suction, top centerline discharge pumping units, complete with motors, baseplates, couplings and guards, as shown on the Contract Drawings and as specified herein for the magnesium chloride system.

1.2 RELATED WORK

- A. Concrete work and the installation of anchor bolts are included in Division 3.
- B. Painting is included in Division 9.
- C. Valves, mechanical piping and appurtenances and pipe supports are included in Division 15.
- D. Electrical work is included in Division 16.

1.3 SUBMITTALS

- A. Submit shop drawings and product data in accordance with Division 1. Submittals shall include the following:
 - 1. Certified dimensional drawings of each item of equipment and auxiliary apparatus to be furnished, including equipment weights and location and size of anchor bolts.
 - 2. Literature and drawings describing the equipment, including parts list and materials of construction, in sufficient detail to indicate full conformance with the detail specifications.
 - 3. Motor performance data, wiring diagrams, one-lines and conduit entry dimensions and details. Other submittals as required by Division 16.
 - 4. Cut sheets on accessory items.
 - 5. Manufacturer's certified rating curves, to satisfy the specified design conditions, showing pump characteristics of discharge, head, brake horsepower, efficiency and guaranteed net positive suction head required (NPSHR). When applicable, variable speed curves shall be provided showing at least three speeds plotted equally from maximum rpm to minimum rpm. Minimum rpm shall be no less than that required to obtain minimum flow. Curves shall show the full recommended range of performance and include shut-off head. This information shall be prepared specifically for the pump proposed. Catalog sheets showing a family of curves will not be acceptable.
- B. Operation and Maintenance Data
 - 1. Complete operating and maintenance instructions shall be furnished for all equipment specified in this Section as provided in Division 1. The maintenance

instructions shall include troubleshooting data and full preventative maintenance schedules and complete spare parts lists with ordering information.

2. Include certified performance data and curves from factory tests.

1.4 REFERENCE STANDARDS

- A. Design, manufacturing and assembly of elements of the equipment herein specified shall be in accordance with, but not limited to, published standards of the following, as applicable:
 1. American National Standards Institute (ANSI)
 2. American Society for Testing and Materials (ASTM)
 3. American Bearing Manufacturers Association (ABMA)
 4. Hydraulic Institute Standards (current edition)
 5. National Electrical Manufacturers Association (NEMA)
 6. NSF/ANSI 61
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.5 QUALITY ASSURANCE

- A. To assure unity of responsibility, the motors, couplings, guards and supporting base shall be furnished by the pump manufacturer. All pumping units specified herein shall be furnished by a single manufacturer.
- B. The equipment specified herein is intended to be of proven ability with extensive history of manufacturing pumps of this model or similar design. The equipment furnished shall be designed, constructed, and installed to operate satisfactorily when installed in accordance with Manufacturer's written instructions and industry standards. Pumps shall be manufactured in accordance with the applicable ANSI and ASME Standards, except where otherwise specified herein.
- C. Pumps designed for services other than those specified herein and only adapted for this use, shall only be acceptable provided they include each and every feature specified herein. Manufacturer shall modify his standard equipment as necessary to provide the materials and features specified herein.
- D. The pump manufacturer shall be fully responsible for the design, arrangement and operation of all connected rotating components as assembled and mounted on a fabricated steel base to ensure that neither harmful nor damaging vibrations occur at any speed within the specified operating range.
- E. Vibration, when measured in the direction of maximum amplitude on the pump and motor bearing housings, shall not exceed limits given in the latest ANSI/HI nomograph for the applicable pump type.
- F. The complete pumps, as an assembled unit, shall be certified to NSF/ANSI 61 and Annex G and meet the requirements of the US Safe Drinking Water Act of 2014. The new pumping units shall include an additional nameplate displaying NSF-G certification. Units that have NSF materials and NSF coating only are not NSF certified will not be considered equal or acceptable.

1.6 DELIVERY, STORAGE AND HANDLING

- A. All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the unit and equipment are ready for operation.
- B. All equipment and parts must be properly protected against any damage during shipment. The Contractor shall store equipment in accordance with the manufacturer's instruction.

1.7 MAINTENANCE

- A. Furnish all special tools and test equipment required for the proper servicing of all equipment.
- B. Furnish the following spare parts for each size of pump in a given service.
 - 1. One Mechanical Seal
 - 2. One set Repair kit (includes a set of pump bearings, O-rings and gaskets)

1.8 EQUIPMENT WARRANTY

- A. Equipment warranty shall be 5 years for the bare shaft pump, and 12 months from start up and not to exceed 18 months from shipment for other pump system components.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The pumping units shall all be supplied by one manufacturer and shall be complete including pumps, motors, baseplates, couplings, guards and other accessories as specified herein.
- B. The pumps shall conform to ANSI / ASME specification B73.1 latest edition, in all respects.
- C. The pumps, motors, drives, couplings, and base plates shall be designed and built for 24-hour continuous service at any and all points within the specified range of operation, without overheating, without damaging cavitation, and without excessive vibration or noise.
- D. Each major piece of equipment shall be furnished with a stainless-steel nameplate (with embossed data) securely mounted to the body of the equipment. As a minimum, the nameplate for the pumps shall include the manufacturer's name and model number, serial number, rated flow capacity, head and speed. As a minimum, nameplates for motors shall include the manufacturer's name and model number, serial number, horsepower, speed, input voltage, amps, number of cycles, power and service factors.

2.2 CONDITIONS OF OPERATION

- A. The pumps shall be ITT Goulds Pumps Model 3196 or pre-approved equal.

- B. The pumps within each service type shall be identical in every respect with all parts interchangeable.
- C. Each pump shall be designed for the conditions of service tabulated as follows:

<u>PUMPING UNIT DESIGN REQUIREMENTS</u>	
<u>Item No.</u>	
Pumped Liquid	Magnesium Chloride
Number of Units to be Supplied	2 Each
ITT Goulds Pumps Model	3196
Maximum Full Load Motor Speed (rpm)	1,180
Maximum Motor horsepower (Hp)	2.0
Minimum Suction Size (inches)	4
Minimum Discharge Size (inches)	3
Design Rating - Flow (gpm)	150
Design Rating - TDH (feet)	14
Minimum Efficiency at Design Rating (%)	50%
Maximum NPSH Required (feet) at Design Rating	4.4
Minimum Shut Off Head at Design Speed	18.9
Minimum Continuous Flow at Design Speed (gpm)	150
Secondary Condition - TDH (feet)	17
Minimum Capacity at Secondary TDH (gpm)	110
Minimum Efficiency at Secondary TDH (%)	50%

- D. Where total dynamic head (TDH) is referred to in conjunction with the specific discharge requirements, it shall be understood to consist of the sum of the pressure head plus the velocity head, in feet, at the discharge nozzle of the pump minus the pressure head and the velocity head at the suction nozzle of the pump. The efficiency of the pump shall be understood to be based upon total head as just defined.

2.3 PUMP CONSTRUCTION

- A. The pump shall be a full back pull-out design with registered fit between the pull-out assembly and the casing.
- B. The pump envelope dimensions shall conform in all respects to ANSI/ASME B73.1, latest edition.
- C. The casing shall be ASTM A744 CF8M stainless steel and have a fully machined wet face with fully confined case gasket and shall be of self-venting design with integral rigid casing feet. Flange finishes shall have serrated surface conforming to ASME/ANSI B16.5 and shall be available in 150 or 300 Class flat or raised face. The standard Class 150 pump casings shall be furnished with Class 300 wall thickness. Casing and rear cover plate shall have a 3 mm (1/8") corrosion allowance.
- D. The impeller shall be the same material as the casing. The impeller shall be semi-open design. Impeller clearance shall be set against the casing, allowing clearances within the pump to be restored without removing the pump from the installed location. Clearance

shall be set externally. The impeller shall be furnished with back pump-out vanes to reduce axial thrust and seal chamber pressures. Impeller-to-shaft connection shall be threaded onto the shaft and sealed with a fully confined Teflon O-ring with controlled compression. The impeller shall have female threads, with the shaft machined for male threads. Impeller shall be balanced to ISO 1940, Figure 2, Grade 6.3.

- E. The shaft shall be alloy steel, GR 4140, of solid construction for maximum strength and rigidity. Shaft deflection at all operating points shall not exceed 0.002 inch. The shaft key slot shall be designed with a machined radius "sled runner" edge for maximum strength at the coupling. Critical surfaces shall be round to 0.005 in and maximum roughness at the seal chamber shall be .4 micrometer. A "hook" type renewable shaft sleeve shall be furnished to ensure no pumpage contacts the shaft or the impeller attachment mechanism.
- F. The bearing frame shall be cast iron with integral cooling fins and cast frame foot rigidly attached to the baseplate. The bearing frame shall be designed for flood oil lubrication with a large sump design. There shall be an available option for regreasable or greased for life lubrication. A plugged oil fill hole and grease fittings shall be provided. The frame shall be sealed with Inpro VBXX-D hybrid labyrinth bearing isolators constructed of bronze stators and stainless-steel rotors. Lip seals are not acceptable. Furnish a magnetic drain plug and a one-inch NPT sight glass that can be installed on either side of the bearing housing. Impeller clearance shall be set by jackscrew adjustment which shall cause the shaft and impeller to move axially. The bearing housing shall have a provision to securely mount a Bluetooth enabled condition monitoring sensor at the top of the bearing frame.
- G. Furnish premium severe-duty ball bearings. The inboard bearing shall be single row deep groove and pressed onto the shaft. The outboard bearing shall be double row angular contact deep groove and positively secured to the shaft by means of a locknut and lock washer. Both bearings shall be located by a shoulder on the shaft with less than .025 mm end play. The inboard bearing shall float in the bearing housings while the outboard bearing shall be locked in place in the bearing carrier. The bearings are to be sized for a 10-year average life and shall meet or exceed the minimum as required by ASME B73.1, latest edition.
- H. The rear seal chamber cover shall be of the same material as the casing, suitable for accepting various seal designs from all major seal manufacturers. The seal chamber must meet the dimensions outlined in ASME B73.1. Standard bore standard, big bore and tapered bore options shall be available. Tapered bore options shall include axial ribs in ductile iron castings or integral cast in vane particle ejector ring in alloy castings. The axial ribs or integral vanes shall facilitate movement of solids, vapors and heat away from the mechanical seal.

2.4 PUMP DRIVE SYSTEM

- A. Each pump shall be driven by a horizontal variable speed squirrel cage induction electric motor with a maximum horsepower and speed as specified under Paragraph 2.02B. The pump motors shall be suitable for driving the pumps continuously over the entire pumping range. The pump motors shall be furnished by the pump manufacturer.

- B. Each pump shall be directly connected to its driver by means of a flexible elastomeric spacer coupling, suitably sized to transmit the required driving torque and to accommodate unavoidable shaft misalignment.
- C. Motors shall have a Totally Enclosed Fan Cooled enclosures with a 1.15 service factor. Motors shall be 460 volt, 3 phase, 60 hertz. Motors shall be Nidec/US, GE, TECO/Westinghouse or Reliance, no further substitute allowed.
- D. The motor shall be non-overloading at any point in the design operating range of the pump, including run-out and shut-off. The total capacity of the motor (nameplate rating) shall not be exceeded while the pump is operating at any point on the characteristic curve. The service factor shall not be used as part of the motor rating.
- E. Each motor shall be tested at the motor factory and test results submitted for record.

2.5 BASEPLATES, COUPLINGS, GUARDS

- A. The pump and motor shall be mounted on a rigid cast-iron camber top or fabricated steel baseplate. The fabricated steel baseplate shall conform to the dimensional requirements of ASME B73.1. The baseplate shall include a minimum 4-inch diameter grout hole with pump and motor mounting pads machined to 0.005 inch per foot and coplanar with all baseplate pads.
- B. Furnish a Rexnord Omega coupling or equal.
- C. The coupling guard shall conform to ANSI B15.1 and OSHA 1910 standards, extending from the motor to the bearing frame.
- D. The pump shall have standard shaft guards covering the rotating parts of the shaft and mechanical seal in compliance with ASME B73.1 – 2020, The shaft guard shall include easily removed cutouts allowing access to all seal gland port connections. Guards shall be constructed of 304 stainless steel and painted safety orange.
- E. Pump manufacturer shall factory mount and rough align motors on baseplates. Final alignment shall be done by Contractor in the field. Motors may be dismantled for shipment. Coupling components will ship loose for final assembly in the field by the Contractor.

2.6 SHOP TESTS

- A. The Engineer shall have the right to witness the factory tests and inspect any equipment to be furnished under this Section prior to their shipment from place of manufacture.
- B. Each pump casing and seal chamber cover shall include a non-witnessed factory component hydrostatic test performed in accordance with the latest edition of the Hydraulic Institute Standard.
- C. One pump of each rating specified herein shall be factory performance tested in accordance with the latest edition of the Hydraulic Institute Standard 14.6. Notification of such test and a list of test equipment and procedures shall be furnished to the Engineer at least 10 working days before the schedule test date.

1. Each pump shall be tested, and data recorded at its operating conditions of service as listed in Paragraph 2.2 above. Sufficient test point readings shall be made to establish complete head flow capacity, efficiency, and brake horsepower curves for each pump.
 2. The acceptance criteria for the factory tests at the specified design rating will be to Hydraulic Institute Standard 14.6 grade 1B, power basis, unless otherwise specified.
 3. If the application is variable speed a minimum speed curve shall be plotted on the performance curve basis the affinity laws and the test data.
 4. All gauges and other test instruments shall be calibrated in accordance with manufacturer's ISO 9001 qualified calibration schedule.
- D. A complete test report for one pump, including certified characteristic curves of the pump, consisting of at least all information required in Paragraph 1.3 above, except for NPSHR, and certified copies of the hydrostatic test report, shall be submitted to and approved by the Engineer before the pumps are shipped.

2.7 SURFACE PREPARATION AND SHOP PRIME PAINTING

- A. Each fabricated steel base mounted pumping unit, including base and guard, shall be finish painted manufacturers standard machinery coatings. Motors shall receive manufacturers standard finish paint for corrosive atmospheres.
- B. If specified, the bottom of the baseplate shall be prepared and painted with an epoxy primer suitable for epoxy grout.

2.8 PUMP CONTROLS / PANEL

- A. Provide On/Off control for two, 2HP 460V 3 Phase pumps with push button start and stop per pump with a pump control selection to recirculate for a set time on the off delay timer.
- B. The control panel shall be housed in a NEMA 4X stainless steel enclosure rated for outdoor installation. Panel shall include non-fused disconnect, power distribution control transformer for 120V control power, U-Line motor starters with electronic overloads, phase monitor, three position selector switch for manual operation and recirculation of both pumps, pilot light for running. Automatic recirculation relay logic controls utilizing an off delay timer, once the three position switch is in recirculate and the start push button is pressed the pump will run for a selected time and then stop. The panel shall be UL 508A listed.

END OF SECTION

DIVISION 16

ELECTRICAL

SECTION 16000
GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 ELECTRICAL REQUIREMENTS

- A. The electrical requirements are supplemental to the General and Supplementary Conditions and the General Requirements of these Specifications. The Electrical Sections shall apply to phases of the work specified, shown on the Drawings, or required to provide for the complete installation of Electrical Systems for this project.
- B. The work shall include all items, articles, materials, operations and methods listed, mentioned or scheduled in these specifications and the accompanying drawings. All material, equipment and labor shall be furnished together with all incidental items required by good practice to provide the complete systems described.
- C. Examine and refer to all Civil and Utility drawings and specifications for construction conditions which may affect the electrical work. Inspect the project site and existing facilities for verification of present conditions. Make proper provisions for these conditions in performance of the work and cost thereof.
- D. See general requirements for optional proposal items. Note alternates listed and include any changes in work and price required to meet the requirements of the respective alternate.

1.2 CODES AND STANDARDS

- A. Work shall meet the requirements of the plans and specifications and shall not be less than the minimum requirements of applicable sections of the latest Codes and Standards of the following organizations:

- American National Standards Institute (ANSI)
- Americans with Disabilities Act (ADA)
- Certified Ballast Manufacturers (CBM)
- Electrical Testing Laboratories (ETL)
- Independent Testing Laboratories (ITL)
- National Electrical Code (NEC) Latest Edition
- National Electrical Manufacturers Association (NEMA)
- National Fire Protection Association (NFPA)
- Occupational Safety & Health Act (OSHA)
- Underwriters Laboratories (UL)
- Uniform Building Code (UBC)
- Rules and Regulations of the State Fire Marshal
- Requirements of the Serving Utility Company
- Local and State Codes and Ordinances

1.3 FEES AND PERMITS

- A. The Electrical Contractor shall pay all fees and arrange for all permits required for work done under his contract and under his supervision by subcontract.

1.4 MATERIALS AND EQUIPMENT

- A. Manufacturer's trade names and catalog numbers listed are intended to indicate the quality of equipment or materials desired. Manufacturers not listed must have prior approval. Written prior approval must be obtained from the Engineer ten (10) days prior to bid opening. Requests are to be submitted sufficiently ahead of the deadline to give ample time for examination. The items approved will be listed in an addendum and only this list of equipment will be accepted in lieu of specified products. Submittals must indicate the specific item or items to be furnished in lieu of those specified, together with complete technical and comparative data on specified items and proposed items.
- B. Electrical equipment may be installed with manufacturer's standard finish and color except where specific color, finish or choice is indicated. If the manufacturer has no standard finish, equipment shall have a prime coat and two finish coats of approved enamel.
- C. This Contractor shall be responsible for materials and equipment installed under this contract. This Contractor shall also be responsible for the protection of materials and equipment of others from damage as a result of his work.
- D. Manufactured material and equipment applied, installed, connected, erected, used, cleaned and conditioned as directed by manufacturer, unless herein specified to the contrary.
- E. This Contractor shall make the required arrangement with the General Contractor for the introduction into the area of equipment.
- F. Store materials and equipment indoors at the job site or, if these are not possible, store on raised platforms and protect from the weather by means of waterproof covers. Coverings shall permit circulation of air around the materials to prevent condensation of moisture. Screen or cap openings in equipment to prevent the entry of vermin.

1.5 INTENT OF DRAWINGS

- A. The drawings are partly diagrammatic and do not necessarily show exact location of conduit, unless specifically dimensioned. Riser and other diagrams are schematic and do not necessarily show the physical arrangement of the equipment. They shall not be used for obtaining quantities or lineal runs of conduit. Discrepancies shown on different plans or between plans and actual field conditions shall be brought to the attention of the Engineer for resolution.

1.6 RESPONSIBILITY

- A. Be responsible for the installation of a satisfactory and complete system in accordance with the intent of the drawing and specifications. Provide, at no extra cost, all incidental items required for completion of the work even though they are not specifically mentioned or indicated on the drawings or in the specifications.
- B. The drawings do not attempt to show complete details of the building construction which affect the electrical installation; and reference is therefore required to the Civil and Architectural drawings and specifications and to shop drawings of all trades for additional details which affect the installation of the work covered under this Division of the Contract.
- C. Location of electrical system components shall be checked for conflicts with openings, structural members and components of other systems having fixed locations. In the event of any conflicts, the Engineer shall be consulted and his decision shall govern. Necessary changes shall be made at no additional expense to the Owner.
- D. Determine, and be responsible for, the proper location and character of inserts for hangers, chases, sleeves and other openings in the construction required for the work, and obtain this information well in advance of the construction progress so work will not be delayed. Roughing-in fixtures, etc. must be laid out accurately. Connections to equipment of the same class shall be equal heights, plumb, and at right angles to the wall, unless otherwise directed.
- E. Final location of inserts, hangers, etc., required for each installation, must be coordinated with facilities required for other installations to prevent interference.
- F. Take extreme caution not to install work that connects to equipment until such time as complete Shop Drawings of such equipment have been approved. Any work installed by the Contractor, prior to approval of Shop Drawings, will be at the Contractor's risk.
- G. At all times during the performance of this Contract properly protect work from damage and protect the Owner's property from injury or loss. Make good any damage injury or loss, except such as may be directly due to errors in the Proposal Documents or caused by Agents or Employees of the Owner. Adequately protect adjacent property as provided by law and the Proposal Documents. Provide and maintain passageways, guard fences, lights and other facilities for protection required by Local conditions.
- H. Circuiting and switching shall be exactly as shown on drawings. Combining of home runs in compliance with NEC is acceptable, but do not exceed three different phase conductors, switching conductors, one neutral, and one equipment ground conductor per home run. Contractor shall refer to NEC Article 310 and adjust accordingly.
- I. Combining of wiring of various systems in conduit runs is not acceptable, unless otherwise specified herein or noted on drawings.

1.7 INSPECTION

- A. All work and material is subject to inspection at any time by the Engineer or his representative. If the Engineer or his representative finds material that does not conform to these specifications or that is not properly installed or finished, correct the deficiencies in a manner satisfactory to the Engineer at no additional expense to the Owner.

1.8 WORKMANSHIP

A. GENERAL

- 1. Work under this contract shall be performed by workmen skilled in the particular trade including work necessary to properly complete the installation in a workmanlike manner to present a neat and finished appearance.

B. EXCAVATION AND BACKFILL

- 1. Provide all excavating and backfilling as required, with backfilling only after approval of the Engineer. Backfill to be free of all debris and decayable matter.

C. CUTTING, PATCHING AND FRAMING

- 1. Obtain Engineer approval before performing any cutting on structural members or patching of building surfaces. Any damage to the building or equipment by this Contractor shall be the responsibility of this Contractor and shall be repaired by skilled craftsmen of the trades involved at no additional expense to the Owner.
- 2. Chases, openings, sleeves, hangers, anchors, recesses, equipment pads, framing for equipment, provided by others only if so noted on the drawings. Otherwise, they will be provided by this Contractor for his work. Whether chases, etc., are provided by this Contractor or others, this Contractor is responsible for correct size and locations.

1.9 COORDINATION

- A. This Contractor shall plan his work to proceed with a minimum interference with other trades and it shall be his responsibility to inform the General Contractor of all openings required in the building structure for installation of work, and to provide sleeves as required. Dimensions of equipment installed and/or provided by others shall be checked in order that correct clearances and connections may be made.

1.10 CLEAN UP

- A. Keep the premises free from accumulation of waste material or rubbish caused by his work or employees.
- B. Upon completion of work, remove materials, scraps and debris relative to his work and leave the premises, including wet well, crawl spaces, and pipe chases in clean and orderly condition. Remove all dirt and debris from the interior and exterior of all devices and equipment. After construction is completed, wash all light fixtures and lamps; remove all labels from fixture lenses.

1.11 TEMPORARY FACILITIES

A. OFFICES

1. Contractor shall provide temporary offices for himself including lights, heat and telephone, if required.

B. REMOVAL

1. Contractor shall completely remove his temporary installations when no longer needed and the premises shall be completely clean, disinfected, patched, and refinished to match adjacent areas.

C. LADDERS AND SCAFFOLDS

1. The Contractor shall provide their own ladders, scaffolds, etc. of substantial construction for access to their work in various portions of the building as may be required. When no longer needed, they shall be removed by the Contractor.

D. PROTECTION DEVICES

1. The Contractor shall provide and maintain his own necessary barricades, fences, signal lights, etc. required by all governing authorities or shown on the drawings. When no longer needed, they shall be removed by the Contractor. The Contractor shall assume all responsibility for which the Owner may be held responsible because of lack of above items.

E. TEMPORARY WATER

1. The Contractor shall provide all water required by his trade for construction. Temporary drinking water shall be provided by Contractor from a proven safe source dispensed by single service containers.

F. TEMPORARY FIRE PROTECTION

1. The Contractor shall provide all necessary first-aid hand fire extinguishers for Class A, B, C and special hazards as may exist in his own work area only in accordance with good and safe practice and as required by jurisdictional safety authority. The Contractor shall provide general area fire extinguishers only.

1.12 TEMPORARY ELECTRICAL FACILITIES

A. DESCRIPTION OF SYSTEM

1. Service required- The Contractor shall provide and connect movable temporary panels to the temporary distribution board. Provide minimum of one (1) temporary panel. The temporary panel shall be located as required for the construction conditions. Coordinate quantities and locations with the General Contractor. Each panel shall have provisions for 100A service at voltage available.
2. Provide temporary electric power for items listed, throughout the construction period, so that power can be secured at any desired point from a temporary service panel within building proper.
 - a. Power centers for miscellaneous tools and equipment used in the construction period, so that power can be secured at any desired point from a temporary service panel within building proper.

- b. Lighting for safe and adequate working conditions throughout the project area. Provide at least 1/2 watt of incandescent lighting per square foot of floor area. Maintain a socket voltage of at least 110 volts. Use a minimum of 100-watt bulbs.
 - c. Power for construction site offices and for other temporary storage and construction buildings.
 - d. Power to maintain continuous construction during changeover of electrical equipment.
 - e. Power for testing and checking equipment.
3. Coordinate temporary electrical facilities with the General Contractor to avoid duplication of facilities.
- B. CAPACITY
- 1. Provide and maintain adequate electrical power for construction use by all trades during the construction period at the locations necessary.
 - 2. Notify the Serving Utility Company and Engineer when unusually heavy loads will be connected.
- C. POWER COSTS
- 1. The Contractor shall pay all cost of setting and removing temporary service.
- D. USE OF PERMANENT SYSTEM
- 1. Regulate any part of the permanent electrical system which is used for construction purposes to prevent interference with safety and orderly progress of the work.
 - 2. Leave permanent electrical services in a condition as good as new.
 - 3. The permanent heating system is to be connected to the permanent power supply as soon as possible to provide heat to complete construction at no additional cost to the Owner.

1.13 SHOP DRAWINGS

- A. Provide electronic copy, in .pdf format, of manufacturer's literature and/or certified prints as soon as possible but within thirty (30) days after notice to proceed, for items of materials, equipment, or systems where called for in specifications. Shop drawings and literature shall be complete showing item used, size, dimensions, capacity, rough in, etc., as required for complete check and installation. Manufacturer's literature showing more than one item shall be clearly marked as to which item is being furnished or it will be rejected and returned without review.
- B. Each copy of each item submitted must be clearly marked as follows for purposes of identification and record. Submittals not marked (typewritten only) as described below will be rejected and returned without review.

Date:
Name of Project:
Branch of Work:
Submitted by:
Specification or Plan Reference:

- C. Prior to their submission, each submittal shall be thoroughly checked by the Contractor for compliance with the Contract Document requirements, accuracy of dimensions, relationship to the work of other trades, and conformance with sound, safe practices as to erection and installation. Each submittal shall then bear a stamp evidencing such checking and shall show corrections made, if any. Submittals requiring extensive corrections shall be revised before submission. Each submittal not stamped and signed by the Contractor evidencing such checking will be rejected and returned without review.
- D. All submittals will be examined when submitted in proper form for compliance. Such review shall not relieve the Contractor of responsibility for errors, for deviation from the contract Documents, nor for violation of sound safety practices.
- E. The Contractor shall keep in the field office one print of each submittal, which has been reviewed and stamped by the Engineer.
- F. Submittals will be required for each item of material and equipment furnished as noted in specifications.
- G. Submittals which are incomplete relative to quality requirements, capacity, engineering data, dimensional data or detailed list of specialty or control equipment will be rejected. Lists shall include descriptive coding as specified or shown on drawings.

1.14 OPERATION AND MAINTENANCE MANUALS

- A. At the time orders are placed for any item of equipment requiring service or operating maintenance, the Contractor shall request the manufacturer furnish three (3) copies of OPERATION AND MAINTENANCE INSTRUCTIONS for each piece of equipment. These shall be included in the brochure of equipment.
- B. Provide closeout submittals as specified in individual specification sections.

1.15 BROCHURE OF EQUIPMENT

- A. Upon completion of work, prepare a "Brochure of Equipment" containing data pertinent to equipment and systems on job. Binders containing materials shall be one or more three ring binders of sufficient number to hold all literature. Contained in binders shall be: Installation, maintenance, and operating instructions for each piece of equipment; parts lists; wiring diagrams; one copy of each shop drawing and literature submittal; record drawings, etc.
- B. Provide closeout submittals as specified in individual specifications sections
- C. All literature shall be clean, unused and filed under divider headings corresponding to the specifications.
- D. These brochures shall be submitted to the Engineer and Owner and be approved by them before authorization of final payment.

1.16 "AS-BUILT" DRAWINGS

- A. The Contractor shall furnish to the Owner and Engineer a red line marked print set of drawings, each sheet stamped as the "As-Built" drawing and bearing the Contractor's name, date and signature. The "As-Built" drawing shall show the location of all concealed or underground conduit runs and other equipment, devices, outlets, etc., installed other than as shown on the drawings. Dimension underground lines from established building lines. "As-Built" drawings to be developed from a job site record drawing set and shall be clean, neat and all changes legible and shown in the same format and symbols used on the contract drawings. The "As-Built" drawing set shall be submitted to the Engineer for approval, and any deficiencies noted by the Engineer corrected and resubmitted until approved by the Engineer at no additional cost to Engineer or Owner.
- B. Provide closeout submittals as specified in individual specification sections.
- C. Provide "As-Built" submittals as specified in individual specification sections.

1.17 PLACING SYSTEMS IN OPERATION

- A. At the completion of the work and at such time as the Owner shall direct, prior to final acceptance, the Contractor performing this work shall put into satisfactory operation the various systems installed under the specifications. At no additional cost to the Owner, furnish the services of a person completely familiar with the installations performed under this specification, to instruct the Owner's operating personnel in the proper operation and servicing of the equipment and systems. These services shall be available for a period of no less than one (1) day.

1.18 GUARANTY-WARRANTY

- A. This Contractor shall and hereby does warrant and guarantee that all work executed under this Division will be free from defects of materials and workmanship for a period of one year from the date of final acceptance of this work and that he will, at his own expense, repair and/or replace all such defective materials and work and all other work damaged thereby which becomes defective during the term of warranty, except that lamps and tubes shall be his responsibility only for normal lamp life or one year, whichever occurs first.

END OF SECTION

SECTION 16060
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rod electrodes.
 - 2. Wire.
 - 3. Mechanical connectors.
 - 4. Exothermic connections.

1.2 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - 2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.
- B. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- C. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.

1.3 SYSTEM DESCRIPTION

- A. Grounding systems use the following elements as grounding electrodes:
 - 1. Metal underground water pipe.
 - 2. Metal building frame.
 - 3. Concrete-encased electrode (footing rebar).
 - 4. Rod electrode.

1.4 PERFORMANCE REQUIREMENTS

- A. Grounding System Resistance: 25 ohms maximum.

1.5 SUBMITTALS

- A. Per the Project Manual: Requirements for submittals.
- B. Product Data: Submit data on grounding electrodes and connections.
- C. Test Reports: Indicate overall resistance to ground.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

- A. Per the Project Manual: Requirements for submittals.
- B. Project Record Documents: Record actual locations of components and grounding electrodes.

1.7 QUALITY ASSURANCE

- A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.
- B. Perform Work in accordance with State and Local standards.
- C. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum three years documented experience and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Per the Project Manual: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.
- D. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

1.10 COORDINATION

- A. Per the Project Manual: Requirements for coordination.
- B. Complete grounding and bonding of building reinforcing steel prior concrete placement.

PART 2 PRODUCTS

2.1 ROD ELECTRODES

- A. Manufacturers:
 - 1. Erico, Inc.
 - 2. O-Z Gedney Co.
 - 3. Thomas & Betts, Electrical.
 - 4. Substitutions: Per the Project Manual.

- B. Furnish materials in accordance with State and Local standards.
- C. Product Description:
 - 1. Material: Copper-clad steel.
 - 2. Diameter: 3/4 inch
 - 3. Length: 10 feet.
- D. Connector: Connector for exothermic welded connection.

2.2 WIRE

- A. Material: Stranded copper.
- B. Foundation Electrodes: 4 AWG.
- C. Grounding Electrode Conductor: Copper conductor bare.
- D. Bonding Conductor: Copper conductor bare.

2.3 MECHANICAL CONNECTORS

- A. Manufacturers:
 - 1. Copperweld, Inc.
 - 2. Erico, Inc.
 - 3. ILSCO Corporation.
 - 4. O-Z Gedney Co.
 - 5. Thomas & Betts, Electrical.
 - 6. Substitutions: Per the Project Manual.
- B. Furnish materials in accordance with State and Local standards.
- C. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for the particular installation.

2.4 EXOTHERMIC CONNECTIONS

- A. Manufacturers:
 - 1. Copperweld, Inc.
 - 2. Erico, Inc.
 - 3. ILSCO Corporation.
 - 4. O-Z Gedney Co.
 - 5. Thomas & Betts, Electrical.
 - 6. Substitutions: Per the Project Manual.
- B. Furnish materials in accordance with State and Local standards.
- C. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Per the Project Manual: Verification of existing conditions before starting work.
- B. Verify final backfill and compaction has been completed before driving rod electrodes.

3.2 PREPARATION

- A. Remove paint, rust, mill oils, surface contaminants at connection points.

3.3 EXISTING WORK

- A. Modify existing grounding system to maintain continuity to accommodate the scope of work.
- B. Extend existing grounding system using materials and methods compatible with the existing electrical installation, or as specified.

3.4 INSTALLATION

- A. Install in accordance with IEEE 142.
- B. Install rod electrodes at locations, as required, to achieve specified resistance to ground.
- C. Install grounding and bonding conductors concealed from view.
- D. Install grounding electrode conductor and connect to reinforcing steel in foundation footing. Electrically bond steel together.
- E. Bond together metal siding not attached to grounded structure; bond to ground.
- F. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- G. Install continuous grounding using underground cold-water system and building steel as grounding electrode. Where water piping is not available, install artificial station ground by means of driven rods or buried electrodes.
- H. Permanently ground entire light and power system in accordance with NEC, including service equipment, disconnect switches, panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
- I. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service

equipment. Ground conduits by means of grounding bushings on terminations at panelboards with installed number 12 conductor to grounding bus.

- J. Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.
- K. Permanently attach equipment and grounding conductors prior to energizing equipment.
- L. Install Work in accordance with State and Local standards.

3.5 FIELD QUALITY CONTROL

- A. Per the Project Manual: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.
- D. Perform ground resistance testing in accordance with IEEE 142.
- E. Perform continuity testing in accordance with IEEE 142.
- F. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION

SECTION 16070
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Conduit supports.
 2. Spring steel clips.
 3. Sleeves.
 4. Mechanical sleeve seals.
 5. Firestopping relating to electrical work.
 6. Firestopping accessories.
 7. Equipment bases and supports.

1.2 REFERENCES

- A. ASTM International:
1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
 4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.
- B. FM Global:
1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.
- C. National Fire Protection Association:
1. NFPA 70 - National Electrical Code.
- D. Underwriters Laboratories Inc.:
1. UL 263 - Fire Tests of Building Construction and Materials.
 2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
 3. UL 1479 - Fire Tests of Through-Penetration Firestops.
 4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
 5. UL - Fire Resistance Directory.

1.3 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

- A. Firestopping Materials: ASTM E119 or UL 263 to achieve fire ratings of adjacent construction in accordance with UL Design Standards.
- B. Firestop interruptions to fire rated assemblies, materials, and components.

1.5 PERFORMANCE REQUIREMENTS

- A. Firestopping: Conform to applicable code for fire resistance ratings and surface burning characteristics.
- B. Firestopping: Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.6 SUBMITTALS

- A. Per the Project Manual: Requirements for submittals.
- B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.
- C. Product Data:
 - 1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
 - 2. Firestopping: Submit data on product characteristics, performance and limitation criteria.
- D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
- E. Design Data: Indicate load carrying capacity of hangers and supports.
- F. Manufacturer's Installation Instructions:
 - 1. Hangers and Supports: Submit special procedures and assembly of components.
 - 2. Firestopping: Submit preparation and installation instructions.
- G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- H. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.7 QUALITY ASSURANCE

- A. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 or ASTM E814 with 0.10-inch water gauge (24.9 Pa) minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
 - 1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
 - 2. Roof Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.

- B. Through Penetration Firestopping of Non-Fire Rated Roof Assemblies: Materials to resist free passage of flame and products of combustion.
 - 1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
 - 2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.
- C. Fire Resistant Joints in Fire Rated Roof and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.
- D. Fire Resistant Joints Between Floor Slabs and Exterior Walls: ASTM E119 with 0.10-inch water gauge (24.9 Pa) minimum positive pressure differential to achieve fire resistant rating as required.
- E. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- F. Perform Work in accordance with State and Local standards.
- G. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum three years documented experience and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Per the Project Manual: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Per the Project Manual: Environmental conditions affecting products on site.
- B. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F (15 degrees C).
- C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.
- D. Provide ventilation in areas to receive solvent cured materials.

PART 2 PRODUCTS

2.1 CONDUIT SUPPORTS

- A. Manufacturers:
 - 1. Allied Tube & Conduit Corp.
 - 2. Electroline Manufacturing Company.
 - 3. O-Z Gedney Co.
 - 4. Substitutions: Per the Project Manual.
- B. Furnish materials in accordance with State and Local standards.
- C. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
- D. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod.
- E. Set screw: Hardened steel.
- F. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
- G. Conduit clamps - general purpose: One-hole malleable iron for surface mounted conduits.
- H. Cable Ties: High strength nylon temperature rated to 185 degrees F (85 degrees C). Self locking.

2.2 SPRING STEEL CLIPS

- A. Furnish materials in accordance with State and Local standards.
- B. Product Description: Mounting hole and screw closure.

2.3 SLEEVES

- A. Furnish materials in accordance with State and Local standards.
- B. Sleeves Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gauge (1.2 mm) thick galvanized steel.
- C. Sleeves Through Fire Rated and Fire Resistive Walls and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.
- D. Fire-stopping Insulation: Glass fiber type, non-combustible.

2.4 MECHANICAL SLEEVE SEALS

- A. Manufacturers:
 - 1. Thunderline Link-Seal, Inc.
 - 2. NMP Corporation.

3. Substitutions: Per the Project Manual.

B. Furnish materials in accordance with State and Local standards.

C. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.5 FIRESTOPPING

A. Manufacturers:

1. Dow Corning Corp.
2. Fire Trak Corp.
3. Hilti Corp.
4. International Protective Coating Corp.
5. 3M fire Protection Products.
6. Specified Technology, Inc.
7. Substitutions: Per the Project Manual.

B. Furnish materials in accordance with State and Local standards.

C. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.

1. Silicone Firestopping / Elastomeric Firestopping: Multiple component silicone elastomeric compound and compatible silicone sealant.
2. Foam Firestopping Compounds: Multiple component foam compound.
3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
4. Fiber Stuffing and Sealant Firestopping: Composite of mineral fiber stuffing insulation with silicone elastomer for smoke stopping.
5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
7. Firestop Pillows: Formed mineral fiber pillows.

D. Color: Dark gray.

2.6 FIRESTOPPING ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Dam Material:

1. Mineral fiberboard.
2. Mineral fiber matting.

- 3. Alumina silicate fire board.
- C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
- D. General:
 - 1. Furnish UL listed products or products tested by independent testing laboratory.
 - 2. Select products with rating not less than rating of wall or being penetrated.
- E. Non-Rated Surfaces:
 - 1. Stamped steel, chrome plated, hinged, split ring escutcheons or ceiling plates for covering openings in occupied areas where conduit is exposed.
 - 2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Per the Project Manual: Verification of existing conditions before starting work.
- B. Verify openings are ready to receive sleeves.
- C. Verify openings are ready to receive firestopping.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Install damming materials to arrest liquid material leakage.
- D. Obtain permission from Engineer before using powder-actuated anchors.
- E. Do not drill or cut structural members.

3.3 INSTALLATION - HANGERS AND SUPPORTS

- A. Anchors and Fasteners:
 - 1. Concrete Structural Elements: Provide precast inserts, expansion anchors, and preset inserts.
 - 2. Steel Structural Elements: Provide beam clamps, spring steel clips, steel ramset fasteners, and welded fasteners.
 - 3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
 - 4. Sheet Metal: Provide sheet metal screws.
 - 5. Wood Elements: Provide wood screws.

- B. Inserts:
 - 1. Install inserts for placement in concrete forms.
 - 2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 - 3. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
 - 4. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.
- C. Install conduit and raceway support and spacing in accordance with NEC.
- D. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- E. Install multiple conduit runs on common hangers.
- F. Supports:
 - 1. Fabricate supports from structural steel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
 - 2. Install surface mounted cabinets and panelboards with minimum of four anchors.
 - 3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch (25 mm) off wall.
- G. Install Work in accordance with State and Local standards.

3.4 INSTALLATION - FIRESTOPPING

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating.
- D. Compress fibered material to maximum 40 percent of its uncompressed size.
- E. Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- F. Place intumescent coating in sufficient coats to achieve rating required.
- G. Dam material to remain.
- H. Fire Rated Surface:
 - 1. Seal opening at wall and roof as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch (25 mm) on both sides of building element.
 - b. Size sleeve allowing minimum of 1 inch (25 mm) void between sleeve and building element.
 - c. Pack void with backing material.

- d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.
2. Where conduit or raceway penetrates fire rated surface, install firestopping product in accordance with manufacturer's instructions.

I. Non-Rated Surfaces:

1. Seal opening through non-fire rated wall and roof opening as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch (25 mm) on both sides of building element.
 - b. Size sleeve allowing minimum of 1 inch (25 mm) void between sleeve and building element.
 - c. Install type of firestopping material recommended by manufacturer.
2. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, in accordance with manufacturer's instructions.

3.5 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
- B. Construct supports of steel members. Brace and fasten with flanges bolted to structure.

3.6 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with adjustable interlocking rubber links.
- B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.
- C. Set sleeves in position in forms. Provide reinforcing around sleeves.
- D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- E. Extend sleeves through floors 1 inch (25 mm) above finished floor level. Caulk sleeves.
- F. Where conduit or raceway penetrates ceiling or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

3.7 FIELD QUALITY CONTROL

- A. Per the Project Manual: Field inspecting, testing, adjusting, and balancing.
- B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.8 CLEANING

- A. Per the Project Manual: Requirements for cleaning.

B. Clean adjacent surfaces of firestopping materials.

3.9 PROTECTION OF FINISHED WORK

A. Per the Project Manual: Requirements for protecting finished Work.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 16075
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Labels.
 - 3. Wire markers.
 - 4. Conduit markers.
 - 5. Underground Warning Tape.
 - 6. Lockout Devices.

1.2 SUBMITTALS

- A. Per the Project Manual: Submittal procedures.
- B. Product Data:
 - 1. Submit manufacturer's catalog literature for each product required.
 - 2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.
- C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.3 CLOSEOUT SUBMITTALS

- A. Per the Project Manual: Requirements for submittals.
- B. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with State and Local standards.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience and approved by the manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Per the Project Manual: Requirements for transporting, handling, storing, and protecting products.

- B. Accept identification products on site in original containers. Inspect for damage.
- C. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- D. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Per the Project Manual: Environmental conditions affecting products on site.
- B. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

1.8 EXTRA MATERIALS

- A. Per the Project Manual: Requirements for extra materials.
- B. Furnish one container of spray-on adhesive.

PART 2 PRODUCTS

2.1 NAMEPLATES

- A. Furnish materials in accordance with State and Local standards.
- B. Product Description: Laminated three-layer plastic with engraved black letters on white contrasting background color.
- C. Letter Size:
 - 1. 1/8 inch (3 mm) high letters for identifying individual equipment and loads.
 - 2. 1/4 inch (6 mm) high letters for identifying grouped equipment and loads.
- D. Minimum nameplate thickness: 1/8 inch (3 mm).

2.2 LABELS

- A. Furnish materials in accordance with State and Local standards.
- B. Labels: Embossed adhesive tape, with 3/16 inch (5 mm) white letters on black background.

2.3 WIRE MARKERS

- A. Furnish materials in accordance with State and Local standards.
- B. Description: Cloth tape, split sleeve, or tubing type wire markers.

C. Legend:

1. Power and Lighting Circuits: Branch circuit or feeder number.
2. Control Circuits: Control wire number as indicated on shop drawings.

2.4 CONDUIT AND RACEWAY MARKERS

A. Furnish materials in accordance with State and Local standards.

B. Description: Labels fastened with adhesive.

C. Color:

1. 480 Volt System: Black lettering on white background.
2. 240 Volt System: Black lettering on white background.
3. Telephone/Communications System: Blue lettering on white background.

D. Legend:

1. 480 Volt System: 480 VOLTS.
2. 240 Volt System: 240 VOLTS.
3. Telephone/Communications: COMMUNICATIONS.

2.5 UNDERGROUND WARNING TAPE

A. Description: 4-inch-wide plastic tape, detectable type, colored red with suitable warning legend describing buried electrical items, e.g. power, communications, security, etc.

2.6 LOCKOUT DEVICES

A. Lockout Hasps:

1. Reinforced nylon hasp with erasable label surface; size minimum 7-1/4 x 3 inches (184 x 75 mm).

PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 EXISTING WORK

A. Install identification on existing equipment to remain in accordance with this section.

B. Install identification on unmarked existing equipment.

C. Replace lost nameplates, labels, or markers.

3.3 INSTALLATION

A. Install identifying devices after completion of painting.

- B. Nameplate Installation:
 - 1. Install nameplate parallel to equipment lines.
 - 2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
 - 3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
 - 4. Secure nameplate to equipment front using screws or adhesive.
 - 5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
 - 6. Install nameplates for the following:
 - a. Service Disconnects.
 - b. Panelboards.
 - c. Control Panels.

- C. Label Installation:
 - 1. Install label parallel to equipment lines.
 - 2. Install label for identification of individual control device stations.
 - 3. Install labels for permanent adhesion and seal with clear lacquer.

- D. Wire Marker Installation:
 - 1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.

- E. Conduit and Raceway Marker Installation:
 - 1. Install conduit and raceway marker for each conduit and/or raceway longer than 6 feet (2000 mm).
 - 2. Conduit and Raceway Marker Spacing: 20 feet (6000 mm) on center.

- F. Underground Warning Tape Installation:
 - 1. Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches below finished grade, directly above buried conduit, raceway, or cable.

- G. Install Work in accordance with State and Local standards.

END OF SECTION

SECTION 16123
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes building wire and cable; direct burial cable; service entrance cable; armored cable; metal clad cable; and wiring connectors and connections.

1.2 REFERENCES

- A. International Electrical Testing Association:
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. National Fire Protection Association:
1. NFPA 70 - National Electrical Code.
 2. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- C. Underwriters Laboratories, Inc.:
1. UL 1277 - Standard for Safety for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.

1.3 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
1. Stranded conductor for feeders and branch circuits 10 AWG and smaller.
 2. Stranded conductors for control circuits.
 3. Conductor not smaller than 12 AWG for power and lighting circuits.
 4. Conductor not smaller than 16 AWG for control circuits.
 5. Increase wire size in branch circuits to limit voltage drop to a maximum of 3 percent.
- B. Wiring Methods: Provide the following wiring methods:
1. Concealed Dry Interior Locations: Use only building wire, Type THHN/THWN insulation in raceway, or metal clad cable.
 2. Exposed Dry Interior Locations: Use only building wire, Type THHN/THWN insulation in raceway, or metal clad cable.
 3. Wet or Damp Interior Locations: Use only building wire, Type THHN/THWN insulation in raceway.
 4. Exterior Locations: Use only building wire, Type THHN/THWN insulation in raceway.
 5. Underground Locations: Use only Type THHN/THWN or XHHW insulation in raceway, direct burial cable, service-entrance cable, or armored cable.

1.4 DESIGN REQUIREMENTS

- A. Conductor sizes are based on copper. Aluminum conductors are not permitted, unless they have prior approval of the Engineer.
- B. If aluminum conductor is substituted for copper conductor, size to match circuit requirements, terminations, conductor ampacity and voltage drop. Apply oxidation inhibitor to all terminations.

1.5 SUBMITTALS

- A. Per the Project Manual: Requirements for submittals.
- B. Product Data: Submit for building wire and each cable assembly type.
- C. Design Data: If aluminum conductors are permitted, indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors.
- D. Test Reports: Indicate procedures and values obtained.

1.6 CLOSEOUT SUBMITTALS

- A. Per the Project Manual: Requirements for submittals.
- B. Project Record Documents: Record actual locations of components and circuits.

1.7 QUALITY ASSURANCE

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5 m) when tested in accordance with NFPA 262.
- B. Perform Work in accordance with State and Local standards.
- C. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.10 COORDINATION

- A. Per the Project Manual: Requirements for coordination.
- B. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.

- C. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 ft (3000 mm) of length shown.

PART 2 PRODUCTS

2.1 BUILDING WIRE

- A. Manufacturers:
 - 1. AETNA.
 - 2. American Insulated Wire Corp.
 - 3. Colonial Wire.
 - 4. Encore Wire.
 - 5. General Cable Co.
 - 6. Republic Wire.
 - 7. Rome Cable.
 - 8. Service Wire Co.
 - 9. Southwire.
 - 10. Superior Essex.
 - 11. Substitutions: Per the Project Manual.
- B. Product Description: Single conductor insulated wire.
- C. Conductor: Copper.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation Temperature Rating: 75 degrees C.
- F. Insulation Material: Thermoplastic.

2.2 DIRECT BURIAL CABLE

- A. Manufacturers:
 - 1. Diamond Wire & Cable Co.
 - 2. Essex Group Inc.
 - 3. General Cable Co.
 - 4. Substitutions: Per the Project Manual.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation Temperature Rating: 90 degrees C.

2.3 SERVICE ENTRANCE CABLE

- A. Manufacturers:
 - 1. Diamond Wire & Cable Co.

2. Essex Group Inc.
3. General Cable Co.
4. Substitutions: Per the Project Manual.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: Type USE, XHHW-2, or RHW-2.

2.4 ARMORED CABLE

A. Manufacturers:

1. Diamond Wire & Cable Co.
2. Essex Group Inc.
3. General Cable Co.
4. Substitutions: Per the Project Manual.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation Temperature Rating: 90 degrees C.

E. Insulation Material: Thermoplastic.

F. Armor Material: Aluminum.

G. Armor Design: Interlocked metal tape.

2.5 METAL CLAD CABLE

A. Manufacturers:

1. Diamond Wire & Cable Co.
2. Essex Group Inc.
3. General Cable Co.
4. Substitutions: Per the Project Manual.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation Temperature Rating: 75 degrees C.

E. Insulation Material: Thermoplastic.

F. Armor Material: Aluminum.

G. Armor Design: Interlocked metal tape.

H. Jacket: PVC, where required.

2.6 TERMINATIONS

- A. Terminal Lugs for Wires 6 AWG and Smaller: Solderless, compression type copper.
- B. Lugs for Wires 4 AWG and Larger: Color keyed, compression type copper, with insulating sealing collars.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Per the Project Manual: Coordination and project conditions.
- B. Verify interior of building has been protected from weather.
- C. Verify mechanical work likely to damage wire and cable has been completed.
- D. Verify raceway installation is complete and supported.

3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.3 EXISTING WORK

- A. Remove exposed abandoned wire and cable. Patch surfaces where removed cables pass through building finishes.
- B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes when wire and cable servicing boxes are abandoned and removed. Install blank cover for abandoned boxes not removed.
- C. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
- D. Extend existing circuits using materials and methods compatible with existing electrical installations, or as specified.
- E. Clean and repair existing wire and cable remaining or wire and cable to be reinstalled.

3.4 INSTALLATION

- A. Route wire and cable to meet Project conditions.
- B. Neatly train and lace wiring inside boxes, equipment, and panelboards.

- C. Identify and color code wire and cable under provisions of Section 16075. Identify each conductor with its circuit number or other designation indicated.
- D. Special Techniques--Building Wire in Raceway:
 - 1. Pull conductors into raceway at same time.
 - 2. Install building wire 4 AWG and larger with pulling equipment.
- E. Special Techniques - Cable:
 - 1. Protect exposed cable from damage.
 - 2. Support cables above accessible ceiling, using spring metal clips or metal cable ties to support cables from structure. Do not rest cable on ceiling.
 - 3. Use suitable cable fittings and connectors.
- F. Special Techniques - Direct Burial Cable:
 - 1. Trench and backfill for direct burial cable installation. Install warning tape along entire length of direct burial cable, within 3 inches (75 mm) of grade.
 - 2. Use suitable direct burial cable fittings and connectors.
- G. Special Techniques - Wiring Connections:
 - 1. Clean conductor surfaces before installing lugs and connectors.
 - 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 - 3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
 - 4. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
 - 5. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
 - 6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
 - 7. Terminate aluminum conductors with tin-plated, aluminum-bodied compression connectors only. Fill with anti-oxidant compound before installing conductor.
 - 8. Install suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
- H. Install stranded conductors for branch circuits 10 AWG and smaller. Install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.
- I. Install terminal lugs on ends of 600 volt wires unless lugs are furnished on connected device, such as circuit breakers.
- J. Size lugs in accordance with manufacturer's recommendations terminating wire sizes. Install 2-hole type lugs to connect wires 4 AWG and larger to copper bus bars.
- K. For terminal lugs fastened together such as on motors, transformers, and other apparatus, or when space between studs is small enough that lugs can turn and touch each other, insulate for dielectric strength of 2-1/2 times normal potential of circuit.

3.5 WIRE COLOR

- A. General:
 - 1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
 - a. Black and red for single phase circuits at 120/240 volts.
 - b. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
 - 2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
 - a. Black and red for single phase circuits at 120/240 volts.
 - b. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
- B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- D. Feeder Circuit Conductors: Uniquely color code each phase.
- E. Ground Conductors:
 - 1. For 6 AWG and smaller: Green.
 - 2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.6 FIELD QUALITY CONTROL

- A. Per the Project Manual: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION

SECTION 16130
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes conduit and tubing, wireways, outlet boxes, and pull and junction boxes.

1.2 REFERENCES

- A. American National Standards Institute:
1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
 2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
 3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).
- B. National Electrical Manufacturers Association:
1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
 4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
 5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
 7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground: Provide rigid steel conduit, intermediate metal conduit, and plastic-coated conduit. Provide cast metal boxes.
- C. Outdoor Locations, Above Grade: Provide rigid steel conduit and intermediate metal conduit. Provide cast metal or nonmetallic outlet, pull, and junction boxes.
- D. Wet and Damp Locations: Provide rigid steel conduit, intermediate metal conduit, and electrical metallic tubing. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
- E. Exposed Dry Locations: Provide rigid steel conduit, intermediate metal conduit, and electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.4 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 1/2 inch (13 mm) unless otherwise specified.

1.5 SUBMITTALS

- A. Per the Project Manual: Submittal procedures.
- B. Product Data: Submit for the following:
 - 1. Flexible metal conduit.
 - 2. Liquidtight flexible metal conduit.
 - 3. Raceway fittings.
 - 4. Conduit bodies.
 - 5. Wireway.
 - 6. Pull and junction boxes.
- C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 CLOSEOUT SUBMITTALS

- A. Per the Project Manual: Closeout procedures.
- B. Project Record Documents:
 - 1. Record actual routing of conduits larger than 2 inch (DN50).
 - 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Per the Project Manual: Product storage and handling requirements.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- C. Protect PVC conduit from sunlight.

1.8 COORDINATION

- A. Per the Project Manual: Coordination and project conditions.
- B. Coordinate installation of outlet boxes for equipment connected under Section 16150.

PART 2 PRODUCTS

2.1 METAL CONDUIT

- A. Manufacturers:
 - 1. Carlon Electrical Products.
 - 2. Thomas & Betts Corp.
 - 3. Walker Systems Inc.
 - 4. The Wiremold Co.
 - 5. Republic.
 - 6. CalConduit.
 - 7. Allied.
 - 8. Substitutions: Per the Project Manual.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. Rigid Aluminum Conduit: ANSI C80.5.
- D. Intermediate Metal Conduit (IMC): Rigid steel.
- E. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.2 PVC COATED METAL CONDUIT

- A. Manufacturers:
 - 1. Carlon Electrical Products.
 - 2. Thomas & Betts Corp.
 - 3. Walker Systems Inc.
 - 4. The Wiremold Co.
 - 5. Republic.
 - 6. CalConduit.
 - 7. Allied.
 - 8. Substitutions: Per the Project Manual.
- B. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil (0.1 mm) thick.
- C. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

- A. Manufacturers:
 - 1. Carlon Electrical Products.
 - 2. Thomas & Betts Corp.
 - 3. Walker Systems Inc.
 - 4. The Wiremold Co.
 - 5. Republic.
 - 6. CalConduit.

7. Allied.
8. Substitutions: Per the Project Manual.

B. Product Description: Interlocked steel construction.

C. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Manufacturers:

1. Carlon Electrical Products.
2. Thomas & Betts Corp.
3. Walker Systems Inc.
4. The Wiremold Co.
5. Republic.
6. CalConduit.
7. Allied.
8. Substitutions: Per the Project Manual.

B. Product Description: Interlocked steel construction with PVC jacket.

C. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:

1. Carlon Electrical Products.
2. Thomas & Betts Corp.
3. Walker Systems Inc.
4. The Wiremold Co.
5. Republic.
6. CalConduit.
7. Allied.
8. Substitutions: Per the Project Manual.

B. Product Description: ANSI C80.3; galvanized tubing.

C. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron, compression type.

2.6 WIREWAY

A. Manufacturers:

1. Carlon Electrical Products.
2. Thomas & Betts Corp.
3. Walker Systems Inc.
4. The Wiremold Co.
5. Republic.
6. CalConduit.
7. Allied.

- 8. Substitutions: Per the Project Manual.
- B. Product Description: General purpose type wireway.
- C. Knockouts: Manufacturer's standard.
- D. Size: As required.
- E. Cover: Hinged cover with full gaskets.
- F. Connector: Flanged.
- G. Fittings: Lay-in type with drip shield.
- H. Finish: Rust inhibiting primer coating with gray enamel finish.

2.7 OUTLET BOXES

- A. Manufacturers:
 - 1. Carlon Electrical Products.
 - 2. Thomas & Betts Corp.
 - 3. Walker Systems Inc.
 - 4. The Wiremold Co.
 - 5. Raco.
 - 6. Steel City.
 - 7. Hubbell.
 - 8. Substitutions: Per the Project Manual.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch (13 mm) male fixture studs where required.
- C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.
- D. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.8 PULL AND JUNCTION BOXES

- A. Manufacturers:
 - 1. Carlon Electrical Products.
 - 2. Thomas & Betts Corp.
 - 3. Walker Systems Inc.
 - 4. The Wiremold Co.
 - 5. Raco.
 - 6. Steel City.
 - 7. Hubbell.
 - 8. Substitutions: Per the Project Manual.

- B. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:
 - 1. Material: Cast aluminum.
 - 2. Cover: Furnish with ground flange, neoprene gasket, and stainless-steel cover screws.
- D. In-Ground Cast Metal Box: NEMA 250, Type 6, inside flanged, recessed cover box for flush mounting:
 - 1. Material: Cast aluminum.
 - 2. Cover: Nonskid cover with neoprene gasket and stainless-steel cover screws.
 - 3. Cover Legend: "ELECTRIC".

PART 3 EXECUTION

3.1 EXAMINATION

- A. Per the Project Manual: Coordination and project conditions.
- B. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

- A. Remove exposed abandoned raceway. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installation, using materials and methods compatible with existing electrical installation, or as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.3 INSTALLATION

- A. Install Work in accordance with State and Local standards.
- B. Ground and bond raceway and boxes in accordance with Section 16060.
- C. Fasten raceway and box supports to structure and finishes in accordance with Section 16070.
- D. Identify raceway and boxes in accordance with Section 16075.

E. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations, unless dimensioned. Route to complete wiring system.
- B. Arrange raceway supports to prevent misalignment during wiring installation.
- C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- D. Group related raceway; support using conduit rack.
- E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- F. Do not attach raceway to piping systems.
- G. Construct wireway supports from steel channel.
- H. Route exposed raceway parallel and perpendicular to walls.
- I. Maintain clearance between raceway and piping for maintenance purposes.
- J. Maintain 12-inch (300 mm) clearance between raceway and surfaces with temperatures exceeding 104 degrees F (40 degrees C).
- K. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- L. Bring conduit to shoulder of fittings; fasten securely.
- M. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- N. Install conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- O. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch (50 mm) size.
- P. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- Q. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- R. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

S. Close ends and unused openings in wireway.

3.5 INSTALLATION - BOXES

- A. Install wall mounted boxes at elevations to accommodate mounting heights, as required.
- B. Adjust box location up to 10 feet (3 m) prior to rough-in to accommodate intended purpose.
- C. Orient boxes to accommodate wiring devices oriented as specified in Section 16140.
- D. Do not fasten boxes to piping systems.
- E. Support boxes independently of conduit.

3.6 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods in accordance with applicable Codes.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket.

3.7 ADJUSTING

- A. Per the Project Manual: Testing, adjusting, and balancing.
- B. Install knockout closures in unused openings in boxes.

3.8 CLEANING

- A. Per the Project Manual: Final cleaning.
- B. Clean interior of boxes to remove dust, debris, and other material.
- C. Clean exposed surfaces.

END OF SECTION

SECTION 16140 WIRING DEVICES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes receptacles and device plates.

1.2 REFERENCES

- A. National Electrical Manufacturers Association:
 1. NEMA WD 1 - General Requirements for Wiring Devices.
 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

- A. Per the Project Manual: Submittal procedures.
- B. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.5 EXTRA MATERIALS

- A. Per the Project Manual: Spare parts and maintenance products.
- B. Furnish two of each style, size and cover plate.

PART 2 PRODUCTS

2.1 RECEPTACLES

- A. Manufacturers:
 1. Cooper Wiring Devices.
 2. Hubbell, Inc.
 3. Leviton Manufacturing Company.
 4. Pass & Seymour.
 5. Legrand.
 6. Substitutions: Per the Project Manual.
- B. Product Description: NEMA WD 1, Heavy-duty general use receptacle.

- C. Device Body: Ivory plastic.
- D. Configuration: NEMA WD 6, type as indicated on Drawings.
- E. Convenience Receptacle: Type 5-20.
- F. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

2.2 WALL PLATES

- A. Manufacturers:
 - 1. Cooper Wiring Devices.
 - 2. Hubbell, Inc.
 - 3. Leviton Manufacturing Company.
 - 4. Pass & Seymour.
 - 5. Legrand.
 - 6. Substitutions: Per the Project Manual.
- B. Decorative Cover Plate: Smooth, 302 stainless steel.
- C. Weatherproof Cover Plate: Stainless steel plate with hinged and gasketed device cover.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Per the Project Manual: Coordination and project conditions.
- B. Verify outlet boxes are installed at proper height.
- C. Verify openings are neatly cut and completely covered by wall plates.
- D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

- A. Clean debris from outlet boxes.

3.3 EXISTING WORK

- A. Disconnect and remove abandoned wiring devices.
- B. Modify installation to maintain access to existing devices to remain active.
- C. Clean and repair existing wiring devices to remain or to be reinstalled.

3.4 INSTALLATION

- A. Install devices plumb and level.
- B. Install receptacles with grounding pole on bottom.
- C. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.
- D. Install wall plates on flush-mounted receptacles and blank outlets.
- E. Connect wiring devices by wrapping solid conductor around screw terminal. Install stranded conductor for branch circuits 10 AWG and smaller. When stranded conductors are used in lieu of solid, use crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under device screws.
- F. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes to obtain mounting heights as indicated on drawings.
- B. Install receptacles 18 inches above finished floor, unless noted otherwise on the drawings.

3.6 FIELD QUALITY CONTROL

- A. Per the Project Manual: Field inspecting, testing, adjusting, and balancing.
- B. Inspect each wiring device for defects.
- C. Verify each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.

3.7 ADJUSTING

- A. Per the Project Manual: Testing, adjusting, and balancing.
- B. Adjust devices and wall plates to be flush and level.

3.8 CLEANING

- A. Per the Project Manual: Final cleaning.
- B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

**SECTION 16150
EQUIPMENT WIRING CONNECTIONS**

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes electrical connections to equipment.

1.2 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA WD 1 - General Requirements for Wiring Devices.
 - 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

- A. Per the Project Manual: Submittal procedures.
- B. Product Data: Submit wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

- A. Per the Project Manual: Submittal procedures.
- B. Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

1.5 COORDINATION

- A. Per the Project Manual: Coordination and project conditions.
- B. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
- C. Determine connection locations and requirements.
- D. Sequence rough-in of electrical connections to coordinate with installation of equipment.
- E. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

- A. Per the Project Manual: Coordination and project conditions.
- B. Verify equipment is ready for electrical connection, for wiring, and to be energized.

3.2 EXISTING WORK

- A. Remove exposed abandoned equipment wiring connections.
- B. Disconnect abandoned utilization equipment and remove wiring connections. Remove abandoned components when connected raceway is abandoned and removed. Install blank cover for abandoned boxes and enclosures not removed.
- C. Extend existing equipment connections using materials and methods compatible with existing electrical installations, or as specified.

3.3 INSTALLATION

- A. Make all electrical connections.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Install receptacle outlet to accommodate connection with attachment plug.
- E. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- F. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- G. Install terminal block jumpers to complete equipment wiring requirements.
- H. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

3.4 ADJUSTING

- A. Per the Project Manual: Testing, adjusting, and balancing.
- B. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION

**SECTION 16210
ELECTRICAL UTILITY SERVICES**

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes arrangement with Utility Company for permanent electric service; service provisions; and utility metering equipment.

1.2 SYSTEM DESCRIPTION

- A. Utility Company: Northwestern Energy.
- B. System Characteristics: 277/480 volts, three phase, four-wire, 60 Hertz.
- C. Service Entrance: Underground.
- D. Underground Service Provisions: Underground service entrance to building service entrance equipment.
 - 1. Utility Raceway Connection: At Utility Company's point of service.
 - 2. Utility Service-Entrance Conductor Connection: At Metering equipment.

1.3 SUBMITTALS

- A. Per the Project Manual: Submittal procedures.
- B. Submit Utility-Company-prepared drawings.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Utility Company written requirements.
- B. Maintain one copy of each document on site.

1.5 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Utility Company drawings.

1.6 COORDINATION

- A. Coordinate with utility company, relocation of overhead or underground lines interfering with construction. Where power lines are to be relocated, bill utility costs, directly to Owner.
- B. Contact utility company regarding requirements related to service installation. Provide all necessary support to Northwestern Energy for installing the new service and include associated costs.

- C. Utility charges for service installation per the customer agreement will be paid by Owner and are not part of this contract.

PART 2 PRODUCTS

2.1 UTILITY METERS

- A. Furnished by Utility Company.

2.2 UTILITY METER BASE

- A. Furnished by Electrical Contractor.
- B. Product Description: Meter base rated 200 amperes continuous duty complying with utility company requirements.
- C. The electrical contractor shall install meter socket and metering conduit along with the appropriate bonding that meets Code.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Per the Project Manual: Coordination and project conditions.
- B. Verify service equipment is ready to be connected and energized.

3.2 EXISTING WORK

- A. Remove exposed abandoned service entrance raceway and conductors. Cut raceway flush with walls and floors, and patch surfaces.
- B. Disconnect abandoned service equipment and remove.
- C. Maintain access to existing service equipment, boxes, metering equipment, and other installations remaining active and requiring access. Modify installation or provide access panel.
- D. Extend existing service installations using materials and methods compatible with existing electrical installations, or as specified.
- E. Clean and repair existing service equipment to remain or to be reinstalled.

3.3 INSTALLATION

- A. Install service entrance conduits to building service entrance equipment. Utility Company will connect service lateral conductors to service entrance conductors.
- B. Install concrete pad for Utility Company transformer, in accordance with their requirements.

END OF SECTION

**SECTION 16442
PANELBOARDS**

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes branch circuit panelboards.

1.2 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
- B. National Electrical Manufacturers Association:
1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
 2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
 3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
 4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
 5. NEMA PB 1 - Panelboards.
 6. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.
- C. International Electrical Testing Association:
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. National Fire Protection Association:
1. NFPA 70 - National Electrical Code.
- E. Underwriters Laboratories Inc.:
1. UL 67 - Safety for Panelboards.
 2. UL 1283 - Electromagnetic Interference Filters.
 3. UL 1449 - Transient Voltage Surge Suppressors.

1.3 SUBMITTALS

- A. Per the Project Manual: Requirements for submittals.
- B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.
- C. Product Data: Submit catalog data showing specified features of standard products.

1.4 CLOSEOUT SUBMITTALS

- A. Per the Project Manual: Requirements for submittals.
- B. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.
- C. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.6 MAINTENANCE MATERIALS

- A. Per the Project Manual: Requirements for maintenance products.
- B. Furnish two of each panelboard key.

PART 2 PRODUCTS

2.1 BRANCH CIRCUIT PANELBOARDS

- A. Manufacturers:
 - 1. GE Electrical.
 - 2. Square D.
 - 3. Eaton.
 - 4. Substitutions: Per the Project Manual.
- B. Product Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.
- C. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard; furnish insulated ground bus.
- D. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 240 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, or as indicated on Drawings.
- E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits. Do not use tandem circuit breakers.
- F. Enclosure: NEMA PB 1, Type 3R.

- G. Cabinet Box: 6 inches (153 mm) deep, 20 inches (508 mm) wide for 480 volt and less panelboards.
- H. Cabinet Front: Surface cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finish in manufacturer's standard gray enamel.

PART 3 EXECUTION

3.1 EXISTING WORK

- A. Disconnect abandoned panelboards and load centers. Remove abandoned panelboards and load centers.
- B. Maintain access to existing panelboard and load centers remaining active and requiring access. Modify installation or provide access panel.
- C. Clean and repair existing panelboards and load centers to remain or to be reinstalled.

3.2 INSTALLATION

- A. Install panelboards in accordance with NEMA PB 1.1.
- B. Install panelboards plumb.
- C. Height: 6 feet (1800 mm) to top of panelboard; install panelboards taller than 6 feet (1800 mm) with bottom no more than 4 inches (100 mm) above floor.
- D. Install filler plates for unused spaces in panelboards.
- E. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads.
- F. Install engraved plastic nameplates in accordance with Section 16075.
- G. Ground and bond panelboard enclosure according to Section 16060. Connect equipment ground bars of panels in accordance with NFPA 70.

3.3 FIELD QUALITY CONTROL

- A. Per the Project Manual: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.
- D. Perform switch inspections and tests listed in NETA ATS, Section 7.5.
- E. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

3.4 ADJUSTING

- A. Per the Project Manual: Requirements for starting and adjusting.
- B. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

END OF SECTION

**SECTION 16710
COMMUNICATIONS CIRCUITS**

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes arrangement with Telecommunications Utility Company for telecommunication service; and backboards, cabinets, termination devices, outlets, and premises wiring.

1.2 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. National Fire Protection Association:
 - 1. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- C. Telecommunications Industry Association/Electronic Industries Alliance:
 - 1. TIA/EIA 568 - Commercial Building Telecommunications Cabling Standard.
 - 2. TIA/EIA 569 - Commercial Building Standard for Telecommunications Pathways and Spaces.
- D. Underwriters Laboratories, Inc.:
 - 1. UL 2043 - Fire Test for Heat and Visible Smoke Release for Discrete Products and their Accessories Installed in Air-Handling Spaces.

1.3 SYSTEM DESCRIPTION

- A. Service entrance from Telecommunications Utility Company is existing.
- B. Horizontal Pathway: Conform to TIA/EIA 569, using existing raceway, backboards, and equipment racks, as indicated on Drawings.
- C. Horizontal Wiring: Complete from telecommunications room to each device using unshielded horizontal cables.
- D. Outside Plant: Complete between points of service using copper cable, air core and/or fiber backbone, as specified on the Drawings.
- E. General Performance: Backbone cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.
- F. The maximum allowable horizontal cable length is 295 feet.

1.4 SUBMITTALS

- A. Per the Project Manual: Submittal procedures.
- B. Product Data: Submit catalog data for each termination device, cable, and outlet device and any other type of product indicated.
- C. For fiber optic cable, include nominal outside dimension (OD), minimum bending radius, and maximum pulling tension.
- D. Source quality-control reports and field quality-control reports.
- E. Test Reports: Indicate procedures and results for specified field testing and inspection.
- F. Qualification Data: For installer, qualified layout technician, installation supervisor, and field inspector.
- G. Shop Drawings:
 - 1. Cabling administration drawings and printouts.
 - 2. Wiring diagrams to show typical wiring schematics including cross-connects, patch panels and patch cords.
- H. Maintenance Data: For splices and connectors to include in maintenance manuals.

1.5 CLOSEOUT SUBMITTALS

- A. Per the Project Manual: Closeout procedures.
- B. Project Record Documents: Record actual locations and sizes of pathways and outlets.
- C. Maintenance Data: Provide one hard copy and one electronic copy (in .pdf) version of the following Operation and Maintenance Manuals and As-Built drawings.
 - 1. Manuals shall include all products provided, including wire management, cable, devices, and other supporting equipment.
 - 2. As-Built Drawings: Plan layout showing equipment locations, cable routing, and outlet locations with labels indicated for each outlet.
 - 3. Test Reports: Provide test reports for all installed cables. Provide electronic copy only and include with reader that supports the test results in native format.
 - 4. System Warranty.

1.6 QUALITY ASSURANCE

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5 m) when tested in accordance with NFPA 262.
- B. Provide combustible electrical equipment exposed within plenums with peak rate of heat release not greater than 100 kW, peak optical density not greater than 0.5, and average optical density not greater than 0.15 when tested in accordance with UL 2043.

- C. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.2, when tested according to test procedures of this standard.
- D. Installer Qualifications: Experienced installers with at least 5 year's experience installing and certifying Category 6 cabling systems in accordance with TIA/EIA 568 standards. Cabling installer must have personnel certified by BICSI on staff.
- E. Testing Agency Qualifications: An NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD or vendor certified installer to supervise on-site testing.
- F. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, and marked for intended location and application.
- H. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.
- I. Grounding: Comply with ANSI-J-STD-607-A.
- J. Perform Work in accordance with State and Local standards.
- K. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in installing products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of project. Provide certificate of training and certification for qualified layout technician and installation supervisor.
- C. Testing Agency: Company member of International Electrical Testing Association and specializing in testing products specified in this section with minimum three years documented experience.

1.8 EXTRA MATERIALS

- A. Per the Project Manual: Spare parts and maintenance products.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. The contractor is responsible for all materials until project completion.
- B. Test cables upon receipt at Project site.

1. Test optical fiber cable to determine the continuity of the strand end to end. Use optical fiber flashlight or optical loss test set.

1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.11 COORDINATION

- A. Coordinate with utility company and the Owner's communications personnel for exact requirements and locations of points of service. Coordinate with the serving utility for relocation of underground lines interfering with construction.
- B. Coordinate layout and installation of telecommunications pathways and cabling with the Owner.
- C. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

1.12 SOURCE QUALITY CONTROL

- A. Testing: Engage a qualified testing technician to evaluate cables.
- B. Factory test UTP cables according to TIA/EIA-568-B.2.
- C. Cable will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports. Provide in electronic format.

PART 2 PRODUCTS

2.1 OUTSIDE PLANT FIBER BACKBONE CABLE

- A. Product Description: TIA/EIA 568, 62.5/125 um optical fiber noncombustible cable.
- B. Factory-fabricated, jacketed, low-loss, indoor/outdoor rated, glass-type, fiber optic single mode and multi-mode graded index, operating at 850, 1300 and 1550 nanometers (nm).

2.2 OPTICAL FIBER BACKBONE CABLE

- A. Product Description: TIA/EIA 568, 62.5/125 um optical fiber noncombustible cable.
- B. Fiber optic cable shall contain (6) and/or (12) optical fibers - single-mode and multi-mode, as specified on Drawings.

2.3 UNSHIELDED HORIZONTAL CABLE

- A. Manufacturers:
 - 1. Siemon (basis of design).
 - 2. Substitutions: Per the Project Manual.

- B. Product Description: TIA/EIA 568, 250 MHz, 100-ohm, unshielded twisted pair plenum rated noncombustible cable copper conductor with a blue jacket. Verify jacket color with the drawings and scope of work and with the owner prior to ordering.
 - 1. Comply with ICEA S-90-661 for mechanical properties.
 - 2. Comply with TIA/EIA-568-B.1 for performance specifications.
 - 3. Comply with TIA/EIA-568-B.2, Category 6, 250 MHz.
 - 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
 - a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.
 - b. Communications, Riser Rated: Type CMR, complying with UL 1666.

 - 5. Cable shall comply with the following additional features:
 - a. Reverse sequential numbering.
 - b. Round jacket.
 - c. Center isolation member.
 - d. Jacket material is lead free.
 - e. Packaging in 1000 ft. reels.

 - 6. Ethernet Applications Support: 1000BASE-T, 100BASE-T, and 10BASE-T.
 - 7. Standards Compliance:
 - a. ISO/IEC 11801:2002 (Category 6).
 - b. TIA 568-C.2 – 2009.
 - c. Transmission performance verified by UL
 - d. RoHS compliant

- C. 4-pair, 23-24 AWG, Category 6 UTP, copper telecommunications horizontal cable shall be used for connectivity between the patch panels, switches, and work area outlets. Cable will be placed in cable trays and/or conduit raceway.

- D. Cables run continuous from patch panel to outlet module and shall not be spliced.

- E. Refer to Drawings for additional specifications.

PART 3 EXECUTION

3.1 EXISTING WORK

- A. Remove exposed abandoned telecommunications cables and pathways. Cut flush with walls and floors, and patch surfaces.

- B. Disconnect and remove abandoned telecommunications equipment.

- C. Maintain access to existing telecommunications equipment, cabling, and terminations and other installations remaining active and requiring access. Modify installation or provide access panel.
- D. Extend existing telecommunications installations using materials and methods compatible with existing installations, or as specified.
- E. Clean and repair existing telecommunications equipment remaining or is to be reinstalled

3.2 WIRING METHODS

- A. Wiring Method: Install cables in raceways and cable trays, except within consoles, cabinets, desks, and counters. Conceal raceway and cables except in unfinished spaces.
 - 1. Install plenum cable in environmental air spaces, including plenum ceilings.
 - 2. Comply with requirements for raceways and boxes specified in Division 26.
 - 3. New Construction: All raceway shall be concealed, except at ceilings that are exposed.
- B. Wiring within Enclosure: Bundle, lace, and train cables to terminal points with no excess and without exceeding the manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- C. Outdoor Wiring Method: Install cables in underground raceway. Provide hand holes necessary for pulling and storage, as necessary, between buildings and underground vaults. Do not exceed manufacturer's limitations on bending radii. Provide and use lacing bars and distribution rack to support cable in hand holes.

3.3 INSTALLATION - GENERAL

- A. Refer to Section 270553 – Identification for Communications Systems, for specification and requirements on identification for the cabling, raceways, hardware components, etc.
- B. General Requirements for cabling:
 - 1. Comply with NECA 1.
 - 2. Comply with TIA/EIA-568-B.1.
 - 3. Comply with BICSI ITSIM, Chapter 6 – Cable Termination Practices.
 - 4. Terminate jacks and patch panels to wiring standard 568A.
 - 5. Outlet shall not be used as a cross-connect point.
 - 6. Install 110-style IDC termination hardware, unless otherwise indicated.
 - 7. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, patch panels, or Owner-provided panels.
 - 8. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 9. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by the manufacturer.
 - 10. Bundle, lace and train conductors to terminal points without exceeding the manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM. Use lacing bars and distribution spools.

11. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tape, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 12. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used for heating.
 13. Provide pulling cable in all pathways. Monitor cable pull tension.
 14. At the communications equipment, install a 10-foot-long service loop on each end of the cable.
- C. Install pathways in accordance with TIA/EIA 569.
- D. Install wire and cable in accordance with TIA/EIA 568.
- E. UTP Cable Installation:
1. Comply with TIA/EIA-568-B.2.
 2. Do not untwist UTP cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.
- F. Optical Fiber Cable Installation:
1. Comply with TIA/EIA-568-B.3.
 2. Cable may be terminated on connecting hardware that is rack mounted.
 3. Terminators shall be pigtail type, core centered fusion spliced and insulated to matching fiber colors.
- G. Open-Cable Installation:
1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
 2. Suspend UTP cable not in a wireway or pathway, a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
 3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
- H. Ground and bond pathways, cable shields, and equipment in accordance with Section 260526.
- I. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color, but still complies with requirements of TIA/EIA-606-A, for the following:
1. Cables use flexible vinyl or polyester that flexes as cables are bent.
- J. Cable and Wire Identification:
1. Label each cable within 4 inches (100 mm) of each termination, where it is accessible in a handhole, where it enters a building, and elsewhere, as indicated.
 2. Label each terminal strip and screw terminal in each rack or panel.
 - a. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel to a building-mounted device with name and number of particular device, as shown.
 - b. Label each unit and field within distribution racks and frames.
 3. Identification within connector fields in equipment rooms and wiring closets:

- a. Label each connector and each discrete unit of cable-terminating and connecting hardware.

3.4 INSTALLATION – CABLES

- A. Group connecting hardware for cables into separate logical fields. Cables from each room shall be terminated at the patch panel in sequential order.
- B. Separation from EMI sources:
 1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
 2. Separation between open communications cables or cables in cable tray and unshielded power conductors and electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less than 2 kVA: A minimum of 5 inches.
 - b. Electrical Equipment Rating between 2 kVA and 5 kVA: A minimum of 12 inches.
 - c. Electrical Equipment Rating More than 5 kVA: A minimum of 24 inches.
 3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less than 2 kVA: A minimum of 2-1/2 inches.
 - b. Electrical Equipment Rating between 2 kVA and 5 kVA: A minimum of 6 inches.
 - c. Electrical Equipment Rating More than 5 kVA: A minimum of 12 inches.
 4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - a. Electrical Equipment Rating Less than 2 kVA: No requirement.
 - b. Electrical Equipment Rating between 2 kVA and 5 kVA: A minimum of 3 inches.
 - c. Electrical Equipment Rating More than 5 kVA: A minimum of 6 inches.
 5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
 6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.5 FIRESTOPPING

- A. Comply with building codes for all wall penetrations with using approved firestopping methods.
- B. Comply with BICSI TDMM and all applicable codes and regulations.
- C. Comply with TIA/EIA-569-A.

3.6 FIELD QUALITY CONTROL

- A. Per the Project Manual: Field inspecting, testing, adjusting, and balancing. Perform tests and inspections.

- B. Engage a qualified testing agency to evaluate the cables, perform tests and inspections.
- C. Inspect and test optical fiber cables in accordance with NETA ATS, except Section 4. Perform inspections and tests listed in NETA ATS, Section 7.25.
- D. Factory test multi-mode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.
- E. Inspect and test copper cables and terminations in accordance with TIA/EIA 568-B.2
- F. Tests and Inspections:
 - 1. Visually inspect UTP and optical fiber jacket materials for NRTL, certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding, for pint assignments, and inspect cabling connections for compliance with TIA/EIA-468-B.1.
 - 2. Visually confirm Category 6 marking of outlet/connectors.
 - 3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 - 4. Test UTP copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination, but not cross-connection.
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in “Test Instruments (Normative)” Annex, complying with measurement accuracy specified in “Measurement Accuracy (Informative)” Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 - b. Proof of test equipment recertification from manufacturer shall be available upon request.
 - 5. UTP Performance Tests:
 - a. Test for each outlet for a complete link. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:
 - 1) Wire map.
 - 2) Length (physical vs. electrical, and length requirements).
 - 3) Insertion Loss.
 - 4) Near-end crosstalk (NEXT) loss.
 - 5) Power sum near-end crosstalk (PSNEXT) loss.
 - 6) Equal-level far-end crosstalk (ELFEXT).
 - 7) Power sum equal-level far-end crosstalk (PSELFEXT).
 - 8) Return loss.
 - 9) Propagation delay
 - 10) Delay skew.
 - 6. Final Verification Tests: Perform verification tests for UTP systems after the complete communications cabling and workstation outlet/connectors are installed.
 - a. Data Tests: These tests assume the I.T. staff has a network installed and is available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.

7. Optical Fiber Cable Tests:
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by the test equipment manufacturer for channel or link test configuration.
 - b. Link End-to-End Attenuation Tests:
 - 1) Horizontal and single mode backbone link measurements:
 - a) Test at 850, 1300 or 1550 nm in one direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.
 - 2) Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.
 - c. Proof of test equipment recertification from manufacturer shall be available upon request.
- G. Data for each measurement shall be documented. Data for submittals shall be printed in a summary report.
- H. Cable will be considered defective if it does not pass tests and inspections.
- I. Remove and replace cabling where test results indicate that they do not comply with specified requirements.
- J. Prepare test and inspection reports. Provide in electronic format.

END OF SECTION

**SECTION 16820
ACCESS CONTROL**

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes security access devices and signal and control wiring.

1.2 REFERENCES

- A. National Fire Protection Association:
 - 1. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

1.3 SYSTEM DESCRIPTION

- A. Security Access System: Control access to facility at exterior gate entry using keypads and intercoms (future).

1.4 SUBMITTALS

- A. Per the Project Manual: Submittal procedures.
- B. Shop Drawings: Indicate system wiring diagram showing each device and wiring connection; indicate annunciator layout, sequence of operation.
- C. Product Data: Submit catalog data showing electrical characteristics and connection requirements.
- D. Test Reports: Indicate procedures and results for specified field testing and inspection.
- E. Manufacturer's Field Reports: Indicate activities on site, adverse findings, and recommendations.

1.5 CLOSEOUT SUBMITTALS

- A. Per the Project Manual: Closeout procedures.
- B. Project Record Documents: Record actual locations of security access equipment.
- C. Operation and Maintenance Data: Submit manufacturer's standard operating and maintenance instructions.

1.6 QUALITY ASSURANCE

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5 m) when tested in accordance with NFPA 262.

B. Perform Work in accordance with State and Local standards.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of project.

B. Installer: Certified security system installer with service facilities within 100 miles of Project.

1.8 MAINTENANCE SERVICE

A. Per the Project Manual: Maintenance service.

B. Furnish service and maintenance of security access equipment for one year from Date of Substantial Completion.

1.9 EXTRA MATERIALS

A. Per the Project Manual: Spare parts and maintenance products.

PART 2 PRODUCTS

2.1 KEY PAD/INTERCOM COMBINATION UNIT

A. Manufacturers:

1. Security Brands Inc., Model ADV-1000I (basis of design).
2. Substitutions: Per the Project Manual.

B. Product Description: Flush-mount, backlit access control keypad with the following features:

1. Up to 1,000 users.
2. Double gang flush mount design.
3. Security to lockout after (3) failed attempts.
4. Backlit hardened keys.
5. Latch code.
6. Sleep code.
7. Master code.
8. Variable relay time.
9. Event input.
10. Audible tone and LED feedback.
11. Non-volatile memory.
12. Outdoor use.
13. Integral intercom to be connected in the future.

2.2 WIRE AND CABLE

- A. Manufacturers:
 - 1. Siemon (basis of design)
 - 2. Substitutions: Per the Project Manual.
- B. Product Description: Copper, Category 6, 4-pair, solid, UTP, CMR, 23 AWG, Violet in color.

PART 3 EXECUTION

3.1 EXISTING WORK

- A. Maintain access to existing security access equipment and other installations remaining active and requiring access. Modify installation or provide access panel.

3.2 INSTALLATION

- A. Install wiring and cabling in conduit
- B. Install conduit and wiring connections to door hardware devices.
- C. Install engraved plastic nameplates in accordance with Section 270553.
- D. Ground and bond security access equipment and circuits in accordance with Section 260526.

3.3 FIELD QUALITY CONTROL

- A. Per the Project Manual: Field inspecting, testing, adjusting, and balancing.
- B. Test in accordance with manufacturer's recommendations.

3.4 MANUFACTURER'S FIELD SERVICES

- A. Per the Project Manual: Manufacturer's field services.
- B. Furnish services of technician to supervise installation, adjustments, final connections, system testing, and Owner training.

END OF SECTION

DIVISION 17

MISCELLANEOUS

SECTION 17000

FIRE RATED ABOVE GROUND STORAGE TANK AND DIESEL EXHAUST FLUID SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The work included under this section consists of furnishing all labor, materials, services, equipment and appliances required to properly install one 10,000-gallon dual-compartment double-walled above ground storage tank (AST), with a 5,000-gallon diesel fuel compartment and a 5,000-gallon unleaded gasoline compartment. The work also includes a self-contained Diesel Exhaust Fluid (D.E.F.) system.
- B. The AST system shall include the tank, pumping system, piping, fill ports, sensor ports, overfill prevention sumps, fuel offload station with spill containment, concrete foundations, tank monitoring system, emergency fuel shutoffs, signage as required and integration with the existing Syntech FuelMaster ® fuel management system and two existing fuel dispensers.
- C. The Contractor shall furnish all tank foundation design drawings as required to provide for a complete support system for the fuel tank. Foundation drawings are to be stamped by a licensed Engineer as appropriate.
- D. The Contractor shall furnish all labor, materials, supplies, equipment, transportation, travel, and services necessary for a complete turnkey installation.

1.2 REFERENCES

- A. Tanks shall be constructed, tested and listed according to the following Governing Standards:
 - 1. Administrative Rules of Montana 17.57.101 through 17.57.107
 - 2. Administrative Rules of Montana 17.58.326
 - 3. U.L. 142, Underwriters Laboratories, Inc., Steel Aboveground Tanks for Flammable and Combustible Liquids.
 - 4. U.L. 2085, Underwriters Laboratories 2 Hour Fire Rating's Standard for Insulated Aboveground Storage Tanks for Flammable and Combustible Liquids.
 - 5. NFPA 30, National Fire Protection Association Flammable and Combustible Code.
 - 6. NFPA 30A, National Fire Protection Association Automotive and Marine Service Station Code.
 - 7. International Fire Code.
 - 8. B.O.C.A. National Fire Prevention Code.
 - 9. NFPA 31, Standard for Installation of Oil Burning Equipment. PEI/RP200-Petroleum Equipment Institute, Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling.

PART 2 - PRODUCTS

2.1 FIRE RATED ABOVE GROUND STORAGE TANK

- A. The storage tank shall be a 10,000 gallon, two compartment (5,000 / 5,000), double wall horizontal UL-2085 tank, designed for the storage of petroleum product near atmospheric pressure.
1. The primary and secondary tanks shall be manufactured in accordance with Steel Tank Institute Publication No. F941, "Standard for Thermally Insulated Aboveground Storage Tanks."
 2. The listed assembly shall meet the requirements for "protected" tank as defined by the UFC Article 79 and "fire resistant" tanks as defined by Underwriters Laboratories including impact resistance, ballistics protection and hose stream resistance criteria.
 3. The tank shall consist of an inner steel wall, encased by lightweight thermal insulation material, and an outer steel wall.
 4. The outer steel wall shall be UL 2085 listed for secondary containment and capable of providing a minimum 110% containment of the primary storage tank's content.
 5. A legible UL 2085 label shall be affixed to the side of the aboveground storage tank(s).
 6. Steel outer wall of the tank shall be coated to prolong weather resistance and to further reduce maintenance needs.
 7. The storage tank and supports shall be delivered as a complete UL-listed unit.
 8. The storage tank and supports shall meet all Uniform Building Code requirements.
- B. Tank(s) shall be designed for use aboveground and include integral secondary containment, and thermal insulation that provides a minimum two-hour fire rating.
1. Provide a porous, lightweight monolithic thermal insulation material in the tank's interstitial space.
 2. The thermal insulating material shall allow liquid to migrate through the interstice to the monitoring point.
 3. The thermal insulation material shall not be exposed to weathering and shall be protected by the steel secondary containment outer wall.
 4. Thermal insulation material shall be installed at the factory and be in accordance with American Society for Testing Materials (ASTM) Standards C-332 and C-495.
- C. Tank(s) shall be provided with the following minimum warranties:
1. 30-year limited warranty against leakage from the secondary containment tank, and failure of the primary tank caused by cracking, breakup or collapse.
 2. 30-year warranty that the tank(s) was fabricated in accordance with requirements of UL 2085 and UL 142, aboveground storage tank manufacturing standards of Underwriters Laboratories.
 3. One (1) year warranty against failure due to defective materials and workmanship for one (1) year following the date of delivery of the tank to the job site.
- D. The Contractor shall register each tank and serial number with Steel Tank Institute in accordance with instructions provided by the manufacturer with the tank.
- E. Provide an interstitial monitoring tube for monitoring the tank's interstice for liquids.

2.2 VENTING REQUIREMENTS

- A. Provide one (1) normal atmospheric or pressure/vacuum vent for each of the primary tanks.
 - 1. Vents shall discharge upward or laterally, be protected from intrusion of rain, and incorporate a flame arrestor.
 - 2. Vent installation shall comply with applicable sections of the fire and mechanical codes, including, but not limited to, NFPA 30A (2-4.5.e), NFPA 30 (2-3.5), or UFC (7902.1.10), or BOCA (F-3201.1).
- B. Provide one (1) emergency primary tank vent per tank.
 - 1. Vent size shall be determined by the tank configuration, the primary tank capacity, and the product stored.
 - 2. Emergency venting shall comply with provisions of NFPA 30A (2-4.5.f), NFPA 30 (2-3.6), or UFC (7902.2.6), or BOCA (F-3201.1).
- C. Provide one (1) emergency vent for each secondary containment tank interstice.
 - 1. The venting capacity is determined by the tank configuration, secondary tank capacity, and the product stored.
 - 2. Emergency venting shall comply with provisions of NFPA 30A (2-4.5), NFPA 30 (2-3.6), or UFC (7902.2.6) (Article 79 5.3), or BOCA (F-3201.1),
 - 3. and UL 142, and UL 2085.
 - 4. Vents shall be located as close to the center of the tank as possible.

2.3 PIPING

- A. Piping shall be compatible with the fuels (diesel and gasoline) stored and properly designed to resist internal and external wear, vibration and shock. Piping shall be schedule 40 black steel.
- B. Piping shall be designed, fabricated and tested in accordance with current codes of practice developed by Nationally recognized associations such as API, ASME, ANSI, NFPA, PEI or STI. Installation of piping shall meet or exceed current codes of practice and be in strict accordance with manufacturer's specifications. Piping shall be tested for tightness before being placed in service and all deficiencies remedied.
- C. All couplings, unions, elbows, tees, and fittings used in the construction of the protected AST and related accessories shall conform to the standards appropriate for the pipe or tubing being connected.
- D. Aboveground piping shall be adequately supported and be protected from physical damage caused by freezing, frost heaving and vehicular traffic.

2.4 TANK MONITORING SYSTEM

- A. The monitoring system shall have internet connectivity capability with a touch screen display.
- B. The unit shall report fuel levels, tank or line leakage and water contamination
- C. The tank monitoring system shall be a Veeder-Root TLS-450 or equal.

2.5 CONCRETE SUPPORT FOUNDATION FOR FUEL TANK

- A. The structural design of the concrete foundation, whether on grade or on piers, shall properly account for all loads imposed upon the foundation by the tank.
- B. The reinforcement requirements and the design details of construction shall be in accordance with ACI 318. Concrete foundation is to be designed by a person experienced in tank foundation design.
- C. The top of the concrete foundation shall be smooth and level.

2.6 DIESEL EXHAUST FLUID (D.E.F.) SYSTEM

- A. The D.E.F. system shall be a self-contained, closed loop, stand alone, fully assembled, pre-wired outdoor rated, heated tank and pumping system to include the following:
 - 1. Must have 390 +/- 10% Gallon Tank
 - 2. 110 Volt Power Source
 - 3. Double Wall Containment
 - 4. Fuel Island Ready Footprint
 - 5. Outer Tank Must Hold 110% Of Inner Tank Volume
 - 6. Minimum 6 Gallon Per Minute 120 Volt Pump
 - 7. General Construction Inspection Approval Z-40321-510
 - 8. Polyurethane Foam Insulation
 - 9. Hinged, Lockable Lid with Pneumatic Arms
 - 10. Integral Sump
 - 11. Electronic Overfill Sensor
 - 12. Optical Bund Alarm
 - 13. 2 In Dry-Break Fill Port
 - 14. Liquid Level Gauge
 - 15. 500 Watt Internal Submersible Probe Heater with Auto Thermostat to Prevent DEF from Freezing.
 - 16. Overfill Bund Alarm At 85% Of Tank Capacity
 - 17. Auto Stainless Steel Nozzle And Nozzle Holder, with 25 ft Retractable Hose Reel
 - 18. 400 Watt Deck Heater
 - 19. Must have the option to add a pulse meter to connect to the fueling management system.
- B. The D.E.F. system shall be a Blue One Energy “Cube” system or equal

PART 3 - EXECUTION

3.1 CONSTRUCTION

- A. Tank shall be installed on a reinforced concrete foundation constructed by the contractor. Installation and testing shall be in strict accordance with Steel Tank Institute Installation and Testing Instructions for Thermally Insulated, Lightweight, Double Wall Aboveground Storage Tanks.

- B. Tank systems shall be labeled/marked in accordance with industry standards and in compliance with Federal and State requirements. Tank labels/marks shall be easily legible from outside the containment area and shall be capable of readily identifying the regulated substance stored.
- C. Place and compact a minimum of 12-inches of 1½ inch minus base course aggregate below the tank foundation to a firm even surface at 98 percent of the maximum dry density and optimum water content +3 percent in accordance to AASHTO T99 or ASTM 698.in two (2) lifts over the compacted subbase meeting all applicable portions of Section 02235, CRUSHED BASE COURSE.
- D. Two approved, clearly identified and readily accessible emergency disconnect switches shall be provided at approved locations to stop the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. One emergency disconnect switch shall be located at the fueling area site as shown in the plans (mounted to north light pole) and the other shall be mounted on an existing fence post to the south of the fueling area (no less than 20-feet but not more than 100-feet from the fuel dispensers). Such devices shall be distinctly labeled as: EMERGENCY FUEL SHUTOFF. Signs shall be provided in approved locations.
- E. Make any necessary electronics or software updates to the existing fuel system management controls to integrate the new fuel tank monitoring system, the existing fuel dispensers and the Diesel Exhaust Fluid (D.E.F.) systems into a fully functional fueling system.
- F. Contractor shall provide Owner all equipment brochures, manuals, warranties and operational material as necessary to maintain and satisfy regulatory requirements for record keeping. All materials shall be turned over to the Owner's authorized representative at the time of startup and training portion of project.
- G. Anchor the D.E.F. unit to the concrete fueling island as recommended by the manufacturer and as show in the construction plans.

END OF SECTION

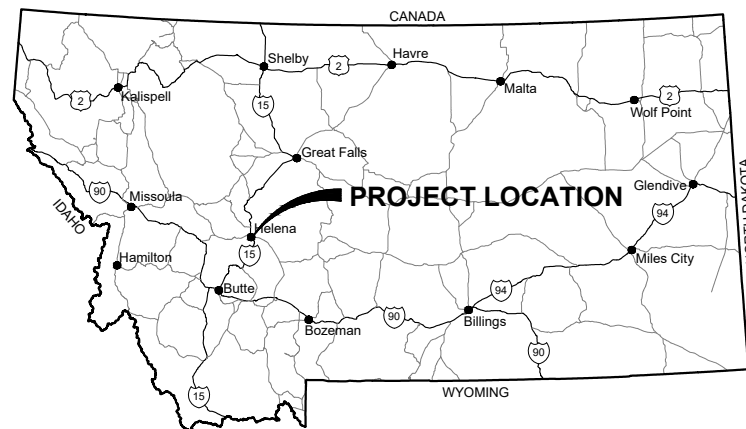
CONSTRUCTION PLANS

SHEET INDEX

PROJECT: 1-18132-T.O.#15
DATE: OCTOBER 31, 2024

SHEET C1	COVER
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SHEET C3	DEMOLITION PLAN
SHEET C4	ENLARGED SITE PLAN
SHEET C5	ENLARGED FUEL SYSTEM PLAN
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SHEET E8	ELECTRICAL DETAIL-DEF WIRING DIAGRAM

LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS CONSTRUCTION PLANS



PLANS PREPARED FOR:

LEWIS AND CLARK COUNTY

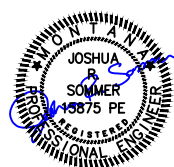


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GREAT WEST ENGINEERING

PLANS PREPARED BY:

JENNA LAUF, E.I.



SECTION 18, TOWNSHIP 10 N, AND RANGE 03 W



NOT TO SCALE

BASE BID - FUELING AND MG/CL SYSTEMS

1. FURNISH AND INSTALL A COMPLETE AND OPERABLE FUELING SYSTEM AS SHOWN AND DESCRIBED IN THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- DEMOLITION AND SALVAGE OF THE EXISTING FUELING SYSTEM
- EARTHWORK AND GRADING
- NEW GROUND LEVEL SPLIT FUEL TANK (5,000 GALLONS DIESEL / 5,000 GALLONS GASOLINE) WITH CONCRETE FOUNDATION AND ALL FUEL PIPING AND ACCESSORIES
- NEW CONCRETE FUELING ISLAND
- NEW CONCRETE SLAB AROUND THE FUEL TANK AND FUELING ISLAND
- THIRTY-FOUR NEW BOLLARDS
- NEW FUEL PIPING TRENCH SYSTEM CAST INTO THE CONCRETE SLAB
- SALVAGE AND INSTALLATION OF TWO EXISTING FUEL DISPENSERS
- SALVAGE AND INSTALLATION OF EXISTING FUELING SYSTEM CONTROL SYSTEM
- NEW DIESEL EXHAUST FLUID (DEF) SYSTEM
- SALVAGE AND INSTALLATION OF TWO LIGHT POLES AND LUMINARIES
- GRAVEL SURFACING TO TRANSITION TO THE NEW CONCRETE SLAB
- ASSOCIATED ELECTRICAL WORK

2. FURNISH AND INSTALL A COMPLETE AND OPERABLE MG/CL SYSTEM AS SHOWN AND DESCRIBED IN THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- DEMOLITION OF THE EXISTING MG/CL SYSTEM
- EARTHWORK AND GRADING
- NEW STRUCTURAL CONCRETE SLAB AND CONTAINMENT WALL SYSTEM
- 4-INCH PERIMETER CONCRETE SLABS AROUND THE TANK CONTAINMENT WALLS
- 6-INCH REINFORCED CONCRETE SLAB AT FILLING STATION
- TWO NEW 10,300 GALLON POLYETHYLENE TANKS WITH LEVEL SIGHT TUBES
- TWO NEW MG/CL PUMPS AND CONTROLS
- NEW OVERHEAD FILLING STATION, INCLUDING BASE, STRUCTURAL STEEL, PIPING AND TWO BOLLARDS
- SCHEDULE 40 PVC PIPING AND BALL VALVES FOR CONNECTIONS TO THE TANKS, PUMPS AND FILLING STATION, INCLUDING ALL FITTINGS, SUPPORTS AND APPURTENANCES
- ASSOCIATED ELECTRICAL WORK

ADDITIVE ALTERNATE NO. 1 - STAINLESS STEEL MG/CL PIPING AND VALVES

1. FURNISH AND INSTALL 316 STAINLESS STEEL PIPING AND FITTINGS (THREADED) FOR ALL MG/CL PIPING IN LIEU OF PVC.
2. FURNISH AND INSTALL STAINLESS STEEL BALL VALVES FOR THE MG/CL SYSTEM IN LIEU OF MOLDED POLYPROPYLENE BALL VALVES.

ADDITIVE ALTERNATE NO. 2 - SECURITY FENCING

1. FURNISH AND INSTALL APPROXIMATELY 277 LINEAR FEET OF 6FT HIGH CHAIN LINK FENCING WITH THREE STRANDS OF BARBED WIRE AT THE TOP.
2. FURNISH AND INSTALL TWO 20FT WIDE AUTOMATIC SLIDING GATES WITH ALL ACCESSORIES AND ELECTRICAL SERVICE.

ADDITIVE ALTERNATE NO. 3 - FUEL TANK MONITORING SYSTEM

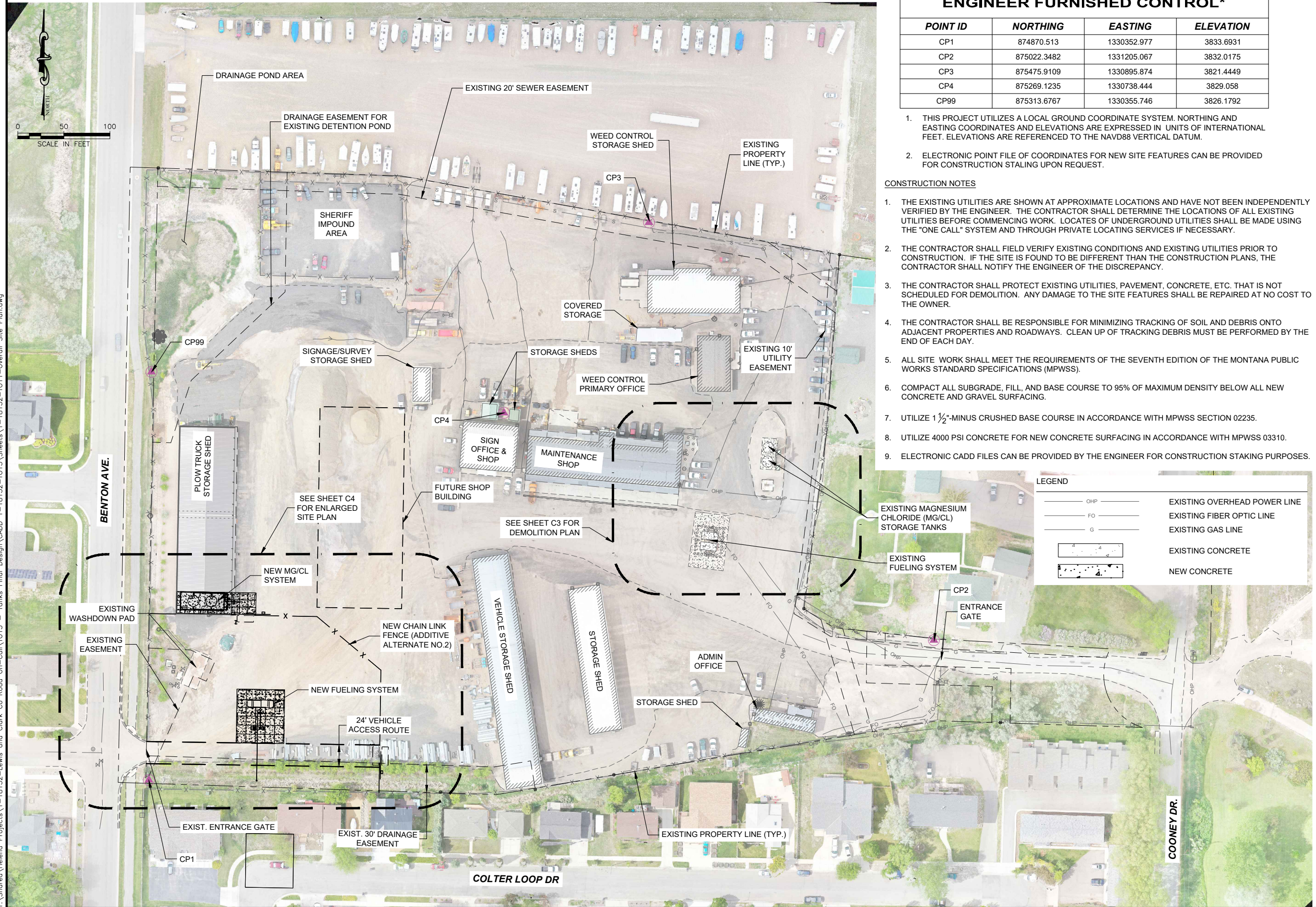
1. FURNISH, INSTALL, AND PROGRAM A "VEEDER-ROOT TLS-450" FUEL TANK MONITORING SYSTEM OR EQUAL.

NO.	REVISION DESCRIPTION	BY	DATE	SET NO.
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△				

SHEET NO.
C1

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ENGINEER FURNISHED CONTROL*

POINT ID	NORTHING	EASTING	ELEVATION
CP1	874870.513	1330352.977	3833.6931
CP2	875022.3482	1331205.067	3832.0175
CP3	875475.9109	1330895.874	3821.4449
CP4	875269.1235	1330738.444	3829.058
CP99	875313.6767	1330355.746	3826.1792

1. THIS PROJECT UTILIZES A LOCAL GROUND COORDINATE SYSTEM. NORTHING AND EASTING COORDINATES AND ELEVATIONS ARE EXPRESSED IN UNITS OF INTERNATIONAL FEET. ELEVATIONS ARE REFERENCED TO THE NAVD88 VERTICAL DATUM.
2. ELECTRONIC POINT FILE OF COORDINATES FOR NEW SITE FEATURES CAN BE PROVIDED FOR CONSTRUCTION STAKING UPON REQUEST.

CONSTRUCTION NOTES

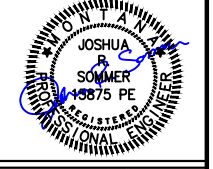
1. THE EXISTING UTILITIES ARE SHOWN AT APPROXIMATE LOCATIONS AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE ENGINEER. THE CONTRACTOR SHALL DETERMINE THE LOCATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. LOCATES OF UNDERGROUND UTILITIES SHALL BE MADE USING THE "ONE CALL" SYSTEM AND THROUGH PRIVATE LOCATING SERVICES IF NECESSARY.
2. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND EXISTING UTILITIES PRIOR TO CONSTRUCTION. IF THE SITE IS FOUND TO BE DIFFERENT THAN THE CONSTRUCTION PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE DISCREPANCY.
3. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES, PAVEMENT, CONCRETE, ETC. THAT IS NOT SCHEDULED FOR DEMOLITION. ANY DAMAGE TO THE SITE FEATURES SHALL BE REPAIRED AT NO COST TO THE OWNER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MINIMIZING TRACKING OF SOIL AND DEBRIS ONTO ADJACENT PROPERTIES AND ROADWAYS. CLEAN UP OF TRACKING DEBRIS MUST BE PERFORMED BY THE END OF EACH DAY.
5. ALL SITE WORK SHALL MEET THE REQUIREMENTS OF THE SEVENTH EDITION OF THE MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MPWSS).
6. COMPACT ALL SUBGRADE, FILL, AND BASE COURSE TO 95% OF MAXIMUM DENSITY BELOW ALL NEW CONCRETE AND GRAVEL SURFACING.
7. UTILIZE 1 1/2" MINUS CRUSHED BASE COURSE IN ACCORDANCE WITH MPWSS SECTION 02235.
8. UTILIZE 4000 PSI CONCRETE FOR NEW CONCRETE SURFACING IN ACCORDANCE WITH MPWSS 03310.
9. ELECTRONIC CADD FILES CAN BE PROVIDED BY THE ENGINEER FOR CONSTRUCTION STAKING PURPOSES.

LEGEND

	EXISTING OVERHEAD POWER LINE
	EXISTING FIBER OPTIC LINE
	EXISTING GAS LINE
	EXISTING CONCRETE
	NEW CONCRETE

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-18132-T015
DESIGNED: JRS
DRAWN: JCL
CHECKED: LMD
APPROVED: JRS
DATE: OCTOBER 31, 2024



LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS

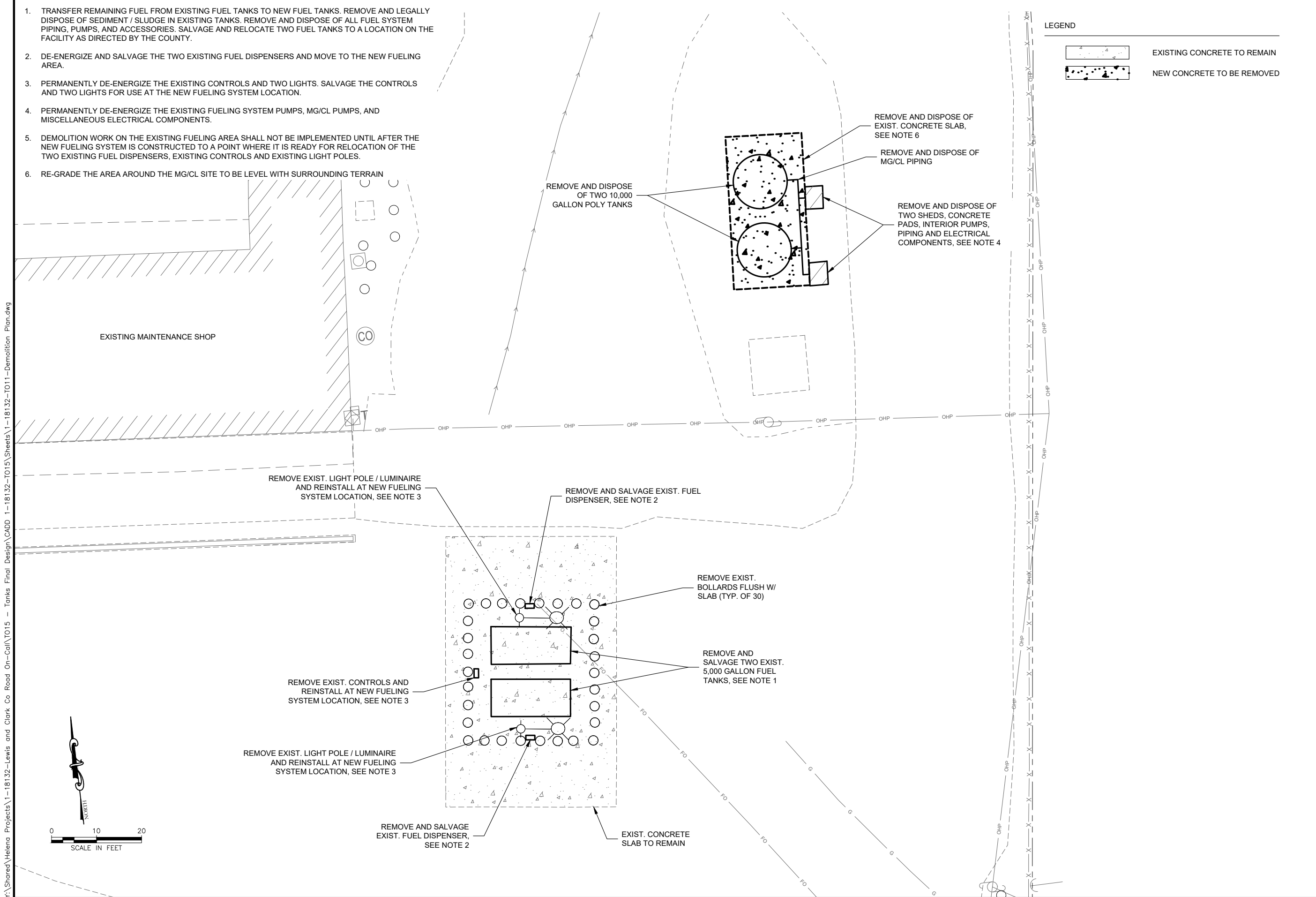
OVERALL SITE PLAN

SHEET NO.
C2

DEMOLITION NOTES:

1. TRANSFER REMAINING FUEL FROM EXISTING FUEL TANKS TO NEW FUEL TANKS. REMOVE AND LEGALLY DISPOSE OF SEDIMENT / SLUDGE IN EXISTING TANKS. REMOVE AND DISPOSE OF ALL FUEL SYSTEM PIPING, PUMPS, AND ACCESSORIES. SALVAGE AND RELOCATE TWO FUEL TANKS TO A LOCATION ON THE FACILITY AS DIRECTED BY THE COUNTY.
2. DE-ENERGIZE AND SALVAGE THE TWO EXISTING FUEL DISPENSERS AND MOVE TO THE NEW FUELING AREA.
3. PERMANENTLY DE-ENERGIZE THE EXISTING CONTROLS AND TWO LIGHTS. SALVAGE THE CONTROLS AND TWO LIGHTS FOR USE AT THE NEW FUELING SYSTEM LOCATION.
4. PERMANENTLY DE-ENERGIZE THE EXISTING FUELING SYSTEM PUMPS, MG/CL PUMPS, AND MISCELLANEOUS ELECTRICAL COMPONENTS.
5. DEMOLITION WORK ON THE EXISTING FUELING AREA SHALL NOT BE IMPLEMENTED UNTIL AFTER THE NEW FUELING SYSTEM IS CONSTRUCTED TO A POINT WHERE IT IS READY FOR RELOCATION OF THE TWO EXISTING FUEL DISPENSERS, EXISTING CONTROLS AND EXISTING LIGHT POLES.
6. RE-GRADE THE AREA AROUND THE MG/CL SITE TO BE LEVEL WITH SURROUNDING TERRAIN

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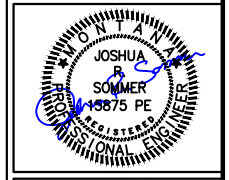


LEGEND

	EXISTING CONCRETE TO REMAIN
	NEW CONCRETE TO BE REMOVED

NO.	REVISION DESCRIPTION	BY	DATE

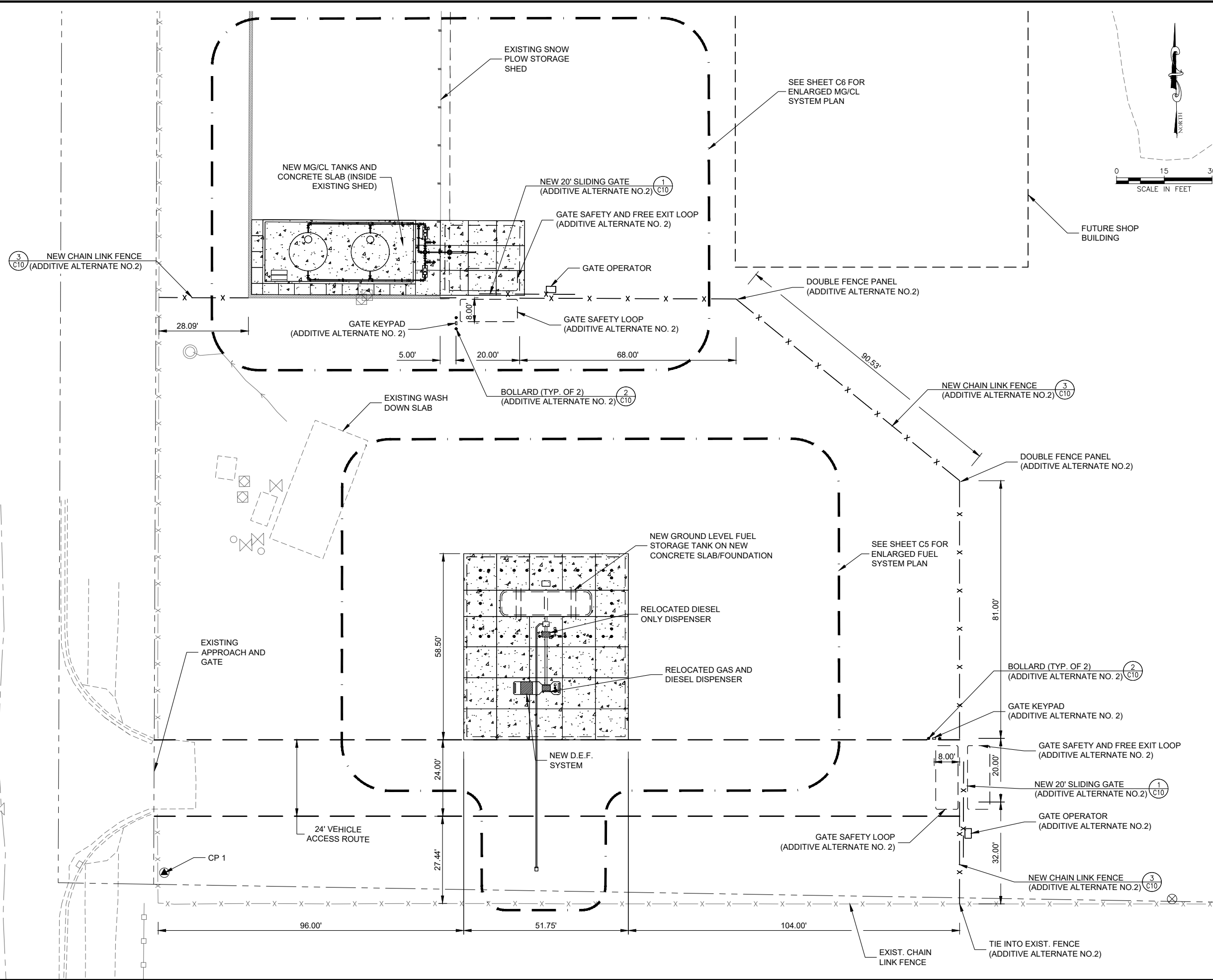
PROJECT: 1-18132-T.O. #15
 DESIGNED: JRS
 DRAWN: JCL
 CHECKED: LMD
 APPROVED: JRS
 DATE: OCTOBER 31, 2024



LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
 DEMOLITION PLAN

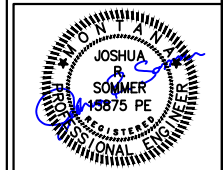
SHEET NO.
C3

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NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-18132-T.O. #15
 DESIGNED: JRS
 DRAWN: JCL
 CHECKED: LMD
 APPROVED: JRS
 DATE: OCTOBER 31, 2024

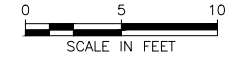


LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS

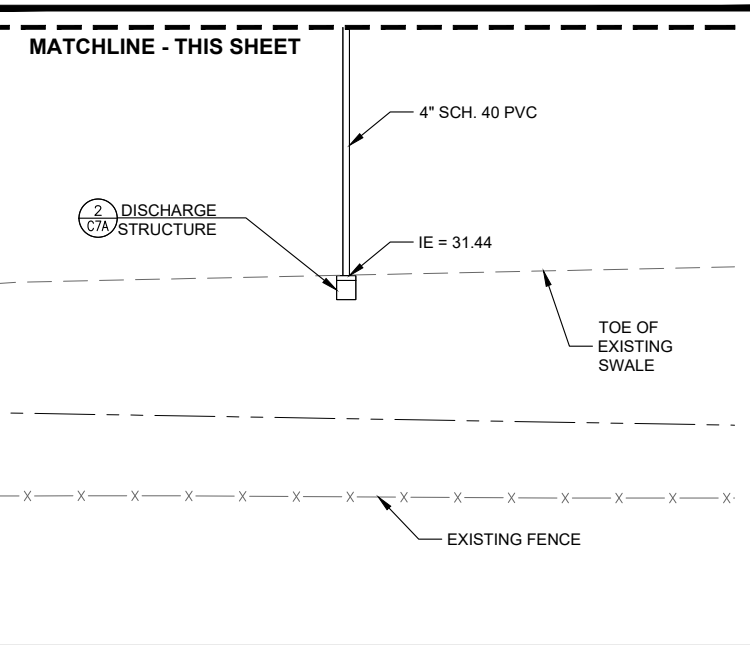
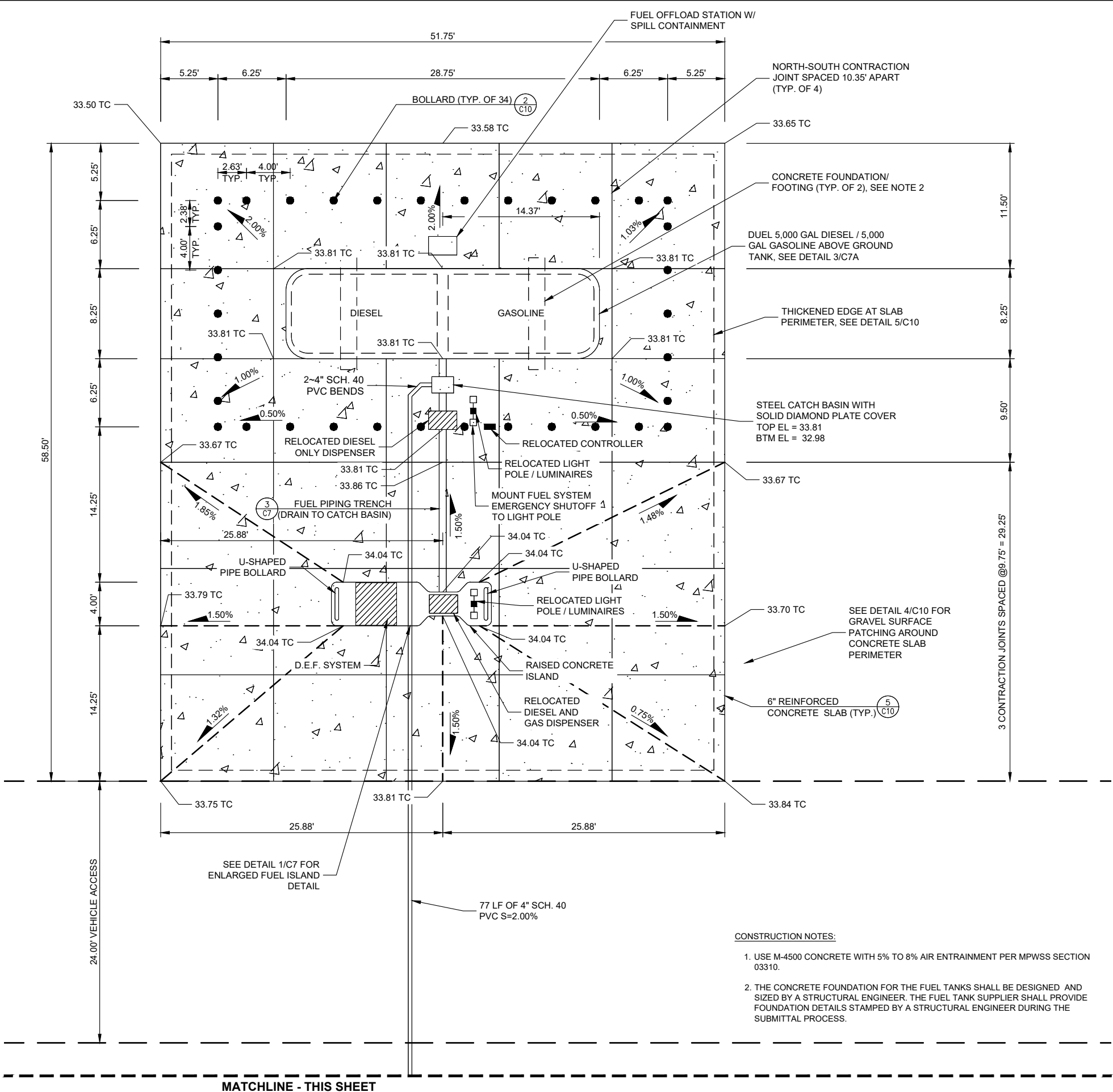
ENLARGED SITE PLAN

SHEET NO.
C4

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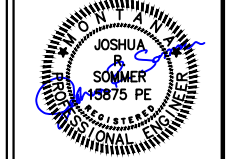
LEGEND
TC = TOP OF CONCRETE



- CONSTRUCTION NOTES:**
1. USE M-4500 CONCRETE WITH 5% TO 8% AIR ENTRAINMENT PER MPWSS SECTION 03310.
 2. THE CONCRETE FOUNDATION FOR THE FUEL TANKS SHALL BE DESIGNED AND SIZED BY A STRUCTURAL ENGINEER. THE FUEL TANK SUPPLIER SHALL PROVIDE FOUNDATION DETAILS STAMPED BY A STRUCTURAL ENGINEER DURING THE SUBMITTAL PROCESS.

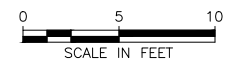
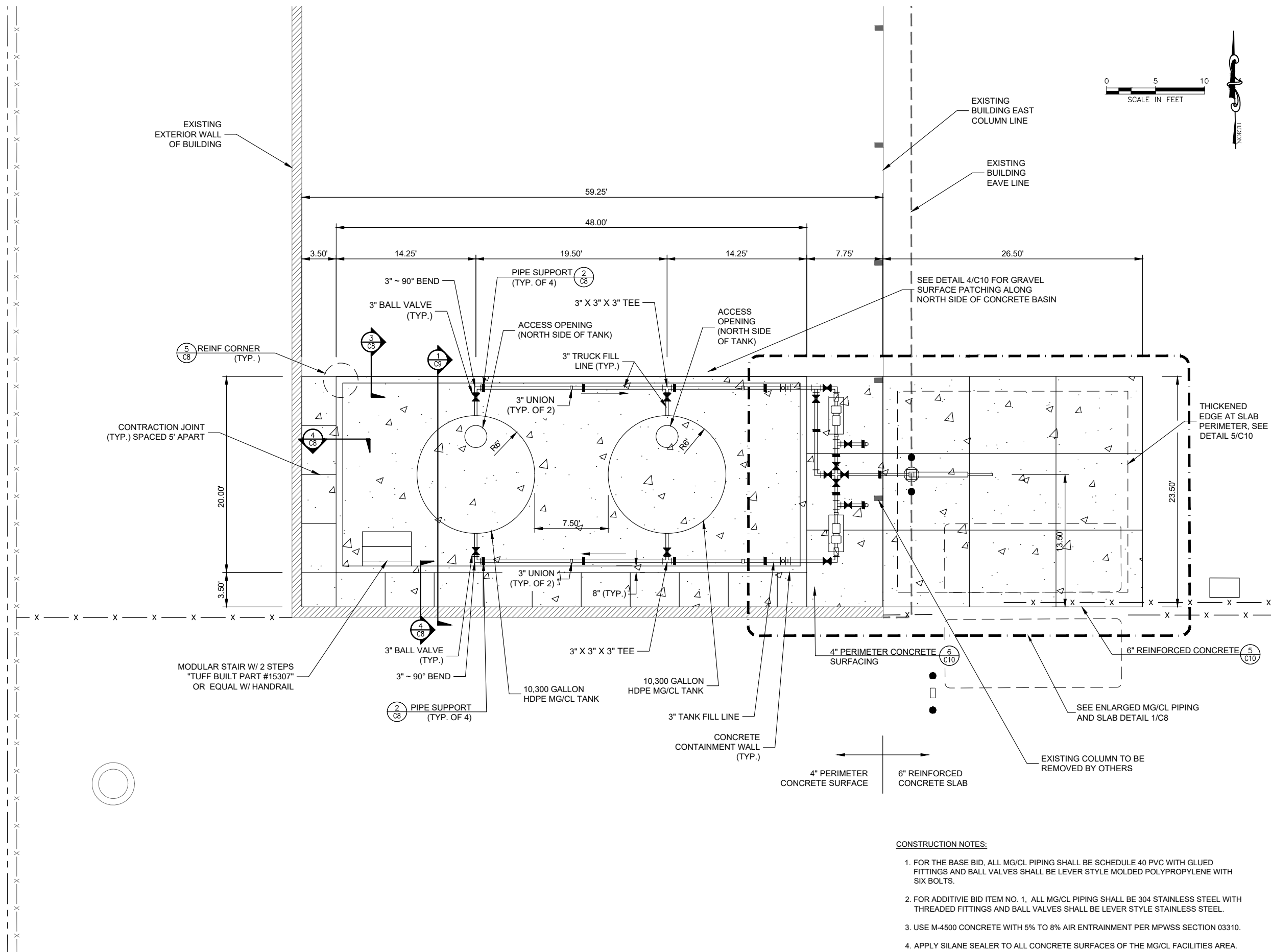
NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-18132-T.O. #15
DESIGNED: JRS
DRAWN: JCL
CHECKED: LMD
APPROVED: JRS
DATE: OCTOBER 31, 2024



LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
ENLARGED FUEL SYSTEM PLAN

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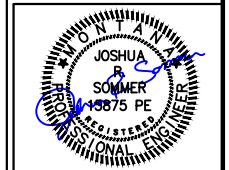


CONSTRUCTION NOTES:

1. FOR THE BASE BID, ALL MG/CL PIPING SHALL BE SCHEDULE 40 PVC WITH GLUED FITTINGS AND BALL VALVES SHALL BE LEVER STYLE MOLDED POLYPROPYLENE WITH SIX BOLTS.
2. FOR ADDITIVIE BID ITEM NO. 1, ALL MG/CL PIPING SHALL BE 304 STAINLESS STEEL WITH THREADED FITTINGS AND BALL VALVES SHALL BE LEVER STYLE STAINLESS STEEL.
3. USE M-4500 CONCRETE WITH 5% TO 8% AIR ENTRAINMENT PER MPWSS SECTION 03310.
4. APPLY SILANE SEALER TO ALL CONCRETE SURFACES OF THE MG/CL FACILITIES AREA.

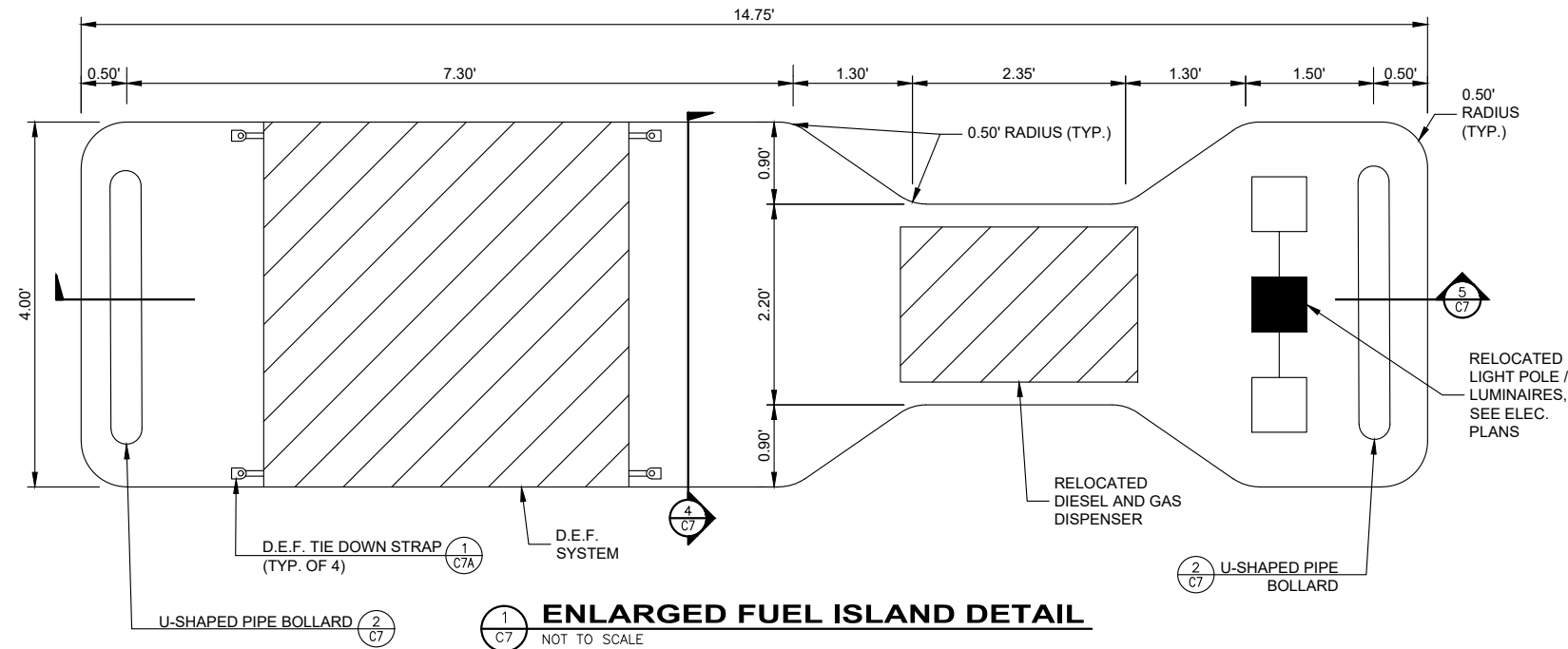
NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-18132-T.O. #15
DESIGNED: JRS
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DATE: OCTOBER 31, 2024

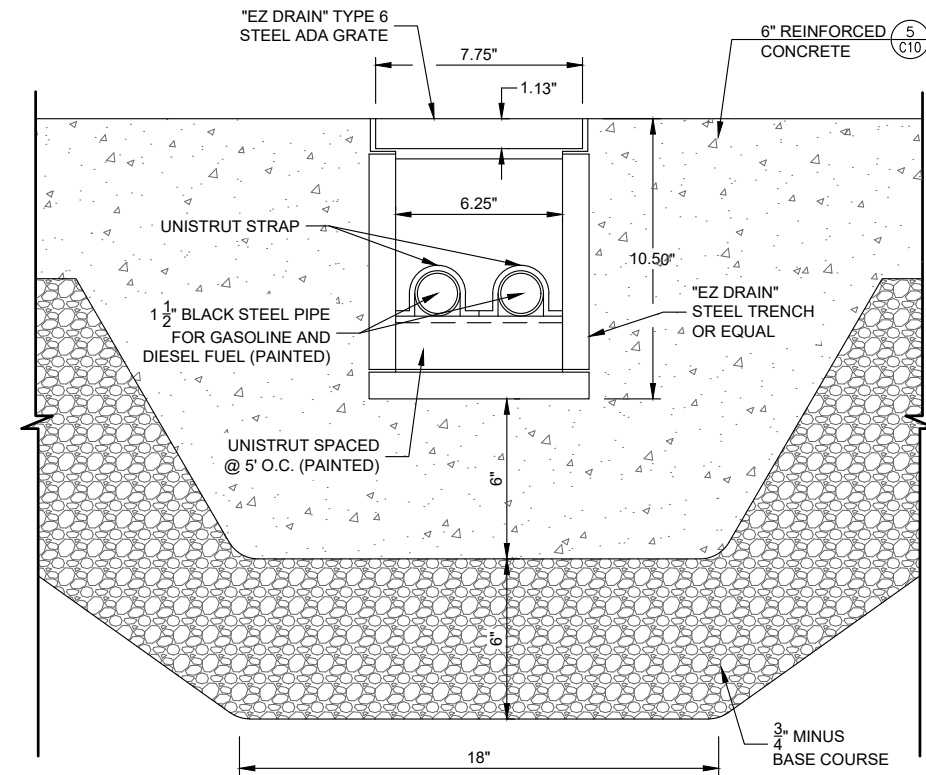


LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
ENLARGED MG/CL SYSTEM PLAN

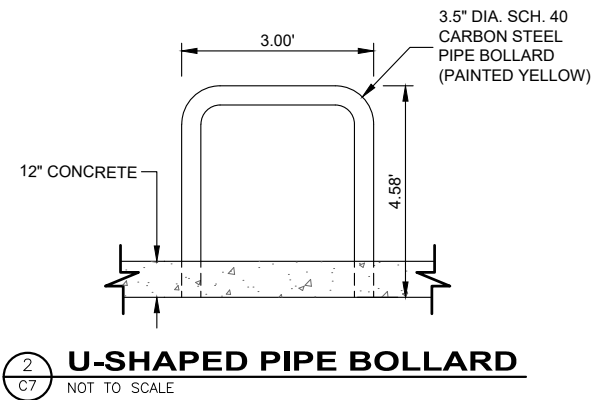
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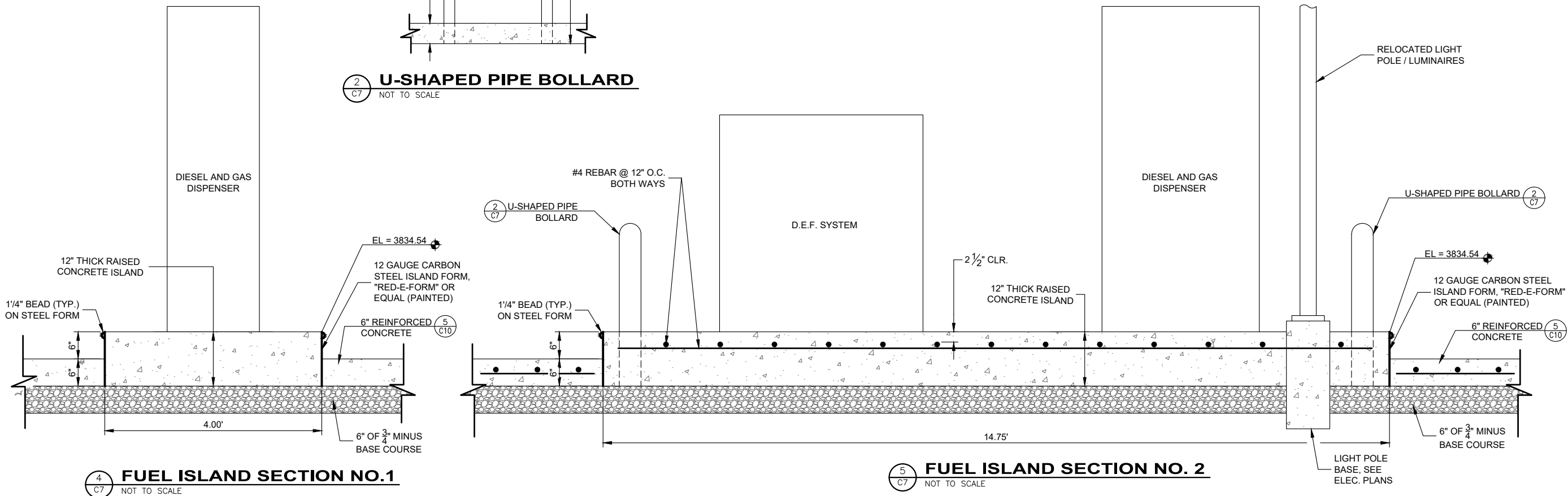
1 ENLARGED FUEL ISLAND DETAIL
NOT TO SCALE



3 FUEL PIPING TRENCH
NOT TO SCALE



2 U-SHAPED PIPE BOLLARD
NOT TO SCALE

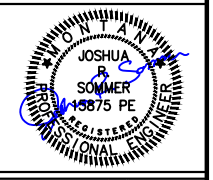


4 FUEL ISLAND SECTION NO. 1
NOT TO SCALE

5 FUEL ISLAND SECTION NO. 2
NOT TO SCALE

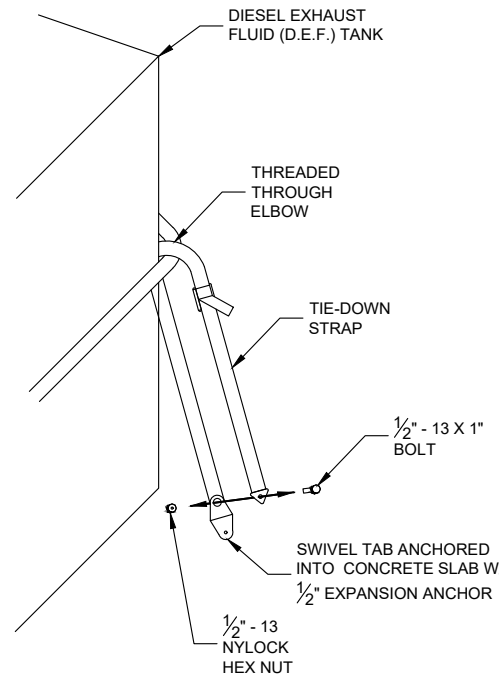
NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-18132-T.O. #15
DESIGNED: JRS
DRAWN: JCL
CHECKED: LMD
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DATE: OCTOBER 31, 2024

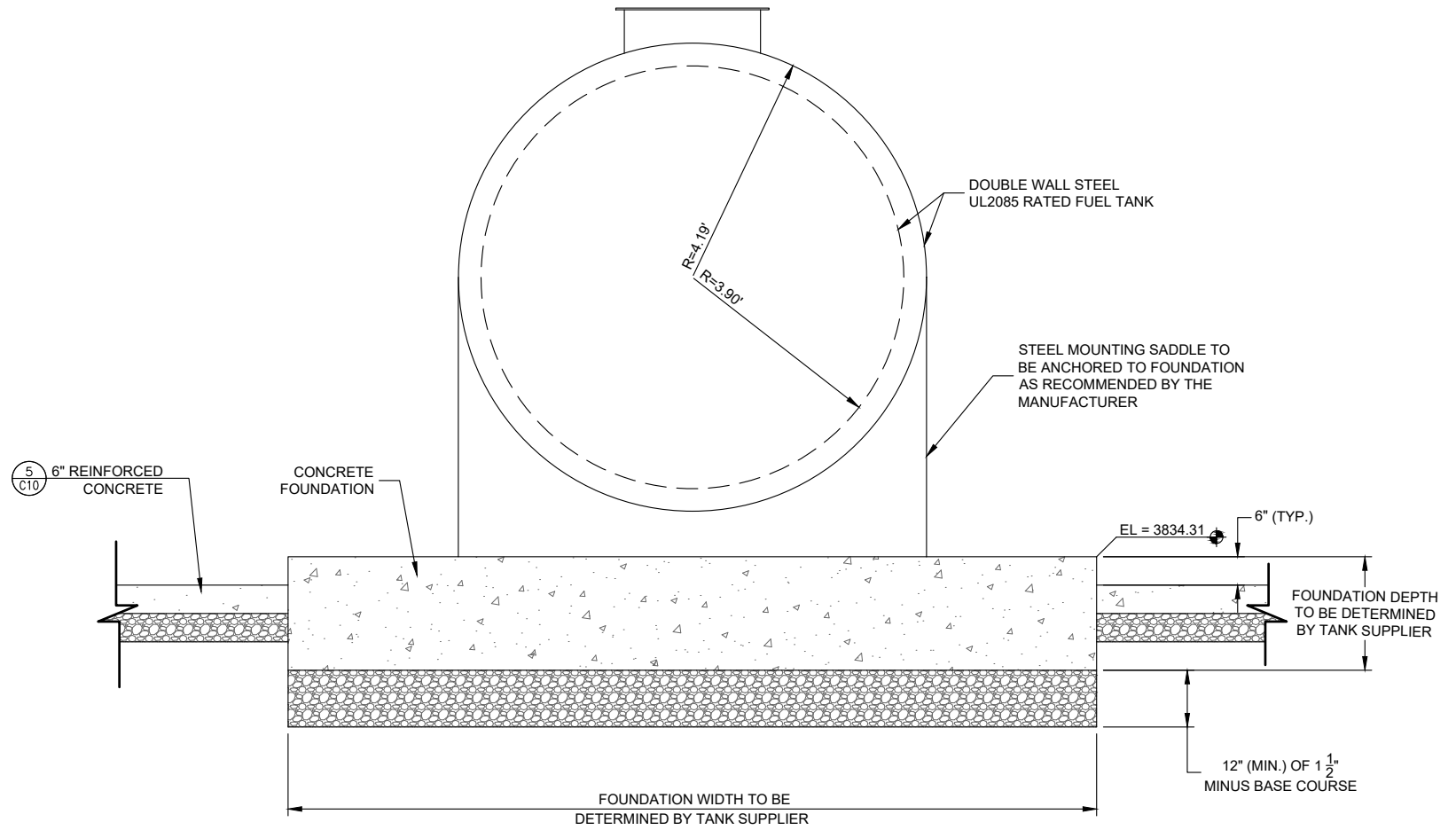


LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
FUELING SYSTEM DETAILS

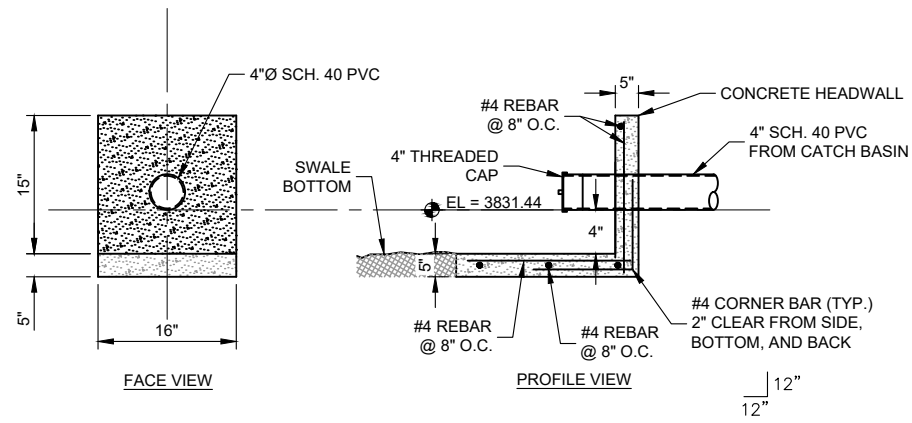
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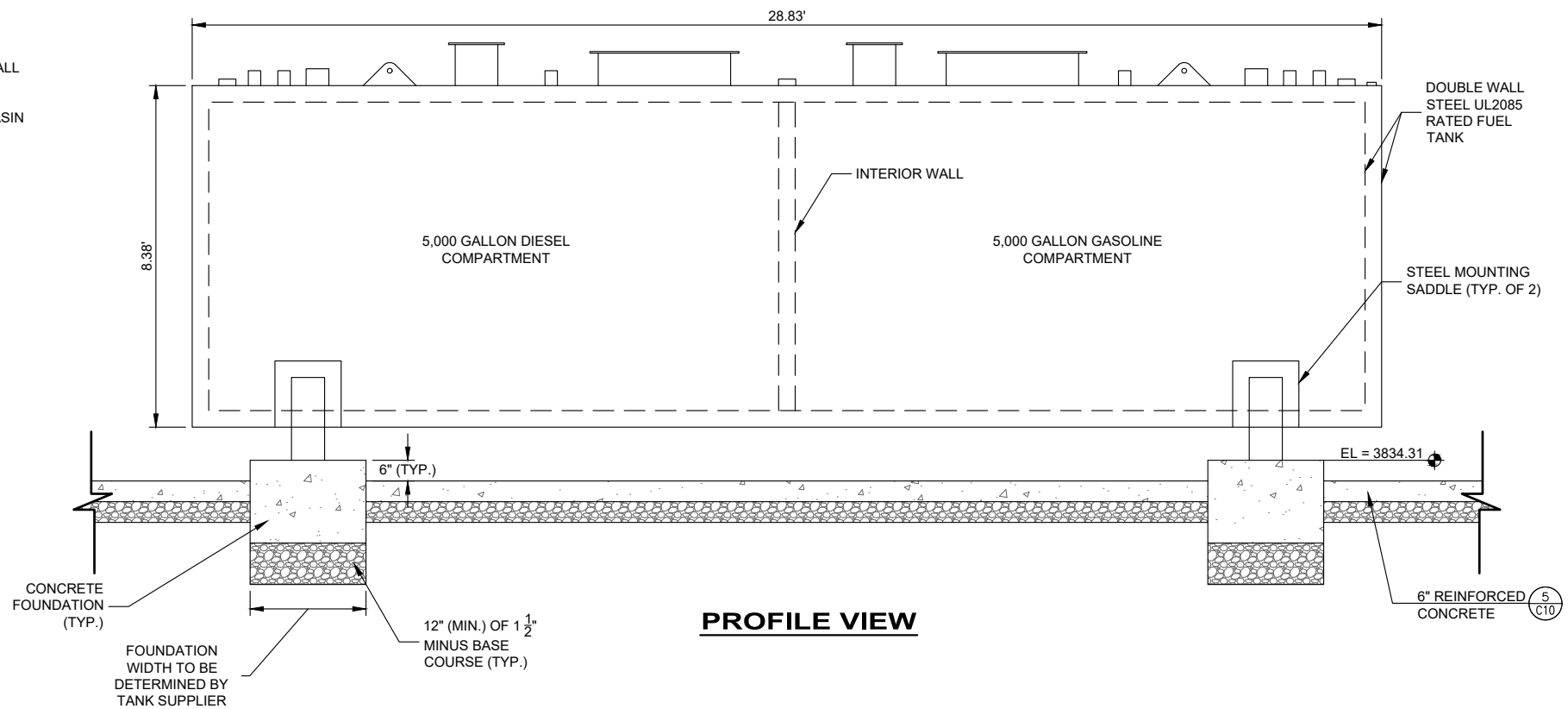
1 D.E.F. TANK TIE DOWN STRAP
NOT TO SCALE



SECTION VIEW



2 DISCHARGE STRUCTURE
NOT TO SCALE

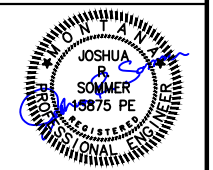


PROFILE VIEW

3 FUEL TANK DETAILS
NOT TO SCALE

NO.	REVISION DESCRIPTION	BY	DATE

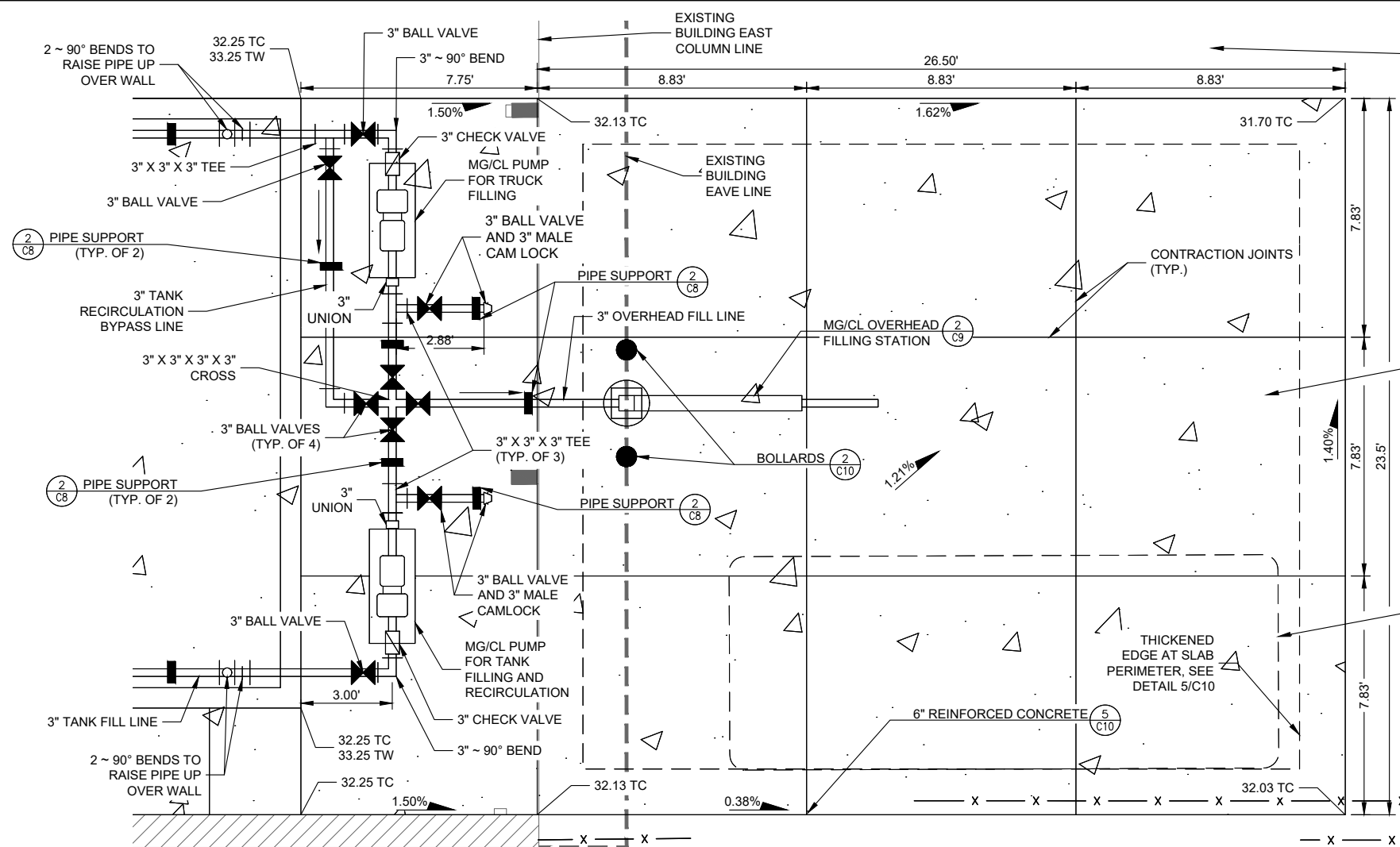
PROJECT: 1-18132-T.O. #15
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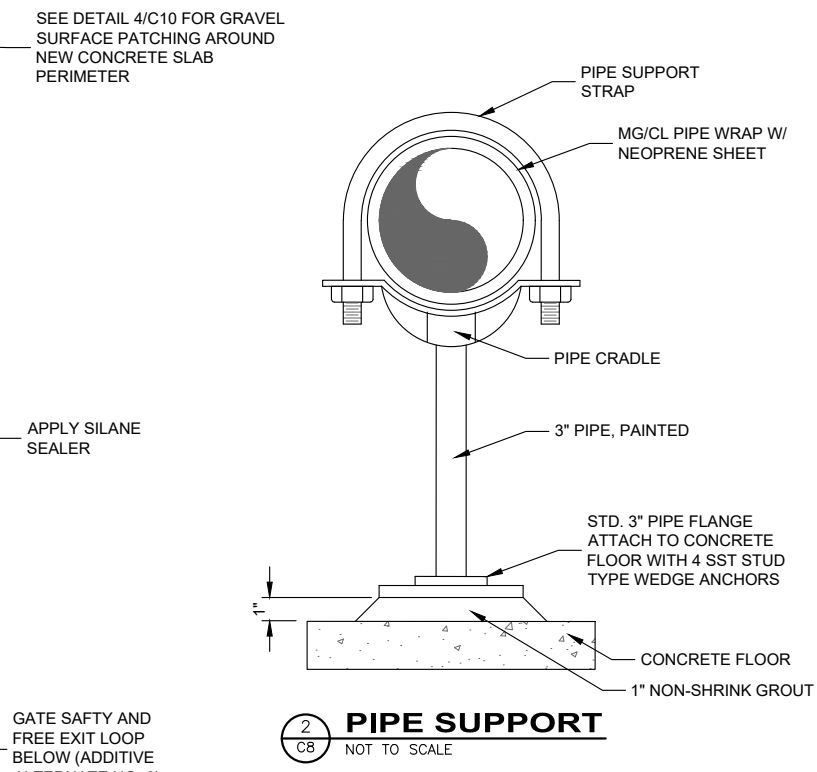
LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
FUELING SYSTEM DETAILS

SHEET NO.
C7A

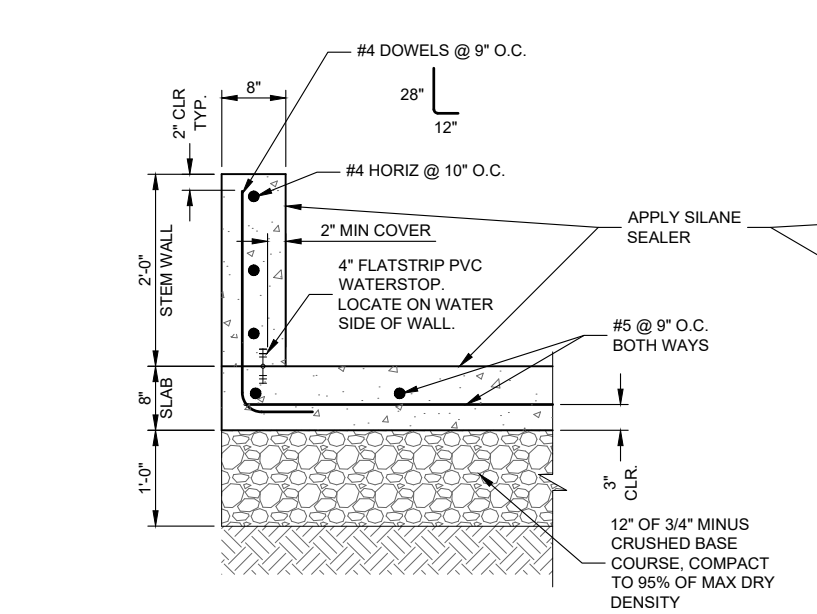
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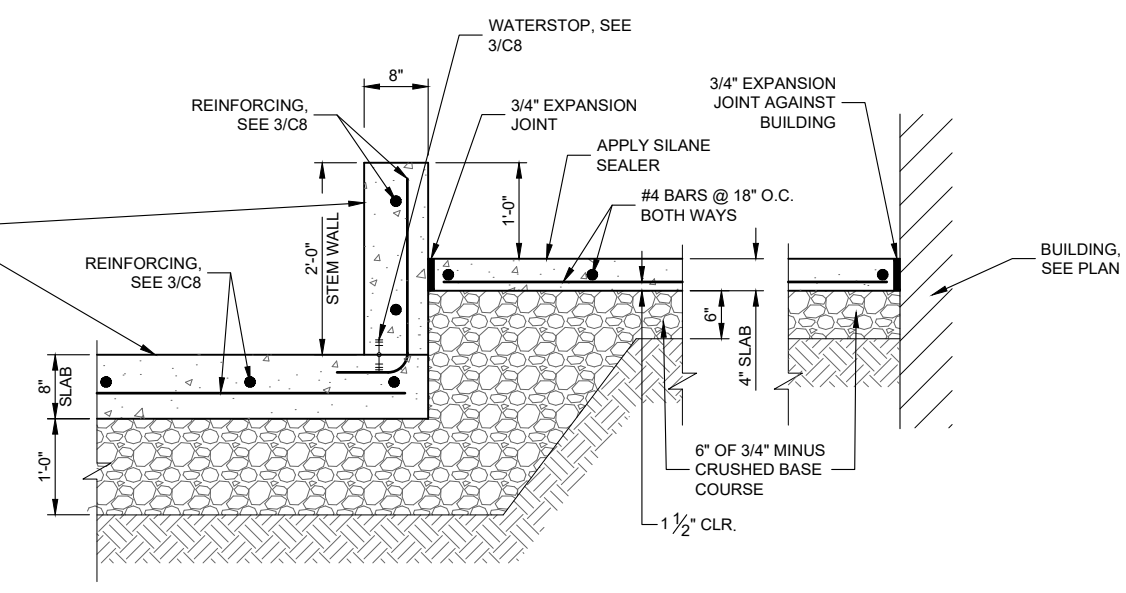
1 ENLARGED MG/CL PIPING AND SLAB DETAIL
NOT TO SCALE



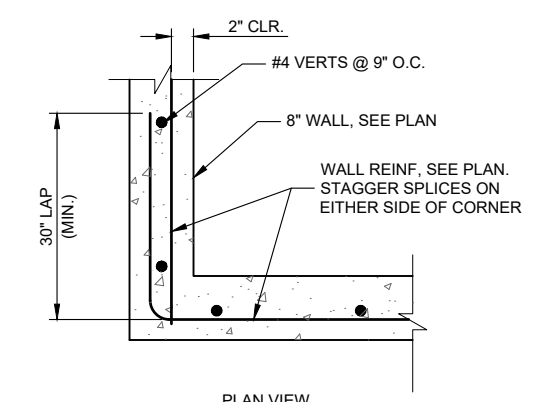
2 PIPE SUPPORT
NOT TO SCALE



3 SLAB TO WALL WATERSTOP
NOT TO SCALE



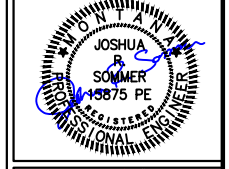
4 BASIN DETAIL SECTION
NOT TO SCALE



5 CORNER REINF. DETAIL
NOT TO SCALE

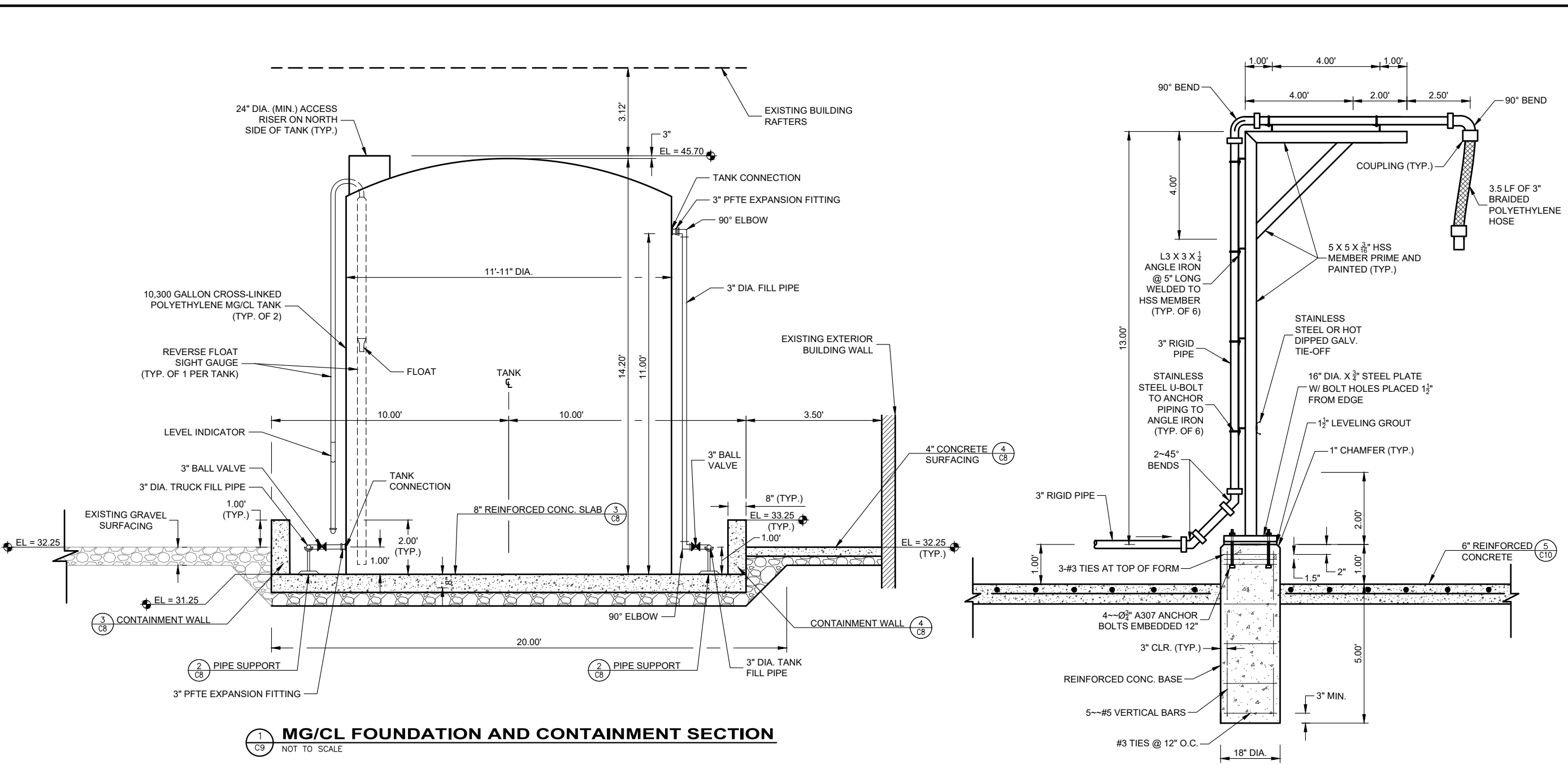
NO.	REVISION DESCRIPTION	BY	DATE

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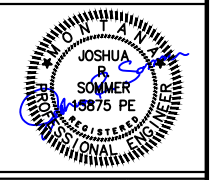
LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
MG/CL SYSTEM DETAILS

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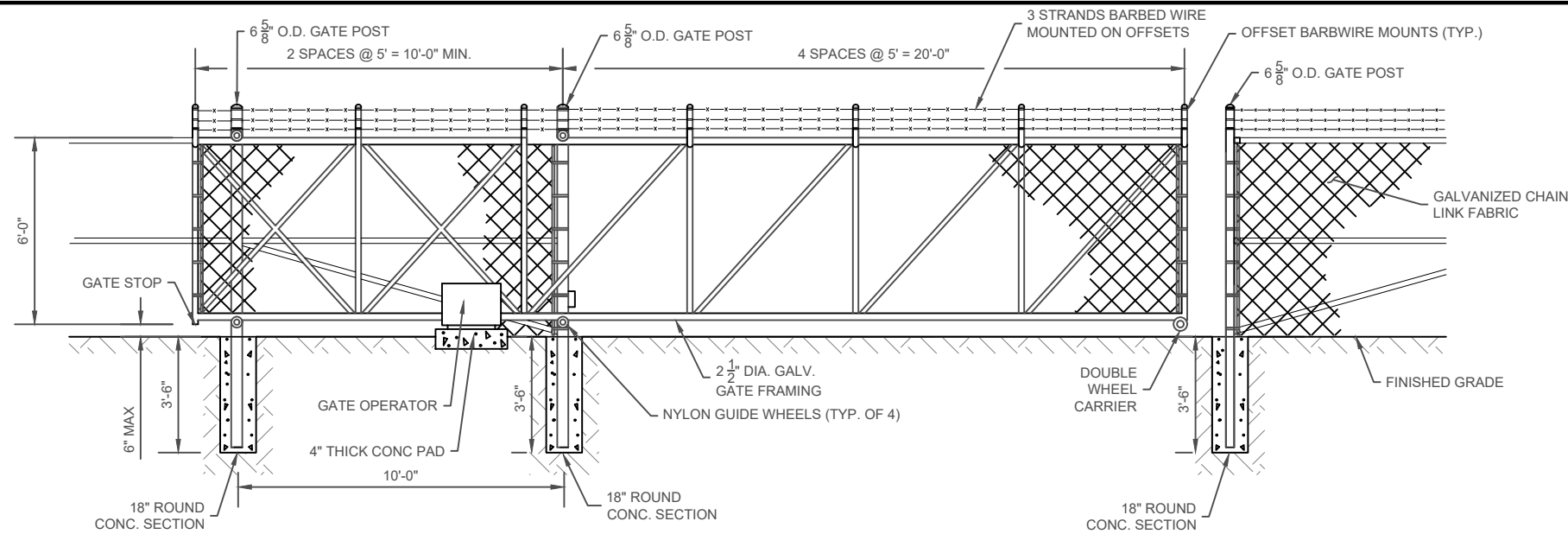
NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-18132-T015	DESIGNED: JRS	DRAWN: JCL	CHECKED: LMD	APPROVED: JRS	DATE: OCTOBER 31, 2024
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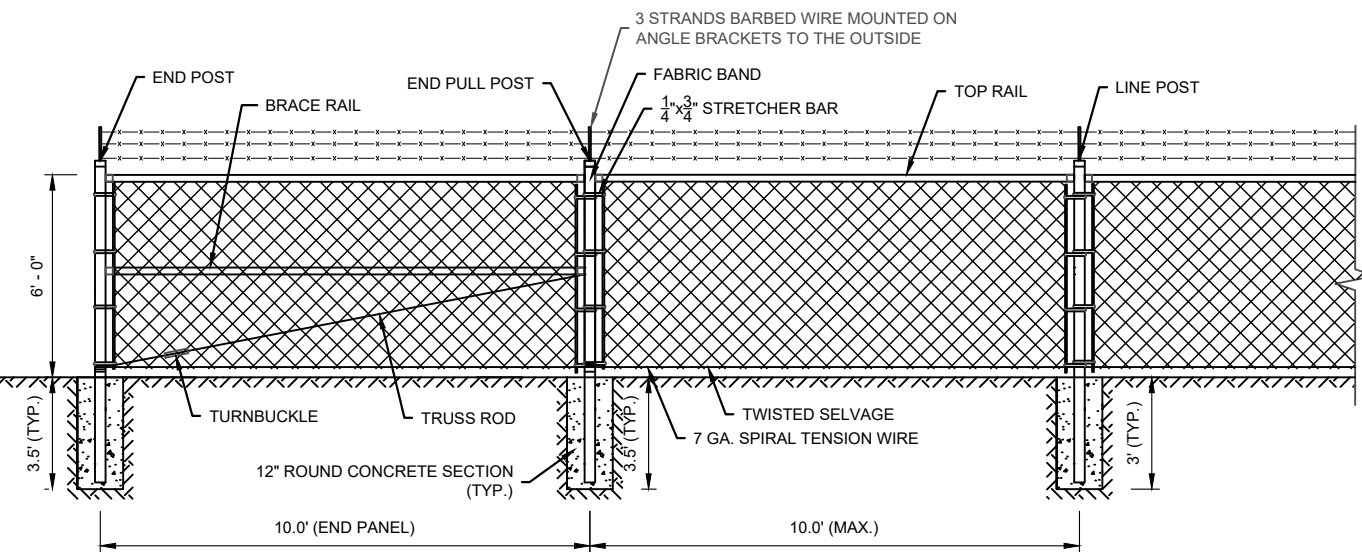


LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
MG/CL SYSTEM DETAILS

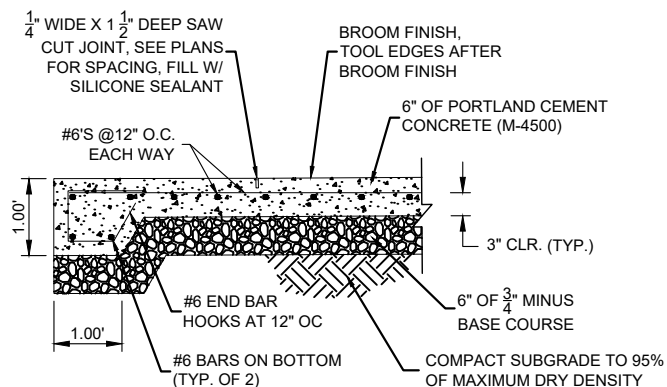
SHEET NO.
C9



1 20' WIDE VEHICLE SLIDE GATE DETAIL (ADDITIVE ALTERNATE NO.2)
C10 NOT TO SCALE



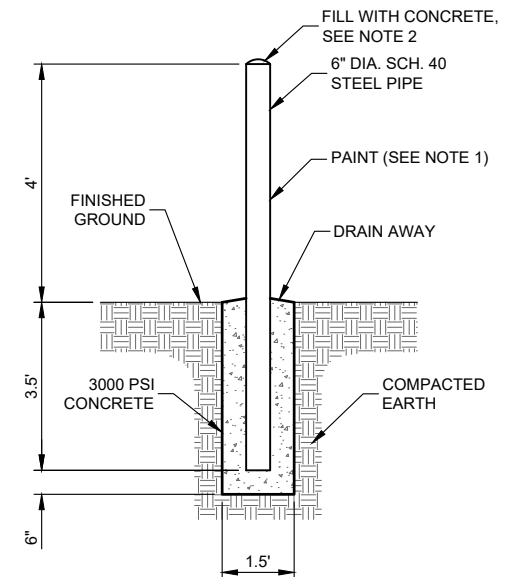
3 CHAIN LINK FENCE DETAIL (ADDITIVE ALTERNATE NO.2)
C10 NOT TO SCALE



5 6" REINFORCED CONCRETE
C10 NOT TO SCALE

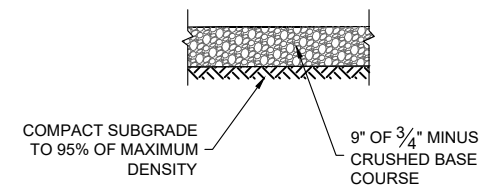
CHAIN LINK FENCE NOTES (ADDITIVE ALTERNATE NO.2):

- ALL CORNER, END, DOUBLE AND PANEL POSTS SHALL BE 2.875" O.D. GALVANIZED STEEL POSTS. LINE POSTS SHALL BE 2.375" O.D. GALVANIZED STEEL POSTS SPACED AT 10'-0".
- ALL BRACE, MID, AND TOP RAILS SHALL BE 1.625" O.D. GALVANIZED STEEL PIPE.
- GATE POSTS SHALL BE 4.0" O.D. GALVANIZED STEEL PIPE.
- CONCRETE FOOTINGS SHALL BE PROVIDED AT EVERY LINE POST AND AT ALL GATES AND CORNER POSTS.
- A SINGLE END PANEL SHALL BE PLACED ON EACH SIDE OF EACH GATE.
- CONCRETE SHALL MEET THE CONCRETE SPECIFICATIONS.
- THE BOTTOM OF THE FENCE SHALL BE WITHIN 2" FROM THE FINISHED GROUND SURFACE.
- THE CONCRETE DIAMETER AT POST EMBEDMENTS SHALL BE FOUR (4) TIMES THE LARGEST CROSS SECTION OF THE POST AND NO SMALLER THAN 12" IN DIAMETER. THE HOLE DEPTH SHALL BE 36" (MIN.) AT THE LINE POSTS AND 42" (MIN.) AT ALL TERMINATION, CORNER, PULL, AND GATE POSTS.



- NOTES:**
- FINISH AND PAINT ALL EXPOSED STEEL WITH 2 COATS OF TRAFFIC YELLOW.
 - FINISH CROWN SMOOTH AND CLEAN.

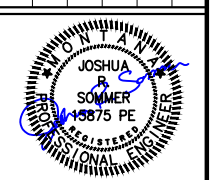
2 BOLLARD
C10 NOT TO SCALE



4 NEW GRAVEL SURFACING
C10 NOT TO SCALE

NO.	REVISION DESCRIPTION	BY	DATE

PROJECT: 1-18132-TO #15
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LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS

DETAILS

SHEET NO.
C10

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MOUNTING HEIGHTS	
DESCRIPTION	HEIGHT
CONTROL / PUSH BUTTON	42"
DISCONNECT SWITCH	60" TO HANDLE
CONVENIENCE OUTLET	18" TO CENTER
ALARM HORN	90" A.F.G., UNLESS NOTED OTHERWISE
MANUAL MOTOR STARTER SWITCH	42"
PANELBOARDS, CABINETS (TO TOP)	72"
MOUNTING HEIGHTS TO BOTTOM OF BOX AND ABOVE FINISHED FLOOR/GRADE, UNLESS NOTED OTHERWISE.	

WORK SPACE NOTE
 MAINTAIN NEC REQUIRED WORK SPACE AROUND ALL ELECTRICAL EQUIPMENT. ADVISE OTHER TRADES OF REQUIREMENTS AND COORDINATE WORK TO AVOID AND PREVENT CONFLICTS.

ELECTRICAL SHEET INDEX	
E1	ELECTRICAL SYMBOLS, LEGEND AND ABBREVIATIONS
E2	OVERALL ELECTRICAL SITE PLAN
E3	ENLARGED ELECTRICAL SITE PLAN - FUEL SYSTEM AND MG/CL SYSTEM
E4	ENLARGED ELECTRICAL PLANS - FUEL SYSTEM AND MG/CL SYSTEM
E5	POWER RISER DIAGRAMS AND SCHEDULES
E6	ELECTRICAL DETAILS
E7	ELECTRICAL DETAIL S AND SCHEDULES
E8	ELECTRICAL DETAIL - DEF WIRING DIAGRAM (REFERENCE)

BASE BID AND ALTERNATES
 PROJECT SCOPE OF WORK IS DIVIDED INTO BASE BID AND ADDITIVE ALTERNATES. ELECTRICAL CONTRACTOR SHALL PROVIDE BIDS ACCORDINGLY TO ACCOUNT FOR THE SEPARATE ITEMS. REFER ALSO TO CIVIL DRAWINGS AND THE FRONT END DOCUMENTS OF THE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
	MANUAL MOTOR STARTER SWITCH
	PUSH BUTTON STATION (MAY BE ONE, TWO OR THREE UNIT)
	DUPLEX OUTLET (SEE NOTES FOR REQUIREMENTS)
	GROUND FAULT CIRCUIT INTERRUPTER OUTLET
	WEATHER PROOF IN USE OUTLET
	SPECIAL PURPOSE OUTLET/CONNECTION
	JUNCTION BOX (J-BOX)
	PULL BOX
	MOTOR CONNECTION
	SPECIAL EQUIPMENT CABINET
	BRANCH CIRCUIT PANELS
	METER
	FUSE WITH RATING
	MOLDED CASE CIRCUIT BREAKER
	EMERGENCY POWER OFF
	HORSEPOWER RATED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	VARIABLE FREQUENCY DRIVE
	COMBINATION MOTOR STARTER/DISCONNECT
	STARTER/CONTACTOR
	CONDUIT UP
	CONDUIT DOWN
	CONDUIT STUB
	TRANSFORMER (RISER DIAGRAM DWG)
	TRANSFORMER (PLAN DWG)
	GROUND CONNECTION
	CIRCUIT (CONCEALED AS SPECIFIED)
	UTILITY ELECTRICAL LINE (FIELD VERIFY UNDERGROUND OR OVERHEAD)
	OVERHEAD POWER
	UNDERGROUND ELECTRICAL
	HOME RUN TO PANEL. NUMBER OF WIRES INDICATED AS FOLLOWS: $\#$ (3), $\#$ (4) OR $\#$ (6), ETC. A CIRCUIT WITH NO HASH MARKS IS TWO WIRE PLUS A GROUND. CIRCUITS ARE 20 AMP WITH #12 WIRE, UNLESS NOTED OTHERWISE. 30/3 INDICATES 30 AMP, 3 POLE ETC.

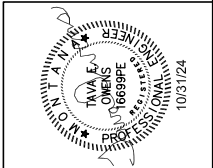
ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
	FLAG NOTE SYMBOL
	EQUIPMENT MARK, SEE PLANS AND SCHEDULES
1PH	SINGLE PHASE
1P	SINGLE POLE
3PH	THREE PHASE
AF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AMP	AMPERE
BKR, CB	CIRCUIT BREAKER
BLDG	BUILDING
C	CONDUIT
CKT	CIRCUIT
CLNG	CEILING
CU	COPPER
DPDT, DPST	DOUBLE POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW
DS	DISCONNECT SWITCH
DWG	DRAWING
E.C., EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY
EPO	EMERGENCY POWER OFF
EX, EXIST	EXISTING
FLA	FULL LOAD AMPS
GFCI, GFI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
ID, I.D.	IDENTIFICATION AND/OR INSIDE DIAMETER (REFER TO CONTEXT)
JB, J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
LTG, LTS	LIGHTING, LIGHTS
LP	LIGHTING PANELBOARD
LV	LOW VOLTAGE

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MDB	MAIN DISTRIBUTION BOARD
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	MANHOLE OR MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MOCP	MINIMUM OVERCURRENT PROTECTION
MT, MTD, MTG	MOUNT, MOUNTED, MOUNTING
NA, NA	NOT APPLICABLE
NEC	NATIONAL ELECTRICAL CODE
OD, O.D.	OUTSIDE DIAMETER
P	POLE
PB	PULLBOX
PF	POWER FACTOR
PH	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PMR	PER MANUFACTURER'S RECOMMENDATIONS
PNL	PANEL
PWR	POWER
RCP, RCP/T	RECEPTACLE(S)
RM	ROOM
SCH	SCHEDULE
SQ. FT.	SQUARE FEET
SPST	SINGLE POLE, SINGLE THROW
SWBD, SWGR	SWITCHBOARD, SWITCHGEAR
TYP.	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
U.N.O., UNO	UNLESS NOTED OTHERWISE
V, VA	VOLT, VOLT-AMPERE
W	WALL-MOUNTED DEVICE, WATT
WP	WEATHERPROOF-IN-USE
XFMR	TRANSFORMER
XP	EXPLOSION-PROOF
(NOT ALL SYMBOLS OR ABBREVIATIONS USED)	

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NO.	REVISION DESCRIPTION	BY	DATE
1			
2			
3			
4			

PROJECT: 14-18132 (GWNE)/24-001 (TESla)
 DESIGNED: TEO
 DRAWN: TEO
 CHECKED: TEO
 APPROVED: TEO
 DATE: OCTOBER 31, 2024



BASIC ELECTRICAL REQUIREMENTS

SUMMARY OF WORK:
 FURNISH ALL LABOR AND MATERIALS AND PERFORM ALL OPERATIONS NECESSARY FOR THE INSTALLATION OF COMPLETE AND OPERATING ELECTRICAL SYSTEMS SUBJECT TO THE CONDITIONS OF THE CONTRACT. PROVIDE SATISFACTORY OPERATION OF ALL EQUIPMENT AND CONTROLS TO THE ENGINEER UPON REQUEST.

EXAMINATION OF SITE:
 VISIT THE SITE BEFORE SUBMITTING BID. NO EXTRAS WILL BE ALLOWED FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS.

COORDINATION:
 COORDINATE AND ORDER THE PROGRESS OF WORK TO CONFORM TO THE OWNER'S SCHEDULE AND THE PROGRESS OF THE WORK OF THE OTHER TRADES. SCHEDULE PLAN WORK SO THAT THE DURATION OF THE INTERRUPTIONS ARE KEPT TO A MINIMUM. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND BECAUSE OF THE SMALL SCALE, IT IS NOT POSSIBLE TO INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. VERIFY ALL SPACE REQUIREMENTS, COORDINATE WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.

VERIFY ALL EQUIPMENT IS READY FOR ELECTRICAL CONNECTIONS. COORDINATE ALL ELECTRICAL CONNECTIONS WITH THE START-UP OF THE EQUIPMENT. THIS CONTRACTOR SHALL PLAN HIS WORK TO PROCEED WITH MINIMUM INTERFERENCE WITH OTHER TRADES AND IT SHALL BE HIS RESPONSIBILITY TO INFORM THE GENERAL CONTRACTOR OF ALL PROVISIONS REQUIRED FOR INSTALLATION OF THE ELECTRICAL WORK.

QUALITY ASSURANCE:
 PERFORM WORK IN ACCORDANCE WITH GOOD COMMERCIAL PRACTICE. PERFORM WORK IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL STANDARDS. THE QUALITY APPEARANCE OF THE FINISHED WORK SHALL BE OF EQUAL IMPORTANCE WITH ITS ELECTRICAL EFFICIENCY. THE ENGINEER MAY REJECT WORK IF WORKMANSHIP AND APPEARANCE ARE NOT SATISFACTORY. INSTALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, UNLESS SPECIFICALLY INDICATED OTHERWISE, OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

REGULATORY AND CODE REQUIREMENTS:
 APPLY FOR AND PAY FOR ALL PERMITS, FEES, LICENSES AND INSPECTIONS FOR THIS DIVISION OF WORK. COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AND ORDINANCES. COMPLY WITH REQUIREMENTS OF THE UTILITY COMPANIES. IN THE CASE OF DIFFERENCES BETWEEN THESE REQUIREMENTS AND ORDINANCES, THE MOST STRINGENT SHALL GOVERN. CALL FOR INSPECTIONS REQUIRED BY LOCAL BUILDING INSPECTION AUTHORITY.

WORK SHALL MEET THE REQUIREMENTS OF THE PLANS AND SHALL MEET NO LESS THAN THE MINIMUM REQUIREMENTS AND LATEST CODES AND STANDARDS OF THE FOLLOWING: ANSI, NEC, NEMA, NFPA, OSHA, UL, UBC, LOCAL FIRE MARSHAL, AND SERVING UTILITIES.

PLANS AND SPECIFICATIONS GO HAND IN HAND. WHAT IS REQUIRED IN ONE IS REQUIRED IN BOTH. WHERE CONFLICTS BETWEEN THE SPECIFICATIONS AND PLANS EXIST, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

RESPONSIBILITY:
 BE RESPONSIBLE FOR THE INSTALLATION OF SATISFACTORY AND COMPLETE SYSTEMS IN ACCORDANCE WITH THE INTENT OF THE DRAWINGS. PROVIDE, AT NO EXTRA COST, ALL INCIDENTAL ITEMS REQUIRED FOR COMPLETION OF THE WORK, EVEN THOUGH THEY ARE NOT SPECIFICALLY MENTIONED OR INDICATED ON THE DRAWINGS.

AT ALL TIMES DURING THE PERFORMANCE OF THIS CONTRACTOR, PROPERLY PROTECT WORK FROM DAMAGE AND PROTECT THE OWNER'S PROPERTY FROM INJURY OR LOSS. MAKE GOOD ANY DAMAGE, INJURY, OR LOSS, EXCEPT SUCH AS MAY BE DIRECTLY DUE TO THE ERRORS IN THE PROPOSAL DOCUMENTS OR CAUSED BY REPRESENTATIVES OF THE OWNER. ADEQUATELY PROTECT ADJACENT PROPERTY AS PROVIDED BY LAW AND THE DOCUMENTS. PROVIDE AND MAINTAIN PASSAGEWAYS, GUARD FENCES, LIGHTS, AND OTHER FACILITIES, AS REQUIRED FOR PROTECTION.

WORKMANSHIP:
 WORK UNDER THIS CONTRACT SHALL BE PERFORMED BY WORKMEN SKILLED IN THE PARTICULAR TRADE INCLUDING WORK NECESSARY TO PROPERLY COMPLETE THE INSTALLATION IN A WORKMANLIKE MANNER TO PRESENT A NEAT AND FINISHED APPEARANCE.

SHOP DRAWINGS:
 SUBMIT SHOP DRAWINGS FOR ALL MATERIALS AND EQUIPMENT SHOWING ANY CHANGES REQUIRED IN ANY DISTRIBUTION EQUIPMENT, PANELBOARDS, ELECTRICAL WIRING, SPACE ALLOCATION, ETC.

PROVIDE PRODUCT DATA WITH MANUFACTURER'S CATALOG INFORMATION SHOWING RATINGS, DIMENSIONS, CONFIGURATIONS AND CONSTRUCTION. ALSO PROVIDE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

OPERATION AND MAINTENANCE DATA:
 AT THE COMPLETION OF WORK, SUBMIT (3) TYPED AND HARD-BOUND COPIES OF AN OPERATING AND MAINTENANCE MANUAL TO THE ENGINEER FOR APPROVAL BEFORE SCHEDULING ANY SYSTEM DEMONSTRATION FOR THE OWNER.

WARRANTIES:
 PROVIDE A WRITTEN WARRANTY TO THE OWNER COVERING THE ENTIRE ELECTRICAL WORK TO BE FREE FROM DEFECTIVE MATERIALS, EQUIPMENT AND WORKMANSHIP FOR A PERIOD OF ONE YEAR AFTER DATE OF ACCEPTANCE.

CLEAN-UP AND CLOSE-OUT:
 KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH CAUSED BY THIS CONTRACTOR'S WORK OR HIS EMPLOYEES.

UPON COMPLETION OF WORK, REMOVE MATERIALS, SCRAPS AND DEBRIS RELATIVE TO THIS CONTRACTOR'S WORK AND LEAVE THE PREMISES IN CLEAN AND ORDERLY CONDITION.

CLEAN EXPOSED SURFACES OF DISCONNECT SWITCHES, METERS, PANELS AND OTHER EXPOSED ITEMS OF GREASE, DIRT OR OTHER FOREIGN MATERIAL. REMOVE RUBBISH AND DEBRIS RESULTING FROM THE OPERATIONS OF THIS CONTRACTOR AND LEAVE SPACES CLEAN AND READY FOR USE.

BASIC MATERIALS AND METHODS

MOTORS AND STARTERS:
 ALL MOTORS, STARTERS AND OTHER ELECTRICAL CONTROL EQUIPMENT SHALL BE LISTED PER THE REQUIREMENTS OF THE NEC.

SEALING:
 MAINTAIN ALL CEILING, FLOOR AND WALL PROTECTION RATINGS FOR FIRE AND SMOKE. SEAL ALL CONDUIT AND ENCLOSURE PENETRATIONS TO COMPLY WITH UL ASSEMBLY AND BUILDING CODE REQUIREMENTS. ALL SEALANTS AND CONSTRUCTIONS SHALL BE APPROVED PRIOR TO APPLICATION. ALL OPENINGS SHALL BE SEALED DAILY.

RACEWAYS: RACEWAYS SHALL BE CONCEALED AND APPROVED FOR USE AND LOCATION.
 DRY LOCATIONS - GRC, IMC, EMT,
 UNDERGROUND - GRC, PVC
 IN SLAB ON GRADE - GRC, IMC,
 FLEXIBLE CONDUIT - GALVANIZED STEEL, LIQUIDTIGHT.

JUNCTION AND PULL BOXES: SIZE PER THE NEC.
 DRY LOCATIONS - STEEL WITH COVERS,
 WET LOCATIONS - CAST ALUMINUM,
 UNDERGROUND/IN SLAB ON GRADE - CAST METAL OR NONMETALLIC.

COUPLINGS AND CONNECTORS:
 GRC - THREADED,
 IMC - THREADED,
 EMT - COMPRESSION,
 PVC - CEMENT.
 JOINT TYPE. INDENTER TYPE CONNECTORS PROHIBITED.

WIRING DEVICES AND PLATES:
 ALL RATINGS SHALL MATCH BRANCH CIRCUIT AND LOAD CHARACTERISTICS. VERIFY RECEPTACLES ARE WEATHERPROOF, IN-USE TYPE, AS REQUIRED.

WIRE:
 COPPER ONLY WITH THHN/THWN TYPE INSULATION IN RACEWAY, UNLESS SPECIFICALLY NOTED OTHERWISE. ALUMINUM CONDUCTORS IN RACEWAY ALLOWED ONLY WITH PRIOR APPROVAL OF THE ENGINEER. UL LISTED LUGS AND CONNECTORS, NEC APPROVED COLOR CODING. ALL WIRE SHALL HAVE AN INSULATION VOLTAGE RATING OF 600 VOLTS; AND AN INSULATION TEMPERATURE RATING OF 75 DEGREE C.

WIRE COLORS: BLACK, RED, AND BLUE FOR CIRCUITS AT 120/208V & 120/240V, SINGLE OR THREE PHASE. BROWN, ORANGE, AND YELLOW FOR CIRCUITS AT 277/480V.

SUPPORTS AND HANGERS:
 SUPPORTS AND HANGERS MUST BE UL LISTED AND APPROVED BY LOCAL INSPECTORS.

ANCHORS:
 HOLLOW MASONRY - TOGGLE BOLT,
 SOLID MASONRY - EXPANSION BOLT,
 METAL - MACHINE SCREWS, BOLTS, WELDING,
 WOOD - WOOD SCREWS.

GROUNDING:
 IN STRICT ACCORDANCE WITH THE NEC AND UTILITY COMPANY REGULATIONS. PROVIDE COPPER EQUIPMENT GROUNDING CONDUCTOR IN ALL RACEWAYS.

PERMANENTLY ATTACH EQUIPMENT AND GROUNDING CONDUCTORS PRIOR TO ENERGIZING EQUIPMENT.

NAMEPLATES:
 PROVIDE ON ALL PANELS, DISCONNECTS, CONTROLLERS, AND EQUIPMENT. NAMEPLATES SHALL HAVE 3/16" HIGH LETTERS ENGRAVED WITH CONTRASTING COLOR FILL. DEVICE PLATE ENGRAVING SHALL BE 1/8" HIGH LETTERS WITH CONTRASTING COLOR FILL.

ENCLOSED SWITCHES:
 UNLESS SPECIFICALLY NOTED OTHERWISE, PROVIDE NEMA KS 1 TYPE GD WITH EXTERNALLY OPERABLE HANDLE INTERLOCKED TO PREVENT OPENING FRONT COVER WITH SWITCH IN THE "ON" POSITION; ENCLOSED LOAD INTERRUPTER KNIFE SWITCH. HANDLE LOCKABLE IN THE "OFF" POSITION.

SWITCH SHALL BE HORSEPOWER RATED FOR AC, AS INDICATED ON THE DRAWINGS. SHORT CIRCUIT CURRENT RATING SHALL BE UL LISTED FOR 10,000 RMS SYMMETRICAL AMPERES MINIMUM, UNLESS NOTED OTHERWISE ON THE PLAN DRAWINGS.

ENCLOSURE SHALL BE NEMA KS 1 TO MEET THE CONDITIONS. FABRICATE THE ENCLOSURE FROM STEEL FINISHED WITH THE MANUFACTURER'S STANDARD GRAY ENAMEL. PROVIDE NEMA 1F FOR INTERIOR DRY LOCATIONS, NEMA 4 FOR INDUSTRIAL LOCATIONS, AND NEMA 3R FOR EXTERIOR LOCATIONS. FURNISH SWITCHES WITH ENTIRELY COPPER CURRENT CARRYING PARTS.

LIGHT FIXTURES:
 EXISTING LIGHT FIXTURES TO BE RELOCATED AND REINSTALLED IN A NEW LOCATION. CLEAN AND REPAIR ANY DAMAGED FIXTURES, POLES, LENSES, ETC. REINSTALLED FIXTURES SHALL BE FULLY OPERATIONAL. CONNECT LIGHT FIXTURES TO BRANCH CIRCUITS, AS INDICATED.

EQUIPMENT:
 SEE PLANS FOR CONNECTION OF EQUIPMENT, INCLUDING PUMPS, FUEL DISPENSERS, CONTROLLERS, GATE OPERATORS, EXHAUST SYSTEMS, ETC. PROVIDE FLEXIBLE CONDUIT (WITH EQUIPMENT GROUND CONDUCTOR) CONNECTION AT ALL MOTORS.

ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION OF ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTION. ELECTRICAL CONTRACTOR SHALL OBTAIN SUBMITTALS TO COORDINATE DISCONNECT MEANS, SPECIFICATIONS, AND VOLTAGE REQUIREMENTS PRIOR TO ROUGH-IN. VERIFY REQUIREMENTS FOR ALL EQUIPMENT. IF DISCREPANCIES OCCUR, NOTIFY THE ELECTRICAL ENGINEER IMMEDIATELY.

ELECTRICAL CONTRACTOR IS TO REVIEW AND COORDINATE WITH ALL DRAWINGS, INCLUDING ALL EQUIPMENT SCHEDULES TO ENSURE THAT ALL CONNECTIONS FOR THE EQUIPMENT ARE PROVIDED. DEVICE LOCATIONS SHALL BE COORDINATED WITH THE APPROPRIATE CONTRACTOR/SUPPLIER PRIOR TO COMMENCEMENT OF WORK OR ELECTRICAL ROUGH-INS.

ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING TO PROVIDE 120V POWER, IF NEEDED, TO ACCOMMODATE ANY LOW VOLTAGE REQUIREMENTS THAT EQUIPMENT MAY HAVE.

INSTALL DISCONNECT SWITCHES, STARTERS, CONTROLLERS, OPERATORS, ETC, TO COMPLETE ALL EQUIPMENT WIRING REQUIREMENTS.

DRAWINGS AND MEASUREMENTS:
 CONTRACT DRAWINGS FOR ELECTRICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, CONDUITS, AND APPROXIMATE SIZES AND LOCATIONS OF EQUIPMENT AND OUTLETS. ELECTRICAL TRADES SHALL FOLLOW THESE DRAWINGS IN LAYING OUT THEIR WORK. CONSULT GENERAL CONSTRUCTION DRAWINGS TO FAMILIARIZE THEMSELVES WITH ALL CONDITIONS AFFECTING THEIR WORK; AND SHALL VERIFY SPACES IN WHICH THEIR WORK WILL BE INSTALLED. COORDINATE WORK WITH OTHER TRADES AS JOB CONDITIONS REASONABLY REQUIRE.

WHERE JOB CONDITIONS REQUIRE REASONABLE CHANGES IN INDICATED LOCATIONS AND ARRANGEMENT, MAKE SUCH CHANGES WITHOUT EXTRA COST TO OWNER.

THE DRAWINGS ARE NOT INTENDED TO BE SCALED FOR ROUGH-IN MEASUREMENTS AND ARE NOT TO SERVE AS SHOP DRAWINGS.

NO MORE THAN THREE PHASE CONDUCTORS, TWO SWITCH LEGS, ONE NEUTRAL AND ONE GROUND SHALL BE INSTALLED PER RACEWAY UNLESS PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.

ALL RACEWAYS SHALL BE CONCEALED IN FINISHED SPACES, UNLESS NOTED OTHERWISE. RACEWAYS IN NON-FINISHED SPACES, SUCH AS STATION ENCLOSURES, SHALL BE PERMITTED TO BE EXPOSED. ALL EXPOSED RACEWAYS SHALL BE ROUTED PLUMB AND SQUARE TO ENCLOSURE SURFACES.

OWNER SUPPLIED EQUIPMENT:
 COORDINATE ELECTRICAL CONNECTIONS FOR OWNER-SUPPLIED EQUIPMENT WITH OWNER, MANUFACTURER DATA, AND EQUIPMENT NAMEPLATE INFORMATION.

SUBSTITUTIONS:
 ALL SUBSTITUTIONS TO BE APPROVED BY OWNER, AND ENGINEER.

INSTALLATION:
 INSTALL WORK IN ACCORDANCE WITH STATE AND LOCAL STANDARDS.

RACEWAY ROUTING, WHEN SHOWN, IS IN APPROXIMATE LOCATIONS. FIELD COORDINATE ROUTING. CUT CONDUIT SQUARE USING SAW OR PIPE CUTTER; DEBURR CUT ENDS. CAP AND LABEL, WHERE REQUIRED.

INSTALL SUITABLE PULLSTRING OR CORD IN EACH EMPTY RACEWAY. INSTALL SUITABLE CAPS TO PROTECT INSTALLED CONDUIT AGAINST ENTRANCE OF DIRT AND MOISTURE.

LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
 ELECTRICAL SYMBOLS, LEGEND AND ABBREVIATIONS

SHEET NO.





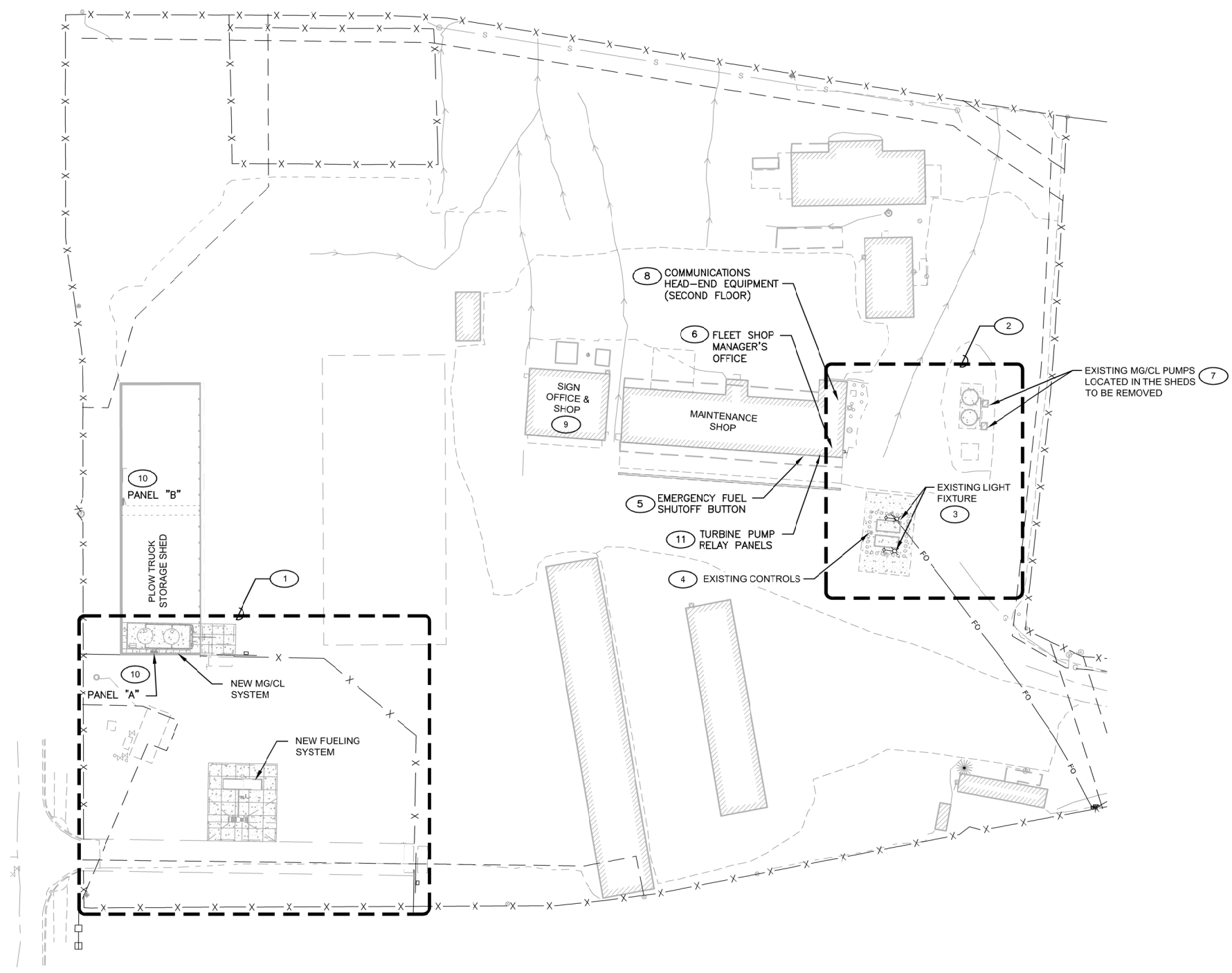
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PROJECT: 1-18132 (GME)/24-001 (TESla)
DESIGNED: TEO
DRAWN: TEO
CHECKED: TEO
APPROVED: TEO
DATE: OCTOBER 31, 2024



LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
 OVERALL ELECTRICAL SITE PLAN



1
E2 **OVERALL ELECTRICAL SITE PLAN** 0 50 100
 SCALE IN FEET

GENERAL ELECTRICAL SITE NOTES

- SEE CIVIL SITE PLANS FOR ADDITIONAL SITE INFORMATION AND REQUIREMENTS. COORDINATE SITE WORK WITH OTHER TRADES.
- REFER TO THE ENLARGED ELECTRICAL SITE PLANS AND POWER RISER DIAGRAMS FOR ADDITIONAL INFORMATION AND REQUIREMENTS IN EACH AREA.
- ELECTRICAL PERMIT SHALL BE OBTAINED FROM THE APPROPRIATE AUTHORITY HAVING JURISDICTION (AHJ) PRIOR TO BEGINNING WORK ON ANY ELECTRICAL WIRING, EQUIPMENT, ETC.

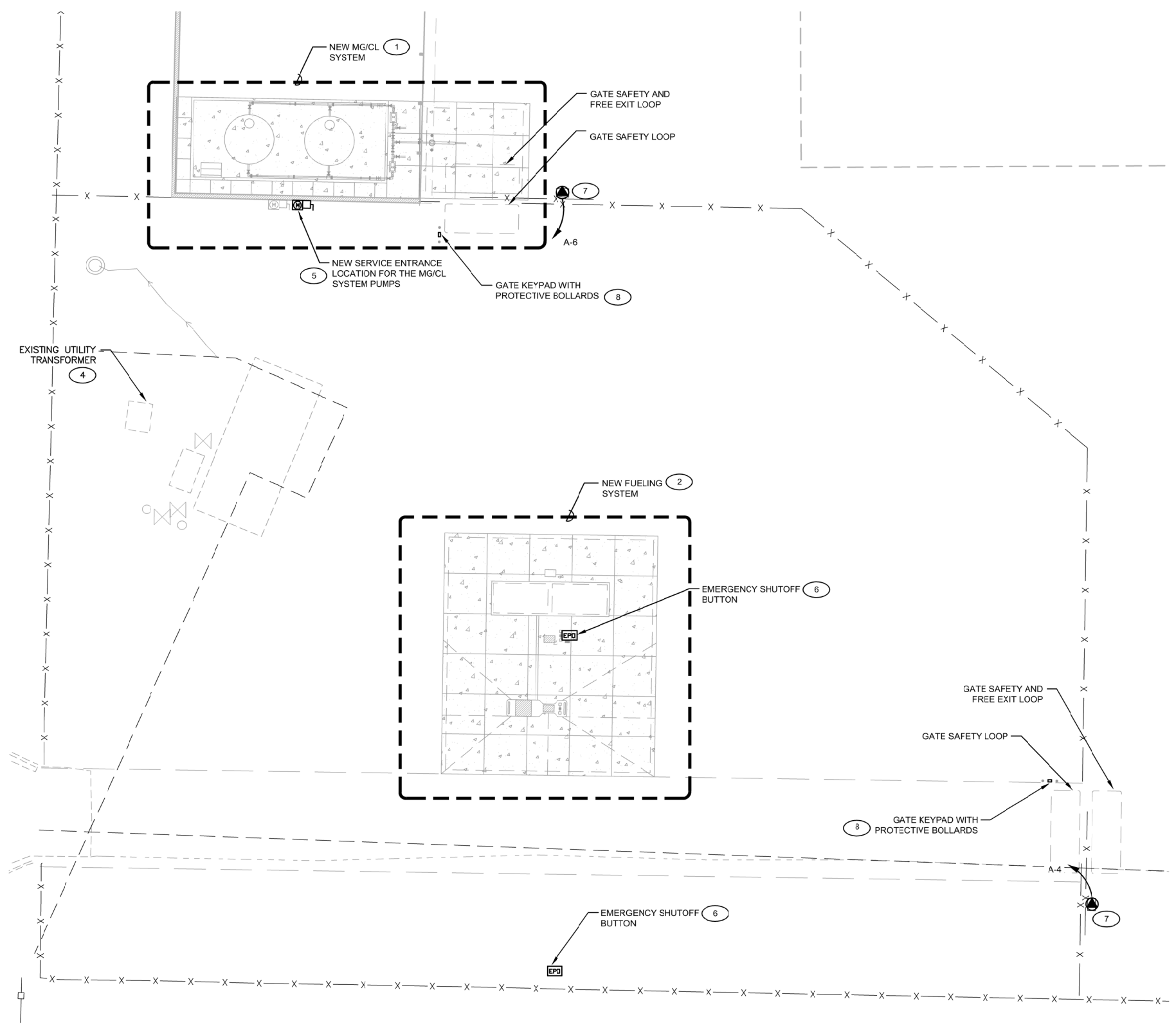
FLAG NOTES THIS SHEET:

- LOCATION OF THE NEW MAGNESIUM CHLORIDE (MG/CL) SYSTEM AND THE NEW FUELING SYSTEM. REFER TO ENLARGED ELECTRICAL SITE PLAN - FUEL SYSTEM AND MG/CL SYSTEM, E3, AND POWER RISER DIAGRAMS, E5, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- LOCATION OF THE EXISTING MG/CL SYSTEM AND THE EXISTING FUELING SYSTEM. EXISTING ELECTRICAL CONNECTIONS SHALL BE REMOVED FOR ALL EQUIPMENT, INCLUDING, BUT NOT LIMITED TO PUMPS, CONTROLS, AND LIGHTING. CONNECTIONS SHALL BE REMOVED IN THEIR ENTIRETY BACK TO SOURCE, OR NEAREST REMAINING DEVICE OR PIECE OF EQUIPMENT. MAINTAIN ELECTRICAL CONNECTIONS FOR ALL EXISTING EQUIPMENT THAT IS TO REMAIN. REFER TO CIVIL DEMOLITION PLAN, C3, FOR ADDITIONAL INFORMATION AND REQUIREMENTS ON THE DEMOLITION IN THIS AREA.
- EXISTING LIGHT FIXTURES TO BE RELOCATED TO THE NEW FUELING SYSTEM AREA. TAKE CARE WHEN REMOVING THEM SO THEY ARE NOT DAMAGED. TYPICAL FOR (2) EXISTING LIGHT FIXTURES.
- EXISTING CONTROLS TO BE RELOCATED TO THE NEW FUELING SYSTEM AREA. TAKE CARE WHEN REMOVING THE CONTROLS SO THEY ARE NOT DAMAGED.
- APPROXIMATE LOCATION OF EXISTING EMERGENCY FUEL SHUTOFF BUTTON ON THE EXTERIOR OF THE BUILDING. EXISTING SHUTOFF BUTTON TO BE REMOVED IN ITS ENTIRETY. NEW SHUTOFF BUTTON(S) WILL BE LOCATED AT THE NEW FUELING AREA.
- APPROXIMATE LOCATION OF EXISTING MONITORING AND CONTROLS FOR THE FUELING SYSTEM. CONTROLS MONITORING IS IN THE FLEET SHOP MANAGER'S OFFICE. COMMUNICATIONS CONNECTION WILL NEED TO BE RE-ESTABLISHED FROM THE EQUIPMENT AT THE NEW FUELING SYSTEM LOCATION BACK TO THE COMPUTER STATION IN THE FLEET SHOP MANAGER'S OFFICE. ELECTRICAL CONTRACTOR TO FIELD COORDINATE ROUTING FROM THE NEW FUEL SYSTEM CONTROLLER LOCATION TO AN EXISTING POINT OF SERVICE IN THE SIGN OFFICE & SHOP (SEE NOTE 9 BELOW). COPPER COMMUNICATIONS CABLING SHALL NOT EXCEED 395 FEET IN LENGTH FOR A SINGLE RUN. PROVIDE FIBEROPTIC AND TRANSITION TO COPPER, AS NEEDED.
- EXISTING SHEDS WILL BE REMOVED AS PART OF THE DEMOLITION. THE SHEDS CONTAIN THE EXISTING MG/CL PUMPS. REMOVE ALL ELECTRICAL CONNECTIONS FOR THE SYSTEM, INCLUDING, BUT NOT LIMITED TO (2) PUMPS, AND ELECTRICAL PANEL, AND THE SERVICE CONNECTION. REMOVE IN THEIR ENTIRETY BACK TO SOURCE, OR NEAREST REMAINING DEVICE OR PIECE OF EQUIPMENT. MAINTAIN ALL ELECTRICAL CONNECTIONS FOR EQUIPMENT THAT IS TO REMAIN.
- COMMUNICATIONS POINT OF DEMARCATION AND HEAD-END EQUIPMENT LOCATED ON THE SECOND FLOOR (EAST END) OF THE MAINTENANCE SHOP BUILDING.
- NEAREST COMMUNICATIONS POINT OF SERVICE IN THE SIGN OFFICE & SHOP. THERE IS AN EXISTING PATHWAY FROM THIS BUILDING TO THE HEAD-END EQUIPMENT IN THE MAINTENANCE SHOP. ELECTRICAL CONTRACTOR TO FIELD COORDINATE ROUTING OF COMMUNICATIONS CABLING CONNECTION AT THE FUEL SYSTEM CONTROLLER TO THIS POINT, THEN UTILIZE THE EXISTING PATHWAY BACK TO THE FLEET SHOP MANAGER'S OFFICE (SEE NOTE 6 ABOVE).
- APPROXIMATE LOCATIONS FOR PANEL "A" AND PANEL "B" IN THE PLOW TRUCK STORAGE SHED. THERE IS A 50A BLOCK HEATER RECEPTACLE LOCATED NEXT TO PANEL "A". THE RECEPTACLE WILL NEED TO BE RELOCATED TO THE BAY WHERE PANEL "B" IS LOCATED SO THAT IT CAN BE UTILIZED. RELOCATE THE OUTLET AND CIRCUIT BREAKER. PROVIDE NEW FEEDER FROM PANEL "B" FOR THE RELOCATED RECEPTACLE. COORDINATE EXACT LOCATION WITH THE OWNER PRIOR TO ROUGH-INS.
- APPROXIMATE LOCATION OF TURBINE PUMP RELAY PANELS INSIDE THE SHOP AREA. PANELS SHALL BE REMOVED AS PART OF THE DEMOLITION SCOPE OF WORK. TYPICAL FOR (2) TURBINE PUMP RELAY PANELS.



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1 ENLARGED ELECTRICAL SITE PLAN - FUEL SYSTEM AND MG/CL SYSTEM (3)



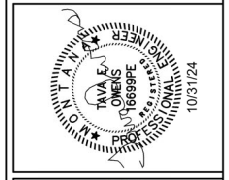
GENERAL ELECTRICAL SITE NOTES

- SEE CIVIL SITE PLANS FOR ADDITIONAL SITE INFORMATION AND REQUIREMENTS. COORDINATE SITE WORK WITH OTHER TRADES.
- ELECTRICAL TERMINATION AT SERVICE EQUIPMENT, AND ALL OTHER ELECTRICAL WORK AS INDICATED ON THIS DRAWING TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK.
- ALL CONDUITS, FOR BRANCH CIRCUIT FEEDERS UNDER PAVEMENT AND LANDSCAPED AREAS SHALL BE SCHEDULE 80 PVC, UNLESS NOTED OTHERWISE. RUN ALL CONDUITS 24" MINIMUM BELOW FINISHED GRADE, UNLESS SPECIFICALLY NOTED OTHERWISE. COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC).
- REFER TO ELECTRICAL DETAILS E6 AND E7, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- REPAIR LANDSCAPE AND PARKING AREAS THAT ARE DISTURBED BY THIS SCOPE OF WORK. AREAS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION, UNLESS NOTED OTHERWISE BY PROJECT SCOPE OF WORK. COORDINATE WITH THE GENERAL CONTRACTOR.
- ELECTRICAL CONTRACTOR SHALL PROVIDE ALL WIRING, CONDUIT, GROUNDING, METERING, ETC. FOR A COMPLETE AND OPERATIONAL SERVICE INSTALLATION.
- COORDINATE AND LOCATE ALL UTILITIES PRIOR TO ANY EXCAVATION. CALL FOR UTILITY LOCATES AND COORDINATION OF WORK PRIOR TO ALL EXCAVATIONS.
- REFER TO POWER RISER DIAGRAMS, E5, FOR ADDITIONAL INFORMATION REGARDING THE SERVICE WHICH IS A PART OF THIS SCOPE OF WORK.
- PROVIDE ADEQUATELY SIZED PULLBOXES FOR POWER, AS NEEDED. STUB UP CONDUIT IN PULLBOX, CAP AND LABEL, AS NEEDED. PULLBOX COVER SHALL READ "ELECTRIC" OR "COMMUNICATIONS," AS APPROPRIATE. PROVIDE A PULLBOX AFTER (2) 90-DEGREE BENDS OR AN ACCUMULATION OF 120-DEGREES OF TOTAL PATHWAY DEVIATION FROM A STRAIGHT LINE BETWEEN EACH ACCESS POINT. LOCATE PULLBOXES SUCH THAT THERE IS A MAXIMUM OF 400'-0" BETWEEN EACH ACCESS POINT. DO NOT LOCATE IN TRAFFIC AREAS, UNLESS SPECIFICALLY MANUFACTURED TO HANDLE VEHICLE TRAFFIC.
- REVIEW EXACT LOCATION OF PULLBOXES WITH THE CIVIL ENGINEER AND OWNER PRIOR TO START OF EXCAVATION. TYPICAL FOR ALL.
- ALL CONDUIT ROUTING SHALL BE FIELD COORDINATED. CAP AND LABEL THE CONDUITS AT BOTH ENDS, AS NEEDED. TYPICAL FOR ALL SITE CONDUIT RUNS.
- ELECTRICAL PERMIT SHALL BE OBTAINED FROM THE APPROPRIATE AUTHORITY HAVING JURISDICTION (AHJ) PRIOR TO BEGINNING WORK ON ANY ELECTRICAL WIRING, EQUIPMENT, ETC. ALL ELECTRICAL WIRING TO COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC).
- ALL WIRING SHALL BE STANDARD COPPER FOR THREE PHASE POWER AND MOTORS, UNLESS NOTED OTHERWISE.

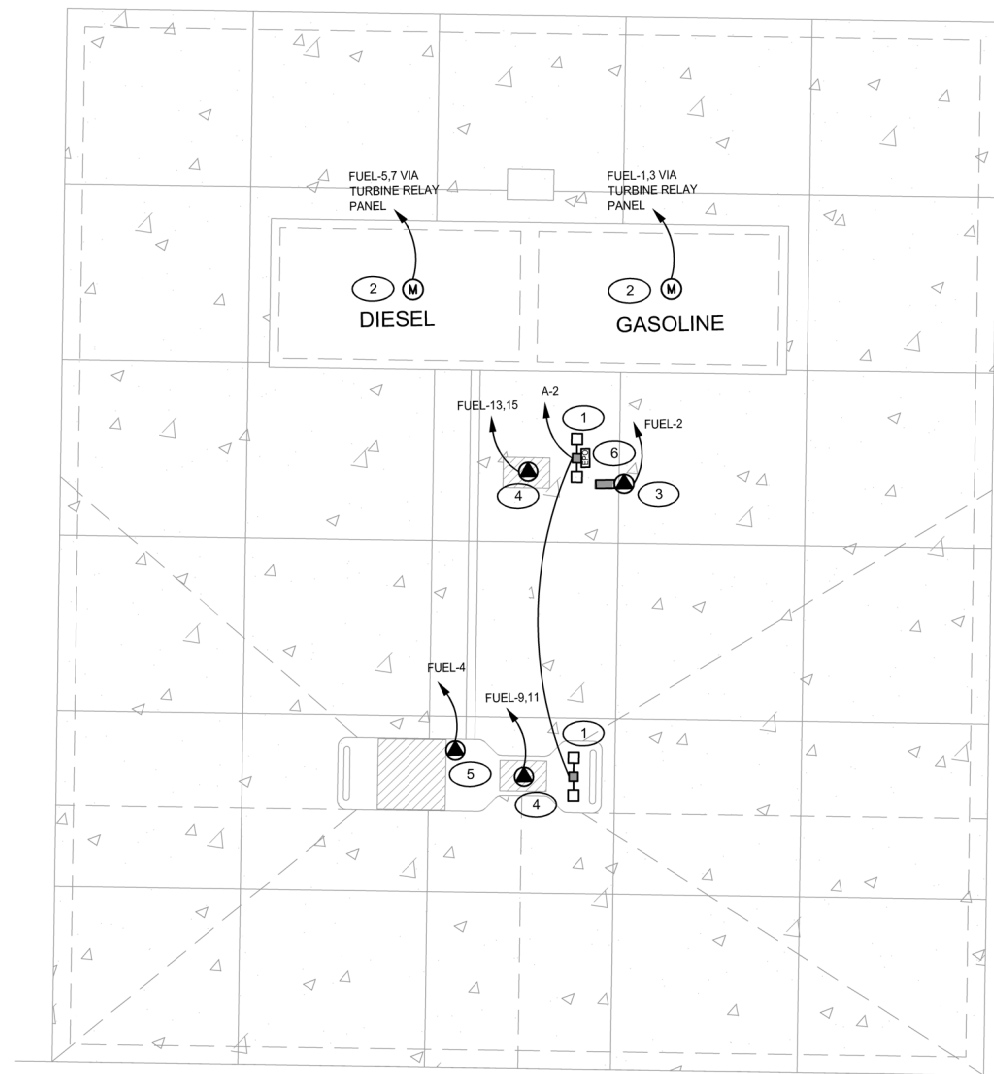
FLAG NOTES THIS SHEET:

- AREA OF THE NEW MAGNESIUM CHLORIDE (MG/CL) SYSTEM. REFER TO ENLARGED ELECTRICAL PLAN - MG/CL SYSTEM, E4, FOR ADDITIONAL INFORMATION AND REQUIREMENTS IN THIS AREA.
- AREA OF THE NEW FUELING SYSTEM. REFER TO ENLARGED ELECTRICAL PLAN - FUEL SYSTEM, E4, FOR ADDITIONAL INFORMATION AND REQUIREMENTS IN THIS AREA.
- COORDINATE ELECTRICAL SERVICE REQUIREMENTS WITH UTILITY COMPANY AND OWNER. UTILITY COMPANY CONTACT IS ERK LORAN AT NORTHWESTERN ENERGY, TELEPHONE NUMBER (406) 443-8912. A SERVICE APPLICATION MUST BE SUBMITTED TO NORTHWESTERN ENERGY. COORDINATE WITH THE UTILITY, OWNER AND GENERAL CONTRACTOR FOR PROGRESS OF WORK TO MEET THE CONSTRUCTION SCHEDULE.
- LOCATION OF THE EXISTING UTILITY TRANSFORMER, 277/430V, 3 PHASE. NEW SERVICE FOR THE MG/CL SYSTEM PUMPS WILL COME FROM THIS TRANSFORMER.
- APPROXIMATE LOCATION OF THE NEW METER/MAIN FOR SERVICE TO THE MG/CL SYSTEM PUMPS. LOCATE NEXT TO THE EXISTING SERVICE ENTRANCE EQUIPMENT ON THE EXTERIOR OF THE FLOW TRUCK STORAGE SHED. COORDINATE EXACT LOCATION WITH THE SERVING UTILITY. REFER TO POWER RISER DIAGRAMS, E5, FOR ADDITIONAL INFORMATION AND REQUIREMENTS FOR THE NEW SERVICE.
- APPROXIMATE LOCATION(S) FOR NEW EMERGENCY FUEL SHUTOFF BUTTON. ONE WILL BE LOCATED ON ONE OF THE FENCE POSTS AND THE OTHER WILL BE LOCATED ON ONE OF THE RELOCATED LIGHT POLES. EMERGENCY FUEL SHUTOFF BUTTON SHALL SHUNT-TRIP ALL POWER TO THE FUEL SYSTEM LOADS IN THE NEW PANEL "FUEL" LOCATED IN THE FLOW TRUCK STORAGE SHED. EMERGENCY FUEL SHUTOFF BUTTON SHALL MEET THE REQUIREMENTS OF ALL APPLICABLE CODES. INSTALL PER THE FUEL SYSTEM MANUFACTURER'S REQUIREMENTS. PROVIDE EMERGENCY POWER OFF (EPO) PUSHBUTTON OPERATOR, 1-5/8" RED MUSHROOM TYPE MAINTAINED CONTACTS, N.C. CONTACT BLOCK, EQUIVALENT TO SQUARE D 9001SKR9RH13 SERIES, OR EQUIVALENT. PROVIDE PROTECTIVE COVER FOR THE MUSHROOM PUSHBUTTON. PROVIDE ALL CABLING, POWER OFF BUTTON, CONNECTIONS, APPURTENANCES, AND DEVICES FOR A FULLY FUNCTIONAL FUEL SHUTOFF. FIELD COORDINATE EXACT LOCATIONS PRIOR TO ROUGH-INS.
- ADDITIVE ALTERNATE NO. 2: NEW CHAINLINK FENCE WITH GATE OPERATORS, 1 HP, 120V. CONNECT TO CIRCUITS, AS INDICATED, IN PANEL "A". COORDINATE EXACT CONNECTION REQUIREMENTS FOR THE NEW GATES WITH THE INSTALLER AND THE ACTUAL EQUIPMENT INSTALLED. THERE WILL BE GATE SAFETY LOOPS - ONE ON EACH SIDE OF THE GATE. TYPICAL FOR (1) LOCATIONS WITH GATE OPERATORS. REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
- ADDITIVE ALTERNATE NO. 2: APPROXIMATE LOCATION FOR PEDESTAL-MOUNTED KEYPAD/INTERCOM FOR ACCESS VIA THE NEW CHAINLINK FENCE WITH GATE OPERATORS AND SAFETY LOOPS. FIELD COORDINATE EXACT LOCATIONS WITH THE OWNER. REFER TO PEDESTAL-MOUNTED KEYPAD/INTERCOM DETAIL, E6, FOR ADDITIONAL INFORMATION AND REQUIREMENTS. UTILIZE DRY CONTACTORS PROVIDED WITH THE GATES TO ACCOMMODATE THE ACCESS CONTROL SYSTEM EQUIPMENT AND PROVIDE CONTROL. AT THE ACCESS CONTROL PEDESTAL, PROVIDE THE KEYPAD/INTERCOM COMBINATION UNIT, AS SPECIFIED. AT THIS TIME, ONLY THE KEYPAD WILL BE UTILIZED FOR ACCESS ENTRY. THE INTERCOM COMPONENT WILL BE CONNECTED AT A LATER TIME. CONNECTION OF THE INTERCOM IS NOT PART OF THIS SCOPE OF WORK. PROVIDE ALL CABLING, CONNECTIONS, DEVICES, AND APPURTENANCES FOR A FULLY FUNCTIONAL GATE ACCESS SYSTEM. REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.

PROJECT: 1-18132 (GWE)/ 24-001 (TESla)
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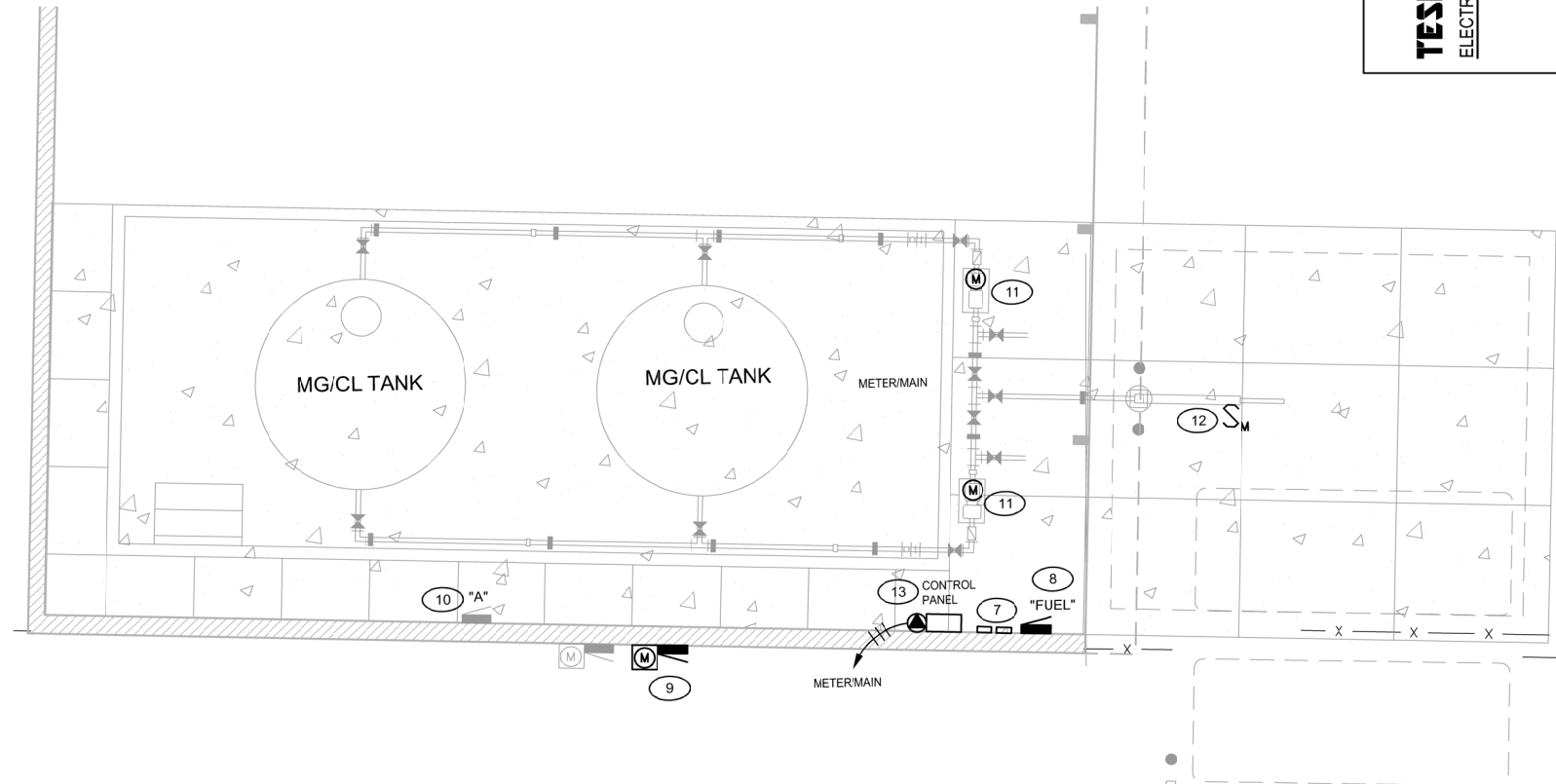


LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
 ENLARGED ELECTRICAL SITE PLAN - FUEL SYSTEM AND MG/CL SYSTEM



1
E4 3/32" = 1'-0"

ENLARGED ELECTRICAL PLAN - FUEL SYSTEM



2
E4 3/32" = 1'-0"

ENLARGED ELECTRICAL PLAN - MG/CL SYSTEM

GENERAL ELECTRICAL NOTES

- REFER TO FLAG NOTES, THIS SHEET, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- ALL 240V, SINGLE PHASE AND 120V FEEDERS ARE (2#12, 1#12G)/1/2", UNLESS SPECIFICALLY NOTED OTHERWISE. REFER ALSO TO PANEL SCHEDULES, E5 AND E7. ALL 480V THREE PHASE FEEDERS ARE AS NOTED ON THE RISER DIAGRAMS, E5.
- COORDINATE ALL DEVICE AND EQUIPMENT LOCATIONS WITH THE OWNER AND/OR SYSTEM SUPPLIER/INSTALLER.
- ALL MOTORS SHALL HAVE A LOCAL DISCONNECTING MEANS LOCATED AT THE MOTOR, OR A MAXIMUM OF 5'-0" AWAY WITHIN SIGHT OF THE MOTOR.
- FIELD COORDINATE MOUNTING OF ELECTRICAL BOXES, PANELS, DEVICES, ETC. AND ROUTING OF CONDUITS WITH OTHER TRADES.
- REFER TO DETAILS, E6 AND E7, FOR ADDITIONAL INFORMATION AND REQUIREMENTS REGARDING THE PANELS, MOUNTING CLEARANCES, ETC.
- FIELD COORDINATE ROUTING OF ALL CONDUITS. CONDUIT ROUTING SHALL NOT INTERFERE WITH THE PIPING.
- COORDINATE ALL CONTROLS WITH THE OWNER, INSTALLER, AND EQUIPMENT SUPPLIED. INSTALL PER THE MANUFACTURER'S RECOMMENDATIONS.
- REFER TO OVERALL ELECTRICAL SITE PLAN, E2, AND ENLARGED ELECTRICAL SITE PLANS, E3, FOR ADDITIONAL INFORMATION AND REQUIREMENTS REGARDING THE SCOPE OF WORK FOR THIS PROJECT.

FLAG NOTES THIS SHEET:

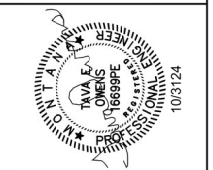
- RELOCATED EXISTING LIGHT POLE/LUMINAIRES. PROVIDE (2#12, 1#12G)1/2" AND CONNECT TO CIRCUIT, AS INDICATED, IN PANEL "A". TYPICAL FOR (2) LIGHT POLES/LUMINAIRES.
- DIESEL AND GASOLINE STORAGE TANKS. EACH TANK WILL HAVE A TURBINE PUMP ASSOCIATED WITH IT. THE PUMPS ARE 1.5 HP, 220V, SINGLE PHASE. CONNECT TO CIRCUITS, AS INDICATED, IN PANEL "FUEL". PUMPS SHALL BE CONNECTED VIA PUMP RELAY PANELS LOCATED IN THE PLOW TRUCK STORAGE SHED. FIELD COORDINATE LOCATIONS FOR THE PANELS. INSTALL PUMPS AND CONTROLS PER THE MANUFACTURER'S REQUIREMENTS. TYPICAL FOR (2) FUEL TANK TURBINE PUMPS.
- RELOCATED CONTROLLER. CONNECT CONTROLLER IN THIS NEW LOCATION THE SAME AS IT WAS IN ITS PREVIOUS LOCATION PRIOR TO REMOVAL. PROVIDE ALL POWER AND COMMUNICATIONS CONNECTIONS. CONTROLS AND MONITORING SHALL BE RE-ESTABLISHED IN THE FLEET SHOP MANAGER'S OFFICE IN THE MAINTENANCE SHOP BUILDING. PROVIDE COMMUNICATIONS CABLING, AS REQUIRED. REFER TO ELECTRICAL SITE PLAN FOR NEAREST COMMUNICATIONS POINT OF SERVICE AND PATHWAY BACK TO THE EXISTING MONITORING LOCATION. FOR POWER, PROVIDE (2#12, 1#12G)1/2" AND CONNECT TO CIRCUIT, AS INDICATED, IN PANEL "FUEL".
- RELOCATED FUEL DISPENSER. CONNECT DISPENSERS VIA THE CONTROLLER, AS REQUIRED. FOR POWER, PROVIDE (2#12, 1#12G)1/2" AND CONNECT TO CIRCUIT, AS INDICATED, IN PANEL "FUEL". PROVIDE ALL CABLING, COMMUNICATIONS, CONNECTIONS, ETC. FOR A COMPLETE AND FULLY FUNCTIONAL FUEL DISPENSING SYSTEM.
- NEW DIESEL EXHAUST FLUID (DEF) SYSTEM. PROVIDE (2#12, 1#12G)1/2" AND CONNECT TO CIRCUIT, AS INDICATED, IN PANEL "FUEL". REFER TO ELECTRICAL DETAIL - DEF WIRING DIAGRAM (REFERENCE), E8, FOR ADDITIONAL INFORMATION AND REQUIREMENTS. DEF SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. PROVIDE A COMPLETE AND FULLY FUNCTIONAL DEF SYSTEM.
- EMERGENCY FUEL SHUTOFF BUTTON MOUNTED ON THE RELOCATED LIGHT POLE. REFER TO ENLARGED ELECTRICAL SITE PLAN, E3, FOR ADDITIONAL INFORMATION AND REQUIREMENTS ON THE EMERGENCY FUEL SHUTOFF BUTTON. THIS BUTTON IS (1) OF (2) TO BE INSTALLED FOR THE SYSTEM.
- APPROXIMATE LOCATION FOR THE FUEL PUMP TURBINE RELAY PANELS. FIELD COORDINATE EXACT LOCATIONS. MAINTAIN CLEARANCE IN FRONT OF THE PANELS TO ALLOW FOR ACCESS.
- NEW PANEL "FUEL" FOR POWER TO THE FUEL PUMPS, FUEL DISPENSERS, DEF, AND FUEL SYSTEM CONTROLLER. FIELD COORDINATE EXACT LOCATION FOR THE PANEL. MAINTAIN NEC REQUIRED CLEARANCES IN FRONT OF THE PANEL. PANEL SHALL BE NEMA 3R RATED FOR OUTDOOR USE. PANEL SHALL HAVE A SHUNT-TRIP MAIN CIRCUIT BREAKER CONNECTED TO THE FUEL EMERGENCY FUEL SHUTOFF BUTTONS TO SHUNT POWER TO THE FUEL SYSTEM IN CASE OF AN EMERGENCY.
- LOCATION FOR NEW ELECTRICAL SERVICE ENTRANCE EQUIPMENT. LOCATE NEXT TO THE EXISTING METERMAIN EQUIPMENT ON THE EXTERIOR OF THE BUILDING. REFER TO POWER RISER DIAGRAMS, E5, FOR ADDITIONAL INFORMATION AND REQUIREMENTS. FIELD COORDINATE NEW SERVICE INSTALLATION WITH THE SERVING UTILITY.
- EXISTING PANEL "A". POWER FOR THE FUEL STATION LIGHTS AND GATE OPERATORS WILL COME FROM THIS PANEL. THERE IS AN EXISTING 50A BLOCK HEATER RECEPTACLE LOCATED NEXT TO THE PANEL. THE RECEPTACLE SHALL BE RELOCATED TO ONE OF THE OTHER BAYS IN THE PLOW TRUCK STORAGE SHED, NEAR PANEL "B". REFER TO ELECTRICAL SITE PLAN, E2, FOR ADDITIONAL INFORMATION.
- NEW MG/CL PUMP, 2.0HP, 460V, 3 PHASE. FIELD COORDINATE EXACT LOCATIONS AND REQUIREMENTS WITH THE INSTALLER AND THE EQUIPMENT PROVIDED. E.C. TO COORDINATE THE INSTALLATION OF THE PUMPS AND PROVIDE ALL WIRE, CONDUIT, ANCHOR BOLTS, TEMPLATES, ETC., AS REQUIRED FOR A COMPLETE INSTALLATION OF EACH PUMP. E.C. TO PROVIDE ELECTRICAL CONNECTION VIA THE CONTROL PANEL (SEE NOTE 13 BELOW). REFER TO POWER RISER DIAGRAMS, E5, FOR ADDITIONAL INFORMATION. TYPICAL FOR (2) NEW MG/CL PUMPS.
- PROVIDE MANUAL MOTOR CONTROL ON/OFF SWITCH AT THE END OF THE OVERHEAD FILL ARM. CONTROLLER SHALL BE MINIMUM 30A, 600V, 3 PHASE, NEMA 3R, AS MANUFACTURED BY EATON, CATALOG NUMBER AH7810WD-C, OR APPROVED EQUIVALENT. FIELD COORDINATE MOUNTING OF THE ON/OFF TOGGLE SWITCH ON THE FILL ARM WITH THE FIELD CONDITIONS. SWITCH MUST ALLOW FOR LOCAL ON/OFF CONTROL FROM THE OVERHEAD FILL ARM.
- PACKAGED CONTROL PANEL FOR THE MG/CL PUMP SYSTEMS. THE CONTROL PANEL WILL CONTAIN STARTERS FOR THE PUMPS; AND AN INTEGRAL STEP-DOWN TRANSFORMER FOR THE LOWER VOLTAGE CIRCUITS. INCLUDING, BUT NOT LIMITED TO, RUN LIGHTS FOR EACH PUMP; A MANUAL ON/OFF CONTROL SWITCH FOR EACH PUMP; A RUN-TIME METER FOR EACH PUMP AND A TIMER FOR ONE OF THE PUMPS. ELECTRICAL CONTRACTOR TO VERIFY AND COORDINATE CONNECTIONS TO THE LOADS WITH THE SUPPLIER/INSTALLER OF THE MG/CL SYSTEM. COORDINATE INSTALLATION WITH THE SUPPLIER/INSTALLER. PROVIDE ALL WIRING, CONDUIT, CONNECTIONS, DEVICES, AND APPURTENANCES FOR A FULLY FUNCTIONAL SYSTEM. REFER ALSO TO CIVIL SPECIFICATIONS FOR ADDITIONAL INFORMATION ON THE MG/CL SYSTEM CONTROLS.



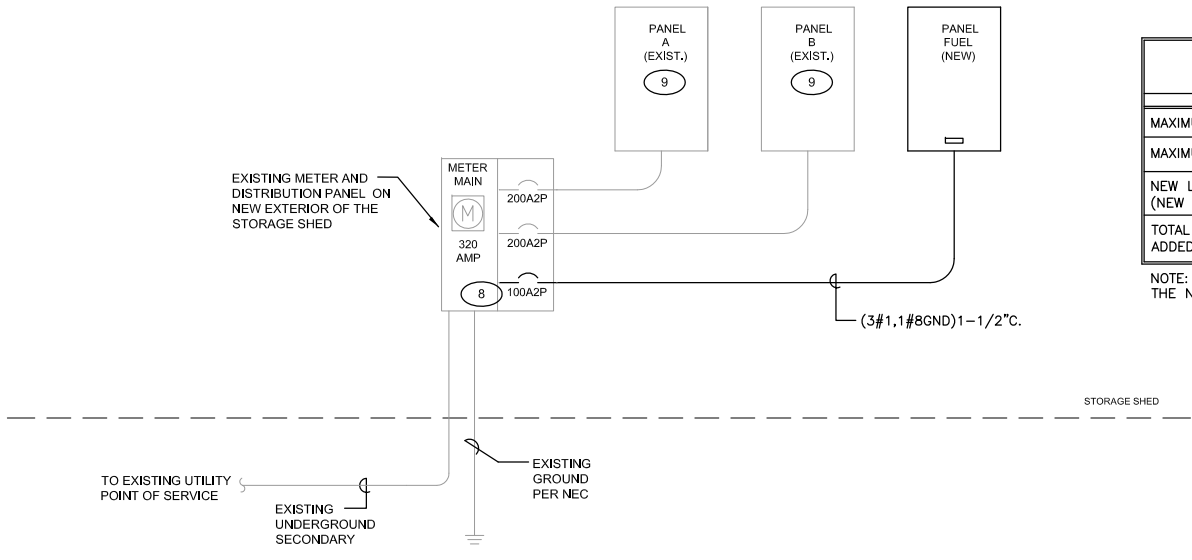
TESla Engineering, LLC
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LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
ENLARGED ELECTRICAL PLANS - FUEL SYSTEM AND MG/CL SYSTEM



1 POWER RISER DIAGRAM - PLOW TRUCK STORAGE SHED 120/240V 1PH 3W SN
 NOT TO SCALE

LOAD JUSTIFICATION	
MAXIMUM DEMAND LOAD FOR PREVIOUS 12 MONTHS	3.9 kVA
MAXIMUM DEMAND LOAD x 1.25 (PER NEC ARTICLE 220.87)	4.9 kVA
NEW LOAD ADDED AS PART OF THE REMODEL SCOPE OF WORK (NEW PANEL "FUEL" AND ADDED TO PANEL "A")	25.6 kVA
TOTAL LOAD (MAXIMUM DEMAND LOAD X 1.25 PLUS NEW LOAD ADDED)	30.5 kVA = 127.1 AMPS

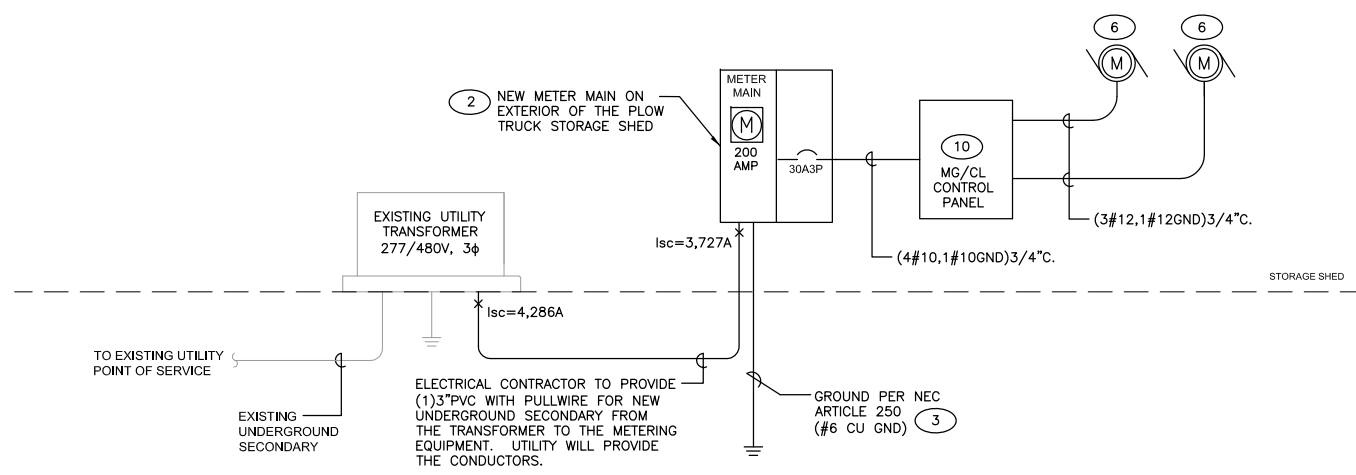
NOTE: THE EXISTING 320A SERVICE IS SUFFICIENT FOR THE EXISTING LOAD AND THE NEW LOAD ADDED AS PART OF THE REMODEL.

GENERAL RISER DIAGRAM NOTES:

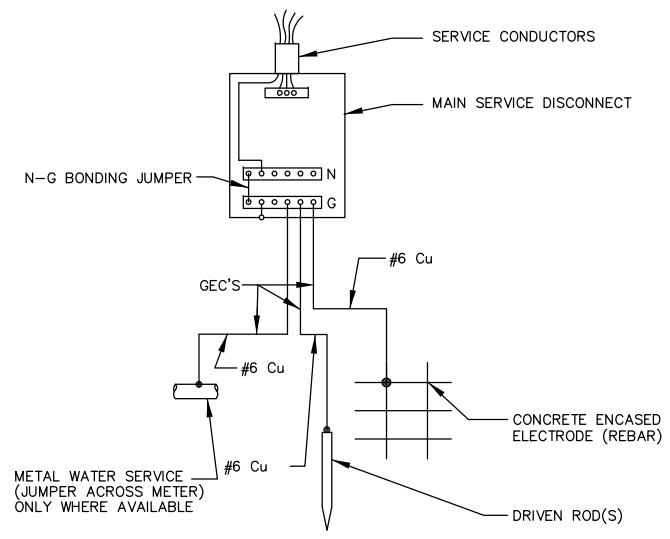
- COORDINATE ALL ELECTRIC SERVICE REQUIREMENTS WITH THE LOCAL SERVING UTILITY, NORTHWESTERN ENERGY. CONTACT IS ERIK LORAN, (406) 443-8912.
- PROVIDE METER/DISCONNECT, CONDUIT, GROUND RODS, ETC. CONFORMING WITH UTILITY COMPANY REGULATIONS AND NEC STANDARDS. UTILITY COMPANY WILL PROVIDE METER.
- GROUND IN STRICT ACCORDANCE WITH NEC ARTICLE 250.
- VERIFY LOCATIONS OF ALL UTILITY SERVICE EQUIPMENT AND THE UTILITY REQUIREMENTS PRIOR TO BIDDING.
- ALL CONDUITS NOT SHOWN SIZED ON THE DRAWINGS SHALL BE SIZED TO NOT EXCEED 40% FILL AND SHALL COMPLY WITH NEC REQUIREMENTS.
- CIRCUIT BREAKERS SHALL BE SERIES RATED FOR AVAILABLE FAULT CURRENTS.
- SEE FLAG NOTES, THIS SHEET, FOR FEEDER AND BRANCH CIRCUIT WIRING INFORMATION NOT DESIGNATED ON THE RISER DIAGRAM. REFER ALSO TO PANEL SCHEDULES, E7, FOR ADDITIONAL INFORMATION ON THE BRANCH CIRCUITS.
- SERVICE INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 70 AND UTILITY REQUIREMENTS.

FLAG NOTES THIS SHEET:

- COORDINATE ALL NEW ELECTRICAL SERVICE REQUIREMENTS WITH UTILITY COMPANY AND OWNER PRIOR TO BID AND ADJUST BID ACCORDINGLY. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE SELF-CONTAINED METER BASE WITH DISCONNECT, GROUNDING AT THE METER MAIN, AND THE CONDUIT RISER. ALL SERVICE CONDUCTORS WILL BE PROVIDED BY THE UTILITY. UTILITY COSTS ASSOCIATED WITH THE NEW SERVICE WILL BE PAID DIRECTLY BY THE OWNER.
- PROVIDE AND INSTALL 200A METER MAIN CONFORMING TO THE UTILITY COMPANY REQUIREMENTS. METER BASE MUST BE A BUS BAR TYPE, RATED FOR 200A WITH LUGS CAPABLE OF ACCEPTING #4/0 ALUMINUM WIRE. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE METER BASE AND GROUNDING AT THE METER BASE. COORDINATE WITH NORTHWESTERN ENERGY.
- CONNECT THE GROUND TO ALL AVAILABLE GROUNDING ELECTRODES INCLUDING REBAR AND DRIVEN GROUND ROD. REFER ALSO TO GROUNDING ELECTRODE SYSTEM DETAIL, THIS SHEET, FOR ADDITIONAL INFORMATION. GROUND RODS MUST HAVE A RESISTANCE TO GROUND OF 25 OHMS OR LESS OR ADDITIONAL RODS SHALL BE ADDED. MINIMUM (2) GROUND RODS SPACED A MINIMUM OF 10'-0" APART.
- REFER ALSO TO ENLARGED ELECTRICAL SITE PLANS, E3, AND ENLARGED ELECTRICAL PLANS, E4, FOR ADDITIONAL INFORMATION REGARDING THE INCOMING SERVICE.
- PROVIDE TEMPORARY SERVICE, AS REQUIRED, DURING CONSTRUCTION.
- NEW 2HP MG/CL PUMP. FIELD COORDINATE EXACT LOCATION AND REQUIREMENTS WITH THE INSTALLER AND THE EQUIPMENT PROVIDED. E.C. TO COORDINATE THE INSTALLATION OF THE PUMP. PROVIDE ALL WIRE, CONDUIT, ANCHOR BOLTS, TEMPLATES, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION OF THE UNIT. E.C. TO PROVIDE THE ELECTRICAL CONNECTION VIA THE CONTROL PANEL (SEE NOTE 10 BELOW). TYPICAL FOR (2) PUMPS.
- REFER ALSO TO ELECTRICAL DETAILS, E6 AND E7, FOR ADDITIONAL INFORMATION.
- PROVIDE NEW 100A2P CIRCUIT BREAKER IN THE EXISTING METER/MAIN. NEW BREAKER SHALL BE COMPATIBLE WITH EXISTING PANEL TYPE.
- EXISTING PANEL AFFECTED BY SCOPE OF WORK. REFER TO PANEL SCHEDULES, E7, FOR ADDITIONAL INFORMATION.
- MG/CL CONTROL PANEL PROVIDED WITH THE SYSTEM. ELECTRICAL CONTRACTOR TO VERIFY AND COORDINATE ALL CONNECTIONS WITH THE SYSTEM SUPPLIER/INSTALLER.



2 POWER RISER DIAGRAM - NEW MG/CL PUMPS 277/480V 3PH 4W SN
 NOT TO SCALE



3 GROUNDING ELECTRODE SYSTEM
 NOT TO SCALE

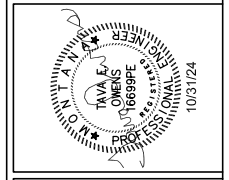
PANEL SCHEDULE FUEL (NEW)*											
NAME	FUEL	ROOM NUMBER	PLOW TRUCK STORAGE SHED								
MFGR.	SQUARE D	AMPS	100	AIC	10,000	PHASE CONDUCTORS		1			
TYPE	NQOD	MAINS	MCB	OCB	100	NEUTRAL CONDUCTORS		1			
WIDTH	-	VOLT LL	240	MCA	88	GROUND WIRE		8			
DEPTH	-	VOLT LN	120	FEED LGTH	40	CONDUIT SIZE		1-1/2"			
MOUNTING SURFACE	PHASE	1	CONAMPS	88	CONDUIT FUNDS		1				
FEED	BOTTOM	WIRES	3	REMARKS	50% EQUIPMENT GROUND BAR	PERCENT VOLTAGE DROP		0.2%			
BREAKER	LOAD	VA	LOAD CODE	CIRCUIT NO.	LOAD	L2	CIRCUIT NO.	LOAD CODE	VA	LOAD	BREAKER
** 25	2 FUEL TANK PUMP (1.5HP)	2200	5	1			2800	2	5	600 FUEL SYS. CONTROLLER	1 20
-	- 2#12, 1#12G, 1/2\"C	2200	5	3	4000			4	5	1800 DEF SYSTEM	1 20
** 25	2 FUEL TANK PUMP (1.5HP)	2200	5	5			2200	6		SPARE	1 20
-	- 2#12, 1#12G, 1/2\"C	2200	5	7	2200			8		SPARE	1 20
25	2 FUEL DISPENSER	2200	5	9			2200	10		BUSSED SPACE	
-	- 2#12, 1#12G, 1/2\"C	2200	5	11	2200			12		BUSSED SPACE	
25	2 FUEL DISPENSER	2200	5	13			2200	14		BUSSED SPACE	
-	- 2#12, 1#12G, 1/2\"C	2200	5	15	2200			16		BUSSED SPACE	
	BUSSED SPACE			17				18		BUSSED SPACE	
	BUSSED SPACE			19	0			20		BUSSED SPACE	
	BUSSED SPACE			21	0			22		BUSSED SPACE	
	BUSSED SPACE			23	0			24		BUSSED SPACE	
	BUSSED SPACE			25	0			26		BUSSED SPACE	
	BUSSED SPACE			27	0			28		BUSSED SPACE	
	BUSSED SPACE			29	0			30		BUSSED SPACE	

* PROVIDE WITH SHUNT-TRIP MAIN CIRCUIT BREAKER (MCB). MCB SHALL BE CONNECTED TO THE EMERGENCY POWER OFF BUTTONS FOR THE FUEL SYSTEM.
 ** CONNECT FUEL TANK PUMP VIA PUMP RELAY PANEL. COORDINATE REQUIREMENTS WITH THE MANUFACTURER/SYSTEM INSTALLER.
 NOTE: PANEL SHALL BE NEMA 3R RATED FOR OUTDOOR USE.

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2			
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PROJECT: 1-18132 (GME)/24-001 (TESla)	DESIGNED: TEO	PROJECT NO.:
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LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
 POWER RISER DIAGRAMS AND SCHEDULES

TABLE "A" WORKING CLEARANCES			
VOLTAGE TO GROUND, NOMINAL	CONDITION: 1 2 3		
	MIN. CLEAR DISTANCE (FT.)		
0-150	3	3 1/2	3
151-600	3	3 1/2	3

WHERE THE CONDITIONS ARE AS FOLLOWS:

1. EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED BUS BARS OPERATING AT NOT OVER 300 VOLTS SHALL NOT BE CONSIDERED LIVE PARTS.
2. EXPOSED LIVE PARTS ON ONE SIDE AND GROUNDED PARTS ON THE OTHER SIDE.
3. EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.

NOTE: THIS INCLUDES, BUT IS NOT LIMITED TO, PANELBOARDS, SAFETY SWITCHES, MOTOR STARTERS, JUNCTION BOXES AND OTHER ELECTRICAL EQUIPMENT.

30" OR WIDTH OF EQUIPMENT IF EQUIPMENT IS WIDER THAN 30" DOES NOT HAVE TO BE CENTERED ON THE EQUIPMENT, BUT AT LEAST EVEN WITH ONE EDGE. EQUIPMENT DOOR SHALL BE ABLE TO OPEN AT LEAST 90 DEG.

NOTE: THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF ELECTRICAL EQUIPMENT REQUIRED BY SECTION 110-26 OF THE NATIONAL ELECTRICAL CODE.

NOTE: THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRED OVER AND UNDER PANELBOARDS FOR CABLES, RACEWAYS, ETC. TO AND FROM PANELBOARDS REQUIRED BY SECTION 110-26 OF THE NATIONAL ELECTRICAL CODE.

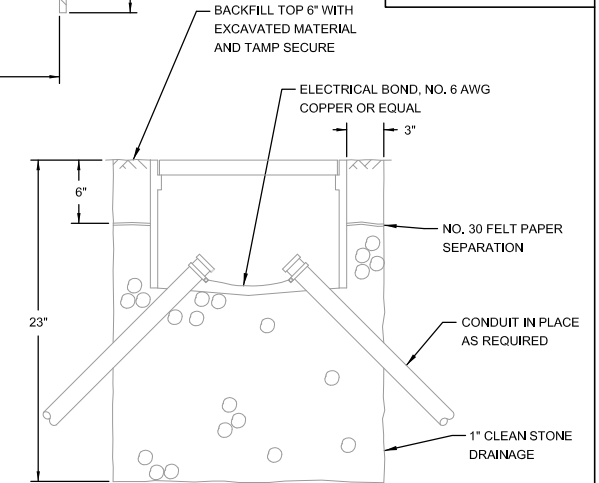
NOTES:

1. NO PIPING, DUCTS OR EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL APPURTENANCES SHALL BE PERMITTED TO BE INSTALLED IN, ENTER, OR PASS THROUGH THE DEDICATED SPACES ABOVE.
2. DETAIL IS REFERENCE FOR VARIOUS TYPES OF INSTALLATIONS. NOT ALL INSTALLATIONS WILL HAVE A SUSPENDED CEILING, CEILING-MOUNTED LIGHT FIXTURES, ETC.

1 DEDICATED WORKING SPACE REQUIREMENTS FOR ELEC. EQUIPMENT
E6 NOT TO SCALE



PULL BOX FIBERGLASS MINIMUM INSIDE DIMENSIONS	
TYPE I	TYPE II
W = 12 INCHES	W = 12 INCHES
L = 18 INCHES	L = 24 INCHES
D = 10 INCHES	D = 12 INCHES



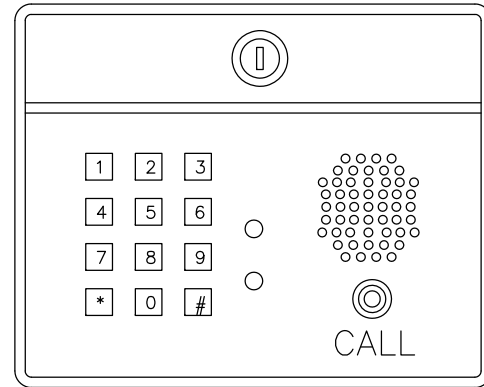
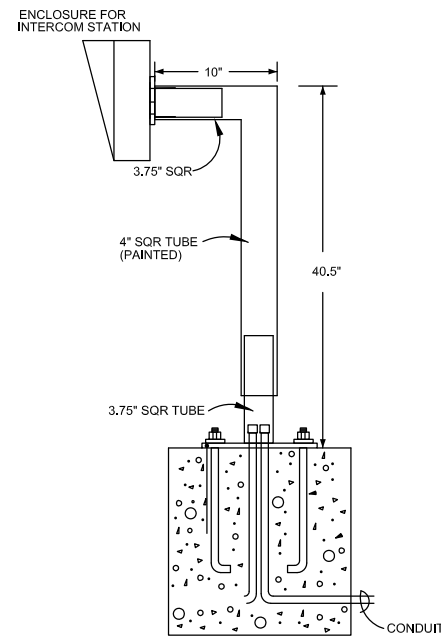
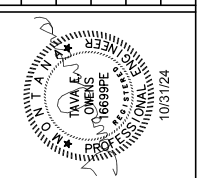
NOTE:
REFER TO LATEST EDITION OF STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION ADOPTED BY THE MONTANA DEPT. OF HIGHWAYS AND THE MONTANA HIGHWAY COMMISSION.

2 TYPICAL JUNCTION/PULL BOX (PB) DETAIL
E6 NOT TO SCALE REFERENCE

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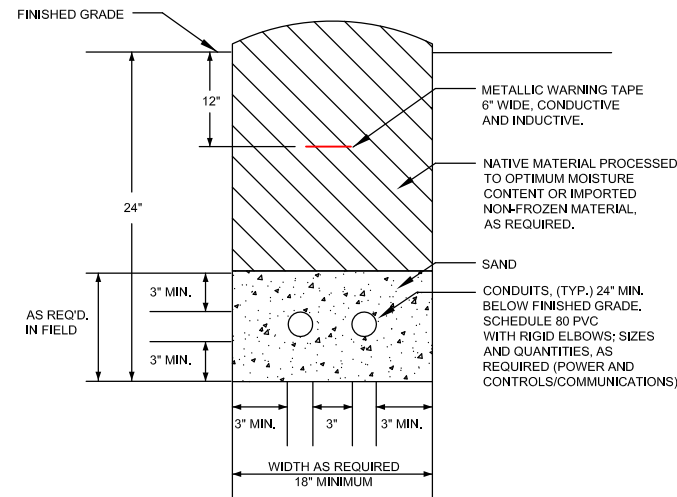
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NOTES:

1. KEYPAD/INTERCOM, AS MANUFACTURED BY SECURITY BRANDS INC, MODEL ADV-1000I, ACCESS CONTROL KEYPAD WITH INTERCOM, OR APPROVED EQUIVALENT.

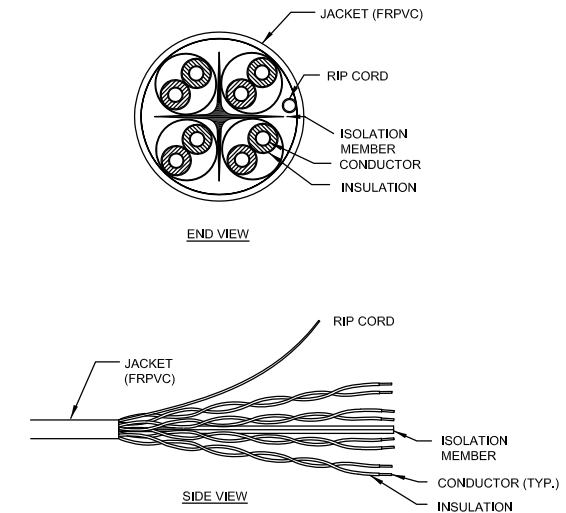
3 PEDESTAL-MOUNTED KEYPAD/INTERCOM DETAIL
E6 NOT TO SCALE



NOTES:

1. DEPTH NOTED ABOVE ARE MINIMUM BURIAL.
2. DEPTHS ARE SPECIFIED FROM FINISHED GRADE. WHERE SURROUND GRADE IS NOT DISTURBED THE DEPTHS ARE FROM EXISTING GRADE.
3. OVER-EXCAVATE TRENCHES AS NECESSARY TO ALLOW FOR:
 - (a) SAND BEDDING
 - (b) LOOSE AND SANDY SOILS, OR
 - (c) WHERE MORE THAN ONE CABLE WILL BE INSTALLED IN TRENCH AND LAYING OF FIRST CABLE MAY CAUSE TRENCH DAMAGE AND REDUCTION IN DEPTH.
4. SAND BEDDING SHALL BE FREE OF ORGANIC AND ROCK MATERIALS.
5. EXCAVATION, BACKFILL AND COMPACTION ARE PART OF THIS CONTRACT. INCLUDING JOINT-USE TRENCHES.
6. WIRING CONSISTS OF INSULATED CONDUCTORS INSTALLED IN DUCTS. CONDUCTOR INSULATION TYPE USE SHALL BE USED FOR LOW VOLTAGE CIRCUITS AND SERVICE ENTRANCE. INSULATION FOR MEDIUM VOLTAGE CIRCUITS SHALL BE EPR. MEDIUM VOLTAGE CIRCUITS SHALL HAVE DRAIN WIRE INSULATION SHIELDING. ALL CONDUCTORS SHALL BE COPPER.

4 TYPICAL DUCTBANK
E6 NOT TO SCALE REFERENCE



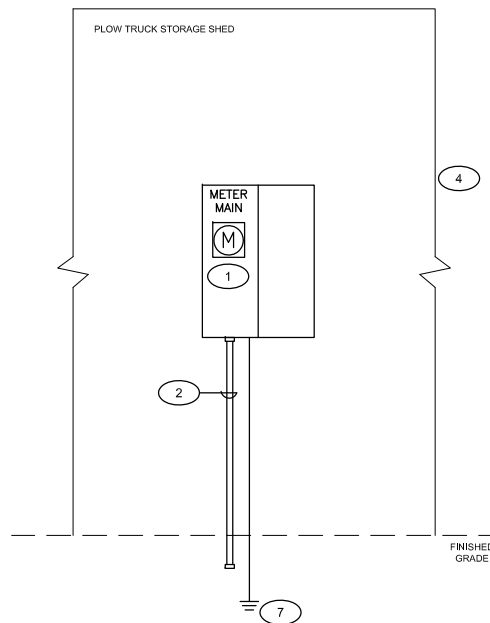
NOTES:

1. CAT 6 CABLE, 4-PAIR UTP, VIOLET JACKET.
2. CABLE O.D. 0.215 IN. (.545 MM), MATERIAL FRPVC, RIP CORD LONGITUDINALLY APPLIED UNDER CABLE JACKET, GEOMETRIC STABILIZATION ISOLATION MEMBER, 23-24 AWG SOLID BARE COPPER CONDUCTOR, FEP CONDUCTOR INSULATION.

5 CAT 6 UTP CABLE - 4 PAIR
E6 NOT TO SCALE REFERENCE

LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
ELECTRICAL DETAILS

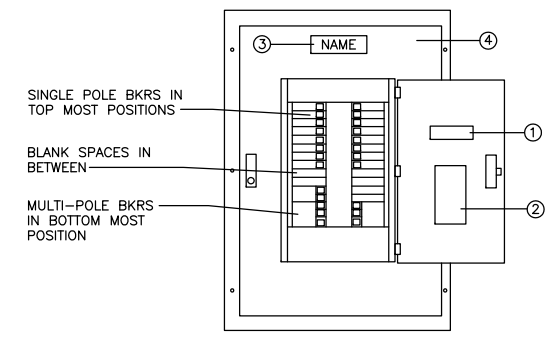
SHEET NO.
E6



1 NEW SERVICE ELECTRICAL EQUIPMENT DETAIL
E7 NOT TO SCALE

DETAIL FLAG NOTES:

- 1 NEW METER / MAIN DISCONNECT FOR THE NEW MG/CL SYSTEM ELECTRICAL SERVICE. REFER TO POWER RISER DIAGRAM, E5, FOR ADDITIONAL INFORMATION AND REQUIREMENTS. PROVIDE METER / MAIN DISCONNECT THAT COMPLIES WITH THE REQUIREMENTS OF THE LOCAL SERVING UTILITY.
- 2 INCOMING SERVICE FEEDER FROM THE UTILITY. REFER TO POWER RISER DIAGRAM, E5, FOR ADDITIONAL INFORMATION.
- 3 ALL CONDUIT AND FITTINGS TO BE GRAY, SCHEDULE 80 PVC CONDUIT.
- 4 MOUNT THE METER / MAIN DISCONNECT ON THE EXTERIOR OF THE PLOW TRUCK STORAGE BUILDING. REFER TO ENLARGED ELECTRICAL PLANS, E3 AND E4, FOR ADDITIONAL INFORMATION. FIELD VERIFY DIMENSIONS OF WALL SPACE REQUIRED TO ACCOMMODATE ALL THE EQUIPMENT. USE FLEX CONNECTORS, E.C. TO COORDINATE LOCATION OF THE EQUIPMENT WITH THE OWNER, UTILITY AND SYSTEMS INSTALLER. METER/MAIN DISCONNECT FOR THE ELECTRICAL SERVICE SHALL BE IN AN ACCESSIBLE LOCATION. TYPICAL ELEVATION IS SHOWN. FIELD MODIFY, AS NECESSARY. VERIFY DIMENSIONS OF ALL EQUIPMENT PRIOR TO INSTALLATION. ALSO COORDINATE SERVICE INSTALLATION WITH THE SERVING UTILITY, NORTHWESTERN ENERGY.
- 5 ALL SCREWS, NUTS, BOLTS, STRAPS, AND SIMILAR CONNECTORS SHALL BE STEEL. PROVIDE NEOPRENE PAD AND/OR FIBER WASHERS BETWEEN DISSIMILAR METALS. (TYPICAL)
- 6 ALL BOXES, FITTINGS AND PIPES TO BE NEMA 3R RATED.
- 7 PROVIDE NEW GROUND THAT COMPLIES WITH THE REQUIREMENTS OF THE UTILITY COMPANY AND THE NEC. GROUND RODS MUST HAVE A RESISTANCE TO GROUND OF 25 OHMS OR LESS OR ADDITIONAL RODS SHALL BE ADDED. MINIMUM (2) GROUND RODS SPACED A MINIMUM OF 10'-0" APART.



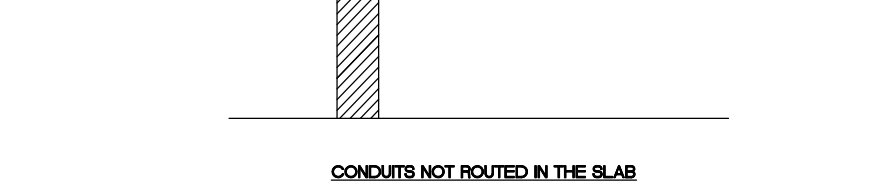
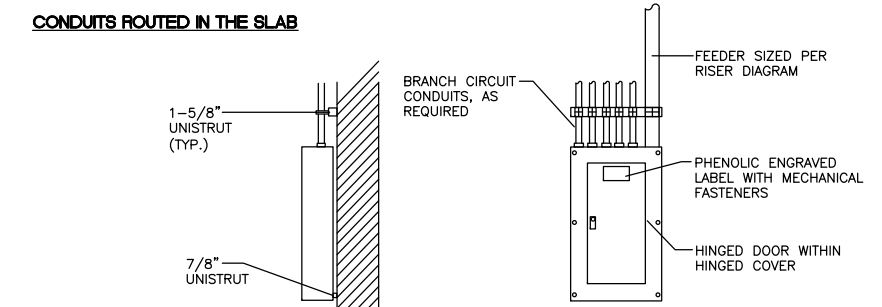
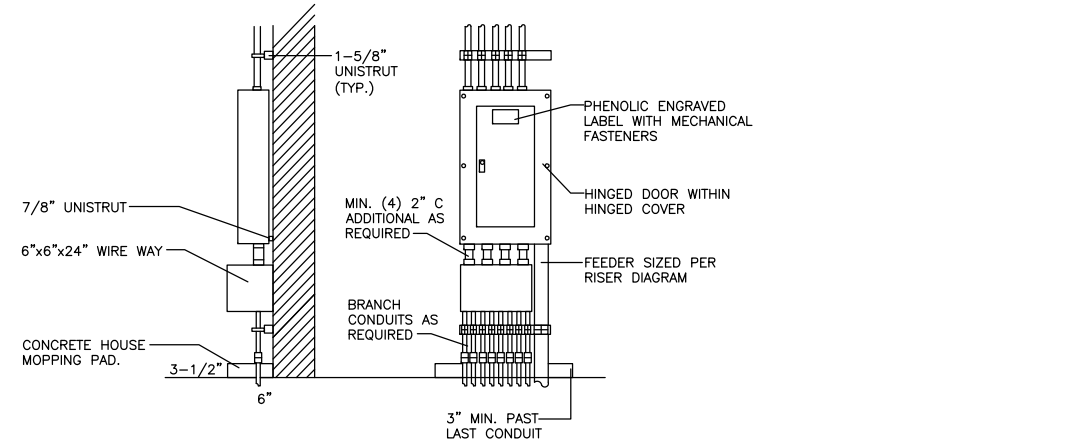
2 TYPICAL DOOR-IN-DOOR PANELBOARD
E7 NOT TO SCALE

- NOTES:
- 1 PROVIDE PAPER, ADHESIVE BACKED, LABEL IDENTIFYING THE FOLLOWING:
 - A. PANELBOARD NAME
 - B. FEEDER SOURCE, BKR SIZE & NO.
 - C. FEEDER SIZE - CABLE(S) & RACEWAY
 - 2 STANDARD CIRCUIT DIRECTORY, TO BE COMPLETED BY THE ELECTRICAL CONTRACTOR
 - 3 ENGRAVED NAMEPLATE IDENTIFYING PANELBOARD NAME.
 - 4 LOCKABLE "DOOR-IN-DOOR" STYLE DOOR & TRIM ASSEMBLY.

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PROJECT: 1-18132 (GME)/ 24-001 (TESla)
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DRAWN: TEO
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3 SURFACE-MOUNTED PANEL DETAIL
E7 NOT TO SCALE

PANEL SCHEDULE A (EXISTING)

NAME	A	ROOM NUMBER	PLOW TRUCK STORAGE SHED
MFGR.	EATON	AMPS	200
AIC	10,000	PHASE CONDUCTORS	3/0
TYPE	LOAD CENTER	MAINS	MLO
OC	200	NEUTRAL CONDUCTORS	3/0
WIDTH	-	VOLT LL	240
MCA	62	GROUND WIRE	6
DEPTH	-	VOLT LN	120
FEED LGTH	25	CONDUIT SIZE	2"
MOUNTING	SURFACE	PHASE	1
CONAMPS	60	CONDUIT RUNS	1
FEED	BOTTOM	WIRES	3
REMARKS	50% EQUIPMENT GROUND BAR	PERCENT VOLTAGE DROP	0.0%

BREAKER	LOAD	VA	LOAD CODE	CIRCUIT NO.	LOAD		CIRCUIT NO.	LOAD CODE	VA	LOAD	BREAKER		
					L1	L2					POLES	AMPS	
20	1	TIMECLOCK/CONTACTOR	200	5	1		700	2	1	500	LTS - FUEL STATION	1	20
20	1	LTS - EXISTING	750	1	3	2750		4	5	2000	GATE OPERATOR (1HP)	1	40
20	1	LTS - EXISTING	750	1	5		2750	6	5	2000	GATE OPERATOR (1HP)	1	40
20	1	LTS - EXISTING	750	1	7	750		8			BUSSED SPACE		
20	1	EXISTING	1000	5	9		1000	10			BUSSED SPACE		
20	1	RCPT - EXISTING	720	2	11	720		12			BUSSED SPACE		
20	1	RCPT - EXISTING	720	2	13		720	14			BUSSED SPACE		
20	1	RCPT - EXISTING	720	2	15	720		16			BUSSED SPACE		
**		BUSSED SPACE			17		0	18			BUSSED SPACE		
**		BUSSED SPACE			19	0		20			BUSSED SPACE		
30	1	EXISTING	2000	5	21		2000	22			BUSSED SPACE		
		BSSD			23	0		24			BUSSED SPACE		
		BUSSED SPACE			25		0	26			BUSSED SPACE		
		BUSSED SPACE			27	0		28			BUSSED SPACE		
		BUSSED SPACE			29		0	30			BUSSED SPACE		

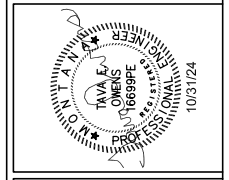
* CIRCUIT AFFECTED BY SCOPE OF WORK. PROVIDE NEW CIRCUIT BREAKER, AS INDICATED, COMPATIBLE WITH EXISTING PANEL TYPE.
** LOAD TO BE MOVED TO PANEL "B". REMOVE EXISTING 50A2P CIRCUIT BREAKER AND INSTALL IN PANEL "B".

PANEL SCHEDULE B (EXISTING)

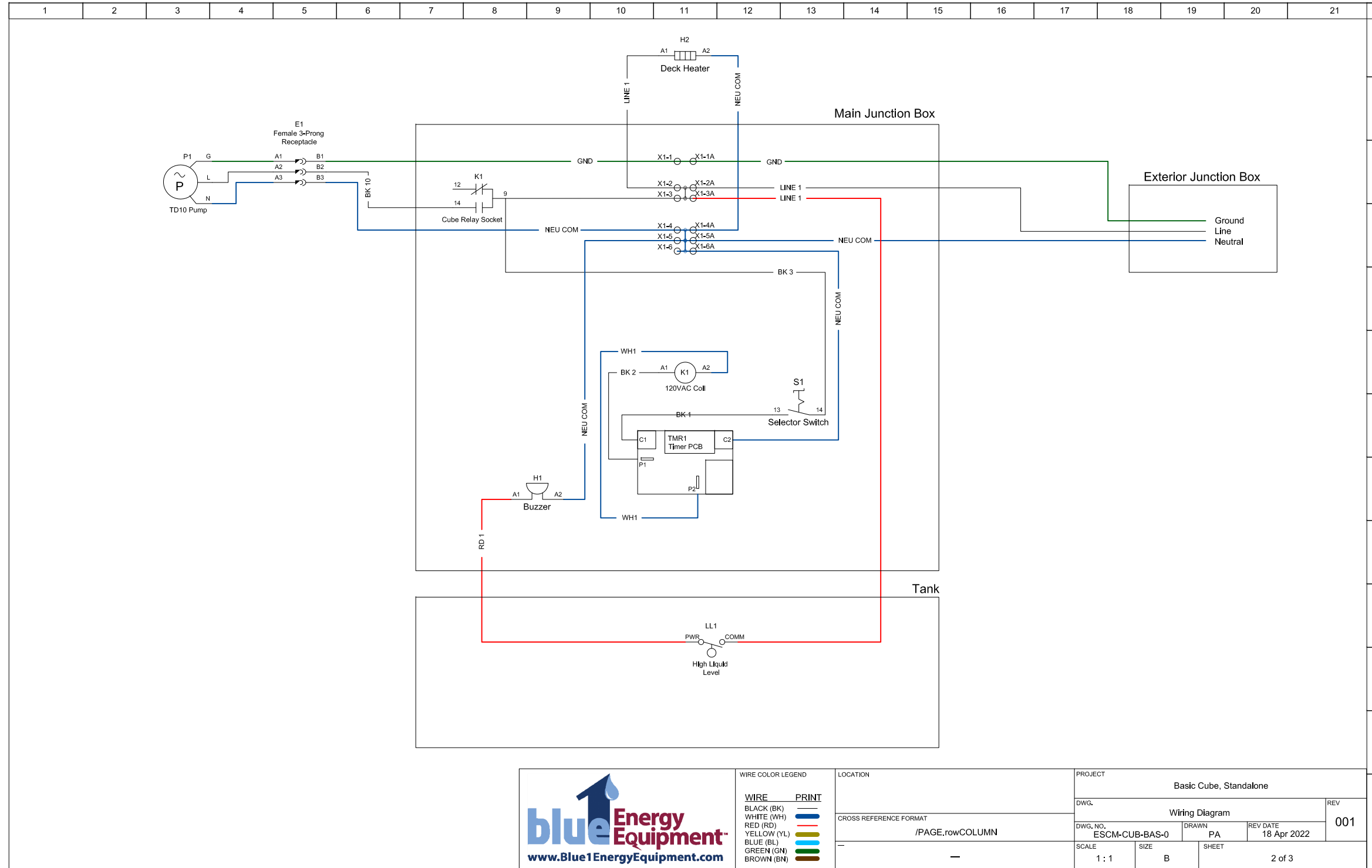
NAME	BOTTOM	ROOM NUMBER	PLOW TRUCK STORAGE SHED
MFGR.	EATON	AMPS	200
AIC	10,000	PHASE CONDUCTORS	3/0
TYPE	LOAD CENTER	MAINS	MLO
OC	200	NEUTRAL CONDUCTORS	3/0
WIDTH	-	VOLT LL	240
MCA	63	GROUND WIRE	6
DEPTH	-	VOLT LN	120
FEED LGTH	175	CONDUIT SIZE	2"
MOUNTING	SURFACE	PHASE	1
CONAMPS	62	CONDUIT RUNS	1
FEED	BOTTOM	WIRES	3
REMARKS	50% EQUIPMENT GROUND BAR	PERCENT VOLTAGE DROP	0.3%

BREAKER	LOAD	VA	LOAD CODE	CIRCUIT NO.	LOAD		CIRCUIT NO.	LOAD CODE	VA	LOAD	BREAKER	
					L1	L2					POLES	AMPS
20	1	LTS - WEST ROW	750	5	1		750	2			BUSSED SPACE	
20	1	LTS - MIDDLE ROW	750	1	3	750		4			BUSSED SPACE	
20	1	LTS - EAST ROW	750	1	5		750	6			BUSSED SPACE	
		BUSSED SPACE			7	0		8			BUSSED SPACE	
20	1	RCPT - WEST	720	5	9		720	10			BUSSED SPACE	
20	1	RCPT - NORTH/W	720	2	11	720		12			BUSSED SPACE	
20	1	RCPT - SOUTH/E	720	2	13		720	14			BUSSED SPACE	
20	1	RCPT - NORTH/E	720	2	15	720		16			BUSSED SPACE	
*	50	RCPT - VEHICLE CHARGE	4500	5	17		4500	18			BUSSED SPACE	
*			4500	5	19	4500		20			BUSSED SPACE	
					21		0	22			BUSSED SPACE	
					23	0		24			BUSSED SPACE	
					25		0	26			BUSSED SPACE	
					27	0		28			BUSSED SPACE	
					29		0	30			BUSSED SPACE	

* LOAD MOVED FROM PANEL "A". REUSE EXISTING CIRCUIT BREAKER AND INSTALL IN THIS PANEL.



LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
ELECTRICAL DETAILS AND SCHEDULES



1 DIESEL EXHAUST FLUID (DEF) SYSTEM WIRING DIAGRAM 1 2
E8 NOT TO SCALE

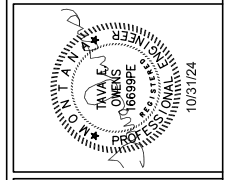
WIRING DIAGRAM FLAG NOTES:

- THIS WIRING DIAGRAM IS DIRECTLY FROM THE MANUFACTURER. THIS SYSTEM IS THE BASIS OF DESIGN. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO PROVIDE A COMPLETE AND FUNCTIONAL DIESEL EXHAUST FLUID (DEF) SYSTEM FOR POWER AND CONTROLS, INCLUDING ANY AND ALL WIRING, BOXES, COMPONENTS, ETC. REQUIRED TO ACCOMPLISH THAT. CONTRACTOR TO VERIFY EXACT REQUIREMENTS WITH THE MANUFACTURER/INSTALLER OF THE SYSTEM PROVIDED.
- THE DEF SYSTEM SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING ALL WIRE AND CONDUIT. TAKE NOTE OF ALL ITEMS IN THE DIAGRAM THAT THE ELECTRICAL CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING AND INSTALLING. NO EXTRAS WILL BE ALLOWED FOR LACK OF KNOWLEDGE OF THE REQUIREMENTS AND/OR LACK OF COORDINATION WITH THE SYSTEM SUPPLIED.

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LEWIS AND CLARK COUNTY FUELING AND MG/CL SYSTEMS
ELECTRICAL DETAIL - DEF WIRING DIAGRAM (REFERENCE)



**Water/Wastewater ▪ Transportation ▪ Grant Services ▪ Solid Waste ▪
Structural ▪ Bridges ▪ Natural Resources ▪ Planning**

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