

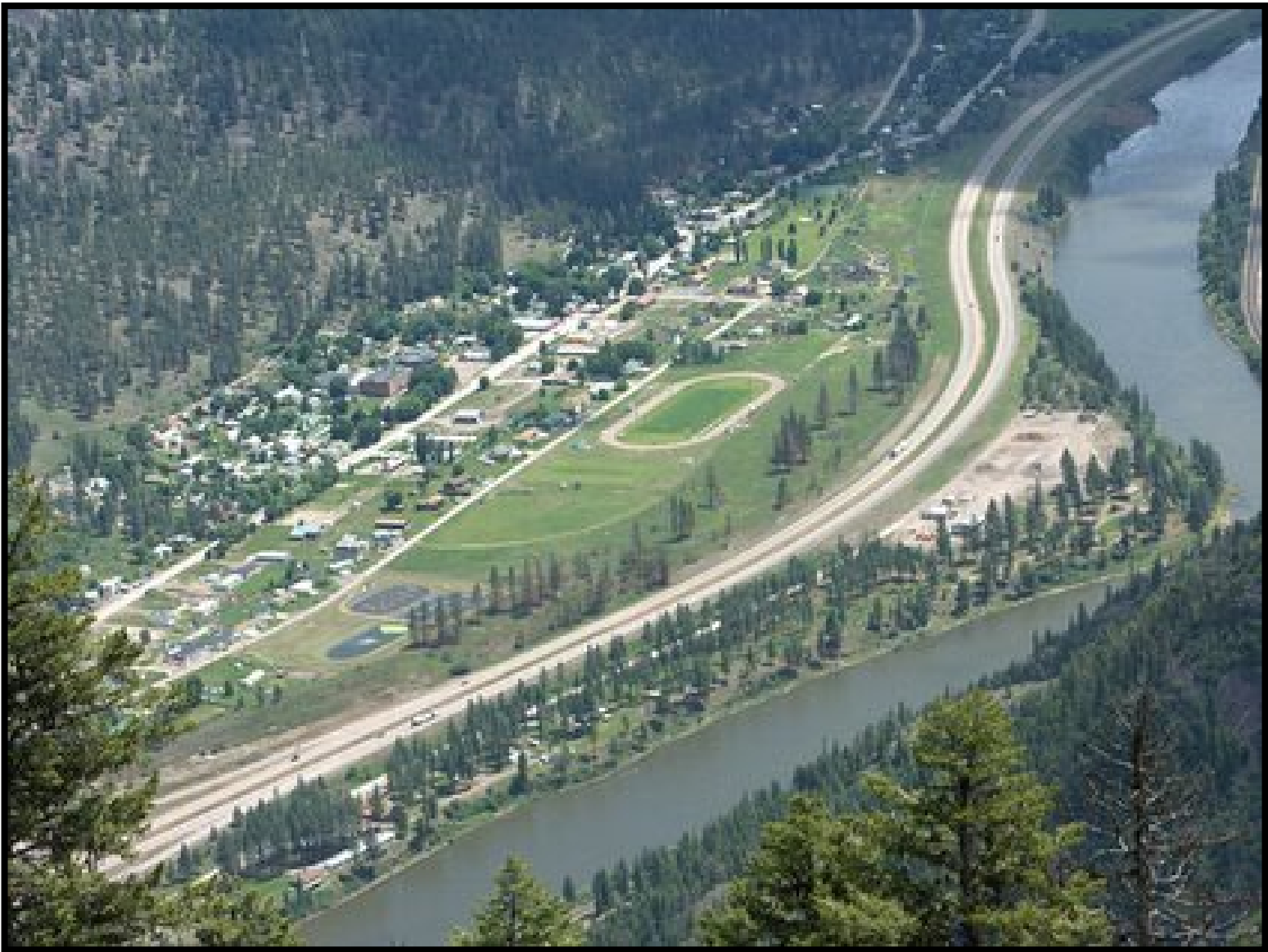
**Contract Documents &  
Specifications**

*For*

**Town of Alberton**

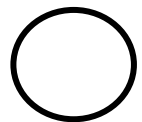
***Water System***

***Improvements Project***



***April, 2024***

Set No.



PREPARED FOR:

# *Town of Alberton*

## *Water System Improvements Project*

April, 2024

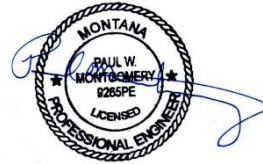
The project consists of the following:

### Phase 2 Distribution System Improvements:

- Significant upgrades to the distribution system, including replacing mains;
- Installing pipes to complete loops in the system; new and appropriately located fire hydrants to address water pressure & delivery problems;
- Replace all existing water meters with new meters in pits;
- Rehabilitating and securing the Town's primary source (spring) and enhancing capacity;

Prepared By: Paul Montgomery, P.E.

Checked By: Adam Eckhart, P.E.



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**DIVISION 0**

**BIDDING & CONTRACTING**

**SECTION 00 11 16  
INVITATION TO BID**

Separate sealed bids for the **Town of Alberton – Water System Improvements Project** will be received by the Town of Alberton (the “Town”) **Attn: Leslie Hottinger, Town Hall – 607 Railroad Ave, Alberton, MT 59820, until 2:00 p.m. local time on Friday, April 19, 2024**, and then publicly opened and read aloud at the **Alberton Senior Center at 701 Railroad Ave.** Bids can be delivered by hand to the Senior Center location no more than 30 minutes prior to the bid opening time. Prior to that, bids must be mailed/delivered to Town Hall. The project will include the furnishing of all labor, skill, equipment, and construction materials to construct the proposed improvements to the Town’s drinking water system in accordance with the plans and specifications included herein. Bids will be for a single base contract and up to two separate alternates, bid on a Unit Price basis.

The project will generally consist of the following work:

BASE BID – Water Distribution Improvements:

- 1,152 lineal feet of 12" diameter PVC watermain, including valves & fittings;
- 1,037 lineal feet of 10" diameter PVC watermain, including valves & fittings;
- 1,102 lineal feet of 8" diameter PVC watermain, including valves & fittings;
- 2,679 lineal feet of 6" diameter PVC watermain, including valves & fittings;
- 235 lineal feet of directionally-drilled 6" through 12" HDPE watermain;
- 12 standard 4¼" fire hydrants, including isolation valves;
- 63 water services including: tap; corp stop; shutoff; valve box; re-connection;
- 1,309 lineal feet of 1" diameter HDPE water service pipe;

ALTERNATE B – Water Metering

- 210 individual water meters including radios;
- 28 water meter pits;
- Remote meter reading equipment;
- Meter reading software and billing system interface, startup, training

ALTERNATE C – Spring Source Improvements

- Replace Spring Source collection structure & penetrations;
- 400 lineal feet of chain link fence & gates

WORKSCOPE FOR BASE BID & ALTERNATES INCLUDES:

- All appurtenant work: rock & exploratory excavation; utility & utility pole conflicts; gravel, pavement & surface restoration; flowable fill; temporary water service; dewatering; traffic control; tree removal/disposal; etc.

Bidders submittal must include bids for the Base Bid **and** both Alternates B & C to be considered responsive

The contract documents, consisting of Drawings and Project Specifications, may be obtained at the office of AMCE at 1064 N. Warren St., Helena, MT 59601 (phone: 406-449-3303). The Instructions to Bidders outlines specific requirements for all Bidders to observe. The required payment for a complete set of contract documents is **\$200** per set or **\$30** for electronic media, which is not refundable\*. A generic set of drawings and project specifications can be examined online at AMCE’s website at [www.a-mce.com](http://www.a-mce.com) (under the “Project Documents” link), available

**April 3, 2024.** Bidders must purchase a numbered set of drawings & specifications in order to be placed on the official Planholders list and to submit a responsive bid.

\*Original Plan Holders for the March 1, 2024 opening will be exempt from the purchasing fee for electronic versions of the project documents.

A Set of Drawings and Project Specifications on the Project will be made available to the local and regional Plans Exchanges.

There will be a Pre-Bid Conference at the **Alberton Town Hall at 607 Railroad Ave, (Town Office Phone: 406-722-3404) at 10:00 a.m. Tuesday, April 9<sup>th</sup>, 2024.** Interested CONTRACTORS are **strongly encouraged** to attend.

CONTRACTORS and any of the CONTRACTOR's subcontractors submitting a bid on this project will be required to obtain registration with the Montana Department of Labor and Industry (DLI) Contractor Registration Unit prior to submitting bids. Forms for registration are available from the Department of Labor and Industry, P.O. Box 8011, 1805 Prospect, Helena, Montana 59604-8011. Information on registration can be obtained by calling 1-406-444-7734. All laborers and mechanics employed by CONTRACTORS or subcontractors in performance of the construction work shall be paid wages at rates as may be required by the laws of and the state of Montana. The CONTRACTOR must ensure that employees and applicants for employment are not discriminated against because of their race, color, religious views, gender or national origin. The **highest** of Montana Prevailing Wage or Federal Davis-Bacon Wage Rates apply to this project.

Each bid or proposal must be accompanied by a Certified Check, Cashier's Check, or Bid Bond payable to the Town of Alberton, Montana, in an amount not less than ten percent (10%) of the total amount of the bid plus alternates. 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. Bidders must demonstrate their qualifications to do the work.

This project is funded with grant and loan funding from the DNRC Renewable Resources Grant Program, Montana Department of Commerce Treasure State Endowment Program and American Rescue Plan Act (ARPA) administered by the Montana DNRC. Award of the project will be contingent upon available funding and award concurrence from the MDNRC, MDOC and ARPA fund administrators. Build America Buy America provisions under the Bipartisan Infrastructure Bill will apply to materials installed under this project.

No bid may be withdrawn 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 of not to exceed sixty (60) days, and to accept the lowest responsive and responsible bid which is in the best interest of the OWNER.

The Town of Alberton is an Equal Opportunity Employer.

Please publish on:

**April 3, 2024**

**April 10, 2024**

Town of Alberton, Montana  
Anna LeDuc, Mayor  
607 Railroad Avenue  
Alberton, MT 59820



**SECTION 00 21 13**  
**INSTRUCTIONS TO BIDDERS**

**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.
    - 1. For purposes of this document, the Issuing Office shall be as follows:

**ANDERSON-MONTGOMERY CONSULTING ENGINEERS**  
**1064 N WARREN ST. HELENA, MT 59601**
  - B. *Bidder* - The Individual or entity who submits a Bid directly to the Owner
  - C. *Successful Bidder* – The lowest responsible Bidder submitting a responsive Bid to whom Owner (on the basis of Owner’s evaluation is hereinafter provided) makes an award.
  - D. *Owner* – The client for which the proposed project is intended to benefit, in this case, Town of Alberton, Montana.

**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 formats for the deposit sum stated in the Invitation for Construction Bids. The deposit sum stated is *NON-REFUNDABLE*.
- 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. ***It is not necessary to submit an entire bound set of project documents at the bid, only those identified in the Bidder’s Checklist.***
- 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, Bidder shall submit with its Bid (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 of Montana.
  - B. Bidder’s contractor license number
  - C. Completed Form C-451 – Qualification Statement

- D. Subcontractor and Supplier qualification information
    - 1. Coordinate with provisions of Article 12 of these Instructions, “Subcontractors, Suppliers, and Others.”
  - E. DBE Subcontractor Solicitation Information
  - F. SRF Certifications regarding Debarment, Suspension, and other Responsibility Matters
  - G. Purchase a number set of Contract Documents and is actively listed on the Planholders List for the project.
- 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 identify:
      - a. Those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
      - b. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
      - c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
      - d. Technical Data contained in such reports and drawings.
    - 2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy

Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
4. Geotechnical Report: A geotechnical report entitled *Geotechnical Report for the Town of Alberton – February 2023* (the “Study”) by Pioneer Technical Services is included as **Appendix A** of these project documents. The Study provides subsurface geotechnical information for at least six borehole locations throughout the distribution system and at the existing storage tank site. It shall be noted that these boreholes do not necessarily represent all of the subsurface materials that may be encountered on this project and the Bidder/Contractor shall assume responsibility for conducting its own geotechnical investigations in order to derive the necessary information upon which to base its bid and determine means and methods for construction. Generalized soil mapping is available through the USDA Natural Resources Conservation Service Web Soil Survey website at: <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.

*Note that the Contractor will be responsible for obtaining soil samples and conducting proctor tests in order to establish optimum moisture levels and compaction rates for native materials used in backfill. All required compaction rates shall be verified by the Contractor. Sampling/analysis shall be conducted for each varying classification of soil encountered over the entire jobsite*

5. It is important to note that at some of the proposed watermain replacement locations may involve the excavation of bedrock to reach the required depths. In submitting a bid, the Bidder accepts all responsibility for conducting its own evaluation or accepting the findings of the Geotechnical Report with regard to the difficulty of excavating to the specified depths. A bid item has been established to specifically identify/quantify rock excavation for watermains, exclusive of general excavation. The Bidder agrees to honor that bid price regardless of a discrepancy between expected and actual field conditions.
- B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous 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.
  - 1. If Bidder wishes to schedule an appointment to conduct Bidders site visit outside of the Pre-Bid Conference, please contact Ingrid Ashley (Operator) at the Town Office: 406-722-3404 to schedule an appointment. The Engineer makes no guarantees as to the availability of the Owner to accommodate Bidder's desired appointment times.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

#### 4.04 Owner's Safety Program

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

#### 4.05 Other Work at the Site

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

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

## **ARTICLE 5 - BIDDER'S REPRESENTATIONS**

- 5.01 It is the responsibility of each Bidder before submitting a Bid to:
- A. Examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
  - B. Visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
  - C. Become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
  - D. Carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions or Appendices, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;
  - E. Consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;
  - F. Agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
  - G. Become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
  - H. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
  - I. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the

Work; and

- J. Agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

#### **ARTICLE 6 - PRE-BID CONFERENCE**

- 6.01 A Pre-Bid conference will be held for this Bid. Bidders are strongly encouraged to attend and contact the Engineer and resolve any questions relevant to the project, prior to bid in order to meet the representations of Article 5 above.

#### **ARTICLE 7 - INTERPRETATIONS AND ADDENDA**

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

#### **ARTICLE 8 - BID SECURITY**

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of ten-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 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.

- 8.05 Attorneys-in-fact who sign Bid Bonds must file with the Bid Bond a certified and effective, dated copy of their power of attorney.

#### **ARTICLE 9 - CONTRACT TIMES**

- 9.01 The number of days within which, or the dates by which, Milestones are to be achieved and the Work is to be substantially completed and 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 an important 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 in the case of a proposed substitute. 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. Substitutes and "or-equal" materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.4 and 7.5 of the General Conditions after the Effective Date of the Contract.
- 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 If an award is made, Contractor shall be allowed to submit proposed substitutes and "or-equals" in accordance with the General Conditions.
- 11.04 Whether explicitly written or not explicitly written, "OR EQUAL" is implicitly listed as an "Approved Manufacturer" for any and all manufacturers listed in any and all specification sections or included herein or added by addendum or construction drawings, either included or added by addendum.**

## **ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS**

12.01 **If required by the bid documents**, 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:

- A. Mechanical Sub-Contractor
- B. Electrical Sub-Contractors
- C. Other Major Sub-Contractor(s) requested

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.

12.02 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

12.03 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 7.6.A

## **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 seal shall be affixed and attested by the corporate secretary or an assistant corporate secretary. 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 official address of the partnership 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 official address of the firm shall be shown.
- 13.05 A Bid by an individual shall show the Bidder's name and official address.
- 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 official address of the joint venture shall be shown.
- 13.07 All names shall be printed in ink below the signatures.
- 13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.
- A. Title 39, Chapter 9, Parts 1 and 2 MCA stipulate contractor registration requirements for the State of Montana. Pursuant to 39-9-201 MCA, each construction contractor must be registered with the Montana Department of Labor and Industry. In accordance with 39-9- 201 MCA, "construction contractor" means a person, firm, or corporation that, in the pursuit of an independent business, offers to undertake, undertakes, or submits a bid for construction.
- B. No bid shall be considered that does not carry the Bidder's Montana Contractors Registration Number on the bid form.
- C. Registration forms and additional information may be obtained by contacting the Montana Department of Labor and Industry, 1805 Prospect Ave., P.O. Box 8011, Helena, MT 59604- 8011, or by calling 406-444-7734.

#### **ARTICLE 14 - BASIS OF BID**

- 14.01 Base Bid and Alternates
- A. Bidders shall submit a Bid on a unit price basis *for the base Bid and Alternates B and C* as provided for in the Bid Form. The tabulated amount on the Bid Form, the Bidders Qualifications and analysis of responses to items on the Bidder's Checklist will be utilized to determine the lowest responsive and responsible bidder.
- B. The Agreement as executed will contain the Substantial Completion time and readiness for final payment time. The Contractor will be assessed liquidated damages at the rate stated in the Agreement for failure to attain Substantial Completion within that time.**

## ARTICLE 15 - SUBMITTAL OF BID

- 15.01 With each purchased copy of the Bidding Documents, a Bidder is furnished one separate bound copy of the Bid Form, and, if required, the Bid Bond. The actual copy of the Bid Form, or a complete and accurate copy, is to be completed and submitted with the Bid security. The supplemental requirements that must be submitted with Bid Form are described in detail on the Bid Form. As noted in the Bid Advertisement, Bidders must purchase a numbered set of drawings & specifications in order to be placed on the official Planholders list and submit a responsive bid (Original Plan Holders for the March 1, 2024 opening will be exempt from the purchasing fee).
- 15.02 A complete Bid shall be submitted 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 envelope (or suitable package) and marked with the project title, “**Alberton Water System Improvements Project - 2023**” plus the name and address of Bidder, accompanied by the Bid security and other required documents. To be considered complete, the submitted bid must include the Bid Form, Bid Security and all other required attachments. The bidder’s checklist is located in Section 00 43 93 for reference. Bids can also be hand carried to the location when/where bids will be opened.
- 15.03 Any irregularities or deviations from the above stated directions, including failure to acknowledge any or all addenda, failure to include any or all of the required Bidder Qualifications, or any and all other irregularities and informalities will be noted at the time of Bid Opening. A judgement on the Bidders Response or Responsibility will be made at the time of Bid Opening, and, contingent upon said judgement, the Bid will either be read aloud or judged unresponsive and not read. Any judgement as to the question of a Bidder’s Response or Responsibility will be subject to further interpretation which may result, without undue justification, in a Bidder’s Bid being ruled disqualified after the time of Bid Opening. Bids deemed unresponsive at the time of Bid Opening are to be considered disqualified this ruling will be FINAL.
- 15.04 A Bid shall be received no later than the date and time prescribed and at the place indicated in the invitation for construction bids. 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, Alberton Water System Improvements Project**” A mailed Bid shall be addressed to:
- Town of Alberton, Montana**  
**Anna LeDuc, Mayor**  
**607 Railroad Ave.**  
**Alberton, MT 59820**

## ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID

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

16.02 If 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 invitation to bid and, unless obviously non-responsive, shall be publicly read aloud. An abstract of the amounts of the base Bids and 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. In the comparison of Bids, **after the determination of the lowest Base Bid**, tabulated Alternate values will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all bidders a “Base Bid plus alternates” or “Engineer’s Estimate” budget after receiving all Bids, but prior to opening them. For comparison purposes, Alternates will be accepted, individually or in any combination as set forth in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive

alternate Bids for which Owner determines funds will be available at the time of award.

- 19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

#### **ARTICLE 20 - BONDS AND INSURANCE**

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

#### **ARTICLE 21 - SIGNING OF AGREEMENT**

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.2 of the General Conditions.

#### **ARTICLE 22 - SALES AND USE TAXES**

- 22.01 Owner is exempt from taxation as legislated by Title 15 of Montana Code Annotated (15-6-201, MCA) & (15-31-102, MCA). Owner is exempt from Montana state sales and use taxes on materials and equipment to be incorporated in the Work.
- 22.02 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.

#### **ARTICLE 23 - WAGE RATE REQUIREMENTS**

- 23.01 If the contract price is in excess of \$100,000, provisions of the Contract Work Hours and Safety Standards Act at 29 CFR 5.5(b) apply.

## **ARTICLE 24 - FUNDING AGENCY SPECIAL PROVISIONS FOR MONTANA PUBLIC FACILITY PROJECTS**

24.01 This project is being funded with funds from the following public facility funding programs or agencies:

- A. Renewable Resource Grant and Loan Program (RRGL)
- B. Treasure State Endowment Program (TSEP) a.k.a. Montana Coal Endowment Program (MCEP)
- C. American Rescue Plan Act (ARPA) Local Fiscal Recovery Funds grant
- D. ARPA Minimum Allocation grant (MAG)
- E. ARPA Competitive grant
- F. ARPA Mineral County MAG
- G. State Revolving Fund (SRF) Loan with Forgiven Principal component
- H. Town of Alberton local funds

24.02 Bidder's attention is direction to Section 00 90 00 – Funding Agency Requirements of these contract documents. The successful Bidder shall comply with all applicable articles therein, including but not limited to, the following Instructions to Bidders;

## **ARTICLE 25 - EQUAL EMPLOYMENT OPPORTUNITY**

25.01 BIDDER'S attention is directed to ARTICLE 1.5.1 [Equal Employment Opportunity and Affirmative Action Requirements] of Section 00 90 00, the requirement for ensuring that employees and applicants for employment are not discriminated against because of their race, color, religion, national origin, gender, marital status, age, or political ideas. Bidders on this work will be required to comply with the President's Executive Orders No. 11246 as amended, 11458, 11518, and 11625.

## **ARTICLE 26 - DISADVANTAGED BUSINESS ENTERPRISES**

26.01 DBE solicitation requirements are located in ARTICLE 1.5.2 [Guidance for Participation By Disadvantaged Business (DBE) Enterprises In United States Environmental Protection Agency Programs of 40 CFR 33] of Section 00 90 00. An online DBE quote request form is available to BIDDERS at <https://app.mdt.mt.gov/dbeqt/>. The BIDDER should fill out and submit the quote request form as early in the bidding period as possible to allow sufficient time for qualified DBE firms to respond. A DBE must be certified as such by a state or federal agency (e.g., the Small Business Administration, the Department of Transportation, or EPA) or by a state, local, or independent private organization, provided their criteria match those under section 8(a) (5) and (6) of the Small Business Act and Small Business Administration's 8(a) Business Development Program Regulations. Self-certification of DBEs is not allowed. Inadequate DBE solicitation efforts by the BIDDER may be grounds for the MDEQ State Revolving Fund

program to withhold funds for the project and withhold authorization to award the construction contract. In accordance with Section 00 90 00 Article 1.5.2, failure to submit evidence showing a “good faith effort” may cause the bid to be rejected as non-responsive.

#### **ARTICLE 27 - DEBARMENT CERTIFICATION**

27.01 BIDDER’S attention is directed to ARTICLE 1.5.3 [Certification Regarding Debarment, Suspension and Other Responsibility Matters] of Section 00 90 00 with respect to Certification Regarding Debarment. Federal funding is being utilized on this project and the successful bidder must provide the debarment certification statement at the time of bid opening with the bid and other forms required.

#### **ARTICLE 28 - COMPLIANCE WITH WAGE RATE REQUIREMENTS**

28.01 BIDDER’S attention is directed to ARTICLE 1.5.7 [Wage Determination] of Section 00 90 00 with respect to wage rates. Under all Schedules of this Contract with the Owner, the Contractor and all subcontractors shall pay for all labor employed at no less than the minimum standard prevailing rate of wages for each classification, which shall be the higher of either the Montana Prevailing Wage Rates or the Federal Davis-Bacon Prevailing Wage Rates, as appended.

#### **ARTICLE 29 - BUILD AMERICA, BUY AMERICA (BABA) REQUIREMENTS**

29.01 BIDDER’S attention is directed to ARTICLE 1.5.10 [Build America, Buy America Requirements] of Section 00900. All of the iron, steel, manufactured products, and construction materials used in the project must be produced in the United States.

For iron and steel, all manufacturing processes, from the initial melting stage through the application of coatings, must occur in the United States. This includes products made primarily of iron or steel such as lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, and reinforced precast concrete and construction materials made primarily of iron or steel such as wire, cables, rebar, framing, joists, decking, grating, railings, stairs, and fencing.

The term “manufactured product” means the manufactured product was manufactured in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product. This includes (but is not limited to) pumps, motors, drives, mixers, motorized screens, controls and switches, membrane bioreactor systems, membrane filtration systems, clarifiers, disinfection systems, HVAC systems, and skids that contain multiple components.

For construction materials, all manufacturing processes for the construction material occurred in the United States. This includes an article, material, or supply that is or consists primarily of non-ferrous metals (construction materials made of ferrous metals are covered under iron and steel), plastic- and polymer-based products including PVC,

composite building materials, and polymers used in fiber optic cables, glass including optic glass, lumber, and drywall.

- 29.02 BABA CERTIFICATION FORMS - The General Contractor shall provide, to the Owner, the Manufacturer/Supplier Certification forms (from Exhibit E of Section 00900) either prior to product purchase or when the products are delivered. The General Contractor(s) shall also provide the Owner with the General Contractor Certification form(s) (from Exhibit E of Section 00900) upon project completion. General Contractor(s) shall ensure that all subcontractors and manufacturers/suppliers on the project have met the BABA requirements.
- 29.03 BABA WAIVERS - A waiver from the Build America, Buy America requirements may be issued by the head of a Federal agency if it is found that: 1) applying the domestic content procurement preference would be inconsistent with the public interest (a “public interest waiver”); 2) types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (a “nonavailability waiver”); or 3) inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent (an “unreasonable cost waiver”). Waiver requests must be submitted for review to the funding Agency.

The EPA has issued the following national waivers: 1) Adjustment Period (September 2, 2022); 2) Small Project (September 26, 2022); 3) De Minimis (October 21, 2022).

**END OF SECTION 00 21 13**

**SECTION 00 41 00  
BID FORM**

**ARTICLE 1 - BID RECIPIENT**

1.01 This Bid is submitted to:

**Town of Alberton  
Anna LeDuc – Town Mayor  
607 Railroad Ave  
Alberton, MT 59820**

**ARTICLE 2 - PROJECT IDENTIFICATION:**

2.01 General Description of Main Work Elements (See Article 6 below for complete list of bid items):

A. Base Bid Schedule A – Furnish/Install:

1. 1,152 lineal feet of 12" diameter PVC watermain, including valves & fittings;
2. 1,037 lineal feet of 10" diameter PVC watermain, including valves & fittings;
3. 1,102 lineal feet of 8" diameter PVC watermain, including valves & fittings;
4. 2,679 lineal feet of 6" diameter PVC watermain, including valves & fittings;
5. 235 lineal feet of directionally-drilled 6" through 12" HDPE watermain;
6. 12 standard 4¼" fire hydrants, including isolation valves;
7. 63 water services including: tap; corp stop; shutoff; valve box; re-connection;
8. 1,309 lineal feet of 1" diameter HDPE water service pipe;

B. Additive Alternate B – Furnish/Install:

1. 210 individual water meters including radios;
2. 28 water meter pits;
3. Remote meter reading equipment;
4. Meter reading software and billing system interface, startup, training

C. Additive Alternate C – Furnish/Install:

1. Replace Spring Source collection structure & connections;
2. 400 lineal feet of chain link fence & gates

D. Workscope for Base Bid & Alternates Includes:

1. All appurtenant work: rock & exploratory excavation; utility conflicts; gravel, pavement & surface restoration; flowable fill; temporary water service; dewatering; traffic control; tree removal; etc.

**ARTICLE 3 - BIDDER'S ACKNOWLEDGEMENTS**

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

3.02 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

- 3.03 Bidder acknowledges the provisions of the Agreement as to the assignment of the procurement contract for procurement of goods and special services for the **Town of Alberton Water System Improvements Project.**

**ARTICLE 4 - BIDDER'S REPRESENTATIONS**

4.01 In submitting this Bid, Bidder represents that:

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

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

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.
- 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.
- K. Bidder may include a mobilization cost deduct and contract time reduction for being awarded the Base Bid plus either Alternate B or Alternate C. The mobilization deduct will be utilized in the tabulation of bids and the determination of lowest responsive/responsible bidder.

## **ARTICLE 5 - BIDDER'S CERTIFICATION**

### **5.01 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 anything 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.

**ARTICLE 6 - BASIS OF BID**

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

<b>BASE BID A – 100: Distribution</b>					
<b>ITEM #</b>	<b>BID ITEM DESCRIPTION</b>	<b>UNITS</b>	<b>QUAN.</b>	<b>UNIT \$</b>	<b>SUBTOTAL</b>
100	Mobilization/Bonding/Insurance	LS	1	\$ _____	\$ _____
102	12" C900 PVC (open trench)	LF	1,152	\$ _____	\$ _____
104	10" C900 PVC (open trench)	LF	1,037	\$ _____	\$ _____
106	8" C900 PVC (open trench)	LF	1,102	\$ _____	\$ _____
108	6" C900 PVC (open trench)	LF	2,679	\$ _____	\$ _____
110	Rock Excavation	CY	2,300	\$ _____	\$ _____
112	Exploratory Excavation	Hr.	80	\$ _____	\$ _____
114	12" DR 13.5 HDPE (trenchless)	LF	56	\$ _____	\$ _____
116	8" DR 13.5 HDPE (trenchless)	LF	57	\$ _____	\$ _____
118	6" DR 13.5 HDPE (trenchless)	LF	122	\$ _____	\$ _____
120	12" Gate Valve	Each	1	\$ _____	\$ _____
122	12" Fitting	Each	16	\$ _____	\$ _____
124	10" Gate Valve	Each	5	\$ _____	\$ _____
126	10" Fitting	Each	10	\$ _____	\$ _____
128	8" Gate Valve	Each	2	\$ _____	\$ _____
130	8" Fitting	Each	13	\$ _____	\$ _____
132	8" Connection to Existing	Each	2	\$ _____	\$ _____
134	6" Gate Valve	Each	7	\$ _____	\$ _____
136	6" Cut-In Valve	Each	1	\$ _____	\$ _____
138	6" Fitting	Each	10	\$ _____	\$ _____
140	6" Connection to Existing	Each	3	\$ _____	\$ _____
142	4" Connection to Existing	Each	1	\$ _____	\$ _____
144	1 ½" Connection to Existing	Each	1	\$ _____	\$ _____
146	Plug & Abandon 4" to 8" Pipe End	Each	18	\$ _____	\$ _____
148	Remove Ex. Hydrant/Valve & Plug	Each	3	\$ _____	\$ _____
150	Standard 5 ¼" Fire Hydrant Assembly	Each	12	\$ _____	\$ _____
152	Standard 2 ⅝" Flush-Type Hydrant Assembly	Each	1	\$ _____	\$ _____
154	Air/Vac Release Valve/Structure - Complete	Each	3	\$ _____	\$ _____
156	Water Service Connection & Curb Box	Each	31	\$ _____	\$ _____
158	Water Service Conn/Curb Box/Meter Pit	Each	28	\$ _____	\$ _____
160	Water Service Stub Out & Curb Box	Each	4	\$ _____	\$ _____

162	3" Gate Valve, 3" Sch. 40 PVC & Cap Assembly @ Sta12+04 Sheet D-4	LS	1	\$ _____	\$ _____
164	1" HDPE Water Service Pipe	LF	1,309	\$ _____	\$ _____
166	2" Reconnection Assembly (Sta. 19+48 Sheet D-5)	LS	1	\$ _____	\$ _____
168	1½" Sch. 40 PVC Water Service Pipe	LF	15	\$ _____	\$ _____
170	Utility Conflict (Crossing or Parallel)	Each	28	\$ _____	\$ _____
172	Utility Pole Conflict	Each	9	\$ _____	\$ _____
174	Imported Trench or Stabilization Backfill*	CY	500	\$ _____	\$ _____
176	Town Street Section (Base Course & Pvm't)	SY	20	\$ _____	\$ _____
178	Concrete Sidewalk	SF	800	\$ _____	\$ _____
180	Concrete Driveway Replacement	SF	1,000	\$ _____	\$ _____
182	Gravel Road Restoration	SY	4,586	\$ _____	\$ _____
184	Remove/Replace MDT Asphalt Pavement	SY	50	\$ _____	\$ _____
186	Surface Restoration, Seeding, Fertilize	SY	5,455	\$ _____	\$ _____
188	Replace 4' Chainlink Fence & Gates	LF	430	\$ _____	\$ _____
190	Project Sign	LS	1	\$ _____	\$ _____
192	Flowable Fill	LF	364	\$ _____	\$ _____
194	Temporary Water	LS	1	\$ _____	\$ _____
196	Traffic Control - Devices	Days	133	\$ _____	\$ _____
198	Traffic Control - Flaggers	Days	35	\$ _____	\$ _____
200	Layout & Material Testing	LS	1	\$ _____	\$ _____
202	Reset Existing Sign/Marker on New Post	Each	8	\$ _____	\$ _____
204	Reset Existing Mailbox	Each	17	\$ _____	\$ _____
206	Remove/Dispose ≤14" Dia. Tree	Each	17	\$ _____	\$ _____
<b>BASE BID SUBTOTAL:</b>				\$ _____	
<b>BASE BID SUBTOTAL IN WORDS:</b>					

\* - To only be used at Engineer's discretion. If actual imported backfill quantity utilized is less than the estimated quantity, the Contractor will not be entitled to a change in the unit price.

**ADDITIVE ALTERNATE B – 200: Metering, Reading and Billing**

ITEM #	BID ITEM DESCRIPTION	UNITS	QUAN.	UNIT \$	SUBTOTAL
B-100	Mobilization/Bonding/Insurance	LS	1	\$ _____	\$ _____
B-102	¾" Water Meter & New Pit	Each	28	\$ _____	\$ _____
B-104	¾" Water Meter in Existing Pit	Each	40	\$ _____	\$ _____
B-106	¾" Water Meter – Non-Pit	Each	140	\$ _____	\$ _____
B-108	1½" Water Meter - Non-Pit	Each	2	\$ _____	\$ _____
B-110	Surface Restoration, Seeding, Fertilize	SY	350	\$ _____	\$ _____
B-112	Meter Reading & Billing System - Complete	LS	1	\$ _____	\$ _____
<b>ALTERNATE B SUBTOTAL:</b>				\$ _____	
<b>ALTERNATE B SUBTOTAL IN WORDS:</b>					
<b><u>MOBILIZATION DEDUCT:</u> deduct \$ _____ from bid item B-100 for award of Base Bid plus Alternate B.</b>					
<b><u>CONTRACT TIME:</u> deduct _____ days from 65 calendar day Alt B. schedule for award of Base Bid and Alternate B.</b>					

**ADDITIVE ALTERNATE C – 300: Spring Source Improvements**

ITEM #	BID ITEM DESCRIPTION	UNITS	QUAN.	UNIT \$	SUBTOTAL
C-100	Mobilization/Bonding/Insurance	LS	1	\$ _____	\$ _____
C-102	60" Concrete Spring Structure - Complete	LS	1	\$ _____	\$ _____
C-104	6' Chainlink with Barb Extension Fence & Gates	LF	250	\$ _____	\$ _____
C-106	Surface Restoration, Seeding, Fertilize	SY	460	\$ _____	\$ _____
<b>ALTERNATE C SUBTOTAL:</b>				\$ _____	
<b>ALTERNATE C SUBTOTAL IN WORDS:</b>					
<b><u>MOBILIZATION DEDUCT:</u> deduct \$ _____ from bid item C-100 for award of Base Bid plus Alternate C.</b>					
<b><u>CONTRACT TIME:</u> deduct _____ days from 15 calendar day Alt C. schedule for award of Base Bid and Alternate C.</b>					

## TOTAL BID SUMMARY CALCULATION:

BASE BID A SUBTOTAL:	\$ _____
ADDITIVE ALTERNATE B SUBTOTAL:	\$ _____
Alt. B Mobilization Deduct:	(-\$ _____)
ADDITIVE ALTERNATE C SUBTOTAL:	\$ _____
Alt C. Mobilization Deduct:	(-\$ _____)
CUMULATIVE BID TOTAL:	\$ _____
CUMULATIVE BID TOTAL IN WORDS:	

### ARTICLE 7 - TIME OF COMPLETION

7.01 Bidder agrees that the Work will be substantially complete in accordance with the following:

- A. Work under Base Bid will be substantially complete within 140 calendar days;
- B. Work under Additive Alternate B will be allowed another 65 calendar days beyond that allowed under Base Bid;
- C. Work under Additive Alternate C will be allowed another 15 calendar days beyond that allowed under Base Bid and Additive Alternate B;
- D. The Construction Agreement shall reflect any reduction in construction days outlined in the Bidder's completed bid form.

Only one Substantial Completion date will be observed for the entire scope of work established in the Agreement.

All work will be completed and ready for final payment in accordance with Paragraph 15.6 of the General Conditions within **30** calendar days of a single Substantial Completion date as indicated in the Agreement.

7.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

### ARTICLE 8 - ATTACHMENTS TO THIS BID

8.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security
  - 1. See SECTION – 00 43 13;
- B. List of Proposed Subcontractors
  - 1. See Article 12 of SECTION – 00 21 13;

- C. Evidence of authority to do business in the state of Montana; or a written covenant to obtain such license within the time for acceptance of Bids;
  - 1. Montana Contractor's Registration Number:
- D. Required Bidder Qualification Statement with supporting data
  - 1. FORM C-451 (See SECTION – 00 45 13).
- E. USEPA Certification Regarding Debarment, Suspension, and Other Responsibility Matters
- F. DBE Subcontractor Solicitation Information

**ARTICLE 9 - DEFINED TERMS**

9.01 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 10 - BID SUBMITTAL**

This Bid is SUBMITTED on \_\_\_\_\_, 2024

BY:

If Bidder is:

**An Individual**

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

By: \_\_\_\_\_  
*(Individual's Signature)*

Doing business as: \_\_\_\_\_

**A Partnership**

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

By: \_\_\_\_\_  
*(Signature of general partner – attach evidence of authority to sign)*

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

**A Corporation**

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

State of Incorporation: \_\_\_\_\_

Type (General Business, Profession, Service, Limited Liability): \_\_\_\_\_

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

*(Signature – attach evidence of authority to sign)*

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

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

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

*(Signature of Corporate Secretary)*

Date of Qualification to do business in Montana is \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_.

**A Joint Venture**

Name of Joint Venture: \_\_\_\_\_

First Joint Venture Name: \_\_\_\_\_

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

*(Signature of joint venture partner – attach evidence of authority to sign)*

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

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

Second Joint Venture Name: \_\_\_\_\_

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

*(Signature of joint venture partner – attach evidence of authority to sign)*

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

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

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



**BIDDER'S BUSINESS ADDRESS & CONTACT INFORMATION:**

Bidder's Business address: \_\_\_\_\_

Business Phone No. \_\_\_\_\_

Business Fax No. \_\_\_\_\_

Business E-Mail Address \_\_\_\_\_

State Contractor License No. \_\_\_\_\_ (If applicable)

Employer's Tax ID No. \_\_\_\_\_

**ADDRESS FOR GIVING NOTICES:**

Phone and e-mail address, and Address for receipt of *official communications* if different from Business address and contact information:

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

**SECTION 00 43 13  
BID BOND**

**BIDDER** (Name and Address):

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

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

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

**OWNER** (Name and Address):

\_\_\_\_\_  
Town of Alberton  
607 Railroad Ave  
\_\_\_\_\_  
Alberton, MT 59820  
\_\_\_\_\_

**BID**

BID DUE DATE: \_\_\_\_\_ April 19, 2024 \_\_\_\_\_  
PROJECT: \_\_\_\_\_

As described in Project Documents, the Bid is for provision of General Construction Services for the Town of Alberton, Montana – Water System Improvements Project located within established rights-of-ways and easements in the Town of Alberton, MT.

**BOND**

BOND NUMBER: \_\_\_\_\_  
DATE (Not later than Bid due date): \_\_\_\_\_  
PENAL SUM: \_\_\_\_\_ (Words) \_\_\_\_\_ (Figures)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

**BIDDER**

**SURETY**

\_\_\_\_\_  
(Seal)  
Bidder's Name and Corporate Seal

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

By: \_\_\_\_\_  
Signature and Title

By: \_\_\_\_\_  
Signature and Title  
(Attach Power of Attorney)

Attest: \_\_\_\_\_  
Signature and Title

Attest: \_\_\_\_\_  
Signature and Title

Note: (1) Above addresses are to be used for giving required notice.  
(2) Any singular reference to Bidder, Surety, OWNER or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder any difference between the total amount of Bidder's Bid and the total amount of the Bid of the next lowest, responsible and responsive Bidder as determined by OWNER for the Work required by the Contract Documents, provided that:

1.1. If there is no such next lowest, responsible and responsive Bidder, and OWNER does not abandon the Project, then Bidder and Surety shall pay to OWNER the penal sum set forth on the face of this Bond, and

1.2. In no event shall Bidder's and Surety's obligation hereunder exceed the penal sum set forth on the face of this Bond.

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 by 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 and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety and in no case later than one year after 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 or 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.

**END OF SECTION 00 43 13**

**SECTION 00 43 93  
BIDDERS CHECKLIST**

Directions: The following items are to be enclosed in the bid envelope received no later than the bid opening date of: **April 19, 2024, 2:00 p.m.** at the following address:

**Town of Alberton**

**Anna LeDuc – Town Mayor**

**At:**

**Alberton Senior Center – 701 Railroad Ave, Alberton, MT 59820 - on day of bid opening**

- 
- \_\_\_\_\_ Review Instructions to Bidders (Section 00 21 13)
  
  - \_\_\_\_\_ Complete Bid Form (Section 00 41 00) *It is not necessary to submit a complete bound set of project documents*
  
  - \_\_\_\_\_ Bid Bond (Section 00 43 13)
  
  - \_\_\_\_\_ Bidder Qualifications Form C-451 (Section 00 45 13)
  
  - \_\_\_\_\_ Funding Agency Forms (Section 00 90 00 – DBE; Debarment; BABA)
    - DBE Subcontractor Solicitation Information
    - SRF Certification Regarding Debarment, Suspension, and Other Responsibility Matters
    - Build America, Buy America Forms
  
  - \_\_\_\_\_ Contractor’s Registration
  
  - \_\_\_\_\_ Review Site Conditions

**SECTION 00 45 13  
BIDDERS QUALIFICATIONS FORM C-451**

**QUALIFICATIONS STATEMENT**

**THE INFORMATION SUPPLIED IN THIS DOCUMENT IS CONFIDENTIAL TO THE EXTENT  
PERMITTED BY LAWS AND REGULATIONS**

**1. SUBMITTED BY:**

Official Name of Firm: \_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

**2. SUBMITTED TO:**

\_\_\_\_\_

**3. SUBMITTED FOR:**

\_\_\_\_\_

Owner: Town of Alberton

Project Name: Town of Alberton – Water System Improvements Project

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**TYPE OF WORK:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**4. CONTRACTOR'S CONTACT INFORMATION**

Contact Person: \_\_\_\_\_

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

Phone: \_\_\_\_\_

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

**5. AFFILIATED COMPANIES:**

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

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

\_\_\_\_\_

\_\_\_\_\_

**6. TYPE OF ORGANIZATION:**

SOLE PROPRIETORSHIP

Name of Owner: \_\_\_\_\_

Doing Business As: \_\_\_\_\_

Date of Organization: \_\_\_\_\_

PARTNERSHIP

Date of Organization: \_\_\_\_\_

Type of Partnership: \_\_\_\_\_

Name of General Partner(s): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

CORPORATION

State of Organization: \_\_\_\_\_

Date of Organization: \_\_\_\_\_

Executive Officers: \_\_\_\_\_

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

- Vice President(s): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

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

LIMITED LIABILITY COMPANY

State of Organization: \_\_\_\_\_

Date of Organization: \_\_\_\_\_

Members: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

JOINT VENTURE

Sate of Organization: \_\_\_\_\_

Date of Organization: \_\_\_\_\_

Form of Organization: \_\_\_\_\_

Joint Venture Managing Partner

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

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

Joint Venture Managing Partner

- Name: \_\_\_\_\_  
- Address: \_\_\_\_\_  
\_\_\_\_\_

Joint Venture Managing Partner

- Name: \_\_\_\_\_  
- Address: \_\_\_\_\_  
\_\_\_\_\_

**7. LICENSING**

Jurisdiction: \_\_\_\_\_  
Type of License: \_\_\_\_\_  
License Number: \_\_\_\_\_  
Jurisdiction: \_\_\_\_\_  
Type of License: \_\_\_\_\_  
License Number: \_\_\_\_\_

**8. CERTIFICATIONS**

CERTIFIED BY:

Disadvantage Business Enterprise: \_\_\_\_\_  
Minority Business Enterprise: \_\_\_\_\_  
Woman Owned Enterprise: \_\_\_\_\_  
Small Business Enterprise: \_\_\_\_\_  
Other (\_\_\_\_\_): \_\_\_\_\_

**9. BONDING INFORMATION**

Bonding Company: \_\_\_\_\_  
Address: \_\_\_\_\_



\_\_\_\_\_

Bonding Agent: \_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

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

Phone: \_\_\_\_\_

Aggregate Bonding Capacity: \_\_\_\_\_

Available Bonding Capacity as of date of this submittal: \_\_\_\_\_

**10. FINANCIAL INFORMATION**

Financial Institution: \_\_\_\_\_

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

\_\_\_\_\_

Account Manager: \_\_\_\_\_

Phone: \_\_\_\_\_

INCLUDE AS AN ATTACHMENT AN AUDITED BALANCE SHEET FOR EACH OF THE LAST 3 YEARS

**11. CONSTRUCTION EXPERIENCE:**

Current Experience:

List on **Schedule A** all uncompleted projects currently under contract (If Joint Venture list each participant's projects separately).

Previous Experience:

List on **Schedule B** all projects completed within the last 5 Years (If Joint Venture list each

participant's projects separately).

Has firm listed in Section 1 ever failed to complete a construction contract awarded to it?

YES  NO

If YES, attach as an Attachment details including Project Owner's contact information.

Has any Corporate Officer, Partner, Joint Venture participant or Proprietor ever failed to complete a construction contract awarded to them in their name or when acting as a principal of another entity?

YES  NO

If YES, attach as an Attachment details including Project Owner's contact information.

Are there any judgments, claims, disputes or litigation pending or outstanding involving the firm listed in Section 1 or any of its officers (or any of its partners if a partnership or any of the individual entities if a joint venture)?

YES  NO

If YES, attach as an Attachment details including Project Owner's contact information.

## 12. SAFETY PROGRAM:

Name of Contractor's Safety Officer: \_\_\_\_\_

Include the following as attachments:

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) OSHA No. 300- Log & Summary of Work-Related Injuries & Illnesses for the past 5 years.

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) list of all OSHA Citations & Notifications of Penalty (monetary or other) received within the last 5 years (indicate disposition as applicable) - IF NONE SO STATE.

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) list of all safety citations or violations under any state all received within the last 5 years (indicate disposition as applicable) - IF NONE SO STATE.

Provide the following for the firm listed in Section V (and for each proposed Subcontractor furnishing or performing Work having a value in excess of 10 percent of the total amount of

the Bid) the following (attach additional sheets as necessary):

Workers' compensation Experience Modification Rate (EMR) for the last 5 years:

YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____

Total Recordable Frequency Rate (TRFR) for the last 5 years:

YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____

Total number of man-hours worked for the last 5 Years:

YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____

Provide Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) Days Away From Work, Days of Restricted Work Activity or Job Transfer (DART) incidence rate for the particular industry or type of Work to be performed by Contractor and each of Contractor's proposed Subcontractors and Suppliers) for the last 5 years:

YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____

**13. EQUIPMENT:**

MAJOR EQUIPMENT:

List on **Schedule C** all pieces of major equipment available for use on Owner's Project.

**14. SUBCONTRACTORS**

MAJOR SUBCONTRACTORS:

List on **Schedule D** all "Major Subcontractors" planned for use on the Project.

I HEREBY CERTIFY THAT THE INFORMATION SUBMITTED HEREWITH, INCLUDING ANY ATTACHMENTS, IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

NAME OF ORGANIZATION: \_\_\_\_\_

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATED: \_\_\_\_\_

NOTARY ATTEST:

SUBSCRIBED AND SWORN TO BEFORE  
ME THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_

NOTARY PUBLIC - STATE OF \_\_\_\_\_  
MY COMMISSION EXPIRES: \_\_\_\_\_

REQUIRED ATTACHMENTS

1. Schedule A (Current Experience).
2. Schedule B (Previous Experience).
3. Schedule C (Major Equipment).
4. Audited balance sheet for each of the last 3 years for firm named in Section 1.
5. Evidence of authority for individuals listed in Section 7 to bind organization to an agreement.

6. Resumes of officers and key individuals (including Safety Officer) of firm named in Section 1.
7. Required safety program submittals listed in Section 13.
8. Additional items as pertinent.

SCHEDULE A

CURRENT EXPERIENCE (Current projects and those completed within the past year)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				





**SCHEDULE D – LIST OF MAJOR SUBCONTRACTORS**

*(If any of the given "MAJOR SUB-CONTRACTS" will not be used, so indicate by listing "NA" in the respective row under "PROPOSED SUBCONTRACTOR").*

<b>MAJOR SUB-CONTRACTS</b>	<b>PROPOSED SUBCONTRACTOR</b>	<b>CITY / STATE</b>
<del>Mechanical Work (HVAC)</del>		
Mechanical Work (Plumbing)		
<del>Electrical Work</del>		
<del>Roofing Work</del>		
Site / Civil		
Dewatering		
<del>Environmental / Groundwater Remediation</del>		
<del>OTHERS (PLEASE SPECIFY)</del>		

**SECTION 00 51 00  
NOTICE OF AWARD**

**To:** \_\_\_\_\_

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

**Contract:**     **Town of Alberton**

**Project:**     **Water System Improvements Project**

You are notified that your Bid dated: \_\_\_\_\_ for the above Contract has been considered. Your unit price bid, with documentation, has been found to be in the best interest of the District and you are being provided this Notice of Award for a Contract for the construction of the Town of Alberton Water Improvements Project.

The Contract Price of your Contract is:

A. Base Bid: \_\_\_\_\_ **(in words),**

          \$ \_\_\_\_\_ **(in figures).**

B. Alternate B \_\_\_\_\_ **(in words),**

          \$ \_\_\_\_\_ **(in figures).**

C. Alternate C \_\_\_\_\_ **(in words),**

          \$ \_\_\_\_\_ **(in figures).**

You must comply with the following conditions precedent **within 14 days** of the date you receive this Notice of Award.

1.     Deliver to the OWNER 2 copies of the fully executed counterparts of the Contract Documents.
2.     Deliver required certificates of insurance, as described in the contract documents.
3.     Deliver Bond Documents.

Failure to comply with these conditions within the time specified will entitle OWNER to consider your Cost Quotation in default, to annul this Notice of Award.

Within ten days after you comply with the above conditions, OWNER will return to you one fully executed counterpart of the Contract Documents.

DATED this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

TOWN OF ALBERTON

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

**ACCEPTANCE OF NOTICE**

Receipt of the above Notice of Award is hereby acknowledged this \_\_\_\_ day of \_\_\_\_\_, 2024.

\_\_\_\_\_  
Contractor

BY: \_\_\_\_\_  
Name Title

Copy to ENGINEER

**END OF SECTION 00 51 00**

**SECTION 00 52 00**  
**AGREEMENT BETWEEN OWNER AND CONTRACTOR**  
**FOR CONSTRUCTION CONTRACT**

THIS AGREEMENT is by and between the Town of Alberton (“Owner”) and \_\_\_\_\_ (“Contractor”).

Owner and Contractor hereby agree as follows:

**ARTICLE 1 – WORK**

1.1 Contractor shall complete all Work as specified or indicated in the Contract Documents for the *Water System Improvements Project*. The Work is generally described as follows:

- Base Bid – Furnish/Install:
  - 1,152 lineal feet of 12" diameter PVC watermain, including valves & fittings;
  - 1,037 lineal feet of 10" diameter PVC watermain, including valves & fittings;
  - 1,102 lineal feet of 8" diameter PVC watermain, including valves & fittings;
  - 2,679 lineal feet of 6" diameter PVC watermain, including valves & fittings;
  - 235 lineal feet of directionally-drilled 6" through 12" HDPE watermain;
  - 12 standard 4¼" fire hydrants, including isolation valves;
  - 60 water services including: tap; corp stop; shutoff; valve box; re-connection;
  - 1,379 lineal feet of 1" diameter HDPE water service pipe;
- Additive Alternate B – Furnish/Install:
  - 210 individual solid-state water meters including radios;
  - 28 meter pits;
  - Remote meter reading equipment;
  - Meter reading software and billing system interface, startup, training
- Additive Alternate C – Furnish/Install:
  - Replace Spring Source collection structure & connections;
  - 400 lineal feet of chain link fence & gates

**WORKSCOPE FOR BASE BID & ALL ALTERNATES INCLUDES:**

- All appurtenant work: rock & exploratory excavation; utility conflicts; gravel, pavement & surface restoration; flowable fill; temporary water service; dewatering; traffic control; tree removal; etc.

**ARTICLE 2 – THE PROJECT**

2.1 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Town of Alberton Water System Improvements Project.

**ARTICLE 3 – ENGINEER**

3.1 The Project has been designed by:

Anderson-Montgomery Consulting Engineers, Inc.

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

#### ARTICLE 4 – CONTRACT TIMES

##### 4.1 *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. The Total Contract Time allowed for this Project will be as follows:
1. **BASE BID A: 140 consecutive** calendar days from the date of the Notice to Proceed to the date of Substantial Completion;
  2. **ALTERNATE B: an additional 65 consecutive** calendar days;
  3. **ALTERNATE C: an additional 15 consecutive** calendar days;
- B. *The Bid Form allows for reduced contract times in the event that the lowest responsive/responsible bidder is awarded the Base Bid plus Alternates B and/or Alternate C. The Bidder-provided contract time reductions shall be considered when establishing the overall contract period.*

##### 4.2 *Contract Times: Dates*

- A. The Work will be substantially completed on or before \_\_\_\_\_, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before \_\_\_\_\_.

##### 4.3 *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 the Owner up to **\$1,000.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
  2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner up to **\$750.00** for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

## ARTICLE 5 – CONTRACT PRICE

- 5.1 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. Mobilization:
    - Up to 50% of the Base Bid and individual Alternates mobilization bid item(s) upon submittal of the first pay application after breaking ground;
    - Up to 75% of the Base Bid and individual Alternates mobilization bid item(s) when the overall collective project completion reaches 50%;
    - Up to 100% of the Base Bid and individual Alternates mobilization bid item(s) when the project is complete and the Contractor has demobilized all equipment.
  - B. *The Bid Form allows for reduced contract prices in the event that the lowest responsive/responsible bidder is awarded the Base Bid plus Alternates B and/or Alternate C. The Bidder-provided contract price reductions shall be considered when establishing the overall contract dollar amount.*

## ARTICLE 6 – PAYMENT PROCEDURES

- 6.1 *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.
- 6.2 *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 15<sup>th</sup> 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; and
      - b. **95** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
  - B. Upon Substantial Completion **of the entire construction to be provided under the Contract Documents**, Owner shall pay an amount sufficient to increase total payments to Contractor to **97.5** percent of the Work completed, less such amounts

set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **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.

6.3 *Final Payment*

- A. Upon final completion and acceptance of the Work and receipt of all lien waivers 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.

6.4 *Gross Receipts Withholding Requirements*

- A. Pursuant to Section 15-50-206(2)(3), MCA, the Owner is required to withhold one percent (1%) of all payments due the Contractor and is required to transmit such moneys to the Montana Department of Revenue as part of the public contractor's license fee. In like fashion, the Contractor is required to withhold one percent (1%) from payments to subcontractors.

**ARTICLE 7 – INTEREST**

- 7.1 All amounts not paid when due shall bear interest at the **maximum rate allowed by law at the place of the Project.**

**ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS**

- 8.1 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
  - A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
  - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (3) reports and drawings related to other work scheduled in the general vicinity of the project during the planned construction period.
  - E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract



Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

## ARTICLE 9 – CONTRACT DOCUMENTS

### 9.1 *Contents*

- A. The Contract Documents consist of the following:
  - 1. This Agreement
  - 2. Performance bond
  - 3. Payment bond
  - 4. General Conditions Supplementary Conditions
  - 5. Specifications:
    - a. Technical Specifications – Divisions 2 through 33;
    - b. Work Plan (See Section 01 11 00)
    - c. Montana Public Works Standard Specifications (Current Edition)
  - 6. Construction Drawings consisting of the Drawings listed on the Index Sheet in Appendix B, each bearing the following general title: **Town of Alberton Water System Improvements Project** are not attached, but included by reference.
  - 7. Addenda
  - 8. Exhibits to this Agreement
    - a. Funding Agency Special Provisions for Montana Public Facility Projects
  - 9. 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.
- B. The documents listed in Paragraph 9.1.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**

### 10.1 *Terms*

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

### 10.2 *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.

### 10.3 *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.

### 10.4 *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.

### 10.5 *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 anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
  - 2. “fraudulent practice” means an intentional misrepresentation of facts made
    - (a) to influence the bidding process or the execution of the Contract to the

detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

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

10.6 *Other Provisions*

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

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

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

<p><b><u>OWNER:</u></b></p> <p><b><i>TOWN OF ALBERTON</i></b></p> <p>By: _____  Print Name: Anna LeDuc  Title: Town Mayor</p> <p>Attest: _____</p> <p>Print Name: _____  Title: _____</p> <p>Address for giving notices:</p> <p>Town of Alberton  607 Railroad Ave  Alberton, MT 59820</p>	<p><b><u>CONTRACTOR:</u></b></p> <p>_____</p> <p>By: _____  Title: _____</p> <p><i>(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)</i></p> <p>Attest: _____</p> <p>Print Name: _____  Title: _____</p> <p>Address for giving notices:</p> <p>_____</p> <p>_____</p> <p><i>(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)</i></p>
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**SECTION 00 55 00  
NOTICE TO PROCEED**

Owner: **Town of Alberton**

Owner's Contract No.:

Contractor:

Contractor's Project No.:

Engineer: **Anderson Montgomery Consulting  
Engineers**

Engineer's Project No.:

Project: **Water System Improvements Project**

Contract Name:

Effective Date of Contract:

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**TO CONTRACTOR:**

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on

\_\_\_\_\_, 2024. (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 \_\_\_\_\_.

Before starting any Work at the Site, Contractor must comply with the following:

*[Note any access limitations, security procedures, or other restrictions]*

---

Recommended:

Accepted:

Accepted:

\_\_\_\_\_  
Engineer (Authorized Signature)

\_\_\_\_\_  
Owner (Authorized Signature)

\_\_\_\_\_  
Contractor (Authorized Signature)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Date)

**SECTION 00 61 10  
PERFORMANCE BOND**

CONTRACTOR *(name and address):*  
*place of business):*

SURETY *(name and address of principal*

OWNER : **Town of Alberton**  
**607 Railroad Ave**  
**Alberton, MT 59820**

**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

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

**CONTRACTOR AS PRINCIPAL**

**SURETY**

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

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

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

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

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

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

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

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

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

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

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

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

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

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

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

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

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

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not

constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

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

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

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

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



Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### 14. Definitions

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

payments made to or on behalf of the Contractor under the Construction Contract.

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

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

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

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

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

16. Modifications to this Bond are as follows:

**SECTION 00 61 13  
PAYMENT BOND**

CONTRACTOR *(name and address):*  
*of business):*

SURETY *(name and address of principal place*

OWNER : Town of Alberton, Alberton, MT 59820

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

- 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:



## PARTIAL PAYMENT ESTIMATE

			<b>Contractor's Application for Payment No:</b>			<b>1</b>				
<b>Owner:</b>			<b>Contractor:</b>			<b>Contract No. _____</b>		<b>Schedule No. _____</b>		
Town of Alberton, Montana			Business Name:			<b>Partial Payment Estimate Date:</b>				
607 Railroad Avenue			Business Address:			<b>Page _____</b>		<b>Of _____</b>		
Alberton, MT 59820			Primary Contact:							
<b>Contact: Anna LeDuc, Mayor</b>			Contact Cell Phone:			<b>PERIOD OF ESTIMATE</b>				
						<b>From _____</b>		<b>To _____</b>		
						mo/day/yr		mo/day/yr		
<b>CONTRACT CHANGE ORDER SUMMARY</b>					<b>ESTIMATE</b>					
No.	Approval	Amount			Original Contract					
	Date	Additions	Deductions		Change Orders					
					\$ -					
					Revised Contract					
					\$ -					
					Work Completed					
					Stored Materials					
					\$ -					
					<b>SUBTOTAL</b>					
					\$ -					
					Retainage					
					\$ -					
					Previous Payments					
					\$ -					
					Gross Amount Due					
					\$ -					
<b>TOTALS</b>		\$	-	\$	-	1% MT Gross Receipts Tax				
<b>NET CHANGE</b>		\$			-	Net Due to Contractor				
						\$ -				
<b>CONTRACT TIME</b>										
Contract Time			Start							
From Change Order			Stop							
Total Contract Time			0			Weather Days				
Time Used						Substantial Completion				
Total Days Remaining			0							
Percent of Time Used			#DIV/0!							
<b>CONTRACTOR'S CERTIFICATION</b>					<b>ENGINEER'S CERTIFICATION</b>					
The undersigned Contractor certifies that to the best of their knowledge, information and belief the work covered by this payment estimate has been completed in accordance with the contract documents, that all amounts have been paid by the contractor for work for which previous payment estimates was issued and payments received from the owner, and that current shown herein is now due.					The undersigned certifies that the work has been carefully inspected and to the best of their knowledge and belief. The quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents.					
<b>Contractor</b>					<b>Engineer</b>					
<b>By</b>					<b>By</b>					
<b>Date</b>					<b>Date</b>					
<b>APPROVED BY OWNER</b>					<b>ACCEPTED BY AGENCY</b>					
The review and acceptance of this estimate does not attest to the correctness of the quantities shown or that the work has been performed in accordance with the contract documents.										
<b>Owner</b>					<b>By</b>					
<b>By</b>					<b>Title</b>					
<b>Date</b>					<b>Date</b>					





**SECTION 00 63 49  
WORK CHANGE DIRECTIVE**

No. \_\_\_\_\_

Date of Issuance: \_\_\_\_\_

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

Project: <b>Water System Improvements Project</b>	Owner: <b>Town of Alberton</b>	Owner's Contract No.:
Contract:	Date of Contract:	
Equipment Seller:	Engineer's Project No.:	

**You are directed to proceed promptly with the following change(s):**

Item No.	Description

**Attachments (list documents supporting change):**

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

**Purpose for Work Change Directive:**

- Authorizations for Work described herein to proceed on the basis of Cost of the Work due to:
  - Non-agreement on pricing of proposed change.
  - Necessity to expedite Work described herein prior to agreeing to changes on Contract Price and Contract Time.

**Estimated change in Contract Price and Contract Times:**

Contract Price \$ \_\_\_\_\_ (increase/decrease)    Contract Time \_\_\_\_\_  
(increase/decrease) Days

If the change involves an increase, the estimated amounts are not to be exceeded without further authorization.

Recommended for Approval by Engineer:	Date
Authorized for Owner by:	Date
Accepted for Equipment Seller by:	Date
Approved by Funding Agency (if applicable):	Date

**END OF SECTION 00 63 49**

**SECTION 00 63 63  
CHANGE ORDER**

Change Order No: \_\_\_\_\_ Date of Issuance: \_\_\_\_\_ Effective Date: \_\_\_\_\_

Project: <b>Water System Improvements Project</b>	Owner: <b>Town of Alberton</b>	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

**The Contract Documents are modified as follows upon execution of this Change Order:**

Description:

Attachments: (List documents supporting change):

**CHANGE IN CONTRACT PRICE:**

Original Contract Price:

\$ \_\_\_\_\_

[Increase] [Decrease] from previously approved Change Orders No. \_\_\_\_\_ to No. \_\_\_\_\_:

\$ \_\_\_\_\_

Contract Price prior to this Change Order:

\$ \_\_\_\_\_

[Increase] [Decrease] of this Change Order:

**CHANGE IN CONTRACT TIMES:**

Original Contract Times:   Working days

Calendar days Substantial completion (days or date): \_\_\_\_\_

Ready for final payment (days or date): \_\_\_\_\_

[Increase] [Decrease] from previously approved Change Orders No. \_\_\_\_\_ to No. \_\_\_\_\_:

Substantial completion (days): \_\_\_\_\_

Ready for final payment (days): \_\_\_\_\_

Contract Times prior to this Change Order:

Substantial completion (days or date): \_\_\_\_\_

Ready for final payment (days or date): \_\_\_\_\_

[Increase] [Decrease] of this Change Order:

Substantial completion (days or date): \_\_\_\_\_  
\$ \_\_\_\_\_ Ready for final payment (days or date): \_\_\_\_\_

Contract Price incorporating this Change Order: Contract Times with all approved Change Orders:

Substantial completion (days or date): \_\_\_\_\_  
\$ \_\_\_\_\_ Ready for final payment (days or date): \_\_\_\_\_

---

RECOMMENDED:

ACCEPTED:

ACCEPTED:

By: \_\_\_\_\_ By: \_\_\_\_\_ By: \_\_\_\_\_  
Engineer (Authorized Signature) Owner (Authorized Signature) Contractor (Authorized Signature)

Date: \_\_\_\_\_ Date: \_\_\_\_\_ Date: \_\_\_\_\_  
Approved by Funding Agency (if applicable): \_\_\_\_\_ Date: \_\_\_\_\_

**SECTION 00 65 16**  
**CERTIFICATE OF SUBSTANTIAL COMPLETION**

Owner: **Town of Alberton**  
Contractor:  
Engineer: **Anderson Montgomery Consulting Engineers**  
Project: **Town of Alberton – Water System Improvements Project**

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

**This [preliminary] [final] Certificate of Substantial Completion applies to:**

- All Work  The following specified portions of the Work:

**Date of Substantial Completion**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

Amendments to Owner's responsibilities:

- None  
 As follows

Amendments to  
Contractor's responsibilities:

- None  
 As follows:

The following documents are attached to and made a part of this Certificate: *[punch list; others]*

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

<b>EXECUTED BY ENGINEER:</b>	<b>RECEIVED:</b>	<b>RECEIVED:</b>
By: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____



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.

**SECTION 00 72 00 STANDARD  
GENERAL CONDITIONS OF THE  
CONSTRUCTION CONTRACT**

Prepared by



Issued and Published Jointly by



These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

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**STANDARD GENERAL CONDITIONS OF THE  
CONSTRUCTION CONTRACT**

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.1 *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. §§5501 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.

## 1.2 *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

### 2.1 *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.

### 2.2 *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.

### 2.3 *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.

### 2.4 *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.

### 2.5 *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.

## 2.6 *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**

### 3.1 *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.

### 3.2 *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.

### 3.3 *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).

### 3.4 *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.

### 3.5 *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**

#### 4.1 *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.

#### 4.2 *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.

#### 4.3 *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.

#### 4.4 *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.

#### 4.5 *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**

### *5.1 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.

## 5.2 *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.

### 5.3 *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.

### 5.4 *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.

## 5.5 *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.

## 5.6 *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.H 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**

### *6.1 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.

### *6.2 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.

### 6.3 *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.

#### 6.4 *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.

#### 6.5 *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.

## 6.6 *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.

6.7 *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**

7.1 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently,  
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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.

## 7.2 *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.

## 7.3 *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.

## 7.4 *"Or Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items

from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an “or equal” item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
  - a. in the exercise of reasonable judgment Engineer determines that:
    - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
    - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
    - 3) it has a proven record of performance and availability of responsive service; and
    - 4) it is not objectionable to Owner.
  - b. Contractor certifies that, if approved and incorporated into the Work:
    - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
    - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor’s Expense*: Contractor shall provide all data in support of any proposed “or equal” item at Contractor’s expense.
- C. *Engineer’s Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each “or-equal” request. Engineer may require Contractor to furnish additional data about the proposed “or-equal” item. Engineer will be the sole judge of acceptability. No “or-equal” item will be ordered, furnished, installed, or utilized until Engineer’s review is complete and Engineer determines that the proposed item is an “or-equal”, which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer’s Determination*: Neither approval nor denial of an “or-equal” request shall result in any change in Contract Price. The Engineer’s denial of an “or-equal” request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

## 7.5 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.

#### 7.6 *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.

#### 7.7 *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.

#### 7.8 *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

#### 7.9 *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**

### 8.1 *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.

## 8.2 *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.

## 8.3 *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 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**

### *9.1 Communications to Contractor*

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

### *9.2 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.

- 9.3 *Furnish Data*
- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.
- 9.4 *Pay When Due*
- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.
- 9.5 *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.
- 9.6 *Insurance*
- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.
- 9.7 *Change Orders*
- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.8 *Inspections, Tests, and Approvals*
- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.9 *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**

### *10.1 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.

### *10.2 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.

### *10.3 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.

### *10.4 Rejecting Defective Work*

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

### *10.5 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.

10.6 *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.

10.7 *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.

10.8 *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.

## 10.9 *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**

### 11.1 *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.

## 11.2 *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.

## 11.3 *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.

## 11.4 *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 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 11.01.C.2.a and 11.01.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.

#### 11.5 *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.

#### 11.6 *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.

#### 11.7 *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.

#### 11.8 *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**

#### 12.1 *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**

### **13.1 *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.

### 13.2 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.

### 13.3 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**

### **14.1 *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.

### **14.2 *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.

#### 14.3 *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.

#### 14.4 *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.

#### 14.5 *Uncovering Work*

- A. Engineer has the authority to require special 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.

14.6 *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.

14.7 *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**

15.1 *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.

#### 15.2 *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.

#### 15.3 *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

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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.

#### 15.4 *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.

#### 15.5 *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.

## 15.6 *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.

#### 15.7 *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.

#### 15.8 *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

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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**

### *16.1 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.

### *16.2 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.

### 16.3 *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.

### 16.4 *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 (2) 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**

### 17.1 *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**

### 18.1 *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.

### 18.2 *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.

### 18.3 *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.

### 18.4 *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.

18.5 *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.

18.6 *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.

18.7 *Controlling Law*

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

18.8 *Headings*

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

**SECTION 00 73 00  
SUPPLEMENTARY CONDITIONS**

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

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

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

***SC-6.2 – Insurance—General Provisions***

**SC-6.2 Add the following paragraph immediately after Paragraph 6.2.B:**

1. With 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 a 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 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 coverage shall remain in effect throughout the life of the Agreement, except that the Contractor shall maintain the Commercial General Liability Policy including project 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-6.3 – Contractor’s Liability Insurance***

**SC-6.3 Add the following new paragraph immediately after Paragraph 6.3.J:**

K. The limits of liability for the insurance required by Paragraph 6.3 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 6.3.A.1 and A.2 of the General Conditions:

<b>State:</b>	<b>Statutory</b>
<b>Federal, if applicable (e.g., Longshoreman’s):</b>	<b>Statutory</b>
<b>Employer’s Liability:</b>	<b>\$500,000.00</b>

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

<b>General Aggregate</b>	<b>\$ 3,000,000.00</b>
<b>Products - Completed Operations Aggregate</b>	<b>\$ 3,000,000.00</b>
<b>Personal and Advertising Injury</b>	<b>\$ 1,000,000.00</b>
<b>Each Occurrence (Bodily Injury and Property Damage)</b>	<b>\$ 1,000,000.00</b>

**Coverage to include:**

- 1) Premises – Operations
- 2) Operations of Independent Contractor.
- 3) Contractual Liability.
- 4) Personal Injury
- 5) Products and Completed Operations
- 6) Broad Form Property Damage will include explosion, collapse, blasting, and underground where applicable.
- 7) Per Project Aggregate Endorsement.

**2. Automobile Liability under Paragraph 6.03.D. of the General Conditions:**

**Bodily Injury:**

<b>Each person</b>	<b>\$ 500,000.00</b>
<b>Each accident</b>	<b>\$ 1,000,000.00</b>

**Property**

<b>Damage: Each</b>	<b>\$ 1,000,000.00</b>
<i>[or]</i> Combined Single Limit of	<b>\$ 1,000,000.00</b>

**Coverage to include:**

- 1) All Owned.
- 2) Hired
- 3) Non-Owned

**3. Excess or Umbrella Liability:**

Contractor's Liability Insurance under 6.3.B1 through 6.3.B.4 may be satisfied by primary insurance or a combination of primary and excess or umbrella insurance. Primary occurrence limit cannot be less than \$1,000,000.00. Deductible not to exceed \$5,000.00 per occurrence on property damage.

**4. Contractor's Pollution Liability:**

<b>Each Occurrence</b>	<b>\$ N.A.</b>
<b>General Aggregate</b>	<b>\$ N.A.</b>

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

**5. Additional Insureds: In addition to Owner and Engineer, include as additional insureds all Engineering Subconsultants.**

**6. Contractor's Professional Liability:**

<b>Each Claim</b>	<b>\$1,000,000.00</b>
<b>Annual Aggregate</b>	<b>\$ 3,000,000.00</b>

**7. The Contractual Liability coverage required by paragraph 6.03.B.1 through 6.03.B.4 of the General Conditions shall provide coverage for not less than the following amounts:**

<b>Each Occurrence:</b>	<b>\$ 1,000,000.00</b>
<b>Aggregate</b>	<b>\$ 3,000,000.00</b>



**SC-6.3.I.3 Replace paragraph 6.3.I.3 with the following:**

6.3.I.3. Contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 45 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 6.2.C will so provide).

***SC-6.5 – Property Insurance***

**SC-6.5. Delete Paragraph 6.5.A in its entirety and insert the following in its place:**

CONTRACTOR shall purchase and maintain property insurance, completed value form, 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, Engineer, Engineer's Consultants, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of any of them 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, falsework, 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, earth movement, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, flood damage, and such other perils 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 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 that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by ENGINEER;
5. Be endorsed to allow occupancy and partial utilization 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.
6. Include performance/hot testing and startup;
7. Be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

8. Hold CONTRACTOR responsible for any deductible or self-insured retention;
9. Be purchased and maintained by CONTRACTOR in accordance with this Paragraph SC- 6.5 and shall comply with the requirements of Paragraph 6.5.B of the General Conditions.  
The qualifications of the insurance company shall comply with the requirements of paragraph 6.2.B.
10. 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).
11. Allow for the waiver of the insurer's subrogation rights, as set forth below.
12. Provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
13. Not include a co-insurance clause
14. Include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
15. 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.
16. Include by express endorsement coverage of damage to Contractor's equipment.

**SC-6.5.A.1 Add the following new subparagraph after subparagraph 6.5.A.1:**

- a. In addition to Owner, Contractor, and all Subcontractors, include the Engineer and Engineering Subconsultants as insureds.

**SC-6.5.B. Replace Paragraph 6.5.B. with the following language:**

All of the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 6.5 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 45 days prior written notice has been given to

Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 6.6.

**SC-7.6.A Amend Paragraph 7.6.A by adding the following text to the end of the Paragraph:**

The Contractor shall not award work valued at more than fifty percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.

**SC7.7 B Patent Fees and Royalties Modify Paragraph 7.7 B by replacing the text with the following:**

7.7 B 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.

***SC-10.3 – Project Representative***

**SC-10.3 Add the following new paragraphs immediately after Paragraph 10.03.A:**

- A. 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.

B. 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.

**SC-15.4 Add the following to the end of Paragraph 15.4.A:**

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 times 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 15.3. 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-15.6 Final Payment***

**SC-15.6.A Add the following Paragraph Immediately after Paragraph 15.6.A**

Upon correction of deficiencies and completion of the entire Work, Contractor shall notify Engineer in writing requesting a final inspection. If, in the Opinion of the Engineer, the Contractor has satisfactorily completed the Work, Owner, Agency, Engineer, and Contractor shall execute the Final Inspection and Acceptance.

**SC-17.1.B Add the following Paragraph Immediately after Paragraph 17.1.B entitled 17.1.C Dispute Resolution Process - Mediation.**

***C. Dispute Resolution Process – Mediation:*** Owner and Contractor agree that they shall first submit any and all unsettled claims, counterclaims, disputes, and other matters in question between them arising out of or relating to this Agreement or the breach thereof ("Disputes") to mediation by a mediator to be agreed upon by the parties, or each party will choose a mediator and those mediators will together choose a mediator for the mediation. Owner and Contractor agree to participate in the mediation process in good faith. The process shall be conducted on a confidential basis, and shall be completed within 120 days. If such mediation is unsuccessful in resolving a Dispute, then (1) the parties may mutually agree to a dispute resolution of their choice, or (2) either party may seek to have the Dispute resolved by a court of competent jurisdiction.

**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](http://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](http://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](http://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](http://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](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

<b>Wage</b>	<b>Benefit</b>
\$35.30	\$30.94

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

**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.

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## BRICK, BLOCK, AND STONE MASONS

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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 Batcher; 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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

	<b>Wage</b>	<b>Benefit</b>
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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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)

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$38.56	\$17.93

**Travel:**  
No Free Zone  
\$60.00/day

**Duties Include:**

All work on substations

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## LINE CONSTRUCTION – GROUNDMAN

<b>Wage</b>	<b>Benefit</b>
\$30.11	\$17.44

**Travel:**  
No Free Zone  
\$60.00/day

**Duties Include:**

All work on substations

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## LINE CONSTRUCTION – LINEMAN

<b>Wage</b>	<b>Benefit</b>
\$50.35	\$19.54

**Travel:**  
No Free Zone  
\$60.00/day

**Duties Include:**

All work on substations

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## MILLWRIGHTS

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$25.00	\$0.00

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

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## PILE BUCKS

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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

<b>Wage</b>	<b>Benefit</b>
\$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	<b>No Rate Established</b>	
	<b>Wage</b>	<b>Benefit</b>
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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"General Decision Number: MT20240078 01/05/2024

Superseded General Decision Number: MT20230078

State: Montana

Construction Type: Heavy

Counties: Lake, Lincoln, Mineral, Ravalli and Sanders  
Counties in Montana.

HEAVY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	<ul style="list-style-type: none"><li>. Executive Order 14026 generally applies to the contract.</li><li>. The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.</li></ul>
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	<ul style="list-style-type: none"><li>. Executive Order 13658 generally applies to the contract.</li><li>. The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.</li></ul>

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number            Publication Date  
   0    01/05/2024

ELEC0768-010 12/01/2023

	Rates	Fringes
ELECTRICIAN.....	\$ 36.66	15.67

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ENGI0400-009 05/01/2013

	Rates	Fringes
POWER EQUIPMENT OPERATOR: (Zone 1)		
(1) A-frame truck Crane, oiler (except crane).....	\$ 23.47	10.40
(2) Crane Oiler,Bulldozer, Roller (Dirt and Grade Compaction).....	\$ 23.94	10.40
(3) Mechanic, Scraper.....	\$ 24.34	10.40
(4) Cranes, 25 tons - 44 tons.....	\$ 27.00	11.40
(5) Cranes, 45 tons to and incl. 74 tons.....	\$ 28.00	11.40
(6) Cranes, 75 tons to and incl. 149 tons; Cranes, Whirley (All).....	\$ 29.00	11.40
(7) Cranes, 150 tons to including 250 tons (add \$1.00		

for every 100 tons over  
250 tons); Crane, Stiff-  
Leg or

Derrick; Helicopter Hoist; Crane, Tower (all)...	\$ 30.00	11.40
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ZONE DEFINITIONS FOR POWER EQUIPMENT OPERATORS:

The zone hourly rates applicable to each project shall be determined by measuring the road miles over the shortest practical maintained route from the nearest County Court House of the following listed towns to the center of the job:

BILLINGS, BOZEMAN, BUTTE, GREAT FALLS, HELENA, KALISPELL, MISSOULA

- Zone 1: 0 to 30 miles - Base Pay
- Zone 2: 30 to 60 miles - Base Pay + \$3.50
- Zone 3: Over 60 miles - Base Pay + \$5.50

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 IRON0014-016 07/03/2023

	Rates	Fringes
IRONWORKER: Reinforcing and Structural.....	\$ 31.68	28.07

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 SUMT2011-054 02/08/2011

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 24.30	7.80
CARPENTER, Excludes Form Work....	\$ 21.13	7.00
LABORER: Common or General.....	\$ 17.99	5.90
LABORER: Pipelayer.....	\$ 21.81	4.83
LABORER: Landscape and Irrigation.....	\$ 15.14 **	1.30
OPERATOR: Backhoe.....	\$ 21.44	8.05
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 21.99	8.55
OPERATOR: Excavator.....	\$ 22.94	9.05
OPERATOR: Grader/Blade.....	\$ 24.69	8.40
OPERATOR: Loader (Front End)....	\$ 24.20	7.84
TRUCK DRIVER: Dump Truck.....	\$ 18.84	5.92



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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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\*\* Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.20) or 13658 (\$12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local),

a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union

average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.

Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION"

**SECTION 00 90 00**

**FUNDING AGENCY SPECIAL PROVISIONS FOR MONTANA PUBLIC FACILITY PROJECTS**

This section supplements Division 0 of the Montana Public Works Standard Specifications, Seventh Edition, dated April 2021.

Included herein are supplemental general conditions that are required by Montana public facility funding programs or agencies listed in 1.1 below but are not included in the Montana Public Works Standard Specifications, Division 0.

**ARTICLE 1. SPECIAL PROVISIONS**

**1.1 FUNDING AGENCIES**

This project is being funded with funds from one or more of the following public facility funding programs or agencies:

- Renewable Resource Grant and Loan Program (RRGL)
- Montana Coal Endowment Program (MCEP)
- United States Department of Agriculture Rural Development (USDA/RD)
- Community Development Block Grant Program (CDBG)
- Drinking Water or Water Pollution Control State Revolving Fund Loan Program (SRF)
- American Rescue Plan Act (ARPA)

**1.1.1 Applicable Funding Agency Special Provisions**

In addition to Section 1.2 below, the following sections also apply as indicated by an "X":

- ~~Section 1.3 (Additional USDA/RD Requirements)~~
- ~~Section 1.4 (Additional CDBG Requirements)~~
- Section 1.5 (Additional SRF Requirements)
- Section 1.6 (Additional ARPA Requirements)
- ~~Exhibit A (RD Project Sign Detail)~~
- Exhibit A-1 (SRF Project Sign Detail)
- Exhibit A-2 (BIL Project Sign Detail)
- ~~Exhibit B (HUD Form 4010)~~
- Exhibit C (Federal Labor Standards Provisions)
- ~~Exhibit D (Reserved)~~
- Exhibit E (Build America, Buy America Forms)

**1.2 SPECIAL PROVISIONS FOR ALL FUNDING AGENCIES**

The following requirements pertain to all the funding programs or agencies listed in 1.1 above. If project funding sources include any of the programs or agencies listed, the following general requirements must be met in addition to those required in the Montana Public Works Standard Specifications, Division 0:

**1.2.1 Reports, Information, and Access to Records**

The contractor, at such times and in such form as required by the owner (defined herein as the entity for which the project is being constructed) shall furnish reports pertaining to the work or services undertaken pursuant to this contract, the costs and obligations incurred or to be incurred in connection therewith, and any other matters covered by this contract.

The owner and any federal, state or local governmental agency having a valid interest in this project shall be permitted by the contractor to have full access to and the right to examine pertinent documents of the contractor involving transactions related to this contract during the period of the project and for three (3) years from the date of final payment or until all findings have been resolved to the satisfaction of the funding agencies.

### 1.2.2 Contractor Eligibility and Certification Regarding Debarment

The contractor certifies that the contractor's firm and the firm's principals are not debarred, suspended, or otherwise ineligible to receive any Montana public works contracts or subcontracts pursuant to 18-2-432 (2), MCA.

For federally funded projects, the contractor certifies that the contractor's firm and the firm's principals are not debarred, suspended, voluntarily excluded, or otherwise ineligible for participation in federally assisted contracts under Executive Order 12549, "Debarment and Suspension" (24 CFR 24.505).

### 1.2.3 Contractor Registration and Worker's Compensation Requirements

Title 39, Chapter 9, Parts 1 and 2 MCA stipulate contractor registration requirements for the State of Montana. Pursuant to 39-9-201 MCA, each construction contractor must be registered with the Montana Department of Labor and Industry. In accordance with 39-9-102 MCA, "construction contractor" means a person, firm, or corporation that, in the pursuit of an independent business, offers to undertake, undertakes, or submits a bid for construction.

No bid shall be considered that does not carry the bidder's Montana Contractor's Registration Number on the bid form.

Registration forms and additional information may be obtained by contacting the Montana Department of Labor and Industry, 1805 Prospect Ave., P.O. Box 8011, Helena, MT 59604-8011, or by calling 406-444-7734.

The contractor must provide certification that workers' compensation insurance will be maintained as required by the Montana Workers' Compensation Act (39-71-101 MCA).

### 1.2.4 Minimum Wage Requirements

Unless superseded by federal law, 18-2-401 MCA and 18-2-402 MCA require that each employer pay, as a minimum, the rate of wages, including fringe benefits and zone pay applicable for the work being performed, as provided in the current Montana Prevailing Wage Requirements as determined by the Montana Department of Labor and Industry.

The current wage determination(s) must be included in the contract documents.

**If the SRF Loan Program is funding the project in whole or in part**, federal and state laws require that each employer pay, as a minimum, prevailing wages for each classification in accordance with the Federal Labor Standards Provisions (Davis-Bacon) (**Exhibit C**) or Montana Prevailing Wage Requirements, whichever is greater.

**If the CDBG Program is funding the project in whole or in part**, HUD Form 4010-Federal Labor Standards Provisions (**Exhibit B**) must be included in the contract documents.

### 1.2.5 Compliance With State and Federal Laws and Regulations

All applicable laws, ordinances, rules and regulations of authorities having jurisdiction over construction of the project shall apply to the contract throughout.

The contractor must comply with all applicable state and federal occupational disease and health and safety laws and regulations.

### 1.2.6 Project Sign

#### **Exhibit A (RD Project Sign Details):**

All projects will have a sign erected at a prominent location near the major portion of the work in plain view of the general public prior to submittal of the first pay estimate. The sign will generally conform to the following:

"The CONTRACTOR, or such contractor as the ENGINEER may designate, when construction begins, shall erect a sign constructed of 4'X8'X $\frac{3}{4}$ " exterior plywood (A-B) and shall be supported by and bolted to two (2) 4"X4" posts with the bottom of the sign at a point at least two (2) feet above the ground line. The project sign shall be maintained in a good condition until project completion. The sign will be edged, painted and lettered as shown on **Exhibit A**. The letters shall be approximately three (3) inches in height.

The cost of the sign is incidental to the contract price. The sign shall remain the property of the owner.

A statement indicating all agencies participating in the financing of the project shall be included on the sign. The sign shall be subject to agency approval prior to being erected.

**Exhibit A-1 (SRF Project Sign Details):**

All projects will have a sign erected at a prominent location near the major portion of the work in plain view of the general public prior to submittal of the first pay estimate. The sign will generally conform to the following:

“The CONTRACTOR, or such contractor as the ENGINEER may designate, when construction begins, shall erect a sign constructed of 4’X8’X¾” exterior plywood (A-B) and shall be supported by and bolted to two (2) 4”X4” posts with the bottom of the sign at a point at least two (2) feet above the ground line. The project sign shall be maintained in a good condition until project completion. The sign details are shown in **Exhibit A-1**. The letters shall be approximately three (3) inches in height.

The cost of the sign is incidental to the contract price. The sign shall remain the property of the owner. The sign shall be subject to agency approval prior to being erected.

**Exhibit A-2 (BIL Project Sign Details):**

All projects will have a sign erected at a prominent location near the major portion of the work in plain view of the general public prior to submittal of the first pay estimate. The sign will generally conform to the following:

“The CONTRACTOR, or such contractor as the ENGINEER may designate, when construction begins, shall erect a sign constructed of 4’X6’X¾” exterior plywood (A-B) and shall be supported by and bolted to two (2) 4”X4” posts with the bottom of the sign at a point at least two (2) feet above the ground line. The project sign shall be maintained in a good condition until project completion. The sign details are shown in **Exhibit A-2**.

The cost of the sign is incidental to the contract price. The sign shall remain the property of the owner. The sign shall be subject to agency approval prior to being erected.

**1.2.7 Gross Receipts Withholding Requirements**

Pursuant to Section 15-50-206(2)(3), MCA, the owner is required to withhold one percent (1%) of all payments due the contractor and is required to transmit such moneys to the Montana Department of Revenue as part of the public contractor's license fee. In like fashion, the contractor is required to withhold one percent (1%) from payments to subcontractors.

**1.2.8 Clean Air and Clean Water Acts, Executive Order 11738 and EPA Regulations:**

If this Contract exceeds \$100,000, Contractor shall comply with all applicable standards, orders or requirements issued under Section 306 of the Clean Air Act (42 USC 1857(h)); Section 508 of the Clean Water Act (33 USC 1368); Executive Order 11738; and Environmental Protection Agency Regulations (40 CFR Part 15).

**1.2.9 Montana Rules Regarding Equipment and the Introduction and Spread of Aquatic Invasive Species:**

List all equipment that will be used for construction of the project and how the equipment will be used on land, bank and/or in water. Make sure your vehicles, watercraft, and all equipment are clean and free of weeds, weed seeds, and excess grease before using it on land or water. To prevent the spread of invasive species, to the extent practical, remove mud and vegetation from vehicles, heavy machinery, and all other equipment before moving between waters and work sites, especially when working in areas of known infestations. When working in water, drain water from machinery and let machinery dry before moving to another location.

<https://fwp.mt.gov/conservation/aquatic-invasive-species>.

**Requirements in Montana for equipment to be used in water.** To prevent the spread of aquatic invasive species, remove (CLEAN) mud and aquatic plants from heavy machinery and other equipment before moving between waters and work sites. DRAIN water from machinery and let **DRY** completely before moving to another location.

- a) Be sure the equipment is clean and free of weeds, weed seeds, and excess grease before using it in the water waterway.
- b) Be sure you remove mud and aquatic plants from heavy machinery and other equipment before moving between waters and work sites, especially in waters known to be infested with aquatic invasive species.

- c) Drain water from machinery and let dry before moving to another location.
- d) Mandatory inspections are now required for all equipment that:
- Has been previously used outside of Montana
  - Are destined for waters in Montana west of the Continental Divide that has been previously used east of the Continental Divide
  - Are destined for waters of the Flathead Basin that have been previously used outside of the Flathead Basin.

Any equipment that falls into the scenarios laid out above **must** schedule an inspection by calling the state's Aquatic Invasive Species line at 406-444-2440 at least one week in advance of planned use.

### ~~1.3 ADDITIONAL SPECIAL PROVISIONS FOR USDA/RD~~

#### ~~1.3.1 The following documents shall be attached to and made a condition of the contract documents for any project funded, in whole or in part, by Rural Development:~~

~~If the bid amount exceeds \$10,000, but is less than \$100,000, signed Compliance Statement (RD 400-6). Refer to specific equal opportunity requirements set forth in paragraph 18.10 of the General Conditions;~~

~~If the bid amount exceeds \$100,000, signed RD Instruction 1940-Q, Exhibit A-1, Certification for Contracts, Grants, and Loans. Refer to paragraph 18.11 of the General Conditions.~~

#### ~~1.3.2 Free and Open Competition~~

~~All procurement transactions will be conducted in a manner that provides maximum free and open competition. Examples of what are restrictive of competition include but are not limited to: employment preferences to Montana Bidders or Montana Contractors and Montana residents.~~

#### ~~1.3.3 Contractor's Retainage~~

~~No payments will be made that, would deplete the retainage nor place in escrow any funds that are required for retainage or invest the retainage for the benefit of the contractor.~~

#### ~~1.3.4 Build America, Buy America Act (BABAA) Guidance~~

~~a. Build America, Buy America Act (BABAA) Requirements mandated by Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953-58 mandating domestic preference that all iron and steel, manufactured products, and construction materials are produced in the United States.~~

~~b. RUS Bulletin 1780-26 "Guidance for the Use of Engineers Joint Contract Documents Committee (EJCDC) Bidding and Contract Documents on Water and Waste Disposal Projects with Rural Utilities Service Financial Assistance" is available on the RUS website at <https://www.rd.usda.gov/directives/b-1780-26>. This Bulletin is to be used by RD staff in providing information and guidance to funding applicants/recipients (Owners) and professional consultants in the development of Bidding and Contract Documents that are legally sufficient, ensure appropriate services are provided at a reasonable fee, and expedite the achievement of the applicant's goals. This Bulletin supports compliance with 7 CFR 1780, 2 CFR 200 and the Build America, Buy America Act requirements under Title IX of the Infrastructure Investment and Jobs Act, Pub. L. 117-58, §§ 70901-70953.~~

~~a. CONTRACT PROVISIONS. To ensure compliance with the BABAA requirements specific BABAA contract language must be included in each contract including agreements for engineering services, construction contract documents and purchase agreements prepared by the owner. The following modifications are made to Bidding and Construction Contract Documents (EJCDC C-Series, 2018):~~

~~(1) Advertisement for Bids (C-111):~~

~~Add at the end of EJCDC C-111 prior to "This Advertisement is issued by:"~~



**Build America, Buy America Act****Domestic Preference**

~~This project is subject to the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953. Absent an approved waiver, all iron, steel, manufactured products, and construction materials used in this project must be produced in the United States.~~

The following waivers apply to this Contract:

BABAA De Minimis, Small Grants, and Minor Components

~~[add project specific waivers as applicable; If AIS applies instead of BABAA delete the BABAA waiver reference and insert references to the AIS De Minimis and AIS Minor Component waivers].~~

~~(2) — Instructions to Bidders (C-200);~~

~~This list of changes to be made by ENGINEER to the Instructions to Bidders for Construction Contract (EJCDC C-200, 2018). The ENGINEER will develop the Instructions to Bidders using EJCDC C-200 (2018) and the instructions provided below. In addition, ENGINEER will ensure that any applicable state or federal wage rate requirements are added at Article 24. RD does not require the use of Davis Bacon Wage rates in most cases, but other sources of federal funds may. If other funding sources involved in the project require the use of Davis Bacon Wage rates, RD's version of Davis Bacon 29 CFR 5.5 will be added to these construction Contract Documents, as listed in the checklist in Exhibit A. The ENGINEER may either make the changes below directly to the Instructions to Bidders or insert this exhibit directly behind the Instructions to Bidders. If AIS applies instead of BABAA remove reference to BABAA in 1.01.B and 23.03 and replace it with "American Iron and Steel (AIS) requirements instituted by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 and of 2017 and subsequent annual appropriations for WWD programs." Contact the Rural Development State Office for guidance as needed.~~

Article 1.01.B – Add the following:

1.01.B “Domestic Preference — The Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953.

Article 3.02 — Delete in its entirety and insert “Deleted”.

Article 8.01—Add to the end of the paragraph “Bid security must be at least 5% of the Bidder’s maximum Bid price.”

Article 9.02—Delete in its entirety and insert “Deleted”.

Article 10.01—Delete in its entirety and insert “Deleted”.

Article 10.02—Insert after the sentence that starts “Each such request...: “Each such request shall include the Manufacturers’ Certification for Compliance with Domestic Preference requirements. Refer to the suggested Manufacturer’s Certification provided in these construction Contract Documents.”

Article 10.02—Add to the end of this paragraph: “Substitutes and “or equal” materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.05 and 7.06 of the General Conditions after the Effective Date of the Contract. Each such request shall include Manufacturer’s Certification letter to document compliance with Domestic Preference requirements. Refer to Manufacturer’s Certification Letter provided in these Contract Documents.”

Article 11.01—Delete in its entirety and insert “Deleted”.

Article 11.05—Add the following:

“11.05—The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 7.07A.”

Article 13.04—Delete in its entirety and insert “Deleted”.

Article 13.07—Delete in its entirety and insert “Deleted”.

Article 18.05.E—Delete in its entirety and insert “Deleted”.

Article 18.05.F—Delete in its entirety and insert “Deleted”.

Add the following, renumbering if Articles 21 and/or 22 are not used:

### **ARTICLE 23 – FEDERAL REQUIREMENTS**

23.01 If the contract price is in excess of \$100,000, provisions of the Contract Work Hours and Safety Standards Act at 29 CFR 5.5(b) apply.

23.02 Federal requirements at Article 19 of the Supplementary Conditions apply to this Contract.

### **(3) Bid Form (C-410)**

*This list of changes to be made by ENGINEER to the Bid Form for Construction Contract (EJCDC C-410, 2018). The ENGINEER may either make the changes directly to the Bid Form or insert this exhibit directly behind the Bid Form.*

Article 2.01 Delete the “ and” at the end of 2.01.F

Delete the existing text for 2.01.G and add the following text and the referenced attachments to the Bidding Documents:

G. If Bid amount exceeds \$10,000, signed Compliance Statement (RD 400-6). Refer to specific equal opportunity requirements set forth in the Supplementary Conditions of the Construction Contract (EJCDC C-800);

H. If Bid amount exceeds \$25,000, signed Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Lower Tier Covered Transactions (AD-1048);

I. If Bid amount exceeds \$100,000, signed RD Instruction 1940-Q Exhibit A-1, Certification for Contracts, Grants, and Loans.”

~~J. [List other documents and edit above as pertinent].~~

~~Article 4—Delete in its entirety and insert “Deleted”.~~

~~Article 5—Delete in its entirety and insert “Deleted”.~~

~~Article 6.02—Delete in its entirety and insert “Deleted”.~~

~~Article 6.03—Delete in its entirety and insert “Deleted”.~~

~~Article 8.01.A.3—Delete the period at the end of Article 8.018.A.3 and insert the following language: “, including all Domestic Preference requirements.”~~

**~~(5) ENGINEER’S DEVELOPMENT OF AGREEMENT BETWEEN OWNER AND CONTRACTOR (C-520, 2018)~~**

~~This list of changes to be made by the ENGINEER to the Agreement between OWNER and CONTRACTOR for Construction Contract (Stipulated Price) (EJCDC C-520, 2018). The ENGINEER may either make the changes directly to the Agreement or insert this exhibit directly behind the Agreement.~~

~~Article 4.05.C—Delete in its entirety and insert “Deleted”.~~

~~Article 6.02.A.1.a—Replace “[number]” with “95”.~~

~~Article 6.02.A.1.a(1)—Delete in its entirety and insert “Deleted”.~~

~~Article 6.02.A.1.b—Replace “[number]” with “95”.~~

~~Article 6.02.B—After “Substantial Completion” insert “of the entire construction to be provided under the construction Contract Documents”.~~

**~~(6) Supplementary General Conditions (C-800)~~**

~~This is a list of changes to be made by ENGINEER to the Supplementary Conditions of the Construction Contract (EJCDC C-800, 2018). The ENGINEER may also add other project-specific supplementary conditions as required for the Project.~~

~~The Supplementary Conditions (SC) document that is developed for a Project is the contractual means by which the Standard General Conditions of the Construction Contract (EJCDC C-700, 2018) are modified and supplemented for the Project. The references in the Supplementary Conditions items below (and in EJCDC C-800 as published) to adding, deleting, amending, or supplementing are referring to the paragraphs of C-700. Thus, the first item below, SC-1.01.A.8, is a contractual provision that adds the stated language (“The Change Order form to be used etc.”) to Article 1.01.A.8 of C-700.~~

~~The Supplementary Conditions items that follow are mandatory for each specific Project, unless noted otherwise. In most cases they are new (supplemental) SC items; in a few cases, they replace or expand on a Supplementary Condition item that is in EJCDC C-800, as published. Guidance notes should not be included in the Bidding Documents.~~

~~The ENGINEER (in cooperation with the OWNER) should follow the guidance of EJCDC C-800, as published, to develop Project-specific supplementary conditions; as the published guidance indicates, some of the published SC items are mandatory or require additional Project-specific input, such as insurance coverage limits. Other SC items in C-800 as published are optional but, in many cases, will be useful for the specific Project.~~

~~If the project requires compliance with American Iron and Steel instead of Build America Buy America Act, then SC-1.01.A.52 should remove the BABAA reference and define Domestic Preference as “The American Iron and Steel (AIS) requirements mandated by Section 746 of Title VII of the Consolidated Appropriations Act~~

~~of 2017 of 2017 and subsequent annual appropriations for WWD programs. “ Also, in such cases the BABAA specific waivers listed in SC 19.14 should be removed and replaced with applicable AIS waivers (De Minimis and Small Components). Contract the Rural Development State Office for guidance as needed.~~

ARTICLE 1—Delete the sentence “No suggested Supplementary Conditions in this Article.”

SC 1.01.A.8—Add the following at the end of the Paragraph:

The Change Order form to be used on this Project is EJCDC C-941 (2018). Agency approval is required before Change Orders are effective.

SC 1.01.A.30—Add the following at the end of the Paragraph:

For the purposes of Rural Development, this term is synonymous with the term “applicant” as defined in 7 CFR-1780.7 (a) (1), (2) and (3) and is an entity receiving financial assistance from the federal programs.

SC 1.01.A.50—Add the following at the end of the Paragraph:

The Work Change Directive form to be used on this Project is EJCDC C-940 (2018). Agency approval is required before a Work Change Directive is issued.

SC 1.01.A.51—Add the following new paragraph immediately after Paragraph 1.01.A.50:

51. Agency—The Project is financed in whole or in part by USDA Rural Utilities Service pursuant to the Consolidated Farm and Rural Development Act (7 USC Section 1921 et seq.). The Rural Utilities Service programs are administered through the USDA Rural Development offices; therefore, the Agency for these documents is USDA Rural Development.

SC 1.01.A.52—Add the following new paragraph with the title “Domestic Preference Definitions” immediately after Paragraph 1.01.A.51:

~~52.a *Build America, Buy America Act (BABAA)*—Requirements mandated by Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953-58 mandating domestic preference that all iron and steel, manufactured products, and construction materials are produced in the United States.~~

~~52.b *Construction Materials*—Those articles, materials, or supplies—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that are or consist primarily of: non-ferrous metals, plastic and polymer-based products, glass, lumber or drywall.~~

~~52.c *Contractor’s Certification*—Documentation submitted by the Contractor upon Substantial Completion of the Contract that all iron and steel, manufactured products, and construction materials are produced in the United States.~~

~~52.d *De Minimis*—Materials and products that represent a small portion of an infrastructure project, specifically no more than 5% of the project costs up to a maximum of \$1,000,000,~~

~~52.e *Domestic Preference*—The Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953.~~

~~52.f *Engineer’s Certification*—Documentation submitted by the Engineer that Drawings, Specifications, and Bidding Documents comply with Domestic Preference requirements.~~

~~52.g *Manufactured Product*—Items assembled out of components, or otherwise made or processed from raw materials into finished products. Manufactured products must be manufactured (assembled) in the United States, and the cost of components that were mined, produced, or manufactured in the United States must be greater than 55 percent of the total cost of all components of the product.~~

~~52.h *Manufacturer's Certification*—Documentation provided by the Manufacturer stating that Domestic Preference requirements have been satisfied for all provided items. If items are purchased via a Supplier, distributor, vendor, etc. from the Manufacturer directly, then the Supplier, distributor, vendor, etc. will be responsible for obtaining and providing these certifications to the parties purchasing the products.~~

~~52.i *Minor Components*—Components *within* an iron and/or Steel product otherwise compliant with the American Iron and Steel requirements. This waiver, typically used by Manufacturers, allows use of non-domestically produced miscellaneous Minor Components comprising up to five percent of the total material cost of an otherwise domestically produced Iron and Steel product. However, unless a separate waiver for a product has been approved, all other Iron and Steel components in said product must still meet the Domestic Preference requirements. This waiver does not exempt the whole product from the Domestic Preference requirements only Minor Components within said product and the iron or Steel components of the product must be produced domestically. 52.j *Primarily Iron or Steel*—A product is made of greater than 50 percent iron or Steel on a materials cost basis.~~

~~SC-2.02.A—Delete [number] and insert in its place “five.” (or whatever amount is needed for all involved parties/entities to have a copy of the registered documents)~~

~~SC 4.01.A—Delete the last sentence of paragraph.~~

~~SC 4.05.C.5—Paragraph is mandatory for WWD projects.~~

~~SC 4.05.C.5.a—Add the following at the end of this paragraph:~~

~~Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered abnormal weather conditions. Requests for time extensions due to abnormal weather conditions will be submitted to the Engineer within five days of the end of the abnormal weather condition event. It is the responsibility of the Contractor to provide the information listed in SC 4.05.C.5.b.~~

~~SC 6.01—Disregard EJCDC Guidance Notes—Performance and Payment Bonds, Note 1. Performance and Payment Bonds are required for WWD projects.~~

~~SC 6.01—EJCDC Guidance Notes—“Other Bonds,” Warranty Bond, Note 1. RD does not require a Warranty Bond, and RD will not accept a Warranty Bond in place of a Performance and Payment Bond. The decision to include a Warranty Bond is made by the Owner and their counsel. Please refer to EJCDC for guidance.~~

~~SC 7.04.D—Add the following new paragraph immediately after Paragraph 7.04.C:  
D. All products must meet Domestic Preference requirements.~~

~~SC 7.04.E—Add the following new paragraph immediately after Paragraph 7.04.D:  
E. For projects utilizing a *De Minimis* waiver, Contractor shall maintain an itemized list of non-domestically produced components and ensure that the cost is less than 5% of total project cost for project up to a maximum of \$1,000,000.~~

~~SC 7.05.A—Amend the third sentence of paragraph by striking out the following words:~~

~~Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item is permitted,~~

~~SC 7.05.A.1.a.3—Amend the last sentence of Paragraph a.3 by striking out “and;” and adding a period at the end of Paragraph a.3.~~

~~SC 7.05.A.1.a.4—Delete paragraph in its entirety and insert “Deleted.”~~

~~SC 7.05.B—Add the following at the end of paragraph:  
Contractor shall include a Manufacturer's Certification or waiver for compliance with Domestic Preference requirements and supporting data, as applicable. Refer to Sample Language for Manufacturer's Certification provided in these Contract Documents.~~

~~SC 7.06.A.3.a.2—Remove "and" from the end of paragraph.~~

~~SC 7.06.A.3.a.3—Add "; and" to the end of paragraph.~~

~~SC 7.06.A.3.a.4—Add the following new paragraph immediately after Paragraph 7.06.A.3.a.3:  
4. Comply with Domestic Preference requirements by providing Manufacturer's Certification or waiver, as applicable. Refer to Sample Language for Manufacturers' Certification provided in these Contract Documents.~~

~~SC 7.07.A—Amend by adding the following to the end of the paragraph:  
The total amount of work subcontracted by the Contractor shall not exceed fifty percent of the Contract price without prior approval from the Owner, Engineer and Agency.~~

~~SC 7.07.B—Delete paragraph in its entirety and insert "Deleted".~~

~~SC 7.07.E—Delete the second sentence of paragraph and insert the following in its place:  
Owner may not require that Contractor use a specific replacement.~~

~~SC 7.12.A Amend paragraph by adding the following after "written interpretations and clarifications,":  
Manufacturers' Certifications,~~

~~SC 7.16.A.1.c—Amend paragraph by deleting the last period and adding:  
, including Manufacturer's Certification, or waiver for any item in the submittal subject to Domestic Preference requirements. Refer to the Sample Language for Manufacturers' Certification provided in these Contract Documents.~~

~~SC 7.16.C.9—Add new paragraph immediately after Paragraph 7.16.C.8:  
9. Engineer's review and approval of a Shop Drawing or Sample shall include review of Manufacturers' Certifications and any waivers in order to document compliance with Domestic Preference requirements, as applicable.~~

~~SC 7.17.F—Add new paragraph immediately after Paragraph 7.17.E:  
F. Contractor shall certify upon Substantial Completion that all Work and Materials have complied with Domestic Preference requirements. Contractor shall provide Certification to Owner and Engineer. Refer to the Sample Language for Contractor's Certification provided in these Contract Documents.~~

~~ARTICLE 11—Delete the sentence "No suggested Supplementary Conditions in this Article."~~

~~SC 11.02.C—Add new paragraph immediately after Paragraph 11.02.B:  
C. The Engineer or Owner shall contact the Agency for concurrence on each Change Order prior to issuance. All Contract Change Orders must be concurred on (signed) by Agency before they are effective.~~

~~SC 11.03.A.2—Add new Paragraph 11.03.A.2 immediately after Paragraph 11.03.A, which shall be renamed Paragraph 11.03.A.1:  
2. The Engineer or Owner shall contact the Agency for concurrence on each Work Change Directive prior to issuance. Once authorized by Owner, a copy of each Work Change Directive shall be provided by Engineer to the Agency.~~

~~SC 11.05.B—Add the following at the end of this paragraph:~~

~~For Owner authorized changes in the Work, the Contractor will provide the Manufacturer's Certification, or waiver, for materials subject to Domestic Preference requirements except when sole source is specified, in which case the Engineer will provide the Manufacturer's Certification, or waiver.~~

~~SC-11.09.B.2.c— Add new paragraph immediately after Paragraph 11.09.B.2.b:  
c. For change orders involving materials subject to Domestic Preference requirements, Contractor shall include a Manufacturer's Certification or waiver, as applicable. Refer to the Sample Language for Manufacturer's Certification provided in these Contract Documents.~~

~~SC-13.02.C— Delete paragraph in its entirety and insert "Deleted".~~

~~SC-13.03.E— Delete paragraph in its entirety and replace with SC-13.03.E as shown in the EJCDC C-800 Supplementary Conditions.~~

~~ARTICLE 14— Delete the sentence "No suggested Supplementary Conditions in this Article."~~

~~SC-14.03.G— Add new paragraph immediately after Paragraph 14.03.F:  
G. Installation of materials that are non-compliant with Domestic Preference requirements shall be considered defective work. Contractor should ensure that Engineer has an approved Manufacturer's Certification, or waiver, prior to any domestic preference compliant item being delivered to the project site.~~

~~SC-15.01.B.4— Add the following language at the end of paragraph:  
No payments will be made that would deplete the retainage, place in escrow any funds that are required for retainage or invest the retainage for the benefit of the Contractor.~~

~~SC-15.01.B.5— Add new paragraph immediately after Paragraph 15.01.B.4:  
5. The Application for Payment form to be used on this Project is EJCDC@ C-620. The Agency must approve all Applications for Payment before payment is made.~~

~~SC-15.01.B.6— Add new paragraph immediately after Paragraph 15.01.B.5:  
6. By submitting an Application for Payment, based in whole or in part on furnishing equipment or materials, Contractor certifies that such equipment and materials are compliant with Domestic Preference requirements. Manufacturer's Certification for material(s) satisfy these requirements. Refer to the Sample Language for Manufacturer's Certification provided in these Contract Documents.~~

~~SC-15.01.C.2.d— Add the following new paragraph immediately after Paragraph 15.01.C.2.c:  
d. The materials presented for payment in an Application for Payment comply with American Iron and Steel requirements.~~

~~SC-15.01.D.1— Delete paragraph in its entirety and insert the following in its place:  
The Application for Payment with Engineer's recommendations will be presented to the Owner and Agency for consideration. If both the Owner and Agency find the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due twenty (20) days after the Application for Payment is presented to the Owner, and the Owner will make payment to the Contractor.~~

~~SC-15.02.A— Amend paragraph by striking out the following text: "7 days after".~~

~~SC-15.03.A— Modify by adding the following after the last sentence:  
Contractor shall also submit the Contractor's Certification of Compliance certifying that to the best of the Contractor's knowledge and belief all Iron and Steel products, Manufactured Products, and Construction Materials proposed in the Shop Drawings, Change Orders, and Partial Payment Estimates, and those installed for the Project, comply with Domestic Preference requirements.~~

~~SC 18.11—Add new paragraph immediately after Paragraph 18.10:~~

~~18.11 *Tribal Sovereignty*~~

~~A. No provision of this Agreement will be construed by any of the signatories as abridging or debilitating any sovereign powers of the *[insert name of Tribe]* Tribe; affecting the trust-beneficiary relationship between the Secretary of the Interior, Tribe, and Indian landowner(s); or interfering with the government-to-government relationship between the United States and the Tribe.~~

~~SC 19—Add the following new Article 19 immediately after Article 18:~~

~~Article 19—FEDERAL REQUIREMENTS~~

~~19.01 *Agency Not a Party*~~

~~A. This Contract is expected to be funded in part with funds provided by Agency. Neither Agency, nor any of its departments, entities, or employees, is a party to this Contract.~~

~~19.02 *Contract Approval*~~

~~A. Owner and Contractor will furnish Owner's attorney such evidence as required so that Owner's attorney can complete and execute the "Certificate of Owner's Attorney" before Owner submits the executed Contract Documents to Agency for approval. Refer to Certificate of Owner's Attorney and Agency Concurrence provided in these Contract Documents.~~

~~B. Agency concurrence is required on both the Bid and the Contract before the Contract is effective.~~

~~19.03 *Conflict of Interest*~~

~~A. Contractor may not knowingly contract with a Supplier or Manufacturer if the individual or entity who prepared the Drawings and Specifications has a corporate or financial affiliation with the Supplier or Manufacturer. Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest or other interest in or a tangible personal benefit from the Contractor. Owner's officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.~~

~~19.04 *Gratuities*~~

~~A. If Owner finds after a notice and hearing that Contractor, or any of Contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of Owner or Agency in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, Owner may, by written notice to Contractor, terminate this Contract. Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this Contract.~~

~~B. In the event this Contract is terminated as provided in paragraph 19.04.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of this Contract by Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, Owner may pursue exemplary damages in an amount (as determined by Owner) which shall not be less than three nor more than ten times the costs Contractor incurs in providing any such gratuities to any such officer or employee.~~

~~19.05 *Small, Minority and Women's Businesses*~~

~~A. If Contractor intends to let any subcontracts for a portion of the work, Contractor will take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible. Affirmative steps will include:~~

- ~~1. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;~~
- ~~2. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;~~



- ~~3. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;~~
- ~~4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;~~
- ~~5. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.~~

#### ~~19.06 Anti-Kickback~~

~~A. Contractor shall comply with the Copeland Anti-Kickback Act (40 USC 3145) as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans or Grants of the United States"). The Act provides that Contractor or subcontractor shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled. Owner shall report all suspected or reported violations to Agency.~~

#### ~~19.07 Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended~~

~~A. Contractor to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).~~

#### ~~19.08 Equal Employment Opportunity~~

~~A. The Contract is considered a federally assisted construction contract. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965-Comp., p. 339), Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."~~

#### ~~19.09 Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)~~

~~A. Contractors that apply or bid for an award exceeding \$100,000 must file the required certification (RD-Instruction 1940-Q Exhibit A-1). The Contractor certifies to the Owner and every subcontractor certifies to the Contractor 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 the Contract if it is covered by 31 U.S.C. 1352. The Contractor and every subcontractor must 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 Owner. Necessary certification and disclosure forms shall be provided by Owner.~~

#### ~~19.10 Environmental Requirements~~

~~A. When constructing a Project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental conditions:~~

- ~~1. Wetlands—When disposing of excess, spoil, or other Construction Materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.~~
- ~~2. Floodplains—When disposing of excess, spoil, or other Construction Materials on public or private property, Contractor shall not fill in or otherwise convert 100-year floodplain areas (Standard Flood Hazard Area) delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, e.g., alluvial soils on NRCS Soil Survey Maps.~~
- ~~3. Historic Preservation—Applicants shall ensure that Contractors maintain a copy of the following inadvertent discovery plan onsite for review:~~

~~a. If during the course of any ground disturbance related to any Project, any post review discovery, including but not limited to, any artifacts, foundations, or other indications of past human occupation of the area are uncovered, shall be protected by complying with 36 CFR § 800.13(b)(3) and (c) and shall include the following:~~

~~i. All Work, including vehicular traffic, shall immediately stop within a 50 ft. radius around the area of discovery. The Contractor shall ensure barriers are established to protect the area of discovery and notify the Engineer to contact the appropriate RD personnel. The Engineer shall engage a Secretary of the Interior (SOI) qualified professional archeologist to quickly assess the nature and scope of the discovery; implement interim measures to protect the discovery from looting and vandalism; and establish broader barriers if further historic and/or precontact properties, can reasonably be expected to occur.~~

~~ii. The RD personnel shall notify the appropriate RD environmental staff member, the Federal Preservation Officer (FPO), and State Historic Preservation Office (SHPO) immediately. Indian tribe(s) or Native Hawaiian Organization (NHOs) that have an interest in the area of discovery shall be contacted immediately. The SHPO may require additional tribes or NHOs who may have an interest in the area of discovery also be contacted. The notification shall include an assessment of the discovery provided by the SOI qualified professional archeologist.~~

~~iii. When the discovery contains burial sites or human remains, the Contractor shall immediately notify the appropriate RD personnel who will contact the RD environmental staff member, FPO, and the SHPO. The relevant law enforcement authorities shall be immediately contacted by onsite personnel to reduce delay times, in accordance with tribal, state, or local laws including 36 CFR Part 800.13; 43 CFR Part 10, Subpart B; and the Advisory Council on Historic Preservation's Policy Statement Regarding treatment of Burial Sites, Human Remains, or Funerary Objects (February 23, 2007).~~

~~iv. When the discovery contains burial sites or human remains, all construction activities, including vehicular traffic shall stop within a 100 ft. radius of the discovery and barriers shall be established. The evaluation of human remains shall be conducted at the site of discovery by a SOI qualified professional. Remains that have been removed from their primary context and where that context may be in question may be retained in a secure location, pending further decisions on treatment and disposition. RD may expand this radius based on the SOI professional's assessment of the discovery and establish broader barriers if further subsurface burial sites, or human remains can reasonably be expected to occur. RD, in consultation with the SHPO and interested tribes or NHOs, shall develop a plan for the treatment of native human remains.~~

~~v. Work may continue in other areas of the undertaking where no historic properties, burial sites, or human remains are present. If the inadvertent discovery appears to be a consequence of illegal activity such as looting, the onsite personnel shall contact the appropriate legal authorities immediately if the landowner has not already done so.~~

~~vi. Work may not resume in the area of the discovery until a notice to proceed has been issued by RD. RD shall not issue the notice to proceed until it has determined that the appropriate local protocols and consulting parties have been consulted.~~

~~vii. Inadvertent discoveries on federal and tribal land shall follow the processes required by the federal or tribal entity.~~

4. Endangered Species — Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the

~~presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the U.S. Fish and Wildlife Service.~~

~~5. Mitigation Measures—The following environmental mitigation measures are required on this Project: [Insert mitigation measures from the Letter of Conditions here].~~

~~19.11 Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708)~~

~~A. Where applicable, for contracts awarded by the Owner in excess of \$100,000 that involve the employment of mechanics or laborers, the Contractor will comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, the Contractor will compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic will 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.~~

~~19.12 Debarment and Suspension (Executive Orders 12549 and 12689)~~

~~A. A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.~~

~~19.13 Procurement of recovered materials~~

~~A. The Contractor will comply with 2 CFR Part 200.322, "Procurement of recovered materials."~~

~~19.14 Domestic Preference.~~

~~A. Build America, Buy America Act (BABAA). All Iron and Steel Products, Manufactured Products, and Construction Materials used in this project must comply with the Build America, Buy America Act (BABAA) requirements mandated by Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953. Aggregates such as stone, sand, or gravel do not apply to BABAA.~~

~~B. The following waivers apply to this Contract:~~

- ~~1. BABAA De Minimis, Small Grants and Minor Components~~
- ~~2. [add project specific waivers as applicable].~~

## ~~1.4— ADDITIONAL SPECIAL PROVISIONS FOR CDBG~~

### ~~1.4.1— Equal Employment Opportunity Provisions~~

~~a. Equal Employment Opportunity (Executive Order 11246). During the performance of this contract, the Contractor agrees as follows:~~

~~(i) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection of training, including apprenticeship. The contractor agrees to post in~~

~~conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.~~

~~(ii) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.~~

~~(iii) The contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided by the Department's contracting officer advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.~~

~~(iv) The contractor will comply with all of the provision of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.~~

~~(v) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records and accounts by the Department and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.~~

~~(vi) In the event of the contractor's noncompliance with the non-discrimination clauses of this contract or with any of such rules, regulations or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rules, regulations, or order of the Secretary of Labor, or as otherwise provided by law.~~

~~(vii) The contractor will include the provisions of paragraphs 1 through 7 in every subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that each provision will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Department may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event the contractor becomes involved in or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Department, the contractor may request the United States to enter into such litigation to protect the interest of the United States.~~

~~b. Title VII of the Civil Rights Act of 1964. Provides that no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.~~

~~c. Section 109 of the Housing and Community Development Act of 1974. "No person in the United States shall on the ground of race, color, national origin or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds available under this title. Any prohibition against discrimination on the basis of age under the Age Discrimination Act of 1975 or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973 shall also apply to any such program or activity."~~

~~d. Section 3 of the Housing and Community Development Act of 1968. The contractor will ensure that to the greatest extent feasible opportunities for training and employment arising in connection with this CDBG-assisted project will be extended to project area residents. Further, the contractor will, to the greatest extent feasible, utilize business concerns located in or substantially owned by residents of the project area, in the award of contracts and purchase of services and supplies.~~

~~e. Minority Business Enterprise. Under the provisions of Executive Order 11246 contractors on federally funded projects are required to take affirmative steps to assure that minority businesses are used when possible as sources of supplies, equipment, construction and services. Additionally, the contractor must document all affirmative steps taken to solicit minority businesses and forward this documentation along with~~

~~the names of the minority subcontractors and suppliers to the owner upon request.~~

~~f. Nondiscrimination Provision in all Public Contracts Pursuant to Section 49-3-207, MCA, the Contractor certifies that all hiring will be on the basis of merit and qualifications and there will be no discrimination on the basis of race, color, religion, creed, political ideas, sex, age, marital status, physical or mental handicap, or national origin.~~

#### ~~1.4.2 Uniform Federal Accessibility Standards (UFAS)~~

~~All design specifications for the construction of any building shall provide access to the physically handicapped in accordance with the Uniform Federal Accessibility Standards and HUD regulations 24 CFR Part 8, "Nondiscrimination Based on Handicap in Federally Assisted Programs and Activities of HUD".~~

#### ~~1.4.3 Certification of Compliance with Federal Clean Air and Water Acts (Applicable to Federally Assisted Construction Contracts and Related Sub-Contracts Exceeding \$100,000.)~~

~~During the performance of this contract, the contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 USC 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR 15, as amended.~~

#### ~~1.4.4 Preconstruction Conference~~

~~After the contract(s) have been awarded, but before the start of construction, a conference will be held for the purpose of discussion requirements on such matters as project supervision, coordination with city or county officials, on-site inspections, progress schedules and reports, payrolls, payments to contractors, contract change orders, insurance, safety and other items pertinent to the project. The contractor shall arrange to have all supervisory personnel connected with the project on hand to meet with representatives of the engineer and owner to discuss any problems anticipated.~~

#### ~~1.4.5 Contract Pricing~~

~~The cost plus a percentage of cost method of contracting shall not be used.~~

### 1.5 ADDITIONAL SPECIAL PROVISIONS FOR SRF

#### 1.5.1 Equal Employment Opportunity and Affirmative Action Requirements on Federally Assisted Construction Contracts

##### NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation in each trade	<u>2.7%</u>
Goals for female participation in each trade	<u>6.9%</u>

These goals are applicable to all the contractor's construction work (whether or not it is Federal or Federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the

specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number for the subcontractor; employer identification number of the subcontractor, estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed (see form on page 11).

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is the **Missoula Economic Area**.

**This notice shall be included in, and shall be a part of, all solicitations for offers and bids on all federal and federally assisted construction contracts or subcontracts.**

### **EQUAL OPPORTUNITY CLAUSE**

The Equal Opportunity Clause published at 41 CFR Part 60-1.4(b) is required to be included in, and is part of, all nonexempt federally assisted construction contracts and subcontracts. The Equal Opportunity Clause shall be considered to be a part of every contract and subcontract required by the regulations in this part to include such a clause, whether or not it is physically incorporated in such contracts.

In addition to the clause described above, all federal contracting officers, all applicants, and all non-construction contractors, as applicable, shall include the specifications set forth in this section in all federal and federally assisted construction contracts in excess of \$10,000 to be performed in geographical areas designated by the Director pursuant to §60-4.6 of this part and in construction subcontracts in excess of \$10,000 necessary in whole or in part to the performance of non-construction Federal contracts and subcontracts covered under the Executive Order.

### **STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)**

1. As used in these specifications:

- a. "Covered Area" means the geographical area described in the solicitation from which this contract resulted;
- b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
- c. "Employer identification number" means the Federal Social Security number used on the employer's quarterly Federal Tax Return, U.S. Treasury Department Form 941.
- d. "Minority" includes:
  - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
  - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
  - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);
  - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation

and which is set forth in the solicitations from which this contract resulted.

3. If the contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area, (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The contractor shall implement the specific affirmative action standards provided in paragraphs (7)(a) through (p) of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the federal register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the contractor may have taken.

- d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunities and/or participate in training programs for the areas which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under (7)(b) above.
- f. Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- h. Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and subcontractors with whom the contractor does or anticipates doing business.
- i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.
- k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the contractor's obligations under these specifications are being carried out.
- n. Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.



p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7)(a) through (p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under (7)(a) through (p) of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's and failure of such a group to fulfill an obligation shall not be a defense for the contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally, the contractor may be in violation of the Executive order if a specific minority group of women is under-utilized).

10. The contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The contractor shall not enter into any subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.

12. The contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph (7) of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program)

CONTRACTOR'S NAME, ADDRESS & TELEPHONE NUMBER

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Return to:  
USDOL/ESA/OFCCP  
Denver District Office  
1999 Broadway-Suite1177  
P.O. BOX 46550  
Denver, CO 80201-6550

CONTRACTOR' EMPLOYER ID NUMBER: \_\_\_\_\_

**CONTRACT INFORMATION**

PROJECT AND LOCATION:				
Dollar Amount of Contract	Estimated Start Date	Estimated Completion Date	Contract No.	Geographical Area

**NOTIFICATION OF SUBCONTRACTS AWARDED (>\$10,000)**

Subcontractors Name, Address, & Phone Number	Employer ID Number of Subcontractor	Estimated \$ Amount of Subcontract	Estimated Start Date	Estimated Completion Date

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**1.5.2 Guidance for Participation by Disadvantaged Business (DBE) Enterprises In United States Environmental Protection Agency Programs of 40 CFR 33.**

The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CFR Part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or other legally available remedies.

**A. REQUIREMENTS**

1. The recipient and prime contractor will exercise good faith efforts to attract and utilize small, minority, and women's business (DBEs) enterprises primarily through outreach, recruitment, and race/gender neutral activities. At a minimum, the recipient and project bidders will follow the six affirmative steps below:

a. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities including placing DBEs on solicitation lists and soliciting them whenever they are potential sources;

b. Make information on forthcoming opportunities available to DBEs and arrange time frames and establish delivery schedules, when the requirements of the work permit, which will encourage participation by DBEs;

c. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs; including dividing total requirements, when economically feasible, into small tasks or quantities to permit maximum participation by DBEs;

d. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually;

e. Using the services of the Small Business Administration and the Office of Minority Business Enterprise of the U.S. Department of Commerce, as appropriate; and

f. Require a. through e. to be taken if subcontracts are awarded.

**B. FAIR SHARE OBJECTIVE**

1. The fair share objective for this project is 2 %MBE's and 3 % WBE's.

**C. DEFINITIONS**

1. Minority Business Enterprise (MBE) is a business concern which is:

a. Certified as socially and economically disadvantaged by the Small Business Administration;

(1) Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities.

(2) Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system is impaired due to diminished capital and credit opportunities, as compared to others in the same business area who are not socially disadvantaged. In determining the degree of diminished credit and capital opportunities, the Small Business Administration shall consider, but not be limited to, the assets and net worth of such socially disadvantaged individuals. Individuals who certify that they are members of named groups (Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Asian-Indian Americans), are to be considered socially and economically disadvantaged. Economically and socially disadvantaged individuals are deemed to include women.

b. Certified as a minority business enterprise by a State or Federal agency; or

c. An independent business concern which is at least 51 percent owned and controlled by minority group member(s).

(1) A minority group member is an individual who is a citizen of the United States and one of the following:

(a) Black American:

- (b) Hispanic American (with origins from Puerto Rico, Mexico, Cuba, South or Central America)
- (c) Native American (American Indian, Eskimo, Aleut, native Hawaiian); or
- (d) Asian-Pacific American (with origins from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, Taiwan or the Indian subcontinent).

(2) In order to satisfy the third criteria of the MBE definition, the minority ownership's interest must be real, substantial and continuing. Such interest is characterized by:

- (a) Risk of loss/share of profit commensurate with the proportional ownership; and
- (b) Receipt of the customary incidents of ownership, such as compensation (i.e. salary and other personnel compensation).

(3) A minority owner must have and exercise control of the business decisions. Characteristics of control include, but are not limited to:

- (a) Authority to sign bids and contracts;
- (b) Decisions in price negotiations;
- (c) Incurring liabilities for the firm;
- (d) Final staffing decisions;
- (e) Policy-making; and
- (f) General company management decisions.

(4) Only those firms performing a useful business function according to custom and practice in the industry are qualified as MBEs. Acting merely as a passive conduit of funds to some other firm where such activity is unnecessary to accomplish the project does not constitute a "useful business function according to custom and practice in the industry." The purpose of this approach is to discourage the use of MBE "fronts" and limit the creation of an artificial supplier and broker marketplace.

2. Women's Business Enterprise (WBE) is a business which is certified as such by a State or Federal agency, or which meets the following definition:

"A women's business enterprise is an independent business concern which is at least 51 percent owned by a woman or women, who also control and operate it. Determination of whether a business is at least 51 percent owned by a woman or otherwise qualified WBE which is 51 percent owned by a married woman in a community property State will not be disqualified because her husband has a 50 percent interest in her share. Similarly, a business which is 51 percent owned by a married man and 49 percent owned by an unmarried woman will not become a qualified WBE by virtue of his wife's 50 percent interest in his share of the business."

As in the case of a MBE, only United States citizens will be deemed to be WBEs. Similar to the MBE criteria, WBE should meet the criteria cited in subparagraphs C.1.c.(2), (3), and (4).

3. Fair Share or Fair Share Objective A fair share or a fair share objective is an amount of funds reasonably commensurate with the total project funding and the availability of qualified MBEs and W BEs, taking into account experience on EPA-funded projects and other comparable projects in the area. A fair share objective does not constitute an absolute requirement, but a commitment on the part of the bidder to exercise good faith *efforts* as defined in this section to use MBEs and WBEs to achieve the fair share objective.

4. Small Business (SBE). Any business entity, including its affiliates, that is independently owned and operated, and not dominant in its field of operations in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards set forth in 13 CFR Part 121.

5. Small Business in a Rural Area. A small business in a rural area (SBRA) is a business entity meeting the definition of a small business, and is located and conducts its principal operations in a geographical area (county) listed in the Small Business Administration's Listing of Non-Metropolitan Counties by State.

6. Recipient. A party receiving SRF financial assistance.

7. Project. The work financed through an SRF loan.
8. Bidder. A party seeking to obtain a contract with a recipient through a competitive, advertised, sealed bid process.
9. Offeror. A party seeking to obtain a contract with a recipient through a negotiative procurement process.
10. Prime Contractor. A party that has obtained a contract with a recipient through a competitive, advertised, sealed bid process.
11. Good Faith Efforts. Good faith efforts by a recipient, prime contractor, and/or bidder/offeror means efforts to attract and utilize SBEs, MBEs, and W BEs (DBEs) primarily through outreach, recruitment, and race/gender neutral activities. The following are examples of activities to assist recipients, prime contractors and/or bidders/offerors to comply with good faith efforts.
  - a. Include qualified SBEs, MBEs, and WBEs on solicitation lists.
    - (1) Maintain and update a listing of qualified SBEs, MBEs, and WBEs and SBRAs that can be solicited for supplies, construction and/or services.
    - (2) Provide listings to all interested parties who requested copies of the bidding or proposing documents.
    - (3) Contact appropriate sources within your geographic area and State to identify qualified MBEs and WBEs for placement on your minority and women's business listings.
    - (4) Utilize other MBE/WBE listings such as those of the State's Minority Business Office, the Small Business Administration, Minority Business Development Agency, US EPA- Office of Small and Disadvantaged Business Utilization (OSDBU) and the Department of Transportation.
    - (5) Have the State environmental agency personnel review this solicitation list.
  - b. Ensure that SBEs, MBEs, and WBEs are solicited.
    - (1) Conduct meetings, conferences, and follow-ups with SBEs, MBEs, W BEs, and SBRAs, small, minority and/or women's business associations, minority media, etc., to inform these groups of opportunities to provide supplies, services, and construction.
    - (2) MBE utilization is facilitated if the recipient or prime contractor advertises through the minority media. Such advertisements may include, but are not limited to, contracting and subcontracting opportunities, hiring and employment, or any other matter related to the project.
    - (3) Conduct pre bid, pre-solicitation, and post-award conferences to ensure that consultants, suppliers, and builders solicit SBEs, MBEs, WBEs, and SBRAs.
    - (4) Provide bidders and offerors with listings of qualified SBEs, MBEs, W BEs, and SBRAs and establish that a fair share of contracts/procurements should be awarded to these groups.
    - (5) Advertise in general circulation, trade publications, State agency publications of identified source, minority or women's business focused media, etc., concerning contracting opportunities on your projects. Maintain a list of minority or women's business-focused publications that may be utilized to solicit MBEs or WBEs.
    - (6) Provide interested SBEs, MBEs, W BEs, or SBRAs with adequate information about plans, specifications, timing and other requirements of the proposed projects.
    - (7) Provide SBE, SBRA, MBE or WBE trade organizations with succinct summaries of solicitations.
    - (8) Notify SBEs, MBEs, WBEs, or SBRAs of future procurement opportunities so that they may establish bidding solicitations and procurement plans.
  - c. Make information on forthcoming opportunities available to DBEs and arrange time frames and establish delivery schedules, where requirements of the work permit, which will encourage participation by SBEs, MBEs, W BEs and SBRAs.
    - (1) Consider lead times and scheduling requirements often needed by SBE, MBE, WBE or SBRA participation.

(2) Develop realistic delivery schedules which may provide for greater SBE, MBE, WBE or SBRA participation.

(3) Whenever possible, post solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date

d. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs; including dividing total requirements when economically feasible, into small tasks or quantities to permit maximum participation of SBEs, MBEs, WBEs and SBRA.

(1) Perform an analysis to identify portions of work that can be divided and performed by qualified SBEs, MBEs, WBEs and SBRA.

(2) Scrutinize the elements of the total project to develop economically feasible units of work that are within the bonding range of SBEs, MBEs, WBEs and SBRA.

(3) Analyze bid packages for compliance with the good faith efforts to afford SBEs, MBEs, WBEs and SBRA maximum participation.

(4) Encourage contracting with a consortium of SBEs, MBEs, WBEs, and SBRA when a contract is too large for one of these firms to handle individually

e. Use the services and assistance of the Small Business Administration and the Minority Business Development Agency of the US Department of Commerce, as appropriate.

(1) Use the services of outreach programs sponsored by the Minority Business Development Agency and/or the Small Business Administration to recruit bona fide firms for placement on SBEs', MBEs', WBEs', or SBRA's bidders lists to assist these firms in the development of bid packaging.

(2) Seek out Minority Business Development Centers (MBDCs) to assist recipients and prime contractors in identifying MBEs for potential work opportunities on this project.

f. If the prime contractor awards subcontracts, require the prime contractor to take the steps in paragraphs a. through e. of this section.

#### D. ADDITIONAL CONTRACT PROVISIONS

1. The prime contractor must pay its subcontractors for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the owner.

2. The prime contractor must notify the owner in writing prior to any termination of a DBE subcontractor for convenience.

3. If a DBE subcontractor fails to complete work under the subcontract for any reason, the prime contractor must employ the six good faith efforts if soliciting a replacement subcontractor, even if the fair share objectives have already been achieved.

#### E. REPORTING

1. Bidders/offerors shall demonstrate compliance with "good faith" efforts in order to be deemed responsible. Efforts could include maintaining phone/mail logs (see attached MBE/WBE Subcontractor Solicitation Sheet), submitting proof of DBE solicitation advertisements, completion of the on-line DBE quote request form located at <https://app.mdt.mt.gov/dbeqt/>, etc.. The owner may specify other methods of demonstrating compliance.

2. Documentation of a "good faith" effort should be submitted with the bid, or within seven (7) calendar days of the bid opening.

MBE/WBE SUBCONTRACTOR SOLICITATION INFORMATION						
Name, Address & Phone No. of Subcontractor Contacted	Date Request for Quote Sent	Description of Work Offered	Date of Phone Follow-up & Person Contacted	Amount of Quote or Reason for Not Quoting*	Quote Accepted? If not, list reason for rejection	Indicate MBE, WBE, or other Subcontractor

\* - Use additional sheets if necessary.

The undersigned hereby certifies that the above information is true and correct:

Contractor: \_\_\_\_\_

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

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



Build America, Buy America Act (BABAA)  
Version

**1.5.3 Certification Regarding Debarment, Suspension and Other Responsibility Matters****A. INSTRUCTIONS**

Under Executive Order 12549, an individual or organization debarred or excluded from participation in Federal assistance or benefit programs may not receive any assistance award under a Federal program, or a sub-agreement thereunder for \$25,000 or more. The status of prospective individuals or organizations can be checked at:

<https://www.sam.gov>

A prospective prime contractor must submit a completed certification (see form on the following page) or explanation to the project owner for the project. Each prospective subcontractor must submit a completed certification or explanation to the prime contractor for the project.

**B. HOW TO OBTAIN FORMS**

Additional forms may be obtained from the State or may be reproduced.

Build America, Buy America Act (BABAA)  
Version

\_\_\_\_\_  
SRF Project Number

United States Environmental Protection Agency  
Washington, DC 20460

**Certification Regarding Debarment, Suspension, and  
Other Responsibility Matters**

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

\_\_\_\_\_  
Typed Name & Title of Authorized Representative

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Date

\_\_\_\_\_ I am unable to certify to the above statements. My explanation is attached.

### 1.5.4 Prohibition against Listed Violated Facilities

#### A. REQUIREMENTS

- (1) To comply with all the requirements of section 114 of the Clean Air Act, as amended (42 U.S.C. 1857, et seq., as amended by Pub. L. 92-604) and section 308 of the Clean Water Act (33 U.S.C. 1251, as amended), respectively, which relate to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, respectively, and all regulations and guidelines issued thereunder before the award of this contract.
- (2) That no portion of the work required by this prime contract will be performed in a facility listed on the Environmental Protection Agency list of violating facilities on the date when this contract was awarded unless and until the EPA eliminates the name of such facility or facilities from the listing.
- (3) To use his best efforts to comply with clean air and clean water standards at the facilities in which the contract is being performed.
- (4) To insert the substance of the provisions of this clause, including this paragraph (4), in any nonexempt subcontract.

#### B. DEFINITIONS

- (1) Air Act means the Clean Air Act, as amended (42 U.S.C. 1857 et seq.).
- (2) Water Act means the Clean Water Act, as amended (33 U.S.C. 1251 et seq.).
- (3) Clean Air Standards means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted under the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110 (d) of the Air Act (42 U.S.C. 1857c-5(d)), an approved implementation procedure or plan under section 111 (c) or section 111(d), or an approved implementation procedure under section 112(d) of the Air Act (42 U.S.C. 1857c-7(d)).
- (4) Clean Water Standards means any enforceable limitation, control, condition, prohibition, standard, or other requirement which is promulgated under the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. 1342), or by a local government to ensure compliance with pretreatment regulations as required by section 307 of Water Act (33 U.S.C.1317).
- (5) Compliance means compliance with clean air or water standards. Compliance shall also mean compliance with a schedule or plan ordered or approved by a court of competent jurisdiction, the Environmental Protection Agency in accordance with the requirements of the Air Act or Water Act and regulations.
- (6) Facility means any building, plant, installation, structure, mine, vessel, or other floating craft, location, or site of operations, owned, leased, or supervised by a contractor or subcontractor, to be used in the performance of a contract or subcontract. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location or site shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are located in one geographical area.

### 1.5.5 Discovery of Archaeological and other Historical Items

In the event of an archaeological find during any phase of construction, the following procedure will be followed:

- (1) Construction shall be halted, with as little disruption to the archaeological site as possible.
- (2) The Contractor shall notify the Owner who shall contact the State Historical Preservation Officer.

(3) The State Historical Preservation Officer may decide to have an archaeologist inspect the site and make recommendations about the steps needed to protect the site, before construction is resumed.

(4) The entire event should be handled as expediently as possible in order to hold the loss in construction time to a minimum while still protecting archaeological finds.

A similar procedure should be followed with regard to more recent historical resources. Should any artifacts, housing sites, etc., be uncovered, the same procedure should be followed as for an archaeological find.

In the event archaeological/historical data are evaluated to meet National Register criteria, the Advisory Council on Historic Preservation may be notified and asked to comment.

### **1.5.6 Williams-Steiger Occupational Safety and Health Act of 1970**

#### **A. AUTHORITY**

(1) The contractor is subject to the provisions of the Williams-Steiger Occupational Safety and Health Act of 1970.

(2) These construction documents and the joint and several phases of construction hereby contemplated are to be governed, at all times, by applicable provisions of the Federal law(s) , including but not limited to the latest amendment of the following:

a. Williams-Steiger Occupational Safety and Health Act of 1970, Public Law 94-596;

b. Part 1910 - Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations;

c. Part 1926 - Safety and Health Regulations for Construction, Chapter XVII of Title 29, Code of Federal Regulations.

#### **B. SAFETY AND HEALTH PROGRAM REQUIREMENTS**

(1) This project, its prime contractor and its subcontractors, shall at all times be governed by Chapter XVII of Title 29, Code of Federal Regulations, Part 1926 - Safety and Health Regulations for Construction (29 CFR 22801), as amended to date.

(2) To implement the program and to provide safe and healthful working conditions for all persons, general project safety meetings will be conducted at the site at least once each month during the course of construction, by the construction superintendent or his/her designated safety officer. Notice of such meeting shall be issued not less than three (3) days prior, stating the exact time, location, and agenda to be included. Attendance by the owner, architect, general foreman, shop steward(s), and trades, or their designated representatives, witnessed in writing as such, shall be mandatory.

(3) To further implement the program, each trade shall conduct a short gang meeting, not less than once a week, to review project safety requirements mandatory for all persons during the coming week. The gang foreman shall report the agenda and specific items covered to the project superintendent, who shall incorporate these items in his/her daily log or report.

(4) The prime contractor and all subcontractors shall immediately report all accidents, injuries, or health hazards to the owner and architect, or their designated representatives, in writing. This shall not obviate any mandatory reporting under the provisions of the Occupational Safety and Health Act of 1970.

(5) This program shall become a part of the contract documents and the contract between the owner and prime contractor, prime contractor and all subcontractors, as though fully written therein

### **1.5.7 Wage Determination**

The Contractor and all subcontractors shall pay for all labor employed at no less than the minimum standard prevailing rate of wages for each classification, which shall be the higher of either the Montana Prevailing Wage Rates or the Federal Davis-Bacon Prevailing Wage Rates.

Please refer to EXHIBIT C for Federal Labor Standards Provisions for Federally Assisted Construction Contracts.

If you have a question about complying with the prevailing wage regulations (occupations, payroll forms, payment of fringe benefits, travel or per diem, etc.), you should contact the Labor Standards Bureau Wage and Hour Unit of the Montana Department of Labor and Industry or visit their website: <http://dli.mt.gov/>

### **1.5.8 Access**

1. The recipient must insure that representatives of the Environmental Protection Agency and the State will have access to project records and the project work whenever it is in preparation or progress and must provide proper facilities for such access and inspection. The recipient must allow the Regional Administrator, the Comptroller General of the United States, the State agency, or any authorized representative, to have access to any books, documents, plans, reports, papers, including records of contractors which are pertinent to the project for the purpose of making audit, examination, excerpts, copies, and transcriptions thereof. The recipient must insure that a party to a sub-agreement will afford access to such project work, sites, documents, and records.

### **1.5.9 Construction Site Erosion and Sediment Control Measures**

Every effort shall be made by the contractors and subcontractors to prevent and correct problems associated with erosion and runoff processes which could occur during and after project construction. The efforts should be consistent with applicable local ordinances, the EPA Nonpoint Source Pollution Control Guidance and Department of Environmental Quality Stormwater Management Plan.

Wherever appropriate, the contractor's efforts shall reflect the following engineering principles:

1. When appropriate, land grading and excavating should be kept at a minimum to reduce the possibility of creating runoff and erosion problems which require extensive control measures.
2. Whenever possible, topsoil should be removed and stockpiled before grading begins.
3. Land exposure should be minimized in terms of area and time.
4. Exposed areas subject to erosion should be covered as quickly as possible by means of mulching or vegetation.
5. Natural vegetation should be retained whenever feasible.
6. Appropriate structural or agronomic practices to control runoff and sedimentation should be provided during and after construction.
7. Early completion of stabilized drainage systems (temporary and permanent systems) will substantially reduce erosion potential.
8. Roadways and parking lots should be paved or otherwise stabilized as soon as feasible.
9. Clearing and grading should not be started until a firm construction schedule is known and can be effectively coordinated with the grading and clearing activity.

### **1.5.10 Build America, Buy America (BABA) Requirements**

On November 15, 2021, the “Infrastructure Investment and Jobs Act,” (Public Law 117-58), which includes the Build America, Buy America Act (Public Law 117-58, Title IX, Subtitles A and B, Sections 70901-70941) was enacted. This law applies to most programs that receive federal funds including the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund programs.

Section 70914(a) of the Act states that none of the funds made available for a Federal financial assistance program for infrastructure may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.

For iron and steel, all manufacturing processes, from the initial melting stage through the application of coatings must occur in the United States. This includes products made primarily of iron or steel such as lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, and reinforced precast concrete and construction materials made primarily of iron or steel such as wire, cables, rebar, framing, joists, decking, grating, railings, stairs, and fencing.

The term “manufactured product” means the manufactured product was manufactured in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product. This includes (but is not limited to) pumps, motors, drives, mixers, motorized screens, controls and switches, membrane bioreactor systems, membrane filtration systems, clarifiers, disinfection systems, HVAC systems, and skids that contain multiple components (e.g., treatment, pumping, etc.).

For construction materials, all manufacturing processes for the construction material occurred in the United States. This includes an article, material, or supply that is or consists primarily of non-ferrous metals (construction materials made of ferrous metals are covered under iron and steel), plastic- and polymer-based products including PVC, composite building materials, and polymers used in fiber optic cables, glass including optic glass, lumber, and drywall.

**BABA CERTIFICATION FORMS** – The Contractor must ensure that all qualifying iron and steel components, manufactured products, and construction materials used in the project have met the BABA requirements. To verify BABA compliance, the Contractor must obtain a “Manufacturer Certification” form (or equivalent statement) from the product manufacturer. Upon completion of the project, the Contractor shall provide the Owner with the “Contractor Certification” form and copies of all “Manufacturer Certification” forms and/or statements. The referenced certification forms are located in Exhibit E of Section 00900.

**BABA WAIVERS** - A waiver from the Build America, Buy America requirements may be issued by the head of a Federal agency if it is found that: 1) applying the domestic content procurement preference would be inconsistent with the public interest (a “public interest waiver”); 2) types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (a “nonavailability waiver”); or 3) inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent (an “unreasonable cost waiver”). Waiver requests must be submitted to the state for review.

**NATIONAL BABA WAIVERS** – The EPA has issued the following national waivers: 1) Adjustment Period (September 2, 2022); 2) Small Project (September 26, 2022); 3) De Minimis (October 21, 2022).

### **1.5.11 Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment**

This term and condition implements 2 CFR 200.216 and is effective for obligations and expenditures of EPA financial assistance funding on or after 8/13/2020.

As required by 2 CFR 200.216, EPA recipients and subrecipients, including borrowers under EPA funded

revolving loan fund programs, are prohibited from obligating or expending loan or grant funds to procure or obtain; or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use 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 or services means any of the following:

- a. Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
- b. 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).
- c. Telecommunications or video surveillance services provided by such entities or using such equipment.
- d. 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.

Certain prohibited equipment, systems, or services, including equipment, systems, or services produced or provided by entities identified in section 889, are recorded in the System for Award Management exclusion list.

## **1.6 ADDITIONAL SPECIAL PROVISIONS FOR ARPA**

If the project is funded solely by ARPA, the Buy America Build America in 1.3.4 and 1.5.10 of this agreement do not apply. The Federal Labor Standards Provisions (Davis-Bacon) do not apply to projects funded solely by ARPA.

## **1.7 EXHIBITS**

**EXHIBIT A**  
**(RD Sign - Deleted)**



**EXHIBIT A-1 (Required for All Projects)**

SRF Project Sign Detail

Project Title

# WATER SYSTEM IMPROVEMENT PROJECT

**OWNER: Town of Alberton, Montana**  
Distribution; Metering; Supply  
**ENGINEER: Anderson-Montgomery Consulting Engineers, Inc.**  
**CONTRACTOR: TBD**

### PROJECT FUNDING SOURCES & AMOUNTS:

- State Revolving Fund (EPA/DEQ/DNRC)... \$1,194,500
- MDNRC – RRGL Program..... \$ 125,000
- MDOC – MCEP..... \$ 750,000
- ARPA (DNRC) ..... \$1,741,117
- Local Resources ..... \$ 150,000

**TOTAL PROJECT COST: \$3,960,617**



White Background

4'

8'

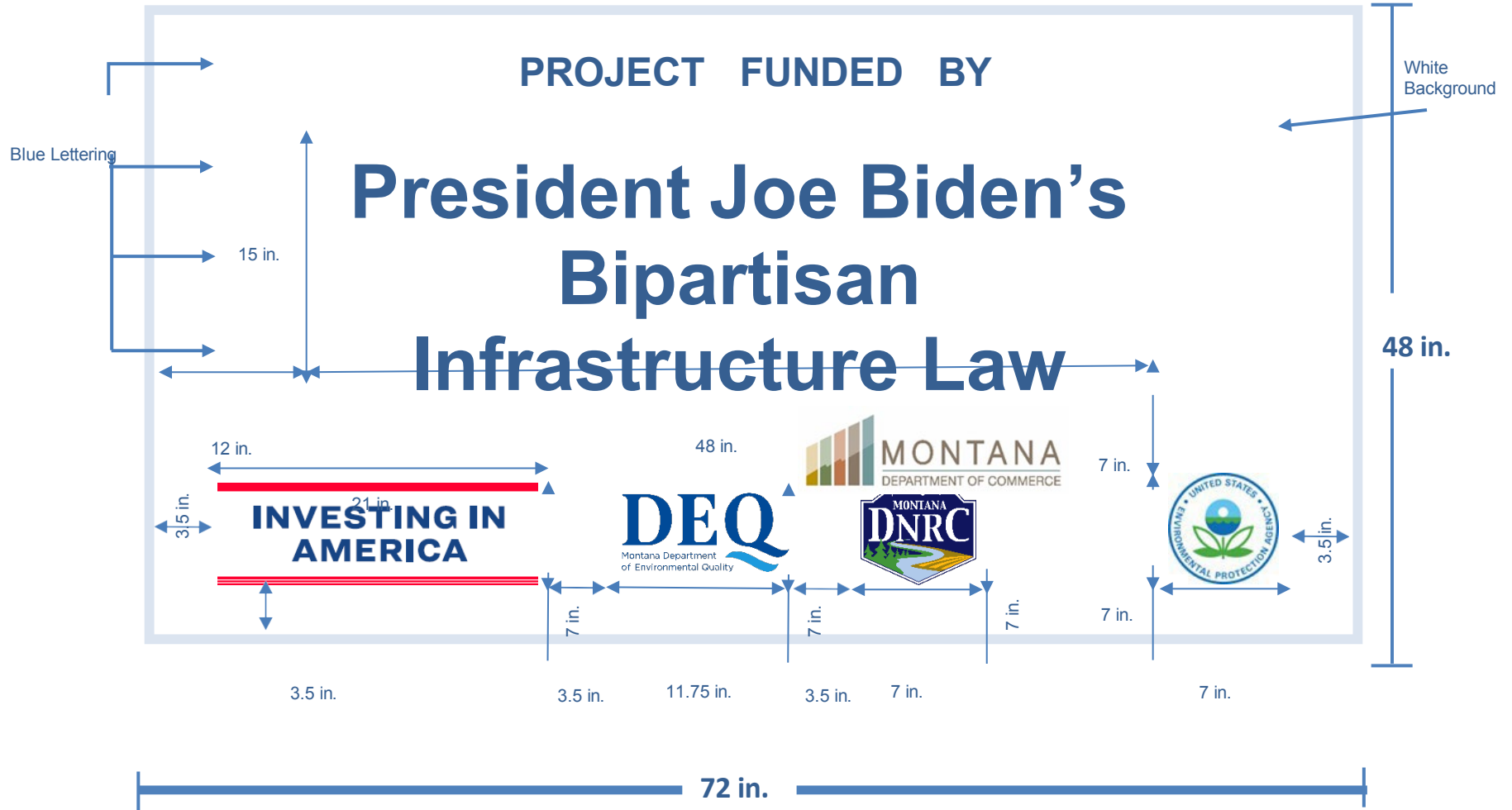
- PROVIDE TREATED REDWOOD 4X4 SUPPORTS FOR SIGN (BOTH ENDS) AND KEEP SIGN A PROPER DISTANCE ABOVE PREVAILING GRADE TO PERMIT VIEWING
- MUST NOT BE WITHIN ROAD RIGHT-OF-WAY
- EXTERIOR TYPE PLYWOOD SUITABLE FOR SIGN

## SRF PROJECT SIGN

Black Lettering

**EXHIBIT A-2 (Required for All Projects)**

BIL Project Sign Detail



**Investing In America Signage (BIL)**

**EXHIBIT B (Required for CDBG Projects)**

HUD Form 4010-Federal Labor Standards Provisions

**(Not Applicable)**

**EXHIBIT C (Required for SRF Projects)**

Federal Labor Standards Provisions  
For  
Federally Assisted Construction Contracts  
United States Department of Labor  
CFR Code of Federal Regulations Pertaining to ESA  
(Federal Davis-Bacon Wages)

Federal Labor Standards Provisions  
For  
Federally Assisted Construction Contracts  
United States Department of Labor  
CFR Code of Federal Regulations Pertaining to ESA  
(Federal Davis-Bacon Wages)

Title 29, Chapter I, Part 5, Subpart A (29 CFR 5.5)

Section Name: Contract provisions and related matters.

(a) The Recipient shall assure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or the applicable FY appropriation requirements, the following clauses:

**(1) Minimum wages.** (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in Sec. 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the

contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account, assets for the meeting of obligations under the plan or program.

**(2) Withholding.** The loan or grant recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency or SRF program) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

**(3) Payrolls and basic records.** (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the



registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the SRF program if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the SRF program. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead, the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the SRF program if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the SRF program, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under Sec. 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under Sec. 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the loan or grant recipient or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### **(4) Apprentices and trainees**

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually

registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

**(ii) Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

**(iii) Equal employment opportunity.** The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

**(5) Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

**(6) Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the SRF program may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

**(7) Contract termination:** Debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**(8) Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

**(9) Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

**(10) Certification of eligibility.** (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

**(b) Contract Work Hours and Safety Standards Act.** The Agency Head shall cause or require the contracting officer to insert the following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Sec. 5.5(a) or 4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

**(1) Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

**(2) Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

**(3) Withholding for unpaid wages and liquidated damages.** The loan or grant recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

**(4) Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

**(c)** In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in Sec. 5.1, the Agency Head shall cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Agency Head shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the loan or grant recipient and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

<https://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&sid=99c9a20e960f56be66f17ae91b52c888&rgn=div5&view=text&node=29:1.1.1.1.6&idno=29>

**EXHIBIT D (Required for SRF Projects)**

Reserved

## **EXHIBIT E**

**MT DEQ** Build America, Buy America Act (BABAA)  
Forms

CONTRACTOR CERTIFICATION

**Build America, Buy America Act, 2021**

USE OF IRON, STEEL, MANUFACTURED PRODUCTS, AND CONSTRUCTION MATERIALS

On November 15, 2021, the "Infrastructure Investment and Jobs Act," (Public Law 117-58), which includes the Build America, Buy America Act (Public Law 117-58, Title IX, Subtitles A and B, Sections 70901-70941) was enacted. This law applies to most programs that receive federal funds including the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund programs.

Section 70914(a) of the Act states that none of the funds made available for a Federal financial assistance program for infrastructure may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.

As the general contractor for the project(s) using revolving loan funds, the undersigned attests that they have performed the necessary oversight to ensure this provision was met on the project(s) being funded.

I, the undersigned authorized representative of \_\_\_\_\_, do hereby certify that all iron, steel, manufactured products, and construction materials used in the project(s) have complied with the above provision of the Build America, Buy America Act.

Project Name \_\_\_\_\_,

DEQ Loan Project Number \_\_\_\_\_,

Authorized Signature \_\_\_\_\_, Date \_\_\_\_\_,

Title \_\_\_\_\_,

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

MANUFACTURER CERTIFICATION

**Build America, Buy America Act, 2021**

USE OF IRON, STEEL, MANUFACTURED PRODUCTS, AND CONSTRUCTION MATERIALS

On November 15, 2021, the "Infrastructure Investment and Jobs Act," (Public Law 117-58), which includes the Build America, Buy America Act (Public Law 117-58, Title IX, Subtitles A and B, Sections 70901-70941) was enacted. This law applies to most programs that receive federal funds including the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund programs.

Section 70914(a) of the Act states that none of the funds made available for a Federal financial assistance program for infrastructure may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.

This certification applies to the following specific iron products, steel products, manufactured products, or construction materials to be incorporated into this project:

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

Material/Product Description: \_\_\_\_\_

Location of factory where these products were/will be manufactured: \_\_\_\_\_

Product category (iron and steel, manufactured product, or construction material): \_\_\_\_\_

As a manufacturer for the project(s) using revolving loan funds, the undersigned attests that they have performed the necessary oversight to ensure this provision was met on the project(s) being funded.

I, the undersigned authorized representative of \_\_\_\_\_, do hereby certify that all iron, steel, manufactured products, and construction materials used in the project(s) have complied with the above provision of the Build America, Buy America Act.

Project Name \_\_\_\_\_,

DEQ Loan Project Number \_\_\_\_\_,

Authorized Signature \_\_\_\_\_, Date \_\_\_\_\_,

Title \_\_\_\_\_,

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



CERTIFICATE OF OWNER'S ATTORNEY AND AGENCY CONCURRENCE

*Notes to User: This exhibit consists of two certificates, on a single page, to be attached to the Contract and signed upon execution. The first is a certificate to be signed by the Owner's attorney and the second is the concurrence to be signed by the State Engineer. This page is to be inserted after the Agreement between Owner and Contractor for Construction Contract (Stipulated Price) (EJCDC C-520, 2018) in the Construction Contract Documents.*

CERTIFICATE OF OWNER'S ATTORNEY

\_\_\_\_\_  
PROJECT NAME:

\_\_\_\_\_  
CONTRACTOR NAME AND CONTRACT NUMBER:

I, the undersigned, \_\_\_\_\_, the duly authorized and acting legal representative of \_\_\_\_\_, do hereby certify as follows: I have examined the attached Contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements is adequate and has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have ~~full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the~~ foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions, and provisions thereof.

Name

Date

AGENCY CONCURRENCE

\_\_\_\_\_  
As lender or insurer of funds to defray the costs of this Contract, and without liability for any payments thereunder, the Agency hereby concurs in the form, content, and execution of this Agreement.

\_\_\_\_\_  
Agency Representative

Date

Name

DOMESTIC PREFERENCE *DE MINIMIS* LIST FORMAT

*Notes to User: This exhibit is an example format for Contractors to use in maintaining a list of items to document the use of the De Minimis waiver of the Domestic Preference requirements. This list or similar is required to be filled out throughout the construction Contract as needed. The State Engineer may periodically ask to review this information. At the Contract completion, this list, along with all Manufacturers' certifications, are to be given to the Engineer for delivery to the Owner. This list is applicable for projects governed by BABAA. USDA-RD State Office can provide guidance if AIS applies to the project instead.*

*DE MINIMIS* COSTING WORKSHEET

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

Contract Name/# (if more than one) \_\_\_\_\_

Contractor (Company Name): \_\_\_\_\_

Representative: \_\_\_\_\_

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

Total Project Costs : \_\_\_\_\_ \$

Allowable Total *De Minimis* Costs (5% of project costs) \_\_\_\_\_ \$

Total Cost of all *De Minimis* Items \_\_\_\_\_ \$

Remaining Amount Allowed for Future *De Minimis* Items \_\_\_\_\_ \$

No.	Detailed Description and Manufacturer or Local Source of <i>De Minimis</i> Material	Quantity	Cost Per Item	Total Item Cost
1				
2				
3				
4				
5				
6				
7				
8				

9				
10				
11				
12				

SAMPLE LANGUAGE FOR CONTRACTOR'S  
CERTIFICATION OF COMPLIANCE

*Notes to User: This exhibit provides sample language that the Contractor can use to certify compliance with the Build America Buy America Act requirements. Note that the language can be modified (for example if the project is subject to AIS the BABAA reference should be replaced with language such as "American Iron and Steel (AIS) requirements mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 and subsequent annual appropriations for WWD programs"). A certification is to be provided by Contractor to Engineer for delivery to the Owner and Agency at Substantial Completion. The certification should be on letterhead and should be signed and dated by an authorized company representative.*

GENERAL (PRIME) CONTRACTOR'S CERTIFICATION OF COMPLIANCE WITH  
PROVISIONS OF THE AMERICAN IRON AND STEEL REQUIREMENTS OF SECTION 746 OF  
TITLE VII OF THE CONSOLIDATED APPROPRIATIONS ACT OF 2017 (DIVISION A -  
AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION, AND  
RELATED AGENCIES APPROPRIATIONS ACT, 2017) AND SUBSEQUENT STATUTES  
MANDATING DOMESTIC PREFERENCE

Project Name  
Owner / Applicant  
Contract Number

I hereby certify, that to the best of my knowledge and belief, all Iron and Steel products, Manufactured Products, and Construction Materials installed for this project by my company and by any and all subcontractors and Manufacturers my company has contracted with for this project comply with the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953 or are the subject of a waiver approved by the Secretary of Agriculture or designee.

SAMPLE LANGUAGE FOR MANUFACTURER'S CERTIFICATION OF COMPLIANCE

*Notes to User: This exhibit provides sample language for the Manufacturer's Certification of Compliance with Domestic Preference requirements. Contractor should ensure that Engineer has an approved Manufacturers' Certification prior to any domestic preference item being delivered to the project site. The Manufacturer's Certification should be on letterhead and should indicate the project, specific item being certified, reference which domestic preference requirement is being certified and be signed by an authorized company representative. The Manufacturer's Certification may include multiple domestic preference requirements. It is important for the governing domestic preference requirement (whether AIS, BABAA or other) to be clearly included within the certification.*

---

Date:

---

Company Name:

---

Company Address:

Subject: Domestic Preference Requirement Certification for {*Owner's Name and Project Name (City, State)*} Certification for Project (X), Owner's Name, and Contract Number  
Sample text:

I hereby certify that the following product(s) and / or material(s) shipped or provided for the subject project are in full compliance with the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953.

[List common name of items, products and/or materials]

## ENGINEER'S CERTIFICATIONS

*Notes to User: This exhibit provides sample language for the statements needed for the Engineer of Record's certification; it should be submitted with the bid package to the Agency for concurrence for authorization to bid by Agency. This certification is not intended to be a warranty in any way but rather the designer's professional opinion that to the best of their knowledge the documents comply. This certification does not need to be included in the contract documents. Note that the language can be modified (for example if the project is subject to AIS, the BABAA reference should be replaced with language such as "American Iron and Steel (AIS) requirements mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 and subsequent annual appropriations for WWD programs.").*

The final Drawings and Specifications, construction Contract Documents, Bidding Documents, procurement documents, and any other final design phase deliverables, comply with all applicable federal requirements including the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953, or are the subject of a waiver approved by the Secretary of Agriculture or designee. This includes the following:

- The Engineers Joint Contract Documents Committee (EJCDC) documents have been used, and all acceptable revisions identified in this Bulletin have been made in accordance with the terms of the license agreement, which states in part that the Engineer "will plainly show all changes to the standard EJCDC text, using 'Track Changes' (redline/strikeout), highlighting, or other means of clearly indicating additions and deletions." Such other means may include attachments indicating changes (e.g. Supplementary Conditions modifying the General Conditions).
- Any building(s) designed for this Project will comply with the requirements of the Architectural Barriers Act (ABA) of 1968, the Americans with Disabilities Act (ADA) of 1990, Section 504 of the Rehabilitation Act of 1973, and any federal, state, or local accessibility standards.
- Any building(s) designed for this Project will comply with the Seismic Safety of Federally Assisted New Building Construction requirements of 7 CFR 1792, and any federal, state, or local standards.
- All referenced Products and Construction Materials in the Drawings, Specifications, and Bidding Documents for the Project comply with BABAA.
- All referenced Products and Construction Materials to be referenced in the Addenda, executed Contracts, and Change Orders will comply with BABAA.

---

Engineer Signature

Date

---

Engineer Name and Title

Engineering Company Name

---

**SECTION 00 95 10  
SPECIAL PROVISIONS**

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- |   |  |
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| 6. Soils Information  | 30. Cleanup  |
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| 8. Payments to Contractor                                   | 32. Paving Restoration & Schedule                      |
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## 1. PROJECT DESCRIPTION

The project will be constructed as one Base Bid (Distribution); Additive Alternate B (metering), and; Additive Alternate C (spring source improvements). Work shall generally include: replacing approximately 6,205 lineal feet of 6" through 12" watermain including valves/fittings; replacing/installing 12 standard fire hydrants; reconnecting 60 individual water services; replacing 210 individual water meters (within homes and existing pits); furnishing/commissioning remote meter reading equipment/software and billing system; replacing the spring source collection structure, and; installing fence around the spring box; testing; backfill; utility conflicts; surface restoration; pavement; and all appurtenant work.

## 2. SITE INSPECTION AND PRE-BID CONFERENCE

All Bidders should satisfy themselves as to the construction conditions by personal examination of the site described in this document. Bidders are encouraged to make any investigation necessary to assess the nature of the construction and the difficulties to be encountered. A Pre-Bid conference will be held **April 9, 2024** to provide onsite guidance to potential bidders. Interested Contractors are **strongly encouraged** to attend if they intend to be considered a responsive bidder. Contractors are encouraged to contact the Engineer with any questions before the bid date.

## 3. CONTRACT TIME, CONSTRUCTION PHASING & LIQUIDATED DAMAGES

Time is of the essence on this project and schedules must be adhered to. The following tentative schedule of events will be followed, to the extent possible:

- |                                |   |
|--------------------------------|---|
| a. Re-advertisement for Bids   | April 3, 2024                                 |
| b. Pre-Bid Conference          | April 9, 2024                                 |
| c. Bid Opening 2:00 P.M.       | April 19, 2024                                |
| d. Notice of Award             | May 22, 2024                                  |
| e. Pre-Construction Conference | June 12, 2024                                 |
| f. Notice to Proceed           | June 29, 2024                                 |
| g. Substantial Completion      | February 4, 2025 (220-day contract period)    |
| h. Ready for Final Payment     | December 24, 2025 (presume a winter shutdown) |

The Total Contract Time for this Project will be a maximum of **220 consecutive** calendar days (for Base Bid and Alternates B & C combined), as stated in the Agreement. *Reduced contract periods due to the award of multiple schedules may affect the overall contract time.* Subject to the provisions of the Contract Documents, the Owner shall be entitled to reimbursement for Contractor-caused expenses incurred by the Owner for unscheduled employment of the Engineer. Liquidated damages for the unscheduled employment of the Engineer and/or Inspector will be assessed against the Contractor necessitated by the following:



- The Contractor working beyond the specified contract time.
- The Contractor working more than 8 hours per day, (or 40 hours per week if four ten hour shifts are worked) or on Saturdays, Sundays and Federal Holidays.
- The Contractor utilizing material, supplies, or equipment that requires the redesign of the project.
- The Contractor destroying or disturbing baselines, benchmarks or reference stakes.
- The failure of the Contractor to maintain acceptable as-built records.
- Retests by the Engineer of tests that have failed.
- Retests by others for tests that require Engineer's presence.
- Repeated review of submittals and shop drawings that have not been approved.
- Additional inspection as a result of unacceptable work.
- Failing to follow design or construction documents.
- Submitting excessive or unreasonable claims requiring Engineer's review.
- Failing to properly document pay requests.

Liquidated damages for the unscheduled employment of the Engineer and/or Inspector shall be determined based on the following hourly rates up to the daily limits identified in the Agreement:

Project Manager	\$160.00/Hour
Project Engineer	\$160.00/Hour
Inspector	\$115.00/Hour
Mileage	\$ 0.60/Mile

*See Article 4.3 of the Agreement for details on quantifying liquidated damages.* Out of pocket expenses for materials, equipment, supplies, transportation, and subsistence shall be billed at cost plus ten percent. Liquidated damages for unscheduled employment of the Engineer and/or Inspector shall be deducted from monthly progress payments and the final payment as the damages are incurred.

The Contractor shall reimburse the Owner for all costs incurred as a result of the Contractor's failure to complete the work within the time period specified in the Contract unless modified by a Change in Contract Time. The Owner shall have one or more representatives observing the work at all times work is taking place. The Contractor shall reimburse the Owner for the cost of engineers, architects, attorneys, construction field representatives, and other professionals that are incurred due to the Contractor's failure to complete the work within the Contract time period.

#### **4. PROJECT RELATED CONTACTS**

Owner: **Town of Alberton**

607 Railroad Ave, Alberton, MT 59820

Anna LeDuc – Town Mayor: [albertoncouncild2@gmail.com](mailto:albertoncouncild2@gmail.com); (406)722-3404

Leslie Hottinger – Town Clerk: [townofalberton@blackfoot.net](mailto:townofalberton@blackfoot.net); (406)722-3404

*Temporarily Unassigned* – Utility Operator: [albertonsandwops@gmail.com](mailto:albertonsandwops@gmail.com); (406)722-3404

Engineer: **Anderson-Montgomery Cons. Eng., Inc.**

1064 N. Warren Street, Helena, Montana 59601

Contact: Paul Montgomery, P.E.; [paul@a-mce.com](mailto:paul@a-mce.com); (406)459-8463

Utilities:

NorthWestern Energy – Electrical Power

Eric Loran, District Engineer

Telephone: 406-542-6095, 406-241-3434 (cell)

Spectrum Communications

1-800-892-4357

One Call Locators

Telephone: 811 or (406) 424-5555

## **5. GENERAL CONSTRUCTION REQUIREMENTS**

Construction Limits. Work will occur within the established public right-of-way and easements for the Town of Alberton., and will not affect private land. Where construction limits, or property lines, are not specifically called out on the Drawings, the limit shall be the closest adjacent property line or easement line, whichever is less.

Areas of Disturbances. Approved areas of disturbance are those areas disturbed by construction activities within the construction limits and along designated or approved access routes. Such areas shall require reclamation and revegetation operations, including grading to the original contours, top soiling with salvaged or imported topsoil, seeding, fertilizing, and mulching as specified herein. Other areas that are disturbed by the Contractor's activities outside of the limits noted above will be considered as site damage or unapproved areas of disturbance subject to Repair and Replacement Quality as specified in the Supplementary Conditions. This includes areas selected by the Contractor outside the defined construction limits for mobilization, offices, equipment, or material storage.

## **6. SOILS INFORMATION**

A geotechnical report from Pioneer Technical Services is included in Appendix A of these project documents. The investigation is not comprehensive and may not fully describe the nature of all soils that may be encountered on the project. The Bidder/Contractor is encouraged to conduct its own geotechnical studies in order to derive the necessary information upon which to base its bid and determine means and methods for construction.

Generalized soil mapping is also available through the USDA Natural Resources Conservation Service Web Soil Survey website at:  
<https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.

Note that the Contractor will be responsible for obtaining soil samples and conducting proctor tests in order to establish optimum moisture levels and compaction rates for native materials used in backfill. All required compaction rates shall be verified by the Contractor. Sampling/analysis shall be conducted for each varying classification of soil encountered over the entire jobsite.

## 7. ENGINEERING, INSPECTIONS, AND TESTING

The Contractor's work will be periodically tested and observed to ensure compliance with the Contract Documents. Complete payment will not be made until the Contractor has demonstrated that the work is complete and has been performed as required. If the Engineer detects a discrepancy between the work and the requirements of the Contract Documents at any time, up to and including final inspection, such work will not be completely paid for until the Contractor has corrected the deficiency.

The Engineer will periodically monitor the construction of work to determine if the work is being performed in accordance with the contract requirements. The Engineer does not have the authority or means to control the Contractor's methods of construction. It is, therefore, the Contractor's responsibility to utilize all methods, equipment, manpower, and other means necessary to assure that the work is installed in compliance with the Drawings and Specifications, and laws and regulations applicable to the work. Any discrepancies noted shall be brought to the Contractor's attention, who shall immediately correct the discrepancy. Failure of the Engineer to detect a discrepancy will not relieve the Contractor of his ultimate responsibility to perform the work as required.

The Contractor shall inspect the work as it is being performed. Any deviation from the Contract requirements shall be immediately corrected. Prior to any scheduled observation by the Engineer, the Contractor shall again inspect the work and certify to the Engineer that he has inspected the work and it meets the requirements of the Contract Documents. **All buried work items shall be inspected by the Engineer prior to backfilling, or may not be considered for payment.**

The work will be subject to review by the Owner, whose findings shall be as valid as those of the Engineer. The results of all such observations shall be directed to the Contractor through the Engineer.

Services Provided by the Contractor. The Contractor shall provide the following services:

- Any field surveys to establish locations, elevations, grades and alignments as stipulated on the Plans.
- Preparation and certification of all required shop drawings and submittals as described in the Supplementary Conditions.

- Tests as required by the Contract Documents which include, but are not limited to, proctors and concrete strength laboratory tests. All tests requiring the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to the Engineer. The laboratory shall be staffed with experienced technicians properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- The Contractor shall provide an independent laboratory for any tests necessary to determine the compliance of the materials used in the asphalt mix with the Contract Documents.
- Maintenance of project record drawings.
- The Contractor shall arrange for and pay for all tests required by the Contract Documents.
- The Contractor shall provide an independent laboratory to check compaction of subgrade, backfill and base/subbase course using Proctor information supplied by the Contractor. These tests are only to determine if the material is complying with the Contract Documents. It is the responsibility of the Contractor to insure that this level of compaction is constant in all locations. Compaction testing shall test moisture content and compaction as specified in the Contract Documents. Tests shall be taken upon every specified lift for both trenches and roadways/sidewalks at a maximum spacing of 100 feet along the trench or roadway/sidewalk alignment, or as directed by the Engineer.
- The Contractor shall provide an independent laboratory to determine cast-in-place concrete characteristics including: slump; air content and to cast and test cylinders for strength analysis as specified in the Contract Documents. The Contractor is responsible for proper onsite storage, transportation and laboratory strength testing of the cylinders. All on-site concrete testing shall be performed by a certified ACI technician.
- The Contractor shall provide an independent laboratory to perform, at minimum but not limited to, one (1) set of three (3) Marshall “pucks” to establish a job specific target density for the bituminous mix. For each day’s production, or for each 1,000 tons produced per day, the engineer will mark three random locations upon the mat for the removal of a 4” diameter core to be cut for density determination. A “percent compaction” value will be determined by comparing the average core density values for that day with the job specific target density previously determined by the Marshall “pucks”. The independent laboratory will be required to document the thickness of asphalt material pulled from each core and to further trim each core prior to density testing. Documentation of test results shall be submitted to the engineer as they become available throughout construction activity.
- Contractor shall provide for disinfection and bacteriological testing of all newly installed water mains. Testing shall include chlorine residual testing as well as coliform testing for completed water mains utilized as a source of potable water.

- The contractor shall perform performance tests for any newly installed equipment as specified within these contract documents.

Testing Services Provided by the Owner. The Owner is not required to perform any testing services during the construction of this project. All required testing shall be the responsibility of the Contractor. The Contractor shall provide an approved independent testing laboratory to perform all necessary testing during construction activities.

The Engineer will observe and record the results of Contractor field tests for unit process performance and pressure and leakage of water, sanitary sewers, manholes, tanks, calibration of equipment and related materials tests. Contractor shall coordinate tests with Engineer and provide all necessary equipment and labor to perform the required tests.

## **8. PAYMENTS TO CONTRACTOR**

8.1 Scope. This section supersedes the sections of the General Conditions pertaining to payments to the Contractor, to be in compliance with MCA 28-2-2103 as amended on October 1, 2003. If an alternate billing, approval, and/or payment cycle is required for this project those provisions are discussed in the “Instructions to Bidders” section of these Contract Documents, and shall supersede this section on Payments to the Contractor.

8.2 Application for Partial and Final Payment. The Contractor shall prepare and submit one Application for Payment on a monthly billing cycle, including Schedule of Values to support the request for payment. At the Preconstruction Conference it will be agreed upon which day of the month this application should be submitted so that it coincides with the Owner’s billing approval and payment schedule. After the first partial payment request is submitted the Contractor shall submit their subsequent applications on the same date each month for the duration of the project.

- a. After the Contractor submits their Application for Payment the Owner will have twenty one (21) days to review and approve payment for the entire amount of the request, or the undisputed portion of the request. During this same time period the Engineer will review the payment request and make recommendations to the Owner on the items which the Engineer feels are approved for payment, and which items are in dispute. Items which are in dispute will be documented in writing and provided to the Contractor for correction and resubmission on subsequent payment requests. The undisputed portion will be approved for payment, and will be paid within seven (7) calendar days after approval. Five percent (5%) of all partial payments will be withheld from payment until the completion of the project as discussed below.
- b. The Final Application for Payment, including release of the five percent (5%) retainage, may only be submitted after the Engineer has signed the Certificate of Substantial Completion and all punch list items have been addressed.
- c. The Contractor will complete the Town of Alberton Payment Request and Status Report with each Application for Payment.

## 9. UTILITIES AND WATER SERVICE

The exact locations of existing underground utilities that may conflict with the work are not precisely known. It shall be the Contractor's responsibility to contact the owners of the respective utilities and arrange for field location services.

9.1 Notification. The Contractor shall contact, in writing, all public and private utility companies that may have utilities that may be encountered during excavation. The notification shall include the following information:

- The nature of the work that the Contractor will be performing.
- The time, date and location that the Contractor will be performing work that may conflict with the utility.
- The nature of work that the utility will be required to perform such as moving a power pole, supporting a pole or underground cable, etc.
- Requests for field location and identification of utilities.
- A copy of the letter of notification shall be provided to the Engineer. During the course of construction, the Contractor shall keep the utility companies notified of any change in schedule or nature of work that differs from the original notification.

9.2 Identification. All utilities that may conflict with the work shall be the Contractor's responsibility to locate before any excavation is performed. Field markings provided by the utilities shall be preserved by the Contractor until actual excavation commences. All utility locations on the Drawings should be considered approximate and should be verified in the field by the Contractor. The Contractor shall also be responsible for locating all utilities that are not located on the Drawings.

9.3 Public Utilities. Water, sewer, storm drainage, electric, gas and other utilities owned and operated by the public entities shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All such work shall be in accordance with these Specifications, or the Owner's Standard Specifications or written instructions when the work involved is not covered by these Specifications.

9.4 Other Utilities. Utilities owned and operated by private individuals, railroads, school districts, associations, or other entities not covered in these Special Provisions shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All work shall be in accordance with the utility owner's directions, or by methods recognized as being the standard of the industry when directions are not given by the owner of the utility.

9.5 Damage to Utilities and Private Property. The Contractor shall protect all utilities and private property and shall be solely responsible for any damage resulting from his construction activities. The Contractor shall hold the Owner and Engineer harmless from all actions resulting from his failure to properly protect utilities and private property. All damage to utilities shall be repaired at the Contractor's expense to the full satisfaction of the owner of

the damaged utility or property. The Contractor shall provide the Owner with a letter from the owner of the damaged utility or property stating that it has been repaired to the utility owner's full satisfaction.

9.6 Water Mains and Services. All water mains and services exposed during construction shall be adequately supported and protected from freezing at all times. Sections of water mains shall not be valved off without first giving the Owner sufficient notification and receiving authorization from the Engineer. Unless otherwise permitted in writing by the Owner, water mains and services shall not be shut off for more than 12 hours. If a water service interruption is expected to last longer than 12 hours, temporary water service shall be provided. All recipients of water service shall be notified in advance of **any** interruption of service.

Whenever a water main or service is damaged as a result of the Contractor's operations, the Contractor shall take immediate steps to repair the damage and disinfect all water mains and services contaminated as a result of the damage.

Existing water services from the mains to private property which interferes with trenching operations may be cut and replaced at the Contractor's option and expense provided the requirements for notification, length of interruption, and disinfection specified above are adhered to.

9.7 Maintenance of Water & Wastewater Utility Service. Adequate provisions shall be made for maintaining: water service; sewer service; storm drains, and watercourses encountered during construction. Culverts, ditches, fences, crosswalks, and structures which are disturbed by this construction shall be satisfactorily restored to their original condition upon completion of the work. No additional payment shall be made for this work. All costs shall be merged with related bid items. **Water service interruptions to individual users shall be minimized to the greatest extent possible, but shall not last more than 12 hours under any circumstances. Temporary water service shall be provided to the Town's users if permanent service is not restored within 4 hours or unless specific provisions have been made with affected water users.**

9.8 Structures. The Contractor shall exercise every precaution to prevent damage to existing buildings or structures in the vicinity of his work. In the event of such damages, he shall repair them to the satisfaction of the owner of the damaged structure at no cost to the Owner.

9.9 Overhead Utilities. The Contractor shall use extreme caution to avoid a conflict, contact, or damage to overhead utilities, such as power lines, streetlights, telephone lines, television lines, poles, or other appurtenances during the course of construction of this project.

9.10 Buried Gas Lines. The Contractor shall provide some means of overhead support for buried gas lines exposed during trenching to prevent rupture in case of trench caving.

9.11 Pavement Removal. Where trench excavation or structure excavation requires the removal of curb and gutter, concrete sidewalks, or asphaltic or concrete pavement, the pavement or concrete shall be cut in a straight line parallel to the edge of the excavation by use of a spade-bitted air hammer, concrete saw, colter wheel, or similar approved equipment to obtain a

straight, square clean break. Pavement cuts shall be 2 feet wider than the actual trench opening.

9.12 Survey Markers and Monuments. The Contractor shall use every care and precaution to protect and not disturb any survey marker or monuments, such as those that might be located at lot or block corners, property pins, intersection of street monuments or addition line demarcation. Such protection shall include markings with flagged high lath and close supervision. No monuments shall be disturbed without prior approval of the Engineer. Any survey marker or monument disturbed by the Contractor during the construction of the project shall be replaced at no cost to the Owner by a licensed land surveyor.

9.13 Temporary Utilities. The Contractor shall provide all temporary electrical, lighting, telephone, heating, cooling, ventilating, water, sanitary, fire protection, and other utilities and services necessary for the performance of the work. All fees, charges, and other costs associated therewith shall be paid for by the Contractor. **Specific provisions for temporary water service are detailed in SP 49.**

## 10. STORED MATERIALS

Contractor shall use an approved storage area for materials and offices which should be available on site. Materials and/or equipment purchased by the Contractor may be paid for on a monthly basis providing invoices for said materials and equipment are presented to the Engineer, such materials have been approved through the submittal process and are adequately stored, protected and insured.

## 11. NOTICES

It will be the responsibility of the Contractor to notify the following individuals for the following items:

- Owner and emergency services of service outages in writing a minimum of 24 hours in advance.
- ***Contractor shall notify all property owners and occupants affected by pending construction activities no less than 48-hours prior to mobilizing to each particular work site. Notification shall consist of placing a door-hanger on each residence within 150' of the work site, that states the location, timeframe and nature of the work as well as contact information for the Contractor's project supervisor.***
- Contractor to place "NO PARKING" signs as needed to ensure vehicles are not in the way of construction progress.
- ***Notify all affected parties of water, sewer, or electrical outages in writing 24 hours in advance. Note: water service interruptions shall be minimized to the greatest extent practical, but under no circumstances shall interruptions last no longer than 12-hours***
- Notify Owner, Engineer, and all landowners, 72 hours in advance, of when paving



operations will occur.

- The Contractor shall maintain functional traffic through worksite to the extent that residents are not prevented from accessing their properties.

## **12. DRAWINGS**

The Engineer has located, to the best of his knowledge, all major objects that may influence construction and has indicated them on the Drawings for bidding purposes only. Because of scale, possible additions, subsurface uncertainties, etc., the Contractor shall be responsible for verifying in the field the exact locations of objects that may influence his construction operations. The Engineer and Owner shall in no way be held responsible for objects not located exactly as shown on the Drawings or for objects installed subsequent to preparation of the Drawings.

## **13. FEES AND PERMITS**

The Contractor will be responsible for obtaining and paying for all permits required by Local, State or Federal jurisdictions. Specifically, the Contractor shall obtain the following types of permits or provide documentation that they are not applicable:

- Stormwater Discharge Associated with Construction Permit – Montana DEQ
- Ground Water Discharge Associated with Construction Permit – Montana DEQ Building
- Electrical and Mechanical Permits – Building Codes Bureau, Montana Department of Commerce
- Electrical Permit
- Building Permits

## **14. SUPERVISOR, TELEPHONE AND PROJECT SITE FACILITIES**

At all times during construction the Contractor shall provide a telephone at the project site. In addition, if the phone is not manned, a system must be utilized to deliver messages to the project superintendent within 15 minutes of a phone call. The superintendent in charge of all operations must be on-site during all construction activities. The superintendent in charge of all operations must be qualified to do such work **and** shall be the same person throughout the project. Substitutions for superintendents can be made with the Owner and Engineers approval. The City reserves the right to stop construction if the Contractor's Project Superintendent is absent from the site during construction activity. Additional Contract Time will not be allowed due to such stop work orders.

The Contractor shall maintain a suitable office at the site which shall serve as headquarters for his superintendent. All communications, drawings, instructions, and other articles will be delivered to the Contractor's field office or to the Contractor's main office as appropriate.

Communications delivered to either location shall be deemed to have been delivered to the Contractor. The Contractor shall maintain copies of record drawings, specifications, shop drawings, submittals, and all communications pertinent to the performance of the work at the field office and available for use at all times.

On-site toilet facilities for employees of Contractor and Subcontractors shall be provided and maintained in a sanitary condition. A bulletin board will be maintained on the jobsite for posting wage rates, labor standards and other information to be made available to the contractor's employees.

## **15. CONSTRUCTION WATER**

The Contractor shall secure permission and comply with any usage provisions from the Town of Alberton for the acquisition of construction water. Contractor shall coordinate with the Town and shall install and utilize a suitable backflow preventer and meter. The meter shall be utilized to track water usage by the Contractor. *The Contractor is responsible for any costs associated with the acquisition of construction water from the Town of Alberton.*

## **16. DISPOSAL OF USED WATER**

Disposal of used water shall be the responsibility of the Contractor. Discharges to the surface are subject to permit and regulatory requirements. Discharge of chlorinated water is the responsibility of the Contractor. Discharge to sewer or storm drains must be coordinated with and approved in advance by the Owner. It will be the responsibility of the Contractor to arrange for legal disposal of all groundwater (contaminated or otherwise) during execution of the Work.

## **17. WATER POLLUTION, EROSION AND SEDIMENT CONTROL**

The Contractor shall obtain all required permits and comply with all laws and regulations of the Montana Department of Environmental Quality and with all other federal, state, and local laws and regulations controlling pollution to the environment. The contractor shall apply for these permits as soon as possible after the contract is awarded. The Contractor shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, bitumens, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

Particular care will be required to prevent trench spoils from entering streams or watercourses. Similar care shall be used if removal is required for spoils already in the stream channel. Under no circumstances will equipment be allowed to operate in flowing stream channels, with the exception of booms or buckets extended into the channel to retrieve existing spoils or place riprap at the water line. Machinery wheels or tracks may not enter the channel below water line. Sediment control provisions shall be used whenever work is conducted adjacent to drainages or watercourses to control silt in runoff. Adequate silt barriers or sediment traps shall be used to comply with permit conditions and statutory requirements for all streamside work, both during and after work hours. Measures used may include staked straw bales, sediment ponds, and/or staked silt fence (Mirafi "Enviro-Fence, or equal). Sediment controls shall be considered

incidental to the Work, and no separate payment will be allowed. The Contractor will be solely responsible for the selection and implementation of sediment control measures to assure permit and statutory compliance. **An Erosion Control Plan outlining measures to be taken to control erosion and runoff must be submitted by the Contractor to the Engineer and the Owner for review and approval** prior to any work activities in proximity to any surface waters – including ephemeral/intermittant streams. Scheduling of work tasks must be included in the Plan outlining work procedures, waste disposal practices, earthwork procedures and other activities.

*Note that much of the Work will be conducted on relatively steep, unpaved streets. Erosion/rutting/cutting of these surfaces shall be prevented to the greatest extent possible and shall be fully restored to as good or better condition than prior to construction.*

## **18. MATERIALS SALVAGE**

All utility materials removed during the Work and identified as such, are to be salvaged for the Owner. Such items shall be carefully recovered and delivered to the location directed by the Owner. All other materials removed on the project shall be legally disposed of by the Contractor. Disposal costs shall be part of contract unit prices.

## **19. PROTECTION OF ADJACENT IMPROVEMENTS & LANDSCAPING**

Retain, protect and restore all adjacent improvements impacted by construction. This includes: asphalt; concrete; subgrade materials; gravel surfaces; *cultivated* trees, shrubs and lawn; landscaping stones; retaining walls; drainage improvements; mailboxes; reflector posts; signs, and; irrigation system components. If there is any question about whether a specific site feature must be restored, Contractor shall coordinate with the Engineer & Owner to resolve the matter prior to its removal. Failure to identify and resolve any restoration issue will be the Contractor's responsibility to fully compensate or restore to pre-construction condition or better, at the Owner's discretion.

## **20. CONSTRUCTION SURVEYS**

The Contractor will be responsible for all layout and construction staking utilizing the Engineer's existing control and coordinate data for water infrastructure, street, rights-of-way, easements, sidewalks, monuments, manholes, and any other construction which requires surveying. Dimensions and elevations indicated in layout of work shall be verified by the Contractor. Discrepancies between Drawings, Specifications, and existing conditions shall be referred to the Engineer for adjustment before work is performed.

Existing Engineer Control: The Engineer has set survey control (horizontal and vertical) for use in the design and ultimately the construction of these improvements. A listing of the coordinates and vertical elevation for each of these control points is included in the Plans.

Several of the Engineer's control points may have been disturbed or accidentally removed

before contractor layout begins. The Contractor will be responsible for verifying the accuracy of all control points and laying out all critical project points with the remaining control points. The Contractor will be responsible for preserving and protecting the survey control until proper referencing by the Contractor has been completed. Any survey control obliterated, removed, or otherwise lost during construction will be replaced at the Contractor's expense. Any claims relating to survey location or construction staking accuracy must be supported by original control point data and verified in the field to the satisfaction of the Engineer.

The Engineer shall provide the following staking consisting of stakes or hubs:

Vertical Control – Vertical control will be provided by the existing survey monument benchmarks and control points throughout the site as shown on the Plans.

The Contractor will provide all additional staking and offsets necessary for vertical and horizontal control such that the project may be completed in accordance with the plans and specifications, including centerline of stationing as shown on the project drawings. Stakes shall be provided no more frequently than 200' intervals, at structures, manholes, buildings and branch fittings on piping.

The Contractor shall not order structures or tapping equipment until the field verification of the size and invert elevations is complete and furnished to the Engineer for verification.

The Contractor will utilize the services of a **Professional Land Surveyor**, currently licensed in the State of Montana, for the construction staking for this project. The Town's surveyor (Garland Land Surveying, Inc. (406)203-0394 or [j@garlandlandsurveying.com](mailto:j@garlandlandsurveying.com)) may be approached to perform these surveying functions.

The Contractor will field verify the vertical elevation of all system structures. The Contractor will not order structures (primarily manholes) until the field verification of critical elevations and also exploratory excavations where specified, are complete and furnished to the Engineer for verification.

Contractor shall be aware of property pins. Damage to these pins will require replacement of such by a registered land surveyor at no cost to the owner.

The Contractor is responsible for the location and elevation of all the construction contemplated by the Contract Documents.

Prior to commencing work, the Contractor shall carefully compare and check all drawings, each with the other that in any way affects the location or elevation of the work to be executed, and should any discrepancy be found, he shall immediately report the same to the Engineer for verification and adjustment. Any duplication of work made necessary by failure or neglect on his part to comply with this function shall be done at the contractor's expense.

## **21. SITE DEWATERING**

Certain functions of the work to be performed may require draining, pumping and dewatering operations necessary to complete the work as specified and as indicated on the drawings. It is

the intent of these specifications that such draining, pumping and dewatering operations shall be the obligation of the Contractor. The Contractor shall provide all necessary piping, as required to remove all surface water, groundwater, leakage, and water from excavations. **No separate pay item is designated for dewatering.** This work will be considered incidental to other bid items. Adequate dewatering is defined as the work required to lower the natural groundwater 12" or more below the bottom of excavation in order to get a structurally stable subgrade. If the existing subgrade material is courser rock and is naturally stable, the 12" depth will not be required. Laying and installing pipe in water will not be allowed.

The presence of groundwater can be anticipated. The Bidder/Contractor shall undertake all necessary investigations to determine for himself the conditions and extent of groundwater that is likely to be encountered and shall account for adequate dewatering when preparing the bid and constructing the improvements.

Stabilization – Prior to any embankment/backfill work, subgrades shall be firm, dense, and thoroughly compacted and consolidated and shall be sufficiently stable for equipment or manpower to work. Soil material that has been removed because it is too wet to permit compaction may be stockpiled and removed or spread and allowed to dry. Processing of saturated material will not be directly paid for. If the Contractor chooses to import material in lieu of processing wet materials, Contractor will assume responsibility and expense to do such. Authorization for payable import stabilization will only be per direction of Engineer.

Any discharge of water during pumping and dewatering operations will be subject to approval of the Montana State Department of Environmental Quality. The Contractor shall be responsible for obtaining any necessary discharge permits as well as any damages caused to surrounding structures, land and physical features in the area. Contractor will restore any ground that had been eroded to its natural state. The Contractor shall submit a plan for dewatering to the Engineer.

## **22. SUB-EXCAVATION AND STABILIZATION**

Over-excavation shall be only as specifically authorized by the Engineer. Stabilization bedding and backfill will be imported and payable as specified in the Bid Form or as negotiated. Sub-excavation and stabilization, when required and approved by the Engineer, will be paid at the negotiated contract unit price.

## **23. IMPORTED TRENCH BACKFILL**

Native material is preferable to imported backfill for new pipe installation when the native material is suitable. However, use of on-site excavated soil must be approved by the Project Engineer prior to its placement. Blocky or platy clay, saturated or near saturated soils, will not be permitted for use as backfill material. The Contractor shall provide the Engineer with a Proctor (moisture/density relationship) for the backfill material.

If native material is found unsuitable for trench or stabilization backfill, the Contractor shall provide Imported Trench Backfill. Imported Trench Backfill will be paid by the cubic yard at the

contract unit price or negotiated change order price and wherever possible, shall be subject to a pay limit based on measured dimensions.

The Contractor shall import material meeting the backfill specifications ONLY when directed by Engineer.

#### **24. TIME OF OPEN TRENCHES**

The Contractor shall conduct his work so that trenches will remain open for a minimum possible time. No trench excavation shall begin until proper compaction equipment is at the site where excavation is to take place. Open trench shall be barricaded in a manner sufficient to insure public safety. See SP 51 for details on an "Emergency Access Plan".

#### **25. CONTINUOUS WASTEWATER COLLECTION**

The Contractor will be required to perform all construction activities so that wastewater collection will be un-interrupted. No illicit bypasses of raw or partially-treated sewage will be allowed and the Contractor will be required to conduct its construction operations without affecting the performance of the existing collection system.

Bypass pumping and/or temporary bypass piping may be required to maintain collection system operation. The costs for any bypass pumping will be incidental to the cost of the project. The Contractor shall develop and submit a Bypass Pumping Plan of Operation (BPPO) that provides for reliable and redundant bypass pumping to avoid any unpermitted discharges of pollutants to adjacent land or surface waters. The BPPO will include information on: pump capacity; head vs. discharge curves; control and alarm systems; backup operations and emergency response. All bypass pumping must be noise attenuated due to the proximity to occupied residences. The BPPO will be submitted by the Contractor for review and approval by the Engineer and Owner at least 30-days prior to expected implementation of the plan. Bypass pumping and construction work should be scheduled (to the greatest extent possible) during periods where high flow events are not anticipated, generally in later summer and fall.

#### **26. PLAN OF OPERATION**

The contractor shall submit a logical and well-developed Plan of Operation as a condition of receiving the Notice to Proceed. This Plan will describe the schedule, means/methods and contingency procedures by which each length of water main will be taken out of service to allow for construction of work components constructed under this project.

The Plan of Operation will be reviewed and approved by the Engineer. The Plan will be reviewed and updated every 30 days or as required. The Plan of Operation and the Project Schedule shall be maintained for consistency and accuracy.

#### **27. CONSTRUCTION SCHEDULE**

Contractor shall submit a Construction Schedule to the Owner with the signed Agreement or at the preconstruction conference. The Schedule shall be in horizontal bar chart form and shall

indicate each significant construction activity. The beginning of each work week as well as all significant construction milestones shall be indicated by a solid vertical line. The Contractor's construction schedule(s) shall be updated no less frequently than weekly and the Owner & Engineer shall be notified immediately of any issues that may prevent the project from being completed within the designated contract time. Time is of the essence in this project and it is incumbent upon the Contractor to schedule the work activities to allow for adequate procurement, installation, curing, testing and inspection time within the contract time.

## **28. TRACER TAPE**

All non-metallic water pipe shall be installed with continuous tracer tape installed 12 to 18 inches under the final ground surface. No breaks or splices will be allowed. In addition to tracer tape, install 14-gauge coated copper wire, taped to the top of pipe, and thermite welded to valve body on all water mains. The cost of tracer tape and locator wire shall be part of the overall lump sum and schedule of values.

## **29. SECURITY**

The Contractor shall provide all security measures necessary to assure the protection of his equipment, materials in storage, completed work, and the project in general. This may require the Contractor to hire or employ outside services to guard materials or completed work. All security measures are the Contractor's responsibility.

## **30. CLEANUP**

Cleanup for each item of work shall be fully completed and accepted before the item is considered final. If the Contractor fails to perform cleanup within a timely manner the Owner reserves the right to shut down construction activities.

## **31. DUST CONTROL**

The Contractor will be responsible for maintaining the construction zone and all haul routes to meet the Whitefish/Flathead County regulations for air emission control. Contractor will maintain the access road including watering as deemed necessary and ordered by the Engineer. In addition, any open excavations, stockpile areas or fills producing excessive amounts of dust shall be watered to control dust to a reasonable level, as determined by the Engineer.

## **32. PAVING RESTORATION & SCHEDULE**

All paving disturbed during the course of construction the Work shall be restored to an equal or better condition than the existing pavement. All pavement disturbed in State Route 507 (Railroad Avenue) shall be rebuilt in accordance with MDT Specifications and shall be in accordance with a base course and asphalt section referenced in the project Drawings.

Paving for this Project must be completed within Contract Time unless, in the estimation of the Engineer, weather conditions preclude the placement of asphalt.

### **33. BRUSH AND TREE REMOVAL**

The Contractor shall only remove trees and brush as necessary to complete the work and as specified by the Engineer. The Contractor shall be responsible for the sawing and safely removing trees and brush, removal of all stumps and roots, sawing and removing all limbs. All brush and tree removal shall be completed while providing protection to remaining vegetation, existing utilities and properties adjacent to removal locations and final cleanup upon removal completion. The Contractor is allowed to remove trees not being actively cultivated and are within the public R/W or easement, if they impede the Work.

SEE SP46 BELOW:

### **34. WAGE RATES**

The higher of Montana State wage rates (as determined by the Montana Department of Labor) and Federal Davis-Bacon wage rates shall prevail on all work. The appropriate wage rates are included and shall be applied to this project. The Contractor shall submit weekly payroll reports to the Engineer within seven days following completion of the work week. All required postings and sample forms will be supplied to the Contractor at the Preconstruction Conference.

### **35. CONTRACTOR EXPERIENCE & PERFORMANCE REQUIREMENTS**

Form C-451 Qualifications Statement (00 45 13) is to be submitted with the Bid will be used to assess all potential Contractors qualifications.

### **36. PREQUALIFYING EQUIPMENT AND MATERIALS**

Manufacturer's requests for substitutes ("or equals") for the watermain materials and metering equipment shall be provided to and received by the Engineer at least fifteen (15) days prior to the bid opening date. The Engineer will either accept or reject the substitutions within 7 days of receipt of the request for substitution. It will be the Manufacturers responsibility to provide sufficient documentation that the substituted equipment is equal or superior to the specified materials and that the substituted materials will conform with the objectives and constraints of the overall project. Any significant redesign work that would be required to incorporate the substituted materials may be cause for rejection. All redesign work will be at the expense of the manufacturer.

### **37. TRAFFIC CONTROL**

The Contractor shall adhere to all traffic control requirements (if applicable) as set forth by the Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD). All costs for traffic control shall be included within the traffic control bid item(s) – devices and flaggers.

The Contractor shall submit a detailed Traffic Control Plan (TCP) after Notice of Award and shall make any necessary modifications thereto in order to secure an approved TCP and Encroachment Permit from the Montana Department of Transportation at least one week prior to



issuance of Notice to Proceed.

### **38. VERIFICATION OF INVERT ELEVATIONS**

Invert elevations for a number of existing pipes and structures must be verified in order to implement the Work. The contractor must perform necessary surveying and exploratory excavation to verify location/depth of existing utilities that are impacted by the proposed improvements. This is primarily true of the Spring Structure and all trenchless crossings of the sewer in Railroad Avenue.

### **39. PETROLEUM CONTAMINATED SOILS**

While not evident from any direct observations or history of the existing work site, there is a possibility of the Contractor(s) encountering petroleum-contaminated soils within excavations. If this occurs during construction, the Contractor will cease work in this area 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 or other required entity. The Contractor will proceed with other elements of the project until the change order is processed at no additional cost to the Owner.

### **40. TIME EXTENSION OR SHUTDOWN FOR WEATHER**

It is anticipated that this project will require a shutdown due to inclement weather, which may be requested by the Contractor during the winter months. The Contractor shall indicate the number of calendar days being requested in the formal shutdown request. This initial request may be extended during the shutdown period as long as such extension is justifiable and requested at least 30 days prior to the date the original extension was to elapse. The Owner reserves the right to approve or disapprove any shutdown or extension requests. As a condition of approval of a shutdown, the Contractor shall: provide for maintenance of flows; close all open excavations; provide for maintaining traffic; provide for protection of public property at the work site, and; provide for worker and public safety with proper barriers, barricades, warning signs and notices. The Contractor will not be allowed to perform any work during the shutdown period unless prior approval is granted by the Owner.

Time Extension for Abnormal Weather Conditions – The Contractor may request extension of contract time for abnormal weather conditions which will be generally defined as 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. It will be incumbent on the Contractor to demonstrate that Abnormal Weather impacted work progress.

### **41. STANDARD SPECIFICATIONS**

The Montana Public Works Standard Specifications and Drawings (MPWSS), 7<sup>th</sup> Edition, April 2021, including Appendices, are included in these project documents by reference. Any Work

element that is not specifically addressed in the approved project documents, will default to MPWSS.

#### **42. GEOGRID AND GEOTEXTILE**

The requirements for geogrid and geotextiles are outlined in the project drawings and specifications, identifying the use of the materials where existing soils are removed and structural backfill placed. Generally, the geogrid is placed in the first lift of structural fill. Suitable geogrids include Tensar BX1200, Mirafi BXG12, US Fabrics Basegrid 33 or approved equal. A nonwoven geotextile is used to separate resident soils from the structural fill and materials such as Mirafi 140NL, US Fabrics US90NW or Propex Geotex 351 are deemed acceptable. These nonwoven materials shall be used beneath the crushed base course on paved road sections.

#### **43. PROJECT SIGN**

The Contractor shall construct and install a Bipartisan Infrastructure Law (BIL) project sign in accordance with the Funding Agency Special Provisions (Section 00 90 00). The Contractor shall submit a proposed sign design in accordance with this Section. The temporary sign shall also acknowledge the Department of Natural Resources and Conservation (DNRC), Montana Department of Commerce Coal Endowment Program (MCEP), Mineral County's American Recovery Plan Act (ARPA) Minimum Allocation Grant and match. The applicable dollar amounts for the sign will be provided by the Engineer. The Engineer will review Contractor's submittal and make any comments or corrections at that time. The location of signs shall be determined by the Engineer in the field. The cost of furnishing and installing the sign shall be included in the bid item identified as such.

#### **44. WARRANTY**

Unless specified otherwise, the Contractor shall warranty the project for one (1) year against defective materials and defective workmanship according to the General Conditions. The project shall not be accepted as substantially complete until ALL project segments are substantially complete. Only one (1) notice of substantial completion will be issued for this project. The warranty period will begin upon date of the notice of substantial completion. The one year warranty will not supersede any project components that may have a longer warranty period.

An eleven (11) month project inspection will be held with the Contractor, Owner, Engineer and Funding Agencies being invited to attend. At the inspection, warranty items will be defined for correction according to the General Conditions.

#### **45. HIERACHY OF SPECIFICATION**

In the event that any provision of one Contract Document conflicts with the provision of another Contract Document, the provision in that Contract Document first listed below shall govern, except as otherwise specifically stated:

- Agreement
- Addenda to Contract Documents
- Performance and Labor & Materials Bonds
- Bid Proposal
- Bid Security
- Special Provisions
- Invitation to Bid
- Instructions to Bidders
- Drawings
- Technical Specifications
- Supplementary Conditions
- General Conditions

Whenever notes, specifications, dimensions, details, or schedules in the Specifications or Drawings, or between the Specifications and Drawings, or between Change Order or Work Change Directive drawings and Contract Drawings conflict, the Contractor shall furnish the higher performance or higher quality requirement determined by the Engineer.

#### **46. TREE REMOVAL AND DISPOSAL**

There are several trees that will be impacted by the alignment of the new watermain.

- Approximately eleven Ponderosa Pine (approximately six  $\geq 14$ " in diameter at chest height) between Sta 6+25 and Sta 8+00 on Sheet D-2;
- Approximately fourteen deciduous (approximately eleven  $\geq 14$ " in diameter at chest height) along the south side of Railroad Avenue between Sta. 7+00 and Sta. 12+00 on Sheet D-4.

Removal of these trees will be compensated at the Bid Item #206 unit price outlined in the Bid Form. All other trees/brush impacted by project construction will be considered incidental to construction and will not be compensated under Bid Item 206.

The Contractor will exercise due care to avoid impacting mature trees to the greatest extent practical. Any tree that is within the trench alignment or is subject to significant support root damage will be removed. The Contractor shall be responsible to safely remove and dispose of all impacted trees, grind the stumps to 6" below ground, level, compact and restore the surface to match surrounding grade.

#### **47. NARROW RIGHTS-OF-WAY AND EASEMENTS**

Much of the Work on Meadowview, Rockledge, Apple, Orchard and 2<sup>nd</sup> Streets must be completed within rights-of-way (R/W) and easements that are as narrow as 16 feet. Within these R/W and easements, there is existing sanitary sewer, existing water, overhead power, buried telephone and cable. In some areas, there are residential structures directly on the R/W or easement boundary. It will be necessary for the Contractor to conduct its operations within the R/W or easement and implementing special measures to minimize impacts in private property. Provisions have been made in the Bid Form to allow replacement of some fences and

restore landscaping that will be unavoidably damaged, but the Contractor will be responsible for rectifying any damage to: private property; structures; sidewalk; cultivated trees; power poles; sanitary sewer; pavement or fences beyond that which is identified in the Bid Form.

#### **48. AS-BUILT DRAWINGS**

The Contractor shall independently maintain updated, accurate As-Built drawings throughout execution of the construction contract as per Specification Section 01 78 39. Weekly progress meetings will include the transfer of field observations from the Contractor's as-built records to those of the Engineer's onsite inspector. At the end of the project, the Contractor shall submit to the Engineer an original set of project drawings with all modifications properly identified and represented. Within 90-days of final payment and once all the field changes have been verified and documented, the Engineer will prepare a complete set of as-built drawings and certify that the project was built in accordance with the MDEQ-approved project documents, noting the modifications called out in the as-built drawings. These certified as-builts shall be submitted to the Owner, MDEQ and the participating funding agencies.

#### **49. TEMPORARY WATER SERVICE**

The Contractor shall be responsible for, and be able to demonstrate that all pipes, fittings, service lines and appurtenances for the temporary distribution of water during construction, satisfy the following requirements:

- a. All materials must comply with ANSI/NSF, where such standards exist, and must be acceptable to MDEQ;
- b. No component of the temporary distribution system may be in contact with, or at risk of being in contact with, sources of contamination;
- c. The temporary system must be configured to maintain a minimum working pressure of 35psi at all points in the distribution system including the service lines;
- d. Where accumulation of air could diminish the flow capacity of the system, air relief must be provided;
- e. All piping and valves must be adequately restrained where necessary and protected from physical damage to the extent practicable;
- f. Each temporary setup of distribution piping must be visually inspected for leaks at full pressure prior to use and daily during use. Visual leaks occurring during use must be reported to the project engineer and repaired immediately;
- g. Each temporary setup of distribution piping must be flushed, disinfected, and microbiologically tested in accordance with AWWA Standard C651;
- h. There may not be any potential cross-connections to the temporary distribution system;
- i. A double check assembly backflow prevention valve, at a minimum, must be installed to protect the municipal supply connection to the temporary distribution system. Backflow prevention valves must conform to standards issued by AWWA.
- j. All temporary water utility piping must be in full compliance with Section 33 51 36 of these specifications.

## **50. SPRING BOX DISINFECTION**

The spring box structure (Sheet SS-4) shall be disinfected at the time of testing by chlorination in a manner similar to AWWA Standard C652-02: "Disinfection of Water Storage Facilities"

- a. Disinfection shall not take place until any interior coating or sealant is fully cured;
- b. Acceptable forms of chlorine for disinfection shall be:
  1. Liquid chlorine as specified in AWWA C652-02
  2. Sodium hypochlorite as specified in AWWA C652-02.
- c. Acceptable methods of chlorination shall be:
  1. Chlorination method 1 as outlined in AWWA C652-02 Section 4.3;
  2. Chlorination method 2 as outlined in AWWA C652-02 Section 4.3;
  3. Chlorination method 3 as outlined in AWWA C652-02 Section 4.3;
- d. Acceptable chlorine application methods shall be:
  1. Chemical feed pump.
  2. Spraying, brushing, or painting of all water-contact surfaces

## **51. EMERGENCY ACCESS PLAN**

The OWNER and CONTRACTOR acknowledge that construction of this project will result in temporary access restrictions to residences and outbuildings. The narrow rights-of-way, natural and manmade obstacles within narrow streets, steep grades, etc, all contribute to the difficulty of maintaining access to properties within the project area. The CONTRACTOR shall develop an approvable Emergency Access Plan (the "Plan") for each block of: Meadowview; Rockledge; Apple; Orchard, 2<sup>nd</sup>; and Riverview that will allow emergency vehicle (fire, ambulance, law enforcement) access during project construction. The Plan shall be provided as a Submittal under Section 01 33 00 of these specifications before Notice to Proceed is granted. OWNER and ENGINEER will review the Plan for completeness. CONTRACTOR shall implement the approved Plan during all construction that impacts each particular block. The Action Plan shall include:

- a. coordinating the maximum length (and time) of open trenches with the ability to access all residences/structures – with the objective of minimizing impacts to emergency vehicular access;
- b. identifying methods of stockpiling materials so as not to impact access;
- c. if necessary, identifying and improving alternate routes for emergency vehicle access to residences/structures.

**END OF SECTION 00 95 10**

# **DIVISION 1**

## **GENERAL REQUIREMENTS**

**SECTION 01 11 00  
SUMMARY OF WORK**

**PART 1 - GENERAL**

1.01 PROJECT

- A. Project Name: Water System Improvements Project
- B. Owner's Name: Town of Alberton
- C. Project Design Team:
  - 1. Anderson-Montgomery Consulting Engineers, Inc.  
1064 N. Warren St.  
Helena, MT 59601
- D. The Project consists of the following major project elements to be conducted on the Town of Alberton's drinking water system:

BASE BID – Water Distribution Improvements:

- 1,152 lineal feet of 12" diameter PVC watermain, including valves & fittings;
- 1,037 lineal feet of 10" diameter PVC watermain, including valves & fittings;
- 1,102 lineal feet of 8" diameter PVC watermain, including valves & fittings;
- 2,679 lineal feet of 6" diameter PVC watermain, including valves & fittings;
- 235 lineal feet of directionally-drilled 6" through 12" HDPE watermain;
- 12 standard 4¼" fire hydrants, including isolation valves;
- 63 water services including: tap; corp stop; shutoff; valve box; re-connection;
- 1,309 lineal feet of 1" diameter HDPE water service pipe;

ALTERNATE B – Water Metering

- 210 individual water meters including radios;
- 28 water meter pits;
- Remote meter reading equipment;
- Meter reading software and billing system interface, startup, training

ALTERNATE C – Spring Source Improvements

- Replace Spring Source collection structure & penetrations;
- 400 lineal feet of chain link fence & gates

WORKSCOPE FOR BASE BID & ALTERNATES INCLUDES:

- All appurtenant work: rock & exploratory excavation; utility & utility pole conflicts; gravel, pavement & surface restoration; flowable fill; temporary water service; dewatering; traffic control; tree removal/disposal; etc.

1.02 TYPE OF CONTRACT

- A. Contract Type: A single prime contract based on a Stipulated Price as described in this Document.

### 1.03 OWNER OCCUPANCY

- A. The existing building identified in this summary is currently utilized by the Owner. Cooperate with the Owner to minimize conflict due to demolition and construction activities although it is acknowledged that construction progress is will take precedence. Coordinate with the Owner and their operations at all times.

### 1.04 CONTRACTOR USE OF SITE AND PREMISES

- A. The Contractor shall conduct operations and take all necessary precautions to protect the public and Town representatives from exposure to dangers associated with the Work.
- B. Provide secure access to and from designated work area as required by law and per the requirements of the Owner,
  - 1. Do not obstruct roadways, sidewalks, or other public ways without permit.
- C. Existing building spaces may not be used for storage unless specifically authorized by the Owner.
- D. Time Restrictions:
  - 1. Limit conduct of especially noisy and dusty exterior work to the hours of 8 am to 7 pm or as described in Special Provisions.
- E. Utility Outages and Shutdown:
  - 1. Interruption of any utility services must be coordinated through the Town's water system operator. This coordination is to allow the reasonable use of the existing facilities at all times during normal working hours and interfere minimally with the Owner's operational activities.
  - 2. Do not disrupt or shut down utility services without 7 days notice to the Town's operator and authorities having jurisdiction.
  - 3. Prevent accidental disruption of utility services to other facilities.

### 1.05 WORK SEQUENCE

- 1. The Contractor will closely coordinate with the Owner and Engineer before conducting any work that impacts existing facilities.
- 2. *A detailed work plan sequence and schedule will be established by the Contractor and submitted to the ENGINEER and OWNER for consideration and approval according to the Submittal process outlined in Section 01 33 00.*

## **PART 2 - PRODUCTS - NOT USED**

## **PART 3 - EXECUTION - NOT USED**

**END OF SECTION 01 11 00**



## SECTION 01 12 16 WORK SEQUENCE

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. This Section includes:
  - 1. General Work Sequence.

#### 1.02 GENERAL WORK SEQUENCE

- A. All work will need to be done while maintaining operation – to the greatest extent possible - of the existing water distribution system. Where existing service cannot be maintained to an active residence for a period longer than 4 consecutive hours, the Contractor is required to provide temporary water services in accordance with Section 33 51 36 unless specific provisions for halting water service have been arranged with all affected water users.
- B. *Note that replacement of water distribution piping is primarily confined to the north and west sections of Alberton (see Plan Sheet G-1), the replacement of water meters under Additive Alternate B will be applicable to **all** active water users in Town.*
- C. It will be the Contractor's responsibility to establish means & methods to schedule and stage construction so as to efficiently conduct the work while minimizing disruption of service, traffic and access to residences within the Work area.
- D. A Plan of Operation (01 70 00 – Part 1.03.B) detailing the process by which the Contractor will conduct the distribution piping and meter replacements will be submitted for Engineer review/approval at least 30 days prior to the proposed start of construction.
- E. Coordinate construction schedule and operation with Owner and Engineer. Accommodate Owner occupancy requirements.
- F. The Plan of Operation will estimate all dates when interruption of service or temporary water service will be implemented. Dates shall be updated as construction progresses.
- G. Contractor shall stay within time restraints for certain construction tasks as identified in the Contract Documents.
- H. Contractor shall provide Owner and Engineer full access to new and existing facilities for the duration of the project.

### PART 2 - PART 2 PRODUCTS (Not Used)

### PART 3 - PART 3 EXECUTION (Not Used)

**END OF SECTION 01 12 16**

**SECTION 01 20 00  
REQUIRED FORMS**

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

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

1.02 SCHEDULE OF VALUES

- A. Form to be used: Schedule of Values for Contract Payment – follow instructions in Section 01 29 00 Part 1.03
- B. Forms filled out by hand will not be accepted.
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section.
- D. Revise schedule to list approved Change Orders, with each Application For Payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Form to be used: Application for Payment (Section 00 62 76).
- B. Forms filled out by hand will not be accepted.
- C. Execute certification by signature of authorized officer.
- D. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed.
- E. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- F. Submit electronic copy of each Application for Payment.

1.04 MODIFICATION PROCEDURES

- A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.
- B. For minor changes in the work not involving adjustment in the Contract Sum or Contract Time, the Engineer will issue instructions directly to Contractor by written order. The Contractor shall carry out such written orders promptly.
- C. For required changes, Engineer will issue a document signed by Owner instructing

Contractor to proceed with the change, for subsequent inclusion in a Change Order.

1. Form to be used: Work Change Directive (Section 00 63 49)
  2. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
  3. Promptly execute the change.
- D. For changes for which advance pricing is desired, Engineer will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within seven (7) days.
- E. Contractor may propose a change by submitting a request for change to Engineer, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation.
- F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
- G. Form to be used: Change Orders (Section 00 63 63)
1. Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
  2. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
  3. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- 1.05 APPLICATION FOR SUBSTANTIAL COMPLETION
- A. Form to be used: Certificate of Substantial Completion (Section 00 65 16)
  - B. Substantial Completion is the stage in the progress of the work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can utilize the work for its intended use.
  - C. Substantial Completion establishes the responsibilities of the Owner and Contractor for security, maintenance, heat, utilities and damage to the Work and insurance.
- 1.06 APPLICATION FOR FINAL PAYMENT
- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
  - B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 01 77 00.
2. Contractor's Affidavit of Completion, Payment of Debts and Claims, and Release of Liens.
3. Consent of Surety Company to Final Payment.

**PART 2 - PRODUCTS - NOT USED**

**PART 3 - EXECUTION - NOT USED**

**END OF SECTION 01 20 00**

**SECTION 01 26 00**  
**CONTRACT MODIFICATION PROCEDURES**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
  - 1. Division 1 Section "Payment Procedures" for administrative requirements.
  - 2. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.03 VARIATIONS IN WORK

- A. Engineer will issue a Field Order authorizing variations in Work, not involving adjustment of the Contract Sum or the Contract Time.

1.04 PROPOSAL REQUESTS

- A. Owner-initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Engineer are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in the Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicated applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Engineer.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

#### 1.05 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, the Engineer will issue a Change Order for signatures of Owner and Contractor.
- B. Change Order Form shall be in accordance with Section 00 63 63 of these Specifications

#### 1.06 WORK CHANGE DIRECTIVE

- A. Work Change Directive: Engineer may issue a Work Change Directive on EJCDC Document C-940 form – see Section 00 63 49 of these specifications. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
- B. Work change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- C. Documentation: The Contractor shall maintain detailed records on a time and material basis for work required by the Work Change Directive.
- D. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

### **END OF SECTION 01 26 00**

**SECTION 01 27 00  
MEASUREMENT AND PAYMENT**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

Drawings and Special Provisions of the Contract, including general and Supplementary Conditions and other Division 1 Specifications Sections, apply to this Section.

1.02 SUMMARY

This Section specifies administrative and procedural requirements for measurement and payment.

1.03 DEFINITIONS

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.

1.04 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. If actual amount of work performed and materials furnished under unit price items is different than the estimated amount in the Bid Form, the Contractor shall supply to the Engineer, the necessary information to determine the actual quantity of work performed. Significant discrepancies between actual and estimated quantities for unit price items will be handled in accordance with Articles 10 and 11 of the General Conditions.
- D. List of Bid Items: A list of unit Bid Items is included at the end of this Section.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION**

3.01 LIST OF BID ITEMS

**A. Bid Items 100, B-100, C-100: Mobilization/Bonding/Insurance**

1. Description: This item shall cover the costs of preparatory work and operations including, but not limited to, those necessary for the movement of personnel, equipment, permitting, supplies and incidental to the project site; for the establishment of all facilities necessary for the work on the project; THIS ITEM SHALL NOT EXCEED 12% OF THE INDIVIDUAL BID SCHEDULE AMOUNT(S).
2. Unit of Measurement: Lump Sum
3. Measurement: When the percentage of the original contract amount for each unit shown below is earned, the percentage of the Contract Lump Sum price for MOBILIZATION shown will be paid.

<u>Percentage of Original Contract Amount In-Place</u>	<u>Percentage of Lump Sum Price for Mobilization Earned</u>
5	50
50	75
100	100

4. Payment: Payment for MOBILIZATION will be made on the percentage of the contract unit price bid per lump sum as indicated in the Bid Form.

**B. Bid Items 102, 104, 106, 108: C900 PVC Main**

1. Description: This item shall consist of furnish/install 6" thru 12" AWWA C900 PVC distribution mains.
2. Work required shall include: excavation; dewatering (if necessary); subgrade stabilization; backfill; compaction tests; bedding; piping; tracer wire; warning tape; flushing; disinfection; other materials; sheeting and shoring, testing and repair, labor, tools, equipment, submittals and incidentals necessary to complete the work as specified. Note that ductile iron fittings, transition fittings, valves, hydrants, connections to other mains, joint restraints, thrust blocks and road restoration are included under other bid items.
3. Unit of Measurement: Lineal foot.
4. Measurement: Measurement shall be per lineal foot of pipe as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per lineal foot as specified in the Bid Form.

**C. Bid Item 110: Rock Excavation**

1. Description: This item is defined as the excavation of all hard, compacted or cemented materials that require the use of ripping and excavating equipment larger than defined for common excavation. It is expected that rock will be



encountered during some portion of the distribution system installation and at the new storage tank site.

2. Work required shall include furnishing all equipment, materials and labor necessary to: establish site access; excavation and material stockpile necessary to reach the elevations (for distribution piping and storage tank base) indicated on the drawings; materials testing.
3. Unit of Measurement: Cubic Yard (yd<sup>3</sup>)
4. Measurement: Measurement shall be per yd<sup>3</sup> of approved rock excavation as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per yd<sup>3</sup> as specified in the Bid Form.

**D. Bid Item 112: Exploratory Excavation**

1. Description: This item shall consist of providing necessary and appropriate excavating equipment and labor for excavation and backfill for purposes of locating buried utilities and structures.
2. Work required shall include: Furnishing all labor, tools, equipment, materials, submittals and incidentals necessary to complete the work as specified. Disposal and surface restoration, if required in exploratory work, shall be included.
3. Unit of Measurement: Actual time to the nearest half hour for which the equipment is used and authorized by the engineer, including standby time between excavation and backfilling to allow the Engineer to make necessary surveys of underground utilities.
4. Measurement: Measurement shall be per hour as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per hour as specified in the Bid Form.

**E. Bid Items 114, 116, 118: Directional Drilled DR 13.5 HDPE Main**

1. Description: This item shall consist of furnish/install 6" thru 12" AWWA C906-21 distribution pipe using the horizontal directional drilling (HDD) method.
2. Work required shall include: excavation of launch & receiving pits; backfill; restoration; and all appurtenant work; butt-fused HDPE installed; flushing; disinfection; testing and repair, labor, tools, equipment, submittals and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lineal foot.
4. Measurement: Measurement shall be per usable lineal foot of pipe as indicated in the Bid Form. Unused lineal footage of HDPE pipe installed (to achieve adequate depth/alignment or due to limitations in bending radius) will not be compensated.

5. Payment: Payment shall be made at the contract unit price bid per usable lineal foot as specified in the Bid Form.

**F. Bid Items 122, 126, 130, 138: Fittings**

1. Description: These items consist of all 6", 8", 10", and 12" fittings – including: all 11¼°, 22½°, 45° and 90° bends; tees; reducers (largest diameter); couplings; flap valves; caps, etc. – *NOTE: does not include valves.*
2. Work required shall include: excavation, dewatering (if necessary); subgrade stabilization, backfill, compaction tests, bedding, piping, tracer wire, warning tape, flushing; disinfection; other materials, sheeting and shoring, testing and repair, labor, tools, equipment, submittals and incidentals necessary to complete the work as specified. Note that buried valves and hydrants are included under other bid items.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each fitting installed as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**G. Bid Items 120, 124, 128, 134: Gate Valves**

1. Description: These items consist of all 6", 8", 10", and 12" gate valves.
2. Work required shall include: excavation, dewatering (if necessary); subgrade stabilization, backfill, compaction tests, bedding, valve/actuator, valve box, backfill, tracer wire, warning tape, flushing; disinfection; other materials, sheeting and shoring, testing and repair, labor, tools, equipment, submittals and incidentals necessary to complete the work as specified. Note that gate valves for fire hydrants are included under the "Fire Hydrant Assembly" item.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each gate valve installed as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**H. Bid Items 132, 140, 142, 144: Connection to Existing Watermain**

1. Description: These items consist of making all new watermain connections to existing 4", 6" and 8" watermains. *Note this does not include service taps or temporary connections.*
2. Work required shall include: excavation, dewatering (if necessary); subgrade stabilization, backfill, compaction tests, bedding, source isolation, tracer wire, warning tape, flushing; disinfection; other materials, sheeting and shoring, testing and repair, labor, tools, equipment, submittals and incidentals necessary to complete the work as specified. Note that the fittings necessary to make re-connection are included under the "Fittings" items.

3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each existing watermain connection as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**I. Bid Item 136: 6" Cut-In Valve**

1. Description: This item shall consist of the installation of a valve on an existing 6" C900 pressurized pipe
2. Work required shall include: Excavation; backfill; gravel; building paper; concrete; hydrants; piping; connections; valve; valve box; restraints; polywrap; dewatering; flushing; disinfection; sheeting; shoring; bedding; utility crossings; surface restoration; all labor; tools (one wrench to be supplied); equipment; submittals; O&M materials; testing and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each cut-in valve assembly as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**J. Bid Item 146: Plug & Abandon 4" through 8" Pipe End**

1. Description: This item shall consist of permanently plugging the end of abandoned 4", 6" & 8" existing water pipes;
2. Work required shall include: Excavation; backfill; gravel; non-shrink grout; dewatering; sheeting; shoring; pipe bedding; surface restoration; all labor; tools; equipment; submittals; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each plugged pipe end
4. Measurement: Measurement shall be per each plugged 4" through 8" pipe end as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**K. Bid Item 148: Remove Ex. Hydrant/Valve & Plug**

1. Description: This item shall consist of removal and disposal of an existing standard fire hydrant and isolation valve assembly;
2. Work required shall include: Excavation; hydrant & valve removal/disposal; backfill; *plugging the existing feed pipe*; gravel; dewatering; shoring; all labor; tools; equipment; submittals; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each

4. Measurement: Measurement shall be per each hydrant assembly removed as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**L. Bid Item 150: Standard 5 ¼” Fire Hydrant Assembly**

1. Description: This item shall consist of furnish/install a complete 5¼” fire hydrant assembly connected to the distribution system at points indicated on the drawings.
2. Work required shall include: Excavation; backfill; gravel; building paper; concrete; hydrant; piping; connections; gate valve; valve box; restraints; polywrap; dewatering; flushing; disinfection; sheeting; shoring; pipe bedding; all labor; tools (one wrench to be supplied); equipment; submittals; O&M materials; testing; startup and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each hydrant assembly installed as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**M. Bid Item 152: Standard 2 ½” Flush-Type Hydrant Assembly**

1. Description: This item shall consist of furnish/install a complete 2½” fire hydrant assembly connected to the distribution system at points indicated on the drawings.
2. Work required shall include: Excavation; backfill; gravel; building paper; concrete; hydrant; piping; connections; gate valve; valve box; restraints; polywrap; dewatering; flushing; disinfection; sheeting; shoring; pipe bedding; all labor; tools (one wrench to be supplied); equipment; submittals; O&M materials; testing; startup and incidentals necessary to complete the work as specified..
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each ground hydrant assembly as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**N. Bid Item 154: Air/Vacuum Release Valve/Structure - Complete**

1. Description: This item shall consist of furnish/install *combination* air/vacuum release valve structures - complete.
2. Work required shall include: Excavation; backfill; bedding; tracing wire; connections; combination air/vacuum release valve; piping; subgrade preparation; base course; couplers; restraints; concrete manhole sections;

cone; casting; cover; insulated lid; materials; de-watering; all labor; tools; equipment; submittals; testing; disinfection and incidentals necessary to complete the work as specified.

3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each complete air/vac release structure installed as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per each complete structure as specified in the Bid Form.

**O. Bid Item 156: Water Service Connection & Curb Box**

1. Description: This item shall consist of tapping the new watermain and furnish/install a corporation stop and new curb box at each active service location shown on the project drawings.
2. Work required shall include: Excavation; backfill; bedding; delineator post; connections to existing house piping; subgrade preparation; gravel; tap; corporation stop; curb valve and box; couplers; restraints; flushing; disinfection; materials; de-watering; all labor; tools; equipment; submittals; testing; disinfection and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each water service corp stop & curb box combination installed as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per each corp stop & curb box combination installed as specified in the Bid Form.

**P. Bid Item 158: Water Service Conn/Curb Box/Meter Pit**

1. Description: This item shall consist of tapping the new watermain and furnish/install a corporation stop, curb box and meter pit at each active service location shown on the project drawings.
2. Work required shall include: Excavation; backfill; bedding; delineator post; connections to existing house piping; subgrade preparation; gravel; tap; corporation stop; curb valve and box; meter pit, couplers; restraints; flushing; disinfection; materials; de-watering; all labor; tools; equipment; submittals; testing; disinfection and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each water service corp stop, curb box and meter pit combination installed as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per each corp stop, curb box and meter pit combination installed as specified in the Bid Form.

**Q. Bid Item 160: Water Service Stub Out & Curb Box**

1. Description: This item shall consist of tapping the new watermain and furnish/install a corporation stop and new curb box at each inactive service location shown on the project drawings.
2. Work required shall include: Excavation; backfill; bedding; delineator post; subgrade preparation; base course; tap; corporation stop; curb valve and box; couplers; restraints; flushing; disinfection; materials; de-watering; all labor; tools; equipment; submittals; testing; disinfection and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each water service corp stop & curb box combination installed as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per each corp stop & curb box combination installed as specified in the Bid Form.

**R. Bid Items 162: 3" Gate Valve, 3" Sch. 40 PVC & Cap Assembly**

1. Description: This item shall consist of furnish/install the 3" service connection at Sta. 12+04 on Railroad Avenue.
2. Work required shall include: Excavation; backfill; cap or connection to any existing 3" service piping; subgrade preparation; gravel; bedding; saddle/tap; threaded gate valve; valve box; couplers; restraints; flushing; disinfection; materials; de-watering; all labor; tools; equipment; submittals; testing; disinfection and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lump Sum
4. Measurement: Measurement shall be per lump sum of all necessary pipe, fittings and re-connection installed.
5. Payment: Payment shall be made at the contract unit price bid per lump sum as specified in the Bid Form.

**S. Bid Items 164, 168: HDPE or PVC Water Service Pipe**

1. Description: This item shall consist of furnish/install 1" thru 1½" AWWA C901-17 HDPE, AWWA C904-2022 PEX pressure tubing or schedule 40 PVC for individual water services.
2. Work required shall include: excavation, dewatering (if necessary) subgrade stabilization, backfill, compaction tests, bedding, piping, warning tape, fittings & all other materials, flushing; disinfection; sheeting and shoring, testing and repair, labor, tools, equipment, submittals and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lineal foot.
4. Measurement: Measurement shall be per lineal foot of service pipe as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per lineal foot as specified in the Bid Form.

**T. Bid Item 166: 2" Reconnection Assembly**

1. Description: This item shall consist of furnish/install the 2" service connection at Sta. 19+48 on Railroad Avenue.
2. Work required shall include: Excavation; backfill; cap or connection to any existing 3" service piping; subgrade preparation; gravel; bedding; saddle/tap; curb valve; valve box; couplers; restraints; flushing; disinfection; materials; de-watering; all labor; tools; equipment; submittals; testing; disinfection and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lump Sum
4. Measurement: Measurement shall be per lump sum of all necessary pipe, fittings and re-connection installed.
5. Payment: Payment shall be made at the contract unit price bid per lump sum as specified in the Bid Form.

**U. Bid Item 170: Underground Utility Conflict**

1. Description: This item shall consist of: crossing beneath, within 1' above or parallel (within 3') of existing buried utilities. Buried utilities will include underground telephone; power; cable television; gas; fiberoptic and sanitary sewer.
2. Work required shall include: Excavation (except for exploratory – covered elsewhere); backfill; protection and preservation of the utility; any necessary re-construction; all labor; tools; equipment; submittals; testing; disinfection and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each utility conflict as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**V. Bid Item 172: Utility Pole Conflict**

1. Description: This item shall consist of: protecting or temporarily moving a power pole or light pole while conducting pipe installation within 6' of the active pole.
2. Work required shall include: protection and preservation of the utility pole or; any necessary re-location or temporary service; all labor; tools; equipment; submittals; testing; disinfection and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each pole that is within 8' of centerline of a new watermain, service line or other underground improvement.
4. Measurement: Measurement shall be per each utility pole conflict as indicated in the Bid Form.

5. Payment shall be made at the contract unit price bid per each as specified in the Bid Form.

**W. Bid Item 174: Imported Trench or Stabilization Backfill**

1. Description: This item shall consist of furnish/install imported trench or stabilization (sub-ex) backfill to properly bury new pipe.
2. Work required shall include: furnish/install the appropriate class/character of backfill, wetting, compaction, testing, all labor, tools, equipment, materials, submittals and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Cubic Yard
4. Measurement: Measurement shall be per cubic yard for all imported backfill installed as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per cubic yard as specified in the Bid Form. *NOTE: the use of imported backfill shall be at the Engineer's discretion. If the actual imported backfill quantity utilized is less than the estimated quantity, the Contractor will **not** be entitled to a change in the unit price ordinarily allowed under 00 72 00 - General Conditions Section 13.3.E.1.*

**X. Bid Item 176: Town Street Section (Base Course & Pavement)**

1. Description: This item shall consist of re-paving street surfaces within the Town of Alberton rights-of-way.
2. Work required shall include: layout; subgrade preparation; base course material; tack coat; asphalt; compaction; reflective epoxy painting; all labor; tools; equipment; submittals; testing; and incidentals necessary to complete the work as specified. *Note: this does not include: re-paving within the State Highway 507 (Railroad Avenue) right-of-way.*
3. Unit of Measurement: Square Yard
4. Measurement: Measurement shall be per square yard of town street section as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per square yard as specified in the Bid Form.

**Y. Bid Item 178: Concrete Sidewalk**

1. Description: This item shall consist of replacement or furnish/install 4" thick concrete sidewalk within rights-of-way where indicated on the project drawings.
2. Work required shall include: layout; subgrade preparation; gravel base course; compaction; rebar; concrete; finishing; painting; all labor; tools; equipment; submittals; testing; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Square Foot



4. Measurement: Measurement shall be per square foot of sidewalk as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per square foot as specified in the Bid Form.

**Z. Bid Item 180: Concrete Driveway Replacement**

1. Description: This item shall consist of furnish/install 6" thick concrete driveway within rights-of-way, where indicated on the project drawings.
2. Work required shall include: layout; subgrade preparation; gravel base course; compaction; rebar; doweling; concrete; finishing; painting; all labor; tools; equipment; submittals; testing; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Square Foot
4. Measurement: Measurement shall be per square foot of driveway as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per square foot as specified in the Bid Form.

**AA. Bid Item 182: Gravel Road Restoration/Construction**

1. Description: This item shall consist of: restoring disturbed (unpaved) traffic areas within Town rights-of-way to pre-construction condition & serviceability, or constructing new gravel road.
2. Work required shall include: leveling, contouring, surface grading; rock removal; subgrade compaction; base course installation (in accordance with the graveled surface section in the drawings); compaction; all labor; tools; equipment; materials; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Square Yard
4. Measurement: Measurement shall be per square yard of gravel surface restoration as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per square yard as specified in the Bid Form.

**BB. Bid Item 184: MDT Paved Road Restoration/Construction**

1. Description: This item shall consist of: restoring paved surfaces within State Highway 507 (Railroad Ave.) right-of-way to pre-construction condition & serviceability, or constructing new paved surfaces.
2. Work required shall include: leveling, contouring, surface grading; rock removal; subgrade compaction; sub-base and base course installation (in accordance with the graveled surface section in the drawings); compaction; tack coat, asphaltic pavement installation and compaction, painting, striping, all labor; tools; equipment; materials; and incidentals necessary to complete the work as specified.

3. Unit of Measurement: Square Yard
4. Measurement: Measurement shall be per square yard of paved surface restoration/construction as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per square yard as specified in the Bid Form.

**CC. Bid Items 186, B-110, C-106: Surface Restoration, Seeding, Fertilizing**

1. Description: This item shall consist of: leveling, contouring and preparing disturbed earthen areas for re-vegetation; furnish/install the native grass seed mix and fertilizer, and; monitoring germination.
2. Work required shall include: stockpiling and preserving topsoil; surface grading; rock removal; compaction; re-application of topsoil; rolling; raking; seeding; fertilizing; monitoring; all labor; tools; equipment; materials; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Square Yard of unimproved surface within 12' of centerline of new pipe installation;
4. Measurement: Measurement shall be per square yard of surface restoration as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per square yard as specified in the Bid Form.

**DD. Bid Items 188: Replace 4' Chain Link Fence and Gates**

1. Description: This item shall consist of removal and full replacement of existing residential 4' tall chainlink fence that is impacted by construction.
2. Work required shall include: Layout; excavation; steel posts; cross members; fabric; caps; bracing; concrete; barbed wire; extension arms; gates; erosion and weed control; all labor; tools; equipment; materials; submittals and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lineal Feet
4. Measurement: Measurement shall be per lineal foot of installed fence as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per lineal foot as specified in the Bid Form.

**EE. Bid Item 190: Project Sign**

1. Description: This item shall consist of providing a project sign for the work.
2. Work required shall include: furnish/install the project sign and mounting hardware as indicated on Exhibit A of Specification Section 00 90 00, all labor, tools, equipment, materials, submittals and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lump sum

4. Measurement: Measurement shall be per lump sum for all signage installed as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per lump sum as specified in the Bid Form.

**FF. Bid Item 192: Flowable Fill**

1. Description: This item shall consist of furnish/install Controlled Low Strength Material (CLSM) a.k.a. flowable fill.
2. Work required shall include: furnish/install CLSM backfill, all labor, tools, equipment, materials, submittals and incidentals necessary to complete the work as specified.
3. Unit of Measurement: lineal foot of pipe trench (regardless of width);
4. Measurement: Measurement shall be per lineal foot of pipe trench for all CLSM installed as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per lineal foot of pipe trench as specified in the Bid Form.

**GG. Bid Item 194: Temporary Water Service to Users**

1. Description: This item shall consist of furnish/install/maintain/remove temporary water service to all active water connections that would otherwise be out of water service for longer than 4 hours.
2. Work required shall include: furnish/install/disinfect/maintain/protect over-ground water service pipe, all labor, tools, equipment, materials, chemicals, submittals and incidentals necessary to complete the work as specified. Upon connection to the permanent water distribution system, this work shall also include removal of the temporary water service.
3. Unit of Measurement: Lump Sum
4. Measurement: Measurement shall be per lump sum to provide temporary water for the entire distribution system improvements scope as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per lump sum as specified in the Bid Form.

**HH. Bid Item 196: Traffic Control – Devices**

1. Description: This item shall consist of furnish/install/maintain/remove all traffic control devices/signs/barricades/markers, etc.
2. Work required shall include: furnish/install/maintain/protect all traffic control devices called out in the Contractor's approved traffic control plan, all labor, tools, equipment, materials, submittals and incidentals necessary to complete the work as specified. Upon completion of each segment of water distribution piping, this work shall also include removal of the traffic control devices.
3. Unit of Measurement: Days during which traffic control devices are utilized;

4. Measurement: Measurement shall be per day the traffic control devices package, for the entire distribution system improvements scope as indicated in the Bid Form, is utilized.
5. Payment: Payment shall be made at the contract unit price bid per day as specified in the Bid Form

**II. Bid Item 198: Traffic Control – Flaggers**

1. Description: This item shall consist of furnishing qualified traffic control flaggers during construction operations that require non-regimented traffic control.
2. Work required shall include: furnishing/training/deploying traffic control flaggers, all labor, supplies, tools and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Days during which traffic flaggers are utilized;
4. Measurement: Measurement shall be per day the traffic control flaggers are utilized during the entire distribution system improvements scope as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per day as specified in the Bid Form

**JJ. Bid Item 200: Layout & Material Testing**

1. Description: This item shall consist of survey layout, construction staking, marking, and all materials testing (soils, compaction, concrete, etc.)
2. Work required shall include: all jobsite layout to the precision required under these specifications; reporting to the Engineer's representative, sample collection/storage/transport/analysis/reporting, all labor, tools, equipment, materials, chemicals, submittals and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lump Sum
4. Measurement: Measurement shall be per Lump Sum for the entire project scope as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per lump sum as specified in the Bid Form

**KK. Bid Item 202: Reset Existing Sign/Marker on New Post**

1. Description: This item shall consist of identifying permanent signage that will be impacted by the Work, removing & preserving the sign panel and replacing the panel in the same location/orientation on a new metal pole set in concrete.
2. Work required shall include: Excavation; backfill; bedding; concrete; all labor; tools; equipment; submittals; testing and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each

4. Measurement: Measurement shall be per each sign removed/installed on a new pole as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per each sign removed/installed as specified in the Bid Form

**LL. Bid Item 204: Reset Existing Mailbox**

1. Description: This item shall consist of identifying mailboxes that will be impacted by the Work, removing & preserving the mailbox/post and replacing the mailbox/post in the same location/orientation (on a new metal pole, if necessary) driven into native ground.
2. Work required shall include: Excavation; backfill; pole; driving; all labor; tools; equipment; submittals; testing and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each mailbox removed/installed as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per each mailbox removed/installed as specified in the Bid Form

**MM. Bid Item 206: Remove/Dispose  $\geq 14$ " Dia. Tree**

1. Description: This item shall consist of identifying all trees that will be impacted by the Work, removing & disposing of the tree;
2. Work required shall include: cutting; bucking; hauling; disposing; grinding the stump to 6" below surrounding ground surface; disposing; all labor; tools; equipment and incidentals necessary to complete the work as specified. *Note – the Contractor shall be responsible for any property damage resulting from performance of this bid item;*
3. Unit of Measurement: Each tree  $\geq 14$ " in diameter at chest height;
4. Measurement: Measurement shall be per each tree removed/disposed of as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per each tree removed/disposed as specified in the Bid Form

**NN. Bid Item B-102:  $\frac{3}{4}$ " Water Meter & New Pit**

1. Description: This item shall consist of furnish/install a  $\frac{5}{8}$ "x  $\frac{3}{4}$ " solid-state water meter and meter pit at locations shown on the project drawings.
2. Work required shall include: excavation; subgrade; backfill; compaction; surface restoration; all materials; meter; radio transceiver; antenna; pit; lid; submittals; testing results; operation, maintenance and installation instructions; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each individual meter & pit combination furnished on-site.

5. Payment: Payment shall be made at the contract unit price bid per each meter & pit combination as specified in the Bid Form.

**OO. Bid Item B-104: 3/4" Water Meter in Existing Pit**

1. Description: This item shall consist of furnish/install a 5/8"x 3/4" solid-state water meter within an existing meter pit at locations shown on the project drawings.
2. Work required shall include: excavation; subgrade; compaction; all materials; meter; radio transceiver; antenna; new lid; submittals; testing results; operation, maintenance and installation instructions; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each individual meter installed within an existing pit on-site.
5. Payment: Payment shall be made at the contract unit price bid per each meter appropriately installed as specified in the Bid Form.

**PP. Bid Items B-106, B-108: 3/4" or 1 1/2" Water Meter – Non-Pit**

1. Description: This item shall consist of furnishing/installing a 5/8"x 3/4" solid-state water meter within at all locations that are not within a pit. This includes residential basements, crawl spaces, utility closets, etc. shown on the project drawings.
2. Work required shall include: owner contact and consent; all materials; meter; radio transceiver; antenna; submittals; testing results; operation, maintenance and installation instructions; cleanup and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Each
4. Measurement: Measurement shall be per each individual meter replaced/installed at any non-pit location.
5. Payment: Payment shall be made at the contract unit price bid per each meter replaced as specified in the Bid Form.

**QQ. Bid Item B-112: Meter Reading & Billing System - Complete**

1. Description: This item shall consist of furnishing a remote water meter reading system and all necessary support equipment as described in specification section 33 19 23.
2. Work required shall include: mobile radio frequency meter reading device; Bluetooth-enabled wireless interface; auto-read software package; materials; submittals; testing results; operation, integration with new meters; integration with Town's existing billing software; maintenance and installation instructions; and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lump Sum

4. Measurement: Measurement shall be per lump sum of all necessary hardware & software furnished and completely integrated on-site.
5. Payment: Payment shall be made at the contract unit price bid per lump sum as specified in the Bid Form.

**RR. Bid Item C-102: 60" Concrete Spring Structure - Complete**

1. Description: This item shall consist of furnish/install one 60" diameter concrete manhole structure to replace the existing 55" diameter corrugated metal (CMP) structure at the furthest downstream springbox.
2. Work required shall include: Excavation; backfill; bedding; couplings; connections to existing piping; subgrade preparation; base course; restraints; concrete base, manhole sections and cone; casting; cover; insulated lid; penetrations and sealants; casting/lid; materials; de-watering; all labor; tools; equipment; submittals; testing; bypassing; disinfection and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lump Sum
4. Measurement: Measurement shall be per lump sum complete structure installed as indicated in the Bid Form.
5. Payment shall be made at the contract unit price bid per lump sum complete structure as specified in the Bid Form.

**SS. Bid Item C-104: Chain Link Fence and Gates**

1. Description: This item shall consist of furnish/install 6-foot tall chain link fence with barbed extension around the perimeter of the three spring boxes.
2. Work required shall include: Layout; excavation; steel posts; cross members; fabric; caps; bracing; concrete; barbed wire; extension arms; gates; erosion and weed control; all labor; tools; equipment; materials; submittals and incidentals necessary to complete the work as specified.
3. Unit of Measurement: Lineal Feet
4. Measurement: Measurement shall be per lineal foot of installed fence as indicated in the Bid Form.
5. Payment: Payment shall be made at the contract unit price bid per lineal foot as specified in the Bid Form.

**END OF SECTION 01 27 00**

**SECTION 01 29 00  
PAYMENT PROCEDURES**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section includes:

1. Format and Preparation of Applications.
2. Schedule of Values
3. Submittal Procedures.
4. Substantiating Data.

B. Related Sections include:

1. General Conditions as provided in Contract Forms section of Contract Documents.
2. Section 01 26 00 – Contract Modification Procedures.
3. Section 01 33 00 – Submittal Procedures.
4. Section 01 77 00 – Closeout Procedures.

1.02 FORMAT AND PREPARATION OF APPLICATIONS

A. Utilize: Periodic Estimate for Partial Payment, Form 101 as provided in Contract Forms section of Contract Documents.

B. Preparation

1. Present required information in typewritten form.
2. Execute certification by signature of authorized officer.
3. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
4. List each authorized Change Order as an extension on Continuation Sheet, listing Change Order number and dollar amount as for an original item of Work.
5. Prepare Application for Final Payment as specified in Section 01 77 00.

1.03 SCHEDULE OF VALUES

A. Submit:

1. Typed schedule of values in format similar to Periodic Estimate for Partial Payment, Form 101. The schedule of values shall be derived directly from the Bid Items included in the Bid Proposal included in the Project Documents.
2. In duplicate within 15 days after date of Owner-Contractor Agreement.
3. See Article 9.2 of the General Conditions.

B. Format:



1. Utilize a spreadsheet format referencing items in the Bid Proposal, suitable for insertion into the Partial Pay Estimate.
  2. Identify line items corresponding with number and title of Specification Section.
  3. Provide sufficient information regarding means of measurement of quantities or progress completed for verification by Engineer.
- C. Identify site mobilization including bonds and insurance separately. **Payment for Mobilization, Bonds and Insurance is limited to 10% or less of the Total Bid Amount.** Payment for mobilization will be based on the percentage of the original contract amount in place as described in the following schedule:

Percentage of Original Contract Amount In-Place	Percentage of Lump Sum Price for Mobilization Earned
5	20
10	50
25	60
65	75
90	90
100	100

- D. Payment: Payment for MOBILIZATION will be made on the percentage of the contract unit price bid per lump sum as indicated in the Bid Form.
1. Include within each line item a direct proportional amount of Contractor's overhead and profit.
- E. Revise Schedule of Values to list approved Change Orders, and submit with each Application for Payment.

#### 1.04 PROGRESS PAYMENTS

- A. See Article 9 of the General conditions

#### 1.05 SUBMITTAL PROCEDURES

- A. Submittals

1. Five (5) copies of each Application for Payment or arrangements for electronic submittal of Payment Application documents can be made.
2. Updated construction schedule with each Application for Payment.
3. Payroll records as required.
4. Payment Periods: As stipulated in the Agreement.
5. Submit with transmittal letter as specified for Submittals in Section 01 33 00.
6. Administrative actions which must precede or coincide with submittal of final application for payment include:
  - a. Submit lien waivers, warranties and bonds, and project record documents with final application for payment.

- b. Completion of all work not included in substantial completion as defined in General and Supplementary Conditions.
- c. Completion of project closeout procedures as indicated in Section 01 77 00.
- d. Removal of temporary facilities and services.
- e. Removal of surplus materials, rubbish, or similar elements.
- f. Final cleaning.
- g. Transmittal of project construction record documents to Owner and Engineer.
- h. Consent of surety for final payment.

1.06 SUBSTANTIATING DATA

- A. When Engineer requires substantiating information, submit data justifying dollar amounts in question.
- B. Provide one (1) copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.
- C. Provide copies of invoice(s) for payment of materials stored on-site. Payment will not be made for materials that are not stored on-site or within a bonded warehouse that has been approved by Engineer and Owner.
- D. Contractor shall supply substantiating information in compliance with federal and state requirements for monthly utilization reports and weekly prevailing wage and labor rates for laborers on-site.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01 29 00**

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

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section specifies administrative provisions for coordination construction operations on Project including, but not limited to, the following:

- 1. Preconstruction Conference.
- 2. General project coordination procedures.
- 3. Conservation.
- 4. Coordination Drawings.
- 5. Administrative and supervisory personnel.
- 6. Project meetings.

- B. Related Sections include the following:

- 1. Division 1 Section 01 70 00 - Execution Requirements - for procedure for coordinating general installation and field-engineering service, including establishment of benchmarks and control points.
- 2. Division 1 Section 01 77 00 - Closeout Procedures- for coordinating Contract Closeout.
- 3. Division 1 Section 01 32 00 - Construction Progress Documentation - for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.03 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different specification divisions and sections, that depend on each other for proper installation, connection, and operation.

- 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
- 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
- 3. Make adequate provisions to accommodate items scheduled for later installation.

- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner, Engineer and separate contractors if coordination of their work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's Construction Schedule.
  - 2. Installation and removal of temporary facilities and controls.
  - 3. Delivery and processing of submittals.
  - 4. Progress meetings.
  - 5. Preconstruction conferences.
  - 6. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and minerals.
  - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.
    - a. All materials salvaged in the project shall become the property of the Owner unless otherwise specified. Material identified as salvage shall be delivered by the Contractor to a suitable storage location as directed by the Engineer.

#### 1.04 SUBMITTALS

- A. Staff Names: At the preconstruction conference submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office and mobile telephone numbers by which Contractor's representatives can be reached immediately. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
  - 1. Post copies of the contact list in temporary field office and by each temporary telephone.

#### 1.05 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

#### 1.06 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless

otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within three days of the meeting.
- B. Preconstruction Conference: Engineer and Owner will schedule a preconstruction conference at the Project site or other convenient location. The meeting shall be conducted by the Engineer who shall review work responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and his superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
  2. Contractor shall bring a written, detailed construction schedule to the preconstruction conference.
  3. Agenda: The Owner, Engineer and Contractor shall discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing.
    - d. Designation of responsible personnel.
    - e. Subcontractor list.
    - f. Testing Responsibilities.
    - g. Procedures for processing field decisions and Change Orders.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Preparation of Record Documents.
    - l. Use of the premises.
    - m. Responsibility for temporary facilities and controls.
    - n. Office, work, and storage areas.

- o. Delivery and storage of materials and equipment.
  - p. Security.
  - q. Progress and restoration.
  - r. Working hours.
  - s. Specific County regulations.
  - t. Montana DEQ requirements.
  - u. Specific MSH requirements.
- C. Progress Meetings: Conduct progress meetings at regular intervals. Coordinate dates of meetings with preparation of payment requests.
- 1. Attendees: In addition to representatives of the 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.
  - 2. Agenda: Review and correct or approve minutes of previous progress meetings. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - b. Review present and future needs of each entity present, including the following:
      - i. Interface requirements.
      - ii. Sequence of operations.
      - iii. Status of submittals.
      - iv. Deliveries.
      - v. Off-site fabrications.
      - vi. Access.
      - vii. Site utilization.
      - viii. Temporary facilities and controls.
      - ix. Work hours.
      - x. Hazards and risks.

- xi. Progress, restoration and cleanup.
  - xii. Quality and work standards.
  - xiii. Change Orders.
  - xiv. Documentation of information for payment requests.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- a. Schedule Updating: As needed revise Contractor's construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01 31 00**

**SECTION 01 32 00**  
**CONSTRUCTION PROGRESS DOCUMENTATION**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including, but not limited to, the following:

- 1. Preliminary Construction Schedule.
- 2. Contractor's Construction Schedule.
- 3. Submittals Schedule.
- 4. Daily construction reports.

- B. Related Sections include the following:

- 1. Division 1 Section 01 29 00 - Payment Procedures - for submitting the Schedule of Values.
- 2. Division 1 Section 01 31 00 - Project Management & Coordination - for submitting and distributing meeting and conference minutes.
- 3. Division 1 Section 01 33 00 – Submittals - for submitting schedules and reports.
- 4. Division 1 Section 01 40 00 - Quality Requirements - for submitting a schedule of tests and inspections.
- 5. Division 1 Section 01 77 00 – Closeout Procedures - for submitting digital photographic documentation as part of the Project Record Documents at Project closeout.

1.03 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 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.

#### 1.04 SUBMITTALS

- A. Qualification Data: For firms and persons specified in Section 01 40 00 – Quality Requirements - to demonstrate their capabilities and experience. Include lists of completed project names and addresses, names and address 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 print.
- C. Contractor’s Construction Schedule: Submit two printed copies of initial schedule, one 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 two copies at monthly intervals.

#### 1.05 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 Contractor’s Construction 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**

#### 2.01 CONTRACTOR’S CONSTRUCTION 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 earlier or later completion date. Contract time can only be authorized through the formal Change Order process. See Section 01 26 00 and Standard General Conditions Article 9.07.
  - 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, fabrications, and delivery.
  - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittals" 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.

## 2.02 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.

## 2.03 REPORTS

### **PART 3 - EXECUTION**

#### 3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE UPDATING

- A. At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
  - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, order, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate actual completion percentage for each activity.

### 3.02 CONTRACTOR'S CONSTRUCTION SCHEDULE DISTRIBUTION

- A. 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 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 01 32 00**

**SECTION 01 33 00**  
**SUBMITTAL PROCEDURES**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting shop drawings, Product Data, and other miscellaneous submittals.

1.03 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Engineer's approval. Submittals may be rejected for not complying with requirements.

1.04 SUBMITTAL PROCEDURES

- A. General: If needed, electronic copies of CAD Drawings of the Contract Drawings will be provided by Engineer for Seller's use in preparing submittals. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, deliver, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with requirements in Section 01 32 00 - Construction Progress Documentation - for list of submittals and time requirements for scheduled performance of related construction activities.
- C. 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 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with Engineer's review of subsequent submittals. Engineer will advise Seller when a submittal being processed must be delayed to permit coordination with subsequent submittals. Engineer will advise Seller when a submittal being processed must be delayed for coordination.
  - 2. Allow 15 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 review and processing.
- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 4 by 5 inches on label or beside title block to record Prime Contractor's review and approval markings and action taken by Engineer.
  3. Include the following information on label for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name and address of Engineer.
    - d. Name and address of Contractor.
    - e. Name and address of subcontractor.
    - f. Name and address of supplier.
    - g. Name of manufacturer.
    - h. Unique identifier, including revision number.
    - i. Number and title of appropriate Specification Section.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will discard submittals received from sources other than Contractor.
1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittal, and *deviations from requirement* of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
  2. Include certification stating that information submitted complies with requirements of the Contract Documents.
  3. Transmittal Form: Provide locations on form for the following information:
    - a. Project name.
    - b. Date.
    - c. Destination (To:).

- d. Source (From:).
  - e. Names of subcontractor, manufacturer, and supplier.
  - f. Category and type of submittal.
  - g. Submittal purpose and description.
  - h. Submittal and transmittal distribution record.
  - i. Remarks.
  - j. Signature of transmitter.
- H. Distribution: Furnish copies of submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

## **PART 2 - PRODUCTS**

### **2.01 ACTION SUBMITTALS**

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- 1. Number of Copies: Submit two (2) hard copies and one electronic copy (bearing the Contractor's legal signature) of each action submittal, unless otherwise indicated. Engineer will return one electronic copy via email. Contractor will mark up and retain a copy as a Project Record Document.
- B. 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 operation 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.
- C. 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. Shopwork 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 inches by 11 inches but no larger than 30 by 40 inches.
- D. Coordination Drawings: Comply with requirements in Section 01 31 00 - Project Management and Coordination.
- E. Contractor's Construction Schedule: Comply with requirements in Section 01 32 00 - Construction Progress Documentation for Construction Manager's action.

- F. Submittals Schedule: Comply with requirements in Section 01 32 00 - Construction Progress Documentation.”
- G. Application for Payment: Comply with requirements in Section 01 29 00 - Payment Procedures.
- H. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
  1. Name, address, and telephone number of entity performing subcontract or supplying products.
  2. Number and title of related Specifications Section(s) covered by subcontract.
  3. Drawing number and detail references, as appropriate, covered by subcontract.

## 2.02 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specifications Sections.
  1. Number of Copies: submit two (2) hard copies and one electronic copy of each informational 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 01 40 00 – Quality Requirements.
- B. Contractor’s Construction Schedule: Comply with requirements in Section 01 32 00 - Construction Progress Documentation.
- C. Qualification Data: 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.
- D. Product Certificates: Prepare written statements on manufacturer’s letterhead certifying that product complies with requirements.
- E. Installer Certificates: Prepare written statements on manufacturer’s letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- F. Manufacturer Certificates: Prepare written statements on manufacturer’s letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- G. Material Certificates: Prepare written statements on manufacturer’s letterhead certifying that material complies with requirements.



- H. 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.
- I. 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.
- J. 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.
- K. 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.
- L. 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.
- M. Maintenance Data: Prepare written and graphic instructions and procedure for operation and normal maintenance of products and equipment. Comply with requirements in Section 01 77 00 - Closeout Procedures.
- N. Design Data: 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 calculation. Include page numbers.
- O. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guideline, 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:
  - 1. Preparation of substrates.
  - 2. Required substrate tolerance.
  - 3. Sequence of installation or erection.
  - 4. Required installation tolerance.
  - 5. Required adjustments.
  - 6. Recommendations for cleaning and protection.
- P. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- Q. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance and bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amount of deductibles, if any, and term of the coverage.
- R. Material Safety Data Sheets: Submit information directly to Owner. If submitted to Engineer, Engineer will not review this information but will return it with not action taken.

### **PART 3 - EXECUTION**

#### **3.01 CONTRACTOR'S REVIEW**

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Seller's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

#### **3.02 ENGINEER'S ACTION**

- A. General: Engineer will not review submittals that do not bear Seller's approval stamp 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 indicated action taken, as follows:
  1. No Exceptions Noted.
  2. Exceptions Noted
  3. Returned for Correction.

- 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. Engineer will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

**END OF SECTION 01 33 00**

**SECTION 01 40 00**  
**QUALITY REQUIREMENTS**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 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 and/or Equipment Supplier 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 Documents requirements.
  - 3. Requirements for Contractor/Supplier to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
  - 1. Section 01 32 00 - Construction Progress Documentation - for developing a schedule of required tests and inspections.
  - 2. Divisions 2 through 16 Technical Sections for specific test and inspection requirements.

1.03 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.

1.04 SUBMITTALS

- A. Qualification Data: For testing agencies specified in Section 01 40 00 - Quality Requirements - 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 re-inspecting.
- 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.

#### 1.05 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 those 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.

#### 1.06 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 re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to the Contractor.
- B. **Contractor Responsibilities:** Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
  - 1. Where services are indicated as Contractor's responsibility, 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. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
  6. 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.
  7. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- C. 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.
- D. 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.

E. 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**

**3.01 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 01 40 00**



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

**PART 1 - GENERAL**

1.01 SECTION INCLUDES

- A. Owner-Provided Temporary Utilities.
- B. Contractor-Provided Temporary Utilities.
- C. Security requirements.
- D. Vehicular access and parking.
- E. Waste removal facilities and services.
- F. Field offices.

1.02 OWNER PROVIDED TEMPORARY UTILITIES

- A. Owner will provide the following:
  - 1. Water supply (from hydrant), consisting of connection to Owner's existing water infrastructure. Any damage due to making or maintaining this connection shall be completely repaired by the Contractor with no cost to the Owner.
  - 2. The contractor will be expected to use Owner provided utilities in a conservative manner.
- B. Contractor shall use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 CONTRACTOR-PROVIDED TEMPORARY UTILITIES

- A. Temporary Electrical Services, as required.
- B. Telecommunications Services
  - 1. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization, as needed.
- C. Temporary Sanitary Facilities
  - 1. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
  - 2. Maintain daily in clean and sanitary condition.
- D. Barriers
  - 1. Provide barriers to prevent unauthorized entry to demolition areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from demolition operations.
  - 2. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

- E. Fencing – to be provided as directed by the Engineer to maintain security of the construction site.

#### 1.04 SECURITY

- A. Coordinate with Owner's security program.

#### 1.05 VEHICULAR ACCESS AND PARKING

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Designated existing on-site roads may be used for construction traffic. Coordinate with Construction Manager and MSH on-site representative.
- F. Provide temporary parking areas to accommodate Contractor personnel.

#### 1.06 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site at regular intervals..
- C. If materials to be recycled or must be stored on-site, provide suitable non-combustible storage areas unless otherwise approved by the authorities having jurisdiction.

#### 1.07 FIELD OFFICES (as needed)

- A. Office: Weathertight, with lighting, electrical outlets, heating, ventilating equipment, and equipped with sturdy furniture.
- B. Locate offices a minimum distance of 30 feet from existing structures.

#### 1.08 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition.

### **PART 2 - PRODUCTS - NOT USED**

### **PART 3 - EXECUTION - NOT USED**

### **END OF SECTION 01 50 00**

**SECTION 01 60 00  
PRODUCT REQUIREMENTS**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 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, but are not limited to, the following:
  - 1. Section 01 77 00 - Closeout Procedures - for submitting warranties for contract closeout.
  - 2. Divisions 2 through 16 for specific requirements for warranties on products and installation specified to be warranted.

1.03 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 dated 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 no 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 Specifications: 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 endorse 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.
- F. Reference herein to the name "Contractor" will be considered the same as the name "seller".

#### 1.04 SUBMITTALS

- A. Substitution Request: 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. 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.
- 2. 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: 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 Specifications Submittal: Comply with requirements in Division 1 Section "Submittal Procedures" Show compliance with requirements.
- C. Contractor will be responsible for any project redesign and/or construction costs that may become necessary as a result of the product substitution.

#### 1.05 QUALITY ASSURANCE

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

#### 1.06 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 watertight 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.

#### 1.07 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 Section 01 33 00 – Submittal Procedure and Section 01 77 00 - Closeout Procedures.

### **PART 2 - PRODUCTS**

#### 2.01 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 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. 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.
  2. 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.

## 2.02 PRODUCT SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received 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 deducing 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.

## 2.03 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;
  - 2. 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.
  - 3. 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.
  - 4. Evidence that proposed product provides specified warranty.

5. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners, if requested.
6. Samples, if requested.

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01 60 00**



**SECTION 01 70 00  
EXECUTION REQUIREMENTS**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 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 and surveying.
3. General installation of products.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

- B. Related Sections include, but are not limited to, the following:

1. Section 01 31 00 - Project Management and Coordination - for procedures for coordinating field engineering with other construction activities.
2. Section 01 33 00 - Submittal Procedures - for submitting surveys.
3. Section 01 77 00 - Closeout Procedures for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.03 SUBMITTALS

- A. Qualification Data: As required, land surveyors must 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. Contractor will submit a detailed Plan of Operation that shows how/when new segments of the water distribution system will be installed, tested, disinfected, re-connected and placed into service, and how the old distribution piping will be abandoned. The Plan will also describe the process by which the Contractor will replace all old water meters with new magnetic flow meters.**

1.04 QUALITY ASSURANCE

- A. Land Surveyor Qualifications; A professional land surveyor who is legally qualified to

practice in jurisdiction where Project is located and who is experienced in providing land-surveying services is necessary for all required legal surveys.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
  - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

### **3.02 PREPARATION**

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocated 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 propose utility interruptions.
  - 2. Do not proceed with utility interruptions without Engineer's written permission.
- C. Field Measurements: Take field measurements as required to locate and execute 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 on Drawings.
- E. Review of Contract Documents and Field Conditions: Immediately on discovery of the

need for clarification of the Contract Documents, submit a request for information to Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

### 3.03 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: As required, 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 in the surveying discipline.
- 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.

### 3.04 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. 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 relocated 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.
- C. 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.

### 3.05 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 produces 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.

### 3.06 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of material lawfully.
  1. 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. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- F. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortars, 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.
- G. 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.
- H. 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.
- I. 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.
- J. 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.

### 3.07 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 qualifications requirements in Division 1 Section "Quality Requirements."

### 3.08 PROTECTION OF INSTALLED CONSTRUCTION

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

### 3.09 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction.

1. Repair includes replacing defective parts, refinishing damaged surfaces, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

**END OF SECTION 01 70 00**

**SECTION 01 77 00**  
**CLOSEOUT PROCEDURES**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section Includes:

1. Closeout Procedures.
2. Substantial Completion
3. Final Completion
4. Certificate of Occupancy
5. Final Cleaning.
6. Project Record Documents.
7. Spare parts and Maintenance Products.
8. Warranties and Bonds.
9. Maintenance Service.

B. Related Sections include:

1. Section 01 31 00 – Project Management & Coordination.
2. Section 01 50 00 – Temporary Facilities and Controls.
3. Section 01 78 23 – Operation and Maintenance Data.

1.02 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- D. Owner will occupy all portions of the Project.

1.03 SUBSTANTIAL COMPLETION

- A. Prior to substantial completion Contractor shall review Contract Documents for items which are not complete or need to yet be completed including submittal of all manuals, and testing reports. Contractor shall make a list of incomplete work, a value of the incomplete work, and reasons why work is incomplete. Contractor shall complete all items required to be completed as part of substantial completion.
- B. Contractor shall provide a written notice to Engineer that the work, or specific portions of the work, is substantially complete and ready for review. If there are any items remaining to be corrected or completed Contractor shall submit a list of these items along with the notice

of substantial completion. Along with the list of items the Contractor should provide a written explanation of why these items are not considered necessary for substantial completion.

- C. Upon receipt of Contractor's notice of substantial completion, Engineer will proceed with inspection for substantial completion.
- D. Following the substantial completion inspection by the Engineer and Engineer's subconsultants, Engineer will either prepare certificate of substantial completion, or notify the Contractor in writing that substantial completion has not been met listing the various reasons.
- E. Contractor shall promptly complete the items required to meet substantial completion and submit a second notice of substantial completion to the Engineer.
- F. Engineer will review the work a second time to determine the status of substantial completion.
- G. When Engineer considers the project to be substantially complete, Engineer will prepare the preliminary certificate of substantial completion along with a substantial completion punch list of items to be completed prior to final payment. Engineer will deliver preliminary certificate and punch list to Owner and consider any objections by the Owner as provided in the Conditions of the Contract.
- H. Upon agreement by Owner and Engineer of substantial completion and punch list items, Engineer will execute and deliver to the Contractor and Owner a final certificate of substantial completion along with substantial completion punch list of items to be completed prior to final payment.
- I. A maximum of two (2) reviews of substantially complete work will be completed by Engineer and Engineer's subconsultants for any one portion of work under the Contract. Should a third or subsequent reviews be necessary the following requirements will be met:
  - 1. Owner will compensate Engineer for additional reviews.
  - 2. Owner will deduct the amount of compensation paid to the Engineer for additional reviews from the payment to the Contractor.
  - 3. Compensation shall be at Engineer's standard hourly rates plus actual cost of reimbursables.

#### 1.04 FINAL COMPLETION

- A. Following substantial completion Contractor shall complete remaining work and items to be corrected as part of substantial completion punch list as well as final cleaning and transferring site to Owner.
- B. When Contractor considers that all work is complete, Contractor shall provide written notice of final completion to Engineer.
- C. Following receipt of final completion certification, Engineer and Engineer's subconsultants shall review the work to verify that the requirements for final completion have been met.
- D. Upon review of work for final completion Engineer will either request the Contractor to



make closeout submittals or will notify Contractor that the work is not complete with a list of incomplete or defective work.

- E. Contractor shall promptly take steps to correct all listed deficiencies and incomplete work before sending a second written notice of final completion certification to Engineer.
- F. If final completion was not met following first review, Engineer will review work a second time to determine if the requirements for final completion have been met.
- G. A maximum of two (2) reviews of final complete work will be completed by Engineer and Engineer's subconsultants for any one portion of work under the Contract. Should a third or subsequent reviews be necessary the following requirements will be met:
  - 1. Owner will compensate Engineer for additional reviews.
  - 2. Owner will deduct the amount of compensation paid to the Engineer for additional reviews from the payment to the Contractor.
  - 3. Compensation shall be at Engineer's standard hourly rates plus actual cost of reimbursables.
- H. When Engineer considers all work to be complete in accordance with the Contract Documents, Engineer shall request the Contractor to make closeout submittals.

#### 1.05 CERTIFICATE OF OCCUPANCY

- A. In accordance with State Building Codes, when WORK is complete and ready for occupancy, CONTRACTOR shall contact local building official and request a final building code review for the purposes of obtaining a Certificate of Occupancy for the new Water Treatment Plant.
- B. CONTRACTOR shall, in accordance with Supplementary Conditions submit copy of Certificate of Occupancy with final Application for Payment.

#### 1.06 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains, and foreign substances, polish transparent and glossy surfaces, mop all floors.
- C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

#### 1.07 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the

Work:

1. Drawings.
  2. Specifications.
  3. Addenda.
  4. Change Orders and other modifications to the Contract.
  5. Reviewed Shop Drawings, Product Data, and Samples.
  6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling current and future reference by Owner and Engineer.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
1. Manufacturer's name and product model and number.
  2. Product substitutions or alternates utilized.
  3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured depths of foundations in relation to finish first floor datum.
  2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  3. Provide GPS survey during construction for horizontal and vertical locations of all underground piping and utilities at fittings, valves, building connections, pull boxes, junction boxes, manholes, and other appurtenances.
  4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  5. Field changes of dimension and detail.
  6. Details not on original Contract drawings.
- G. Submit documents to Engineer with claim for final Application for Payment.
- 1.08 SPARE PARTS AND MAINTENANCE PRODUCTS
- A. Provide spare parts, maintenance, and extra Products in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed by Owner; obtain receipt prior to final payment.
- 1.09 WARRANTIES AND BONDS

- A. Provide duplicate notarized copies.
  - B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
  - C. Provide Table of Contents and assemble in D size three ring binders with durable plastic cover.
  - D. Submit prior to final Application for Payment.
  - E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance.
- 1.10 MAINTENANCE SERVICE
- A. Furnish service and maintenance of components during the warranty period.
  - B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
  - C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
  - D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.
- 1.11 FINAL ADJUSTMENT OF ACCOUNTS
- A. Contractor shall submit a final statement of accounting to Engineer. Statement shall reflect all adjustments to the contract sum and include the following:
    - 1. Original contract sum.
    - 2. Additions and deductions resulting from:
      - a. All previous change orders
      - b. Allowances
      - c. Unit prices
      - d. Deductions for uncorrected work
      - e. Penalties and bonuses
      - f. Deductions for liquidated damages
      - g. Deductions for multiple reviews
      - h. Other adjustments
    - 3. Total contract sum as adjusted.
    - 4. Previous payments.
    - 5. Sum remaining due.
  - B. Engineer will prepare a final change order, reflecting approved adjustments to the contract sum which were not previously made by change orders.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01 77 00**

**SECTION 01 78 23**  
**OPERATION AND MAINTENANCE DATA**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section includes:

1. Quality Assurance.
2. Format.
3. Contents of Each Volume.
4. Manual for Equipment and Systems.
5. Instruction of Owner's personnel.
6. Submittals.
7. Asset Management Submittals.
8. Schedule of Submittals.

B. Related Sections include:

1. Section 01 33 00 – Submittal Procedures.
2. Section 01 40 00 – Quality Requirements.
3. Section 01 77 00 – Closeout Procedures.

1.02 QUALITY ASSURANCE

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT

- A. Prepare data in the form of an instructional manual. Arrange data in numerical format in accordance with the Specification Divisions.

1. Binders:

- a. Commercial quality, 8-1/2 x 11 inch three D side ring binders with durable plastic covers.
- b. 2 inch maximum ring size.
- c. When multiple binders are used, correlate data into related consistent groupings.

2. Cover; Identify:

- a. Each binder with typed title OPERATION AND MAINTENANCE INSTRUCTIONS.
- b. Title of Project.
- c. Subject matter of contents.

- d. Volume number.
  - e. Year of construction.
3. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- B. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
  - C. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages. Folded paper should be unfoldable without removal from binder.
  - D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, in three parts as follows:
    1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
    2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      - a. Significant design criteria.
      - b. List of equipment.
      - c. Parts list for each component.
      - d. Operating instructions.
      - e. Maintenance instructions for equipment and systems.
    3. Part 3: Project documents and certificates, including the following:
      - a. Shop drawings and product data.
      - b. Air and water balance reports.
      - c. Certificates.
      - d. Photocopies of warranties.
      - e. Bonds.

#### 1.04 CONTENTS OF EACH VOLUME

- A. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Engineer, Subconsultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
- B. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment

and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

- E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties: Prepare and submit per Section 01 77 00.
- G. Bonds: Prepare and submit per Section 01 77 00.

#### 1.05 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed. Refer to applicable Division 16 specification Sections.
- C. Include color coded wiring diagrams as installed. Refer to applicable Division 26 specification Sections.
- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.
- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Provide control diagrams by controls manufacturer as installed.
- K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage, and local sources of supply.
- N. Additional Requirements: As specified in individual Product specification sections.
- O. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- P. Electronic Copies: Compact discs (CD) OR USB drives shall be provided with all manuals

in electronic format in a portable document format (\*.pdf). The documents shall be placed as required under the appropriate tabs and labels as previously required for the compact disk. Each file shall be adequately labeled to identify the contents without requiring the document to be opened. Additionally all files shall be named consistently and in a uniform system for cataloguing files.

#### 1.06 INSTRUCTION OF OWNER PERSONNEL

- A. Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
- B. For equipment requiring seasonal operation, perform instructions for other seasons within six months.
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

#### 1.07 SUBMITTALS

- A. Submit electronic copy of preliminary draft or proposed formats and outlines of contents before Substantial Completion. Engineer will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit electronic copies of completed volumes fifteen (15) working days prior to final inspection. One (1) copy will be returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.
- D. Submit four (4) sets of revised final volumes in final form within ten (10) days after final inspection.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01 78 23**



**SECTION 01 78 39**  
**PROJECT RECORD DOCUMENTS**

**PART 1 - GENERAL**

1.01 SCOPE

- A. Throughout progress of the work, maintain an accurate record of changes in the Contract Documents, as described below. Upon completion of the work, submit all recorded changes to the Engineer.

1.02 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff.

1.03 ACCURACY OF RECORDS

- A. Thoroughly coordinate changes and field observations/measurements within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of drawings and other documents where such entry is required to describe the change properly.
- B. Accuracy of records shall be such that future searches for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.
- C. Thoroughly document the spacial location and depth of utilities, sewer & water infrastructure that is encountered during construction, whether identified or not on the design drawings.
- D. Make entries within 24 hours after receipt of information that the change has occurred or has been observed.
- E. Work closely with the Engineer's inspector/representative to coordinate and verify the documentation of all as-built records.

1.04 PRODUCT HANDLING

- A. Protect the job set of Record Documents from deterioration loss and/or damage at all times.
- B. If the recorded data is lost, use means necessary to secure the data to the Engineers satisfaction. Acquisition of required data will be at contractor's expense.
  - 1. Such means shall include, if necessary in the opinion of the Engineer, removal and replacement of concealing materials.
  - 2. In such case, restore work to the requirements outlined in the contract documents.

**PART 2 - MATERIALS**

2.01 RECORD DOCUMENTS

- A. Job Set: Promptly following receipt of the Engineer's Notice To Proceed, secure from the Engineer at no charge to the Contractor/Equipment Supplier one complete set of all documents.

### **PART 3 - INSTALLATION/WORKMANSHIP**

#### **3.01 MAINTENANCE OF JOB SET**

- A. Immediately upon receipt of the job set described above, identify each of the documents with the title, "RECORD DOCUMENTS - JOB SET".
- B. Preservation:
  - 1. Considering the contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set acceptable to the Engineer.
  - 2. Do not use the job set for any purpose except entry of new data and for review by the Engineer.
- C. Making entries on drawings:
  - 1. Using an erasable colored pencil (not ink or indelible pencil), clearly describing the change by graphic line and note as required.
  - 2. Date all entries.
  - 3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
  - 4. In the event of overlapping changes, use different colors for the overlapping changes.
- D. Make entries in the other pertinent documents as approved by the Engineer.
- E. Conversion of schematic layouts:
  - 1. In some cases on the drawings, arrangements of conduits, circuits, piping, ducts, and similar items, are shown schematically and are not intended to portray precise physical layout.
  - 2. Final physical arrangement is determined by the Contractor, subject to the Engineer's approval.
  - 3. However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the drawings.
  - 4. Show on the job set of Record Drawings, by dimension accuracy within one inch, the centerline of each run of items as described above.
  - 5. Clearly identify the item by accurate note such as "cast iron drain", "galv. water", and the like.
  - 6. Show, by symbol or note, the vertical location of the item ("under slab", "in ceiling plenum", "exposed", and the like).

7. Make all identification sufficiently descriptive that it may be related reliably to the Specifications.

### 3.02 FINAL PROJECT RECORD DOCUMENTS

#### A. Review and submittal:

1. Submit the completed set of Project Record Documents to the Engineer *prior to requesting final payment and/or the release of retainage.*
2. Participate in *biweekly review meetings.*
3. The Engineer will transfer the information from the project record document to the original project documents which will be noted as record drawings.

### 3.03 CHANGES SUBSEQUENT TO ACCEPTANCE

- #### A. The Contractor is not responsible for recording changes in the work subsequent to final completion, except for changes resulting from work performed under warranty.

**END OF SECTION 01 78 39**

**DIVISION 2**

**EXISTING CONDITIONS, SITEWORK**

**SECTION 02 41 00**  
**SITE DEMOLITION, DISPOSAL & SALVAGE**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings and Special Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this Section. Removal of identified asbestos containing products in the existing pump house will be necessary prior to completion of demolition work.

1.02 SUMMARY

- A. This Section includes the following:
  - 1. Removal and disposal of all construction indicated on the plans or specified in these documents.
  - 2. Removal and disposal of paving, curbing, sidewalks, driveways, crosswalks, utility structures, piping, below grade foundations, improvements to avoid conflict with new construction, disconnection, capping and removal of utilities no longer in use, pollution control during demolition including noise control and removal and legal disposal of materials.
- B. Related Sections include the following:
  - 1. Division 1 Section "Payment Procedures" for a schedule of unit prices.
  - 2. Division 32 Section "Landscaping" for finish grading, including placing and preparing topsoil for lawns and plantings.
  - 3. Division 31 Section "Earthwork" for excavation and embankment, site stripping, grubbing, removing topsoil, and protecting trees to remain.

1.03 SUBMITTALS

- A. Schedule: Submit schedule indicating proposed methods and sequence of operations for selective demolition work to Engineer for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.
- B. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
- C. Coordinate with Owner's continuing occupation of portions of existing building, and with Owner's reduced usage of any portion thereof.
- D. Submit project record documents under provisions of Section 01 77 00.

1.04 REGULATORY REQUIREMENTS

- A. Conform to all applicable codes for worker safety, confined space entry, dust

control, and water and sludge discharges and disposal.

- B. Obtain required permits from authorities.
- C. Notify affected utility companies before starting Work and comply with applicable requirements.
- D. Do not close or obstruct roadways except as permitted by Owner. Do not close or obstruct egress width to exits without prior written permission of Owner.
- E. Do not disrupt or compromise effectiveness of WWTF operations without written permission of Owner.
- F. Conform to procedures applicable if hazardous materials or situations discovered.

#### 1.05 PROJECT CONDITIONS

- A. Dust Control: The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the site or building and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding, and pollution.
- B. Protection of Existing Work: Before beginning any cutting or demolition work, the Contractor shall carefully survey the existing facilities and examine the plans and specifications to determine the extent of the work. The Contractor shall take all necessary precautions to ensure against damage to existing facilities to remain in place, to be reused, or to remain the property of the Owner, and any damage to such work shall be repaired or replaced as approved by the Engineer at no additional cost to the Owner. The Contractor shall carefully coordinate the work of this section with all other work and construct and maintain shoring, bracing and supports, as required.
- C. Protection of Buildings from the Weather: The interior of buildings and all materials and equipment shall be protected from the weather at all times.
- D. Protection of Trees: Trees which might be damaged during demolition and which are indicated to be left in place shall be protected. Any tree designated to remain that is damaged during the Work under this contract shall be replaced. ***Note that there are trees identified that must be removed as a consequence of construction. The Contractor will protect all other trees to the greatest extent practical.***
- E. Burning: The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- F. Occupancy: Owner will be continuously occupying areas of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which will severely impact Owner's normal operations.

- G. Condition of Structures: Owner assumes no responsibility for actual condition of items to be demolished.
  - 1. Conditions existing at time of commencement of contract will be maintained by Owner insofar as practicable. However, variations may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- H. Partial Demolition and Removal: Materials of marketable value that are removed in accordance with the provisions of the Project, but that are not to be possessed by the Owner, shall become the property of the Contractor and shall be removed from the right-of-way. Transport salvaged items from site as they are removed.
  - 1. Storage or sale of removed items on site will not be permitted.
- I. Protections: Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.
  - 1. Confine Work and stockpiling to within Owner's property or easement as approved by Engineer. Leave undisturbed all street and utility appurtenances not indicated for removal or renovation.
  - 2. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of buildings.
  - 3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of element to be demolished, and adjacent facilities or work to remain.
  - 4. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
  - 5. Protect floors with suitable covering when necessary.
  - 6. Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.
  - 7. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to insure that no water leakage or damage occurs.
  - 8. Maintain, during operation and at completion, pavement removal areas in such condition that they will be well drained at all times.
  - 9. Protect and maintain survey monuments or any construction staking from disturbance during pavement removal.
- J. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.
- K. Explosives: Use of explosives will not be permitted.

- L. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
- M. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities as acceptable to governing authorities.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Prior to commencement of selective demolition work, inspect areas in which work will be performed. Photograph existing conditions to structure surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Owner's Representative prior to starting work.

### **3.02 PREPARATION**

- A. Become familiar with required lines of removal and saw cutting.
- B. Identify underground utilities.
- C. Provide, erect, and maintain adequate barriers and warning lights.
- D. Keep streets, sidewalks, and driveways in usable condition; avoid property owner inconvenience insofar as practicable; do not trespass on private property.
- E. Verify traffic control in place prior to commencement of pavement removal.
- F. Inspect and record existing conditions onsite and at adjacent areas prior to starting construction. Commencement of this Section's Work means acceptance of existing conditions.

### **3.03 PAVING REMOVAL**

- A. Saw cutting may be required on concrete and asphalt pavements. Pavement removal beyond the limits established in the notes on the Drawings shall be replaced at the Contractor's expense.
- B. Saw cut vertically; remove on straight lines approximately parallel or perpendicular to centerline of pavement.
- C. Saw cut vertically full depth to obtain a clean break. After saw cutting, use pneumatic jackhammer or similar device prior to breaking out pavement.
- D. Break out remainder of pavement.
- E. Disturbances, breakage, or damage to areas not designated for removal shall be restored at Contractor's expense prior to making final payment.
- F. Leave underlying sub-base material in a condition suitable for traffic if



construction sequence involves delays and if local situation requires access by the public.

- G. Pavement removed beyond the limits established shall be replaced to the same specifications as the adjacent removal at Contractor's expense.

#### 3.04 TOLERANCES

- A. Saw cut full depth to achieve a clean break.
- B. If line of removal falls within 2 feet of an existing joint, adjust line of removal to be the existing joint.
- C. Remove entire width of sidewalk if removal width is less than sidewalk width.

#### 3.05 DEMOLITION

- A. General: Remove and legally dispose of paving, curbing, sidewalks, driveways, crosswalks, utility structures, piping, below grade foundations, improvements to avoid conflict with new construction, disconnection, and capping and removal of utilities no longer in use.
  - 1. Demolition of existing structures and piping shall only commence after provisions are made to ensure continuing existing utility services.
- B. Structures: Existing structures indicated shall be completely removed to two feet below grade. The excavations shall be backfilled and final graded in accordance with other sections of these specifications.
- C. Pavement: Cut, remove and dispose of existing pavement to the lines indicated on the plans or as directed by Engineer. Make straight and an approximately vertical cut of edges along which new pavement is to be placed.
- D. Driveways and Sidewalks: Remove and dispose of existing concrete
- E. Piping: Existing utilities shall be removed as indicated. When utility lines are encountered that are not indicated on the plans, the Engineer shall be notified. Buried piping may be left in place provided that exposed pipe ends are plugged.
  - 1. Pipes shall be plugged with a low slump concrete the entire diameter of the pipe to a minimum depth of 18 inches.
- F. Driveways and Sidewalks: Remove and dispose of existing concrete driveways and/or sidewalks which interfere with construction of improvements or which do not match new grade as shown on the contract documents or as directed by Engineer.
  - 1. Remove to a distance of 8 inches behind curbs, or to greater distance if required to properly match the new curb and gutter grade.
  - 2. Saw cut along a neat line to a depth of at least 25 percent of the concrete thickness and take care in removing the concrete assuring the slab breaks on the sawed neat line.

- G. Filling: Excavations and other hazardous openings shall be filled in accordance with appropriate sections of these specifications.

### 3.06 DISPOSAL

- A. General: Upon completion of demolition, all debris shall be disposed of in a legal manner, and the site shall be fine graded to the prevailing adjacent grades and contours.

### 3.07 SALVAGE

- A. Title to Materials: Title to all materials and equipment to be demolished, excepting Owner salvage and historical items, is vested in the Contractor upon receipt of Notice to Proceed. The Owner will not be responsible for the condition, loss or damage to such property after Notice to Proceed.
- B. Material for Contractor Salvage: Material for salvage shall be stored as approved by the Engineer. Salvage materials shall be removed from Owner's property before completion of the contract. Material for salvage shall not be sold on the site. Salvage material may not be reused in the project without written approval of the Engineer.
- C. Unsalvageable Materials: Materials, other than those permitted to remain in place, shall be disposed of in a legal manner. On-site disposal will not be allowed.

**END OF SECTION 02 41 00**

**DIVISION 3**  
**CONCRETE**

**SECTION 03 05 10**  
**COLD WEATHER CONCRETING PROCEDURES**

**PART 1 - GENERAL**

1.01 DEFINITIONS

- A. Cold weather is defined as a period when for more than 3 successive days the mean daily temperature falls below 40°F or any day when the temperature is expected to fall or falls below freezing.

1.02 SUBMITTALS

- A. The following submittals for construction shall be made in accordance with the project submittal requirements as described in the Supplementary Conditions.
  - 1. Not less than 30 days prior to expected placement of concrete under cold weather conditions, a complete procedure shall be submitted for review covering all aspects of protection of concrete and its ingredients from the detrimental effects of cold weather. Concrete placement during cold weather shall not commence prior to return of the approved procedure.

1.03 PERFORMANCE REQUIREMENTS

- A. Cold weather placement shall comply with ACI 350.5 and ACI 306.1, and this specification section.

1.04 PRODUCT DELIVERY, HANDLING AND STORAGE

- A. The concrete temperature, during placement in cold weather, shall not be less than 55 °F. Temperature measurements of the concrete as delivered to the job site shall confirm this requirement.

**PART 2 - MATERIALS**

2.01 WATER AND AGGREGATE

- A. Water and aggregate may be preheated for cold weather placement; however, their temperature shall not exceed 150 °F. All methods and equipment for heating of water and aggregate shall be subject to the approval of the Engineer and shall conform to ACI 306.

**PART 3 - EXECUTION**

3.01 GENERAL

- A. No concrete shall be placed on frozen ground.
- B. The ground, against which concrete is to be poured, must be protected against freezing after its preparation, or the concrete placement shall be delayed until the ground has fully thawed out.
- C. When temperatures are expected to be below 32 °F the night before the concrete is

placed, all reinforcing steel, forms and the ground shall be preheated, for a minimum of 12 hours, under a minimum temperature of 50 °F.

- D. When temperatures are expected to be below 32 °F any time before the concrete has reached strength of 1000 psi, the concrete must be adequately protected against frost damage by heating blankets, straw or insulation materials for a minimum of 7 days or until at least 1000 psi concrete strength has been reached. The concrete temperature shall at no time fall below 40 °F based on recording temperature monitors placed at a maximum of 50 feet on centers, each way, and around the circumference of the floor, wall, roof slab and wall-footing. Contractor shall provide heat as required to keep the concrete temperature as specified throughout the entire curing period of 7 days.
- E. Weather prediction made by the nearest NOAA station, and corrected for the local elevation and environmental conditions, may be used to determine whether cold weather protection shall be required. Thermometers will be used by the Engineer and these readings shall determine whether cold weather protection shall be required and whether cold weather protection is adequate.
- F. When combustion type heaters are used to maintain concrete temperatures within an enclosure, the exhaust gases shall be vented from the heater to the outside atmosphere so that the concrete is not exposed to the products of combustion.
- G. There will not be any additional reimbursement made to the Contractor for costs incurred for placing concrete during cold weather.

**END OF SECTION 03 05 10**

**SECTION 03 05 20**  
**HOT WEATHER CONCRETING PROCEDURES**

**PART 1 - GENERAL**

1.01 DEFINITIONS

- A. Hot weather is defined as any combination of high air temperature, low relative humidity and wind velocity tending to impair the quality of fresh or hardened concrete or otherwise resulting in abnormal concrete properties. During hot weather, any or all of the methods specified herein for temperature control of concrete shall be used as required to maintain the concrete temperature below the limits specified.

1.02 SUBMITTALS

- A. The following submittals for construction shall be made in accordance with the project submittal requirements as described in the Supplementary Conditions.
  - 1. Not less than 30 days prior to expected placement of concrete under hot weather conditions, a complete procedure shall be submitted for review covering the aspects of protection of concrete and its ingredients from the detrimental effects of hot weather. Concrete placement during hot weather shall not commence prior to the return of the approved procedure.

1.03 PERFORMANCE REQUIREMENTS

- A. Hot weather placement shall comply with ACI 350.5 and ACI 305.1, and this specification section.

1.04 PRODUCT DELIVERY, HANDLING AND STORAGE

- A. Aggregate piles, cement bins and batch plant bins shall be shaded from direct rays of sunlight.
- B. Aggregate piles shall be cooled by wetting and evaporation. Aggregate wetting shall be performed in such a manner that it will not cause wide variations in moisture content impairing slump uniformity.

1.05 GENERAL PRACTICES AND MEASURES

- A. The following list of practices and measures, as described in ACI 305, may be used to reduce or avoid the potential problems of hot weather concreting:
  - 1. Use concrete materials and proportions with satisfactory records in field use under hot weather conditions.
  - 2. Use cool concrete.
  - 3. Use a concrete consistency that permits rapid placement and effective consolidation.
  - 4. Transport, place, consolidate, and finish the concrete with least delay.
  - 5. Plan the job to avoid adverse exposure of the concrete to the environment; schedule placing operations during times of the day or night when weather conditions are

favorable.

6. Protect the concrete against moisture loss at all times during placing and during its curing period.

B. There will not be any additional reimbursement made to the Contractor for costs incurred for placing concrete in hot weather.

## **PART 2 - MATERIALS**

### **2.01 BATCHING AND MIXING**

A. Concrete mix water shall be refrigerated or ice shall be added to the mix up to 100 percent of the water requirement. Ice, when introduced into the mixer, shall be in such form that it will be completely melted and dispersed throughout the mix at the completion of the mixing time. The mixing time shall be held to the minimum practicable consistent with producing concrete meeting the specified requirements.

B. All methods and equipment for cooling of water and aggregate shall be subject to the approval of the Engineer and shall conform to ACI 305.

## **PART 3 - EXECUTION**

### **3.01 CONCRETE TEMPERATURE**

A. The temperature of concrete, as delivered at the time and location of placement, shall not exceed 100 °F under any conditions. The temperature of concrete as delivered at the time and location of placement under the following combined ambient conditions, except concrete that will be deposited within wall or column forms, shall not exceed the following temperatures:

<u>Relative humidity less than %</u>	<u>Ambient temperature greater than °F</u>	<u>Maximum concrete temperature °F</u>
80	90	100
70	90	95
60	90	90
50	90	85
40	90	80
30	80	75
20	75	70

### **3.02 DELIVERY**

A. Concrete shall be placed in the Construction within 90 minutes after the completion of mixing.

### **3.03 PREPARATION FOR PLACING**

A. Elevated forms and reinforcing steel for beams and similar members shall be cooled by fog spraying and evaporation immediately prior to placing concrete. Forms shall be free of standing water when concrete is placed herein.

### **3.04 PLACING**

- A. Concrete shall be placed in shallower layers than under normal weather conditions if necessary to assure coverage of the previous layer while it will respond readily to vibration.

### 3.05 FINISHING

- A. Fog spray shall be used during finishing operations whenever necessary to avoid surface plastic-shrinkage cracking. Fog spray shall also be used after finishing and before the specified curing is commenced to avoid surface plastic-shrinkage cracking.

### 3.06 PROTECTION AND CURING

- A. Forms shall be kept covered and continuously moist. Once forms are loosened and during form removal, concrete surfaces shall be protected from drying and shall be kept continuously wet by fog spraying or other approved means.

**END OF SECTION 03 05 20**



**SECTION 03 10 00  
CONCRETE FORMING AND ACCESSORIES**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
  - 1. Form-facing material for cast-in-place concrete.
  - 2. Shoring, bracing, and anchoring.
- B. Related Requirements:
  - 1. Division 03 – Concrete and Grout
  - 2. Division 32 – Exterior Improvements

1.03 DEFINITIONS

- A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.
- B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

1.04 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review the following:
    - a. Special inspection and testing and inspecting agency procedures for field quality control.
    - b. Construction, movement, contraction, and isolation joints
    - c. Forms and form-removal limitations.
    - d. Shoring and reshoring procedures.
    - e. Anchor rod and anchorage device installation tolerances.

1.05 ACTION SUBMITTALS

- A. Product Data: For each of the following:
  - 1. Exposed surface form-facing material.
  - 2. Concealed surface form-facing material.
  - 3. Void forms.

4. Form ties.
  5. Waterstops.
  6. Form-release agent.
- B. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.
1. For exposed vertical concrete walls, indicate dimensions and form tie locations.
  2. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with ACI 301 and ACI 350.5 when not indicated in Drawings.
    - a. Location of construction joints is subject to approval of the Engineer.
  3. Indicate location of waterstops.
  4. Indicate proposed schedule and sequence of stripping of forms, shoring removal, and reshoring installation and removal.

#### 1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing and inspection agency.
- B. Waterstops, Joint Fillers, Joint Sealers, Backing Rods, and Bond Breaker:
1. Certified mill certificates showing that the material meets all of the requirements specified here-in. The Engineer, at their option, may take samples of any materials and have them tested by an independent testing laboratory to verify their compliance with these Specifications. All such costs shall be borne by the Owner. If any materials should fail to meet these Specifications, all costs for further testing of the replacement materials shall be borne by the Contractor.
- C. Minutes of preinstallation conference.

#### 1.07 QUALITY ASSURANCE

- A. Testing and Inspection Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

#### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

#### 1.09 OBSTRUCTIONS

- A. Contractor shall pay particular attention to removing all obstructions such as concrete, nails, etc., from joints when movements of floor, wall and roof sections can be expected under temperature or other conditions.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301 and ACI 350.5, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.
1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
  2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.
  3. Forms for circular structures shall conform to the circular shape of the structure.
  4. Do not use earth cuts as forms for vertical or sloping surfaces unless required or permitted in drawings.
  5. Formwork shall be essentially watertight and shall prevent loss of mortar from concrete. Seal all joints or gaps with an acceptable material.

### **2.02 FORM-FACING MATERIALS**

- A. As-Cast Surface Form-Facing Material:
1. Provide continuous, true, and smooth concrete surfaces.
  2. Furnish in largest practicable sizes to minimize number of joints.
  3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete, and as follows:
    - a. Plywood, metal, or other approved panel materials.
    - b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      - 1) APA HDO (high-density overlay).
      - 2) APA MDO (medium-density overlay); mill-release agent treated and edge sealed.
      - 3) APA Structural 1 Plyform, B-B or better; mill oiled and edge sealed.
      - 4) APA Plyform Class I, B-B or better; mill oiled and edge sealed.
    - c. Do not use form-facing materials with raised grain, torn surfaces, worn edges, patches, dents, or other defects that will impair the texture of concrete surfaces.
- B. Concealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or another approved material.
1. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class.

1. Provide forms with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

## 2.03 WATERSTOPS

A. Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber waterstops, for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals, with factory fabricate corners, intersections, and directional changes.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. JP Specialties, Inc.
  - b. Sika Corporation.
2. Profile: Ribbed without center bulb.
3. Dimensions: 6 inches by 3/8 inch thick; nontapered.

B. Flexible PVC Waterstops: U.S. Army Corps of Engineers CRD-C 572, for embedding in concrete to prevent passage of fluids through joints, with factory fabricate corners, intersections, and directional changes.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - a. Sika Corporation.
  - b. Or approved equal.
2. Profile: As indicated.
3. Dimensions: As indicated; nontapered.

C. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.

1. Products: Subject to compliance with requirements, provide the following:
  - a. Sika Corporation.
  - b. Or approved equal.

## 2.04 RELATED MATERIALS

A. Reglets: Fabricate reglets of not less than 0.022-inch- thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

- B. Chamfer Strips: Smooth wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- C. Rustication Strips: Smooth wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- D. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
  - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
  - 2. Form release agent for form liners shall be acceptable to form liner manufacturer.
- E. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that leave no corrodible metal closer than 1-1/2 inch to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, leave holes at least 1 inch in diameter in concrete surface.
  - 3. Furnish ties with integral water-barrier plates to walls.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION OF FORMWORK**

- A. Comply with ACI 301 and ACI 350.5.
- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete" for as-cast finishes.
- C. Limit concrete surface irregularities as follows:
  - 1. Environmental Surface Finish-1.0 (ESF-1.0): 1 inch
    - a. No formwork facing material is specified
    - b. Patch voids greater than 1-1/2 in. wide or 1/4 in. deep
    - c. Remove projections greater than 1/2 in.
    - d. Tie holes needed to be patched
    - e. Surface tolerance Class C (ACI 117)
    - f. Leave surfaces with the texture imparted by the forms
    - g. Mockup not required
  - 2. Environmental Surface Finish-2.0 (EFS-2.0): 1/4 inch
    - a. Patch voids greater than 3/4 in. wide or 1/4 in.

- b. Remove projections greater than 1/4 in.
  - c. Patch tie holes
  - d. Surface tolerance Class B (ACI 117)
  - e. Mockup not required
- 3. Environmental Surface Finish-3.0 (ESF-3.0): 1/8 inch
  - a. Patch voids greater than 3/4 in. wide or 1/4" deep
  - b. Remove projections greater than 1/8 in.
  - c. Patch tie holes
  - d. Surface tolerance Class A (ACI 117)
  - e. Provide mockup of concrete surface appearance and texture
- D. Construct forms tight enough to prevent loss of concrete mortar.
  - 1. Minimize joints.
  - 2. Exposed Concrete: Symmetrically align joints in forms.
    - a. For ESF 3.0 surfaces, set the facing materials in an orderly and symmetrical arrangement, and keep the number of seams to a practical minimum. Facing materials shall be supported with studs or other backing capable of maintaining deflection with the tolerances specified in Part 1. Fit adjacent panels with tight joints.
  - 3. Taper form ties shall be placed with the larger end on the side of the structure that will be in contact with liquid.
    - a. Seal tie holes in formwork to prevent leakage where ties penetrate the formwork.
- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
  - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
  - 2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 3. Install keyways, reglets, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.
- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
  - 1. Provide and secure units to support screed strips
  - 2. Use strike-off templates or compacting-type screeds.

- H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.
  - 1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
  - 2. Locate temporary openings in forms at inconspicuous locations.
- I. Chamfer exterior corners and edges of permanently exposed concrete.
- J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.
- K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.
  - 1. Determine sizes and locations from trades providing such items.
  - 2. Obtain written approval of Engineer prior to forming openings not indicated on Drawings.
- L. Construction and Movement Joints:
  - 1. Construct joints true to line with faces perpendicular to surface plane of concrete.
  - 2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.
  - 3. Place joints perpendicular to main reinforcement.
  - 4. Locate joints for beams and slabs in the middle third of spans, unless indicated otherwise in plans.
  - 5. Locate horizontal joints in walls at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  - 6. Space vertical joints in walls as indicated on Drawings.
- M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.
  - 1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
  - 2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.
- N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.02 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
  - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
  - 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
  - 4. Clean embedded items immediately prior to concrete placement.
  - 5. Fill voids in inserts to prevent entry of concrete.
  - 6. Coat surfaces of aluminum embedments to prevent reaction with the concrete.

### 3.03 INSTALLATION OF WATERSTOPS

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm.
  - 1. Install in longest lengths practicable.
  - 2. Locate waterstops in center of joint unless otherwise indicated on Drawings.
  - 3. Allow clearance between waterstop and reinforcing steel of not less than 2 times the largest concrete aggregate size specified in Section 03 30 00 "Cast-In-Place Concrete."
  - 4. Secure waterstops in correct position at 12 inches on center in such a manner that bending over one way or another is prevented.
    - a. Vertical waterstops shall be anchored back to the reinforcement with wire ties or by other acceptable means.
    - b. At flexible waterstops placed horizontally, the waterstop shall be folded upward along its entire length while concrete is placed and consolidated up to the level of the waterstop, and then the waterstop shall be pressed into the top of of the fresh concrete. Then complete concrete placement and consolidation so as to provide full encasement of the water stop in concrete.
  - 5. Waterstops at vertical joints shall terminate 3 in. below the tops of exposed walls.
  - 6. Field fabricate joints in accordance with manufacturer's instructions using heat welding.
    - a. Miter corners, intersections, and directional changes in waterstops.
    - b. Align center bulbs.



- c. Splices shall be strong enough to develop a pulling force of 75 percent of the strength of the waterstop, and shall be watertight.
  7. Clean waterstops immediately prior to placement of concrete.
  8. Waterstops with a center bulb shall have the ends of the center bulb plugged with a flexible material, such as foam rubber, to prevent concrete intrusion at ends where the bulb will be exposed to concrete extrusions.
  9. Support and protect exposed waterstops during progress of the Work.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated on Drawings, according to manufacturer's written instructions, by adhesive bonding, mechanically fastening, and firmly pressing into place.
1. Install in longest lengths practicable.
  2. Locate waterstops in center of joint unless otherwise indicated on Drawings.
  3. Protect exposed waterstops during progress of the Work.

### 3.04 REMOVING AND REUSING FORMS

- A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70% of its 28-day design compressive strength.
  2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work.
1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
  2. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.
1. Align and secure joints to avoid offsets.
  2. Do not use patched forms for exposed concrete surfaces unless approved by Engineer.

### 3.05 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 350 and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

### 3.06 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
  1. Inspect formwork for shape, location, and dimensions of the concrete member being formed, and for compliance within tolerances specified in ACI 117.
  2. Waterstops:
    - a. It is required that all waterstop field joints shall be subject to rigid inspection, and no such work shall be scheduled or started without having made prior arrangements with the ENGINEER to provide for the required inspections. Not less than 24 hours' notice shall be provided to the ENGINEER for scheduling such inspections. All field joints in waterstops shall be subject to rigid inspection for misalignment, bubbles, inadequate bond, porosity, cracks, offsets, and other defects which would reduce the potential resistance of the material to water pressure at any point. All defective joints shall be replaced with material which shall pass said inspection, and all faulty material shall be removed from the site and disposed of by the CONTRACTOR at its own expense.
    - b. The following waterstop defects represent a partial list of defects which shall be grounds for rejection.
      - 1) Offsets at joints greater than 1/16-inch or 15 percent of material thickness, at any point, whichever is less.
      - 2) Exterior crack at joint, due to incomplete bond, which is deeper than 1/16-inch or 15 percent of material thickness, at any point, whichever is less.
      - 3) Any combination of offset or exterior crack which will result in a net reduction in the cross section of the waterstop in excess of 1/16-inch or 15 percent of material thickness at any point, whichever is less.
      - 4) Misalignment of joint which result in misalignment of the waterstop in excess of 1/2-inch in 10 feet.
      - 5) Porosity in the welded joint as evidenced by visual inspection.
      - 6) Bubbles or inadequate bonding which can be detected with a pen knife test. (If, while prodding the entire joint with the point of a pen

knife, the knife breaks through the outer portion of the weld into a bubble, the joint shall be considered defective.)

3. Waterstop Samples:
  - a. Field samples of fabricated fittings (crosses, tees, etc.) may be selected at random by the ENGINEER at their discretion, for testing by a laboratory at the OWNER'S expense. When tested, they shall have a tensile strength across the joints equal to at least 75 percent of the manufacturer's reported tensile strength of the product. These samples shall be fabricated so that the material and workmanship represent in all respects the fittings to be furnished under this contract.

**END OF SECTION 03 10 00**

**SECTION 03 20 00  
CONCRETE REINFORCING**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
  - 1. Steel reinforcement bars.
  - 2. Welded-wire reinforcement.
- B. Related Requirements:
  - 1. Division 03 – Concrete and Grout
  - 2. Division 32 – Exterior Improvements

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review the following:
    - a. Special inspection and testing and inspecting agency procedures for field quality control.
    - b. Construction contraction and isolation joints.
    - c. Steel-reinforcement installation.

1.04 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Each type of steel reinforcement.
  - 2. Bar supports.
    - a. Include a written description of where each bar support will be used.
  - 3. Mechanical splice couplers.
- B. Shop Drawings: Comply with ACI SP-066:
  - 1. Include placing drawings that detail fabrication, bending, and placement.
  - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.

C. Construction Joint Layout: Indicate proposed construction joints required to build the structure where not indicated in Drawings.

1. Location of construction joints is subject to approval of the Engineer.

#### 1.05 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M

B. Material Certificates:

1. Mill test certificates shall be submitted to the Engineer to certify that the reinforcing steel meets the specified requirements. Mill test certificates shall be furnished and paid for by the Contractor.

2. In addition, the Engineer may require that test samples be taken and test certificates be furnished by a reputable material testing laboratory at the Owner's expense.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Steel Reinforcement:

a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.

2. Mechanical splice couplers.

D. Minutes of preinstallation conference.

#### 1.06 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Store reinforcement to avoid contact with earth, oil, or other materials that may decrease bond to concrete.

### **PART 2 - PRODUCTS**

#### 2.01 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60 , deformed. Grade 40 steel shall be allowed for #3 and smaller bars.

B. Low-Alloy Steel Reinforcing Bars: ASTM A706/A706M, deformed.

C. Headed-Steel Reinforcing Bars: ASTM A970/A970M.

- D. Steel Bar Mats: ASTM A184/A184M, fabricated from ASTM A615/A615M, Grade 60, deformed bars, assembled with clips.
- E. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- F. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

## 2.02 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
  - 1. Manufacture bar supports from stainless steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice" and ACI 315, and as follows:
    - a. Where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
      - 1) For plastic protected wire, plastic shall have a thickness of 3/32 inches or greater at points of contact with formwork and the plastic shall extend along the wire at least 1/2 inches from the point of contact in the formwork.
      - 2) For stainless steel protected wire-reinforcement supports, the non-stainless steel portion of the supports shall not extend closer than 3/4 inches from the form surface.
    - b. Precast concrete (adobes) shall, as a minimum, be no less in compressive strength or cement content than the concrete in which it will be cast, and a surface area of not less than 4 square inches. Water absorption and porosity of precast concrete supports shall be equal to or less than water absorption and porosity of concrete being placed. Adobes manufactured from plastic or with low cement contents will not be accepted. Brick, broken concrete masonry units, spalls, rocks or similar materials shall not be used for support of reinforcing steel.
    - c. All-plastic reinforcement supports shall incorporate perforations in plane areas to compensate for the difference in the coefficient of thermal expansion between the plastic and concrete.
- C. Mechanical Splice Couplers: ACI 318 Type 2, same material of reinforcing bar being spliced; tension-compression type.
  - 1. Products: Subject to compliance with requirements, available products by one of the following:

- a. Dayton Superior.
  - b. Or approved equal.
- D. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.
- 1. Finish: Plain.

### 2.03 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice," and in accordance with fabricating tolerances of ACI 117.
- B. Bend reinforcement cold unless heating is approved by the Engineer prior to fabrication.
- C. Minimum inside bend diameters shall conform to the requirements of ACI 350.5 unless otherwise permitted. The beginning of the bend shall not be closer to the concrete surface than the minimum diameter of the bend.
- D. Kinked bars shall not be used.

## **PART 3 - EXECUTION**

### 3.01 PREPARATION

- A. Protection of In-Place Conditions:
  - 1. Do not cut or puncture vapor retarder.
  - 2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

### 3.02 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
  - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
  - 2. The supports shall be of sufficient quantity, strength and stability to maintain the reinforcement in place throughout the concreting operations. Bar supports shall be placed no further than 4 feet apart in each direction.
  - 3. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 350.

1. Placing tolerances shall not reduce cover requirements except as specified in ACI 117.
  2. No "bury" or "carrier" bars will be allowed unless specifically approved by the Engineer.
- E. Reinforcing Tying:
1. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
  2. There shall be at least three ties in each bar length (this shall not apply to dowel laps or to bars shorter than 4 feet, unless necessary for rigidity).
  3. Slab bars shall be tied at every intersection around the periphery of the slab. Wall bars and slab bar intersections shall be tied at not less than every second intersection, but at not greater than the following maximum spacings:
    - a. Slab Bars: Bars No. 5 and smaller = 30 inches; Bars No. 6 through No. 9 = 48 inches; Bars No. 10 through No. 11 = 60 inches
    - b. Wall Bars: Bars No. 5 and smaller = 24 inches; Bars No. 6 through No. 9 = 30 inches; Bars No. 10 through No. 11 = 48 inches.
- F. Reinforcing partially embedded in concrete shall not be field bent unless indicated on the Drawings.
- G. Splices: Lap splices as indicated on Drawings.
1. Bars indicated to be continuous, and all vertical bars shall be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
  2. Stagger splices in accordance with ACI 350.
  3. Lapped spliced bars shall be fastened together with steel tie wire.
  4. Unless specified or shown otherwise on the Drawings, the bars at a lap splice shall be in contact with each other.
  5. Unless shown otherwise on the Drawings, where bars are to be lapped spliced at joints in the concrete, all bars shall project from the concrete first placed, a minimum length equal to the lap splice length indicated on the Drawings. All concrete or other deleterious coating shall be removed from dowels and other projecting bars by wire brushing or sandblasting before the bars are embedded in a subsequent concrete placement.
  6. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
    - a. Mechanical splices for reinforcement not shown on the Project Drawings shall not be used unless accepted by the Engineer.
  7. Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings.



- H. When there is a delay in depositing concrete, reinforcement shall be re-inspected and cleaned when necessary.
- I. Reinforcement relocation - When necessary to move reinforcement beyond the specified placing tolerances to avoid interference with other reinforcement, conduits, or embedded items, submit the resulting arrangement of reinforcement for acceptance by the Engineer.
- J. Install welded-wire reinforcement in longest practicable lengths.
  - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
    - a. For reinforcement less than W4.0 or D4.0, continuous support spacing shall not exceed 12 inches.
  - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
  - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
  - 4. Lace overlaps with wire.
  - 5. The welded wire fabric shall be bent as shown or required on the Drawings to fit the work. Welded wire fabric shall be rolled or otherwise straightened to make a perfectly flat sheet before placing in the Work.

### 3.03 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.
  - 1. Place joints perpendicular to main reinforcement.
  - 2. Continue reinforcement across construction joints unless otherwise indicated.
  - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.
- B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

### 3.04 INSTALLATION TOLERANCES

- A. Comply with ACI 117.

### 3.05 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.
- B. Inspections:
  - 1. Steel-reinforcement placement.

2. Reinforcing support type, spacing, and quantity of reinforcing supports.
3. Steel-reinforcement mechanical splice couplers.
4. Steel-reinforcement welding.

**END OF SECTION 03 20 00**

**SECTION 03 30 00**  
**CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

- 1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

- 1. Section 03 05 10 "Cold Weather Concreting Procedures" for procedures to protect concrete work during cold weather.
- 2. Section 03 05 20 "Hot Weather Concreting Procedures" for procedures to protect concrete work during hot weather.
- 3. Section 03 10 00 "Concrete Forming and Accessories" for form-facing materials, form liners, and waterstops.
- 4. Section 03 20 00 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
- 5. Section 03 60 00 "Grouting" for cement grout, cement mortar, dry-pack mortar, epoxy grout, non-shrink grout.
- 6. Section 32 11 23 "Aggregate Base Courses" for drainage fill under slabs-on-ground.
- 7. Section 07 11 00 "Dampproofing".
- 8. Section 07 13 00 "Sheet Waterproofing".
- 9. Division 03 – Concrete and Grout
- 10. Division 32 – Exterior Improvements

1.03 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.04 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
  - a. Contractor's superintendent.
  - b. Independent testing agency responsible for concrete design mixtures.
  - c. Ready-mix concrete manufacturer.
  - d. Concrete Subcontractor.
2. Review the following:
  - a. Special inspection and testing and inspecting agency procedures for field quality control.
  - b. Construction joints, control joints, isolation joints, and joint-filler strips.
  - c. Semirigid joint fillers.
  - d. Cold and hot weather concreting procedures.
  - e. Concrete finishes and finishing.
  - f. Curing procedures.
  - g. Forms and form-removal limitations.
  - h. Shoring and reshoring procedures.
  - i. Concrete repair procedures.
  - j. Concrete protection.
  - k. Initial curing and field curing of field test cylinders (ASTM C31/C31M.)
  - l. Protection of field cured field test cylinders.

#### 1.05 ACTION SUBMITTALS

- A. Product Data: For each of the following.
  1. Portland cement.
  2. Fly ash.
  3. Slag cement.
  4. Silica fume.
  5. Aggregates.
    - a. Include types, pit or quarry locations, producers' names, gradations, specific gravities, and evidence of not more than 90 days old demonstrating compliance with Product specification.
  6. Admixtures:
    - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates,

temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.

7. Bonding agents.
8. Liquid floor treatments.
9. Curing materials.
10. Joint fillers.
11. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Slump limit.
6. Air content.
7. Nominal maximum aggregate size.
8. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
9. Intended placement method.
10. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  - a. Include new field test data verifying adequacy of modified proportions.

C. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.

2. Ready-mixed concrete manufacturer.
  3. Testing agency: Include copies of applicable ACI certificates.
- B. Material Certificates: For each of the following, signed by manufacturers:
1. Cementitious materials.
  2. Admixtures.
  3. Curing compounds.
  4. Floor and slab treatments.
  5. Bonding agents.
  6. Adhesives.
  7. Semirigid joint filler.
  8. Joint-filler strips.
  9. Repair materials.
- C. Material Test Reports: For the following, from a qualified testing agency:
1. Portland cement.
  2. Fly ash.
  3. Slag cement.
  4. Silica fume.
  5. Aggregates.
- D. Research Reports:
1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
- E. Preconstruction Test Reports: For each mix design.
- F. Field quality-control reports.
- G. Minutes of preinstallation conference.
- 1.07 QUALITY ASSURANCE
- A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician.
1. An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
  2. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

- B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
  - 1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329, as documented according to ASTM E548 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.
  - 1. Personnel performing laboratory tests shall be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Field Quality Control Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
  - 1. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

#### 1.08 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
  - 1. Include the following information in each test report:
    - a. Admixture dosage rates.
    - b. Slump.
    - c. Air content.
    - d. Seven-day compressive strength.
    - e. 28-day compressive strength.

#### 1.09 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 350.5.

### **PART 2 - PRODUCTS**

#### 2.01 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 350.5 unless modified by requirements in the Contract Documents.

#### 2.02 CONCRETE MATERIALS

- A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
  2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
  3. Obtain aggregate from single source.
  4. Obtain each type of admixture from single source from single manufacturer.
- B. Cementitious Materials:
1. Portland Cement: ASTM C150/C150M, Type I/II.
  2. Fly Ash: ASTM C618, Class F.
  3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
  4. Silica Fume: ASTM C1240 amorphous silica.
- C. Normal-Weight Aggregates: ASTM C33/C33M, Class 4S coarse aggregate or better, graded. Provide aggregates from a single source.
1. Alkali-Silica Reaction: Comply with one of the following:
    - a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
    - b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
    - c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.
  2. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
  3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C260/C260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
  2. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
  3. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
  4. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.



F. Water and Water Used to Make Ice: ASTM C94/C94M, potable

## 2.03 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. BASF Corporation.
- b. Dayton Superior.
- c. Euclid Chemical Company (The); an RPM company.
- d. W.R. Meadows, Inc.

## 2.04 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. BASF Corporation.
- b. Dayton Superior.
- c. Euclid Chemical Company (The); an RPM company.
- d. Sika Corporation.
- e. W.R. Meadows, Inc.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

- a. Ambient Temperature Below 50 deg F: Black.
- b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
- c. Ambient Temperature Above 85 deg F: White.

D. Water: Potable or complying with ASTM C1602/C1602M.

E. Clear, Solvent-Borne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. BASF Corporation; MasterKure CC 250 XS
  - b. Dayton Superior; Cure & Seal 25% J22UV
  - c. Euclid Chemical Company (The); an RPM company; Luster Seal 300
  - d. Laticrete International, Inc.; L&M Lumiseal Plus
  - e. W.R. Meadows, Inc; CS-309-30.
  - f. Lambert Corporation; UV Super Seal
  - g. Approved equal.

## 2.05 RELATED MATERIALS

- A. Joint Sealers: two-part, self-leveling, uniform, stiff consistency, non-staining, polyurethane elastomeric sealant which cures at ambient temperature, conforming to ASTM C-920 and does not contain solvents.
  1. The material shall be of a type that will effectively and permanently seal joints subject to movements in concrete.
  2. The mastic shall tenaciously adhere to primed concrete surfaces, shall remain permanently mastic and shall be NSF approved for use with potable water.
  3. For sloping joints, vertical joints and overhead horizontal joints, only “non-sag” compounds shall be used; all such compounds shall conform to the requirements of ANSI/ASTM C 920 Class 12-1/2
  4. For plane horizontal joints, the self-leveling compounds which meet the requirements of ANSI/ASTM C 920 Class 25. For joints subject to either pedestrian or vehicular traffic, a compound providing non-tracking characteristics, and having a Shore “A” hardness range of 25 to 35, shall be used.
  5. Primer materials, if recommended by the sealant manufacturer, shall conform to the printed recommendations of the sealant manufacturer.
  6. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. PERMAPOL RC-270SL RESERVOIR SEALANT, as manufactured by PRODUCTS RESEARCH & CHEMICAL CORP., Gloucester City, New Jersey (800-257-8454)
    - b. SIKAFLEX/2C POLYURETHANE ELASTOMERIC SEALANT, as manufactured by SIKA CHEMICAL CORP., Santa Fe Springs, CA (213-941-0231)
    - c. SELECT SEAL U-227 RESERVOIR GRADE, as manufactured by SPC, Upland, CA (714-985- 5771)

- d. Or approved equal.
- B. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
- C. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 in accordance with ASTM D2240.
- D. Backing Rod: Backing rod shall be an extruded closed cell, polyethylene foam rod. The material shall be compatible with the joint sealant material used and shall have a tensile strength of not less than 40 psi and a compression deflection of approximately 25 percent at 8 psi. The rod shall be 1/8-inch larger in diameter than the joint width except that a one-inch diameter rod shall be used for a 3/4-inch wide joint.
- E. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- F. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:
  - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- G. Bond Breaker: Bond breaker shall be SUPER BOND BREAKER WATER BASE as manufactured by Burke Company, San Mateo, California; SELECT EMULSION CURE 309, as distributed by Select Products Co., Upland, CA (clear or white pigmented) or equivalent. Fugitive dye may be used in bondbreakers if recommended by the manufacturer.

## 2.06 REPAIR MATERIALS

- A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
  - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
  - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

## 2.07 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 350.5.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash or Other Pozzolans: 25 percent by mass.
  2. Slag Cement: 50 percent by mass.
  3. Silica Fume: 10 percent by mass.
  4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
  5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
  2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  3. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.

## 2.08 CONCRETE MIXTURES

- A. Class A: Normal-weight concrete used for footings and topping slabs for precast roof slabs.
1. Exposure Class: ACI 318 F1, S0, W0, C0.
  2. Minimum Compressive Strength: 3500 psi at 28 days.
  3. Maximum w/cm: 0.55.
  4. Slump Limit: 8 inches, plus or minus 1 inch for concrete with verified slump of 3 inches plus or minus 1 inch before adding high-range water-reducing admixture or plasticizing admixture at Project site.
  5. Air Content:
    - a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.
- B. Class B: Normal-weight concrete used for grade beams, exterior columns, and non-fluid retaining foundation walls.

1. Exposure Class: ACI 318 F2, S0, W0, C0.
  2. Minimum Compressive Strength: 4500 psi at 28 days.
  3. Maximum w/cm: 0.45.
  4. Slump Limit: 8 inches, plus or minus 1 inch for concrete with verified slump of 3 inches plus or minus 1 inch before adding high-range water-reducing admixture or plasticizing admixture at Project site.
  5. Air Content:
    - a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.
- C. Class C : Normal-weight concrete used for fluid-retaining slabs-on-ground and walls, and roof slabs over fluid-containing tanks.
1. Exposure Class: ACI 318 F2, S2, W1, C2.
  2. Minimum Compressive Strength: 4500 psi at 28 days.
  3. Maximum w/cm: 0.42.
  4. Minimum Cementitious Materials Content: 560 lb/cu. yd.
    - a. Provide Portland Cement - Type II combined with a minimum of 20 percent, by weight, of cementitious material with either of the following:
      - 1) Fly Ash supplemented with Silica Fume, or
      - 2) Ground-Granulated Blast-Furnace Slag supplemented with Silica Fume.
  5. Slump Limit: 8 inches, plus or minus 1 inch for concrete with verified slump of 3 inches plus or minus 1 inch before adding high-range water-reducing admixture or plasticizing admixture at Project site.
  6. Air Content:
    - a. Exposure Classes F2 and F3: 6 percent, plus or minus, 1.5 percent measured at the point of delivery for concrete containing 3/4-inch nominal maximum size aggregate.
  7. Limit water-soluble, chloride-ion content in hardened concrete to 0.10 percent by weight of cement.
- D. Class D : Normal-weight concrete used for interior slabs-on-grade (excluding the Pump Room slab), topping for metal decks, and equipment bases.
1. Exposure Class: ACI 318 F0, S0, W0, C0.
  2. Minimum Compressive Strength: 4000 psi at 28 days.

3. Maximum w/cm: 0.45.
  4. Minimum Cementitious Materials Content: 540 lb/cu. yd.
  5. Slump Limit: 8 inches, plus or minus 1 inch for concrete with verified slump of 3 inches plus or minus 1 inch before adding high-range water-reducing admixture or plasticizing admixture at Project site.
  6. Air Content:
    - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
  7. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.
- E. Class E: Normal-weight concrete used for slab-on-grade in Pump Room.
1. Exposure Class: ACI 318 F0, S0, W1, C0.
  2. Minimum Compressive Strength: 4500 psi at 28 days.
  3. Minimum Cementitious Materials Content: 560 lb/cu. yd.
    - a. Provide Portland Cement combined with a minimum of 15 percent, by weight, of cementitious material with either of the following:
      - 1) Fly Ash supplemented with Silica Fume, or
      - 2) Ground-Granulated Blast-Furnace Slag supplemented with Silica Fume.
  4. Slump Limit: 8 inches, plus or minus 1 inch 1 for concrete with verified slump of 3 inches plus or minus 1 inch before adding high-range water-reducing admixture or plasticizing admixture at Project site.
  5. Air Content:
    - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.
- F. Class F: Controlled Low Strength Material (CLSM) for flowable backfill.
1. Design and produce non-excavatable CLSM in accordance with the following requirements:
    - a. Unconfined compressive strength greater than 150 psi determined by ASTM D4832.
    - b. Air Content between 5% and 30% determined by ASTM D6023.
    - c. Unit weight of 100-130 lbs/cu. ft. determined by ASTM D6023.

- d. Consistent flow producing a self-leveling product free of segregation determined by ASTM D6103.
  - e. Do not use materials in CLSM with a plasticity index over 4.
  - f. Furnish aggregates in accordance with the following gradation:
    - 1) 3/4-inch sieve: 100 percent passing
    - 2) No. 4 sieve: 65- 100 percent passing
    - 3) No. 30 sieve: 40 - 80 percent passing
    - 4) No. 200 sieve: 10 - 30 percent passing.
- G. Class I: Grout used for Grout Shaping of flumes, wet wells, etc.
- 1. Exposure Class: ACI 318 F0, S2, W0, C0.
  - 2. Minimum Compressive Strength: 4000 psi at 28 days.
  - 3. Maximum w/cm: 0.50.
  - 4. Slump Limit: 4 inches, plus or minus 1 inch.
  - 5. Air Content:
    - a. Exposure Class F0: None required.
  - 6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.

## 2.09 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.
  - 1. 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Verification of Conditions:
  - 1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
  - 2. Do not proceed until unsatisfactory conditions have been corrected.

### 3.02 PREPARATION

- A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
  - 1. Daily access to the Work.

2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

### 3.03 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
  1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
  3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

### 3.04 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
  1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Engineer.
  2. Place joints perpendicular to main reinforcement.
    - a. Continue reinforcement across construction joints unless otherwise indicated.
    - b. Do not continue reinforcement through sides of strip placements of floors and slabs.
  3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.



7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
  2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints:
1. Install dowel bars and support assemblies at joints, where indicated on Drawings.
  2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.
- F. Dowel Plates: Install dowel plates at joints, where indicated on Drawings.
- 3.05 CONCRETE PLACEMENT
- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Notify Engineer and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer in writing, but not to exceed the amount indicated on the concrete delivery ticket.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
  2. Deposit concrete to avoid segregation.
  3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a layer no deeper than 24 inches, and in a manner to avoid inclined construction joints.
  4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 350.5.
    - a. Do not use vibrators to transport concrete inside forms.
    - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Do not place concrete floors and slabs in a checkerboard sequence.
  2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  3. Maintain reinforcement in position on chairs during concrete placement.
  4. Screed slab surfaces with a straightedge and strike off to correct elevations.
  5. Level concrete, cut high areas, and fill low areas.
  6. Slope surfaces uniformly to drains where required.
  7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
  8. Do not further disturb slab surfaces before starting finishing operations.

### 3.06 FINISHING FORMED SURFACES

- A. As-Cast Surface Finishes (see Section 03 10 00 - Concrete Forming and Accessories for required finishes):
1. ACI 350 Environmental Surface Finish ESF-1.0: As-cast concrete texture imparted by form-facing material.
    - a. Apply to concrete surfaces not exposed to view for non- fluid-retaining elements.

2. ACI 350 Environmental Surface Finish ESF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.

- a. Locations: Apply to concrete surfaces exposed to view and all fluid-retaining elements.

B. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### 3.07 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.
3. Apply scratch finish to surfaces to receive grout shaping.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish and fluid-retaining slabs.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

4. Do not add water to concrete surface.
  5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
  6. Apply a trowel finish to surfaces exposed to view.
  7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:
    - a. Slabs on Ground:
      - 1) Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.
    - b. Suspended Slabs:
      - 1) Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated on Drawings. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
1. Coordinate required final finish with Engineer before application.
  2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
  2. Coordinate required final finish with Engineer before application.
- 3.08 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS
- A. Filling In:
1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
  2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
  3. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 6 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4000 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. Prior to pouring concrete, place and secure anchorage devices.
  - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - b. Cast anchor-bolt insert into bases.
  - c. Install anchor bolts to elevations required for proper attachment to supported equipment.
6. Aluminum Inserts and Embeds. All aluminum materials inserted in concrete shall have the contact surface coated with bitumastic.

3.09 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 350.5 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 350.5 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Curing period shall not be less than seven days.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
  - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
  - b. Continuous Sprinkling: Maintain concrete surface continuously wet.

- c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
  - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
    - 1) Method by itself is not permitted for fluid-retaining structures.
  - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions. This method is not permitted for fluid-retaining structures.
    - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
    - 2) Maintain continuity of coating and repair damage during curing period.
- C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
- 1. Begin curing immediately after finishing concrete.
  - 2. Interior Concrete Floors for non- fluid retaining slabs:
    - a. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
      - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
        - a) Lap edges and ends of absorptive cover not less than 12 inches.
        - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
      - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
        - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
        - b) Cure for not less than seven days.
      - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
        - a) Water.
        - b) Continuous water-fog spray.

- b. Floors to Receive Curing Compound:
  - 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
  - 3) Maintain continuity of coating, and repair damage during curing period.
  - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.
- c. Floors to Receive Curing and Sealing Compound:
  - 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
  - 3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.
- 3. Slabs for fluid-retaining structures:
  - a. Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire are of floor.
    - 1) Lap edges and ends of absorptive cover not less than 12 inches.
    - 2) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
  - b. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
    - 1) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
    - 2) Cure for not less than seven days.
  - c. Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

- 1) Water.
- 2) Continuous water-fog spray.

### 3.10 TOLERANCES

- A. Conform to ACI 117.

### 3.11 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.
  1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
  2. Do not apply to concrete that is less than 14 days' old.
  3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
  4. Rinse with water; remove excess material until surface is dry.
  5. Apply a second coat in a similar manner if surface is rough or porous.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

### 3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
  1. Install cork type joint filler in joints in fluid-retaining elements.
  2. Defer joint filling until concrete has aged at least six month(s).
  3. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

### 3.13 JOINT SEALING

- A. Joints, not requiring waterstops or when so indicated on the Drawings, shall be sealed.
- B. Joint sealed areas shall be sandblasted or roughened and blown clean of dust and sand with compressed air before the material may be applied.
- C. Joints shall be primed (if required) and the sealant shall be applied in accordance with the manufacturer's recommendations.



### 3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
  - 1. Repair and patch defective areas when approved by Engineer.
  - 2. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.
- B. Repair cracks in liquid containing concrete structures with widths greater than 0.010 inches, unless otherwise specified or directed by the Engineer.
- C. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, of stiff consistency using only enough water for handling and placing. Mix the repair mortar and turn the mortar frequently with a trowel without adding water.
- D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
    - a. Limit cut depth to 3/4 inch.
    - b. Make edges of cuts perpendicular to concrete surface. Do not feather edges.
    - c. Clean, dampen with water plus another 6 inches around the patch area perimeter, and brush-coat holes and voids with bonding agent.
    - d. Fill and compact with patching mortar before bonding agent has dried. Strike off mortar, leaving the patch slightly higher than the surrounding surface to permit initial shrinkage. Leave the patch undisturbed for 1 hour before finishing.
    - e. Keep the patch damp for 7 days.
    - f. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
  - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
    - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
    - b. Compact mortar in place and strike off slightly higher than surrounding surface.
  - 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Engineer.
- E. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
  - a. Correct low and high areas.
  - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
  - a. Finish repaired areas to blend into adjacent concrete.
5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
  - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
  - b. Feather edges to match adjacent floor elevations.
6. Correct other low areas scheduled to remain exposed with repair topping.
  - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
  - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
  - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
  - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
  - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
  - d. Place, compact, and finish to blend with adjacent finished concrete.
  - e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
  - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
  - b. Dampen cleaned concrete surfaces and apply bonding agent.
  - c. Place patching mortar before bonding agent has dried.
  - d. Compact patching mortar and finish to match adjacent concrete.
  - e. Keep patched area continuously moist for at least 72 hours.
- F. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- G. Repair materials and installation not specified above may be used, subject to Engineer's approval.

### 3.15 WATER HOLDING STRUCTURES LEAKAGE TESTING

- A. Complete in accordance with ACI 350.1.
- B. All concrete structures that are designed to hold or pass water shall be hydraulically tested after curing has completed. All structures shall be prepared for testing by plugging the outlets or providing proper standpipes. The structure shall be filled to the proper operating depth and maintained at that level for (7) days. No leakage will be allowed
- C. All cracks, leaks, and irregularities shall be properly and aesthetically repaired by the contractor at no additional expense to the Owner. All repairs shall be completed to the satisfaction of the Owner.

### 3.16 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform inspections and inspection reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
  1. Testing agency shall be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
  2. Testing agency shall immediately report to Engineer, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
  3. Testing agency shall report results of tests and inspections, in writing, to Owner, Engineer, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

- a. Test reports shall include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
  - 1) Project name.
  - 2) Name of testing agency.
  - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
  - 4) Name of concrete manufacturer.
  - 5) Date and time of inspection, sampling, and field testing.
  - 6) Date and time of concrete placement.
  - 7) Location in Work of concrete represented by samples.
  - 8) Date and time sample was obtained.
  - 9) Truck and batch ticket numbers.
  - 10) Design compressive strength at 28 days.
  - 11) Concrete mixture designation, proportions, and materials.
  - 12) Field test results.
  - 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
  - 14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections:

1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Engineer.

- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 20 cu. yd., but less than 45 cu. yd, plus one set for each additional 50 cu. yd. or fraction thereof.
    - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  2. Slump: ASTM C143/C143M:
    - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    - b. Perform additional tests when concrete consistency appears to change.
  3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; .
    - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  4. Concrete Temperature: ASTM C1064/C1064M:
    - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
  5. Compression Test Specimens: ASTM C31/C31M:
    - a. Cast and laboratory cure two sets of four 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
    - b. Cast, initial cure, and field cure two sets of two standard cylinder specimens for each composite sample.
  6. Compressive-Strength Tests: ASTM C39/C39M.
    - a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
    - b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
    - c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
  7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
  8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified

compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi or less, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.

9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests:
  - a. Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
  - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Engineer.
    - 1) Acceptance criteria for concrete strength shall be in accordance with ACI 350.5 section 1.6.7.3.
11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

### 3.17 PROTECTION

#### A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

**END OF SECTION 03 30 00**

**SECTION 03 60 00  
GROUT AND REPAIR MORTAR**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This section includes, but not limited to, the following:
  - 1. Grouting of structural base plates, equipment baseplates and other miscellaneous uses of non-shrinking grout.
  - 2. Epoxy grouting of anchor bolts and reinforcing bars to be installed in hardened concrete.
  - 3. Repair of deteriorated concrete surfaces
- B. Related Sections include, but are not limited to, the following:
  - 1. Division 03 Section – Concrete and Grout
  - 2. Division 32 – Exterior Improvements

1.03 SUBMITTALS

- A. The Contractor shall submit manufacturers' information indicating the application, formulation, and installation procedures for each brand and type of grout to be used.

1.04 PRODUCT HANDLING

- A. Delivery of Materials: Materials shall be delivered to the project site in original, new and unopened containers bearing the manufacturer's name and label showing at least the following information:
  - 1. Name of material.
  - 2. Federal specification number, if applicable.
  - 3. Manufacturer's name.
  - 4. Contents by volume for major constituents.
  - 5. Handling instructions.
  - 6. Application instructions.
- B. Storage of Materials: Materials shall be stored to prevent moisture contamination, damage, and deterioration of grout materials.
- C. Protection: Materials and Work shall be protected before, during and after

installation of the grout.

## **PART 2 - PRODUCTS**

### **2.01 NONSHRINKING GROUT**

- A. Nonshrinking Grout shall be: Sika Grout 212; Master Builders "Masterflow 713 Grout"; Savereisen Cement "F-100 Level Fill Grout"; U.S. Grout "Five Star Grout"; or USM "Upcon" or equal.

### **2.02 EPOXY GROUT**

- A. Adhesive: Two-component liquid equal to: Thermal-Chem "Mortar Resin Products M3"; Minwax "Por-Rok Anchoring Cement", or equal.
- B. Aggregate: As recommended by the epoxy grout manufacturer.

### **2.03 REPAIR MORTAR**

- A. The material to be used for repair of the Bar Screen structure shall be two-component, polymer-modified, cementitious, non-sag mortar equal to SikaTop-123 Plus" with FerroGard 901 penetrating corrosion inhibitor.

### **2.04 QUICK SETTING HYDRAULIC CEMENT**

- A. Quick setting hydraulic cement shall be SikaSet Plug, or equal

### **2.05 WATER**

- A. Clean and free of deleterious substances.

## **PART 3 - EXECUTION**

### **3.01 NONSHRINKING GROUT**

- A. General: Nonshrinking grout shall be furnished factory-premixed so only water is added at the project site. Grout shall be mixed in a mechanical mixer. No more water shall be used than is necessary to produce a flowable grout as recommended by the manufacturer.
- B. Preparation: Concrete to receive nonshrinking grout shall be saturated with water for 24 hours prior to grouting.
- C. Placement: Grout shall be placed in strict accordance with the directions of the manufacturer so all spaces and cavities below the top baseplates or against concrete slabs or walls are completely filled without voids. Forms shall be provided where structural components of baseplates or launders will not confine the grout.
- D. Finishing: The grout shall be finished smooth in all locations where the top surface or edge of the grout will be exposed to view after it has reached its initial set. Except where shown to be finished on a slope, the edges of grout shall be cut off flush at the baseplate, bedplate, member, or piece of equipment.
- E. Curing: Nonshrink grout shall be protected against rapid loss of moisture by



covering with wet rags or polyethylene sheets. After edge finishing is complete, the grout shall be wet cured for at least 7 days.

### 3.02 EPOXY GROUT

- A. General: Components shall be packed separately at the factory and field mixed. All proportioning and mixing of the components shall be in accordance with the manufacturer's recommendations.
- B. Preparation: Where indicated on the Drawings, anchor bolts and reinforcing bars shall be epoxy grouted in holes drilled into hardened concrete. Diameters of holes shall be  $\frac{1}{4}$  inch larger than the maximum dimension of the bolt head, and  $\frac{1}{2}$  inch larger than the bar diameter. The embedment depth for epoxy-grouted anchor bolts and reinforcing bars shall not be less than ten bolt or bar diameters unless indicated otherwise on the Drawings.
  - 1. Holes shall be prepared for grouting as recommended by the grout manufacturer.
- C. Installation: Anchor bolts and reinforcing bars shall be clean, dry, and free of grease and other foreign matter at the time of installation. The bolts and bars shall be set and positioned and the epoxy grout shall be placed and finished in accordance with the recommendations of the grout manufacturer. Particular care shall be taken to insure that all spaces and cavities are filled with epoxy grout, without voids.

### 3.03 REPAIR MORTAR

- A. General: Components shall be packed separately at the factory and field mixed. All proportioning and mixing of the components shall be in accordance with the manufacturer's recommendations.
- B. Preparation: Where indicated on the Drawings, the interior and exterior surfaces of the Bar Screen structure shall be cleaned and completely free of deleterious substances. The surfaces shall be free of standing or adhered water and shall be prepared in strict accordance with the manufacturer's requirements before the repair mortar is mixed and applied.
- C. Installation: All surfaces shall be clean, dry, and free of grease and other foreign matter at the time of installation. The mortar shall be placed and finished in accordance with the recommendations of the manufacturer. Particular care shall be taken to insure that all spaces and cavities are filled with repair mortar, without voids.

### 3.04 QUICK SETTING HYDRAULIC CEMENT

- A. General. Contents shall be packaged at the factory and mixed with water in the field to obtain the desired consistency. Proportioning and mixing shall be in accordance with the manufacturer's recommendations.
- B. Preparation. The concrete area to receive quick setting hydraulic cement should

- be thoroughly cleaned and lightly dampened just prior to application.
- C. Installation. The quick setting hydraulic cement shall be placed and finished in accordance with the recommendations of the grout manufacturer. Particular care shall be taken to insure that all spaces and cavities are filled without voids.

### 3.05 USES OF GROUT

- A. Non-shrink grout shall be used beneath all equipment bases and other locations shown on the Drawings or specified herein. Grouting thicknesses and application shall meet the equipment manufacturer's requirements.
- B. Epoxy grout shall be used at locations shown on the Drawings or specified herein. Repair of rock pockets or surface defects in concrete work approved for repair by the Engineer shall generally be repaired with epoxy grout unless otherwise directed by the Engineer. Anchor bolts approved by the Engineer for installation in concrete shall be set in epoxy grout unless otherwise directed by the Engineer. This grout shall not be used in contact with potable water.
- C. Quick setting hydraulic cement shall be used at locations shown on the Drawings or specified herein. All penetrations/joints in concrete manholes, vaults, or structures where a watertight seal is required shall use this type of grout.

**END OF SECTION 03 60 00**

**DIVISION 5**

**METALS**

**SECTION 05 50 00**  
**METAL FABRICATIONS**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Metal floor plate.
3. Metal Canopies.
4. Miscellaneous steel trim.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
2. Steel weld plates and angles for casting into concrete.

1.02 ACTION SUBMITTALS

A. Product Data: For the following:

1. Fasteners.
  - a. Furnish ICBO Evaluation reports, product data, and installation instructions for post-installed anchors.
2. Shop primers.
3. Shrinkage-resisting grout.
4. Slotted channel framing.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1.03 INFORMATIONAL SUBMITTALS

A. Adhesive Anchors. Furnish the following:

1. Manufacturer's past project experience data on at least three similar projects supplied with proposed system within the last three years, to include client name, address, contact person, phone number, project location, and description of work.
2. Test reports for each batch of adhesive delivered to site. Provide manufacturer's written certification that each batch delivered meets these Specifications, the intended uses on project, and capability to bond to damp or wet concrete surfaces.

3. Manufacturer's written letter of certification identifying contractor employees qualified for installing adhesive anchors, trained through jobsite instruction conducted by manufacturer.
  4. Furnish specific written statement from EPA and health agencies that the adhesive product is acceptable for use in potable water structures or conveyances prior to use on this project.
- B. All Concrete Anchors. Provide specific instructions or all phases of installation including hole size, preparation, placement, and procedures. Provide also specific instructions for safe handling and installation of all anchors to Contractor staff handling and installing these anchors.
- 1.04 QUALITY ASSURANCE
- A. Qualifications. Qualify welding operators in accordance with requirements of current AWS Standard Qualification Procedure D1.1, Chapter 5.
1. Qualification Tests. Performed by a recognized testing laboratory.
  - B. Certification. Certify welders of structural and reinforcing steel for all positions of welding in accordance with such procedure.
- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. Preparation for Shipment.
1. Insofar as practical, factory assemble items specified herein.
  2. Package and clearly tag parts and assemblies that are of necessity shipped unassembled, in a manner that will protect materials from damage, and facilitate identification and field assembly.
- B. Storage of Adhesive Products.
1. Store components on pallets or shelving in a covered storage area with locking door.
  2. Control temperature within 41 degrees F to 77 degrees F and dispose of product if shelf life has expired.
  3. If stored at temperatures above manufacturer's recommended maximum, test components prior to use to determine if they still meet specified requirements.

## **PART 2 - PRODUCTS**

### 2.01 PERFORMANCE REQUIREMENTS

- A. Like Items of Materials. End products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.
- B. Lifting Lugs. Provide on equipment and equipment components weighing over 100 pounds.

### 2.02 GENERAL

- A. Furnish miscellaneous items.
  - 1. Miscellaneous metal work and castings as shown, or as required to secure various parts together and provide a complete installation.
  - 2. Items specified herein are not intended to be all-inclusive. Provide metal work and castings shown, specified, or which can reasonably be inferred as necessary to complete the project.

## 2.03 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Corrosion-Resisting Structural-Steel Shapes, Plates, and Bars: ASTM A588, Grade 50.
- D. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 316L.
- E. Rolled-Stainless Steel Floor Plate: ASTM A793, Type 316L.
- F. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- G. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
  - 1. Size of Channels: 1-5/8 by 1-5/8 inches.
  - 2. Material: Galvanized steel, ASTM A653/A653M, structural steel, Grade 33 , with G90 coating; 0.108-inch nominal thickness.
- H. Aluminum Structural Shapes & Plates: Alloy 6061-T6, meeting referenced specifications & ASTM sections found in Aluminum Association current Construction Manual Series
- I. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
- J. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.
- K. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.

## 2.04 FASTENERS

- A. General: Unless otherwise indicated, provide ASTM A193, Type 316stainless steel fasteners if not permanently embedded in concrete, but located outdoors in areas subject to the weather; chemical handling areas; equipment rooms subject to drainage, leakage, and washdown; and in galleries and trenches.
  - 1. Provide stainless steel fasteners for fastening aluminum and stainless steel .
  - 2. ASTM A307 or A36 with ASTM A153 galvanized if not permanently embedded in concrete, and not used for structural steel or piping, but located indoors where wash down, leakage, and drainage are not likely to occur (e.g., in personnel

buildings excluding laboratories, on motor floors, in electrical equipment rooms, and in control rooms).

3. For Flanges of Piping, Valves, and Other Similar Connections. As specified in other sections, or as shown.
4. Tie Rod assemblies:
  - a. ASTM A307A or A36 with ASTM A153 galvanized for threaded rods.
  - b. ASTM A668 Class A with ASTM A153 galvanized for clevises and turnbuckles.
  - c. ASTM A307A or A36 with ASTM A123/A153 galvanized for clevis pins.

B. Anchor Bolts:

1. Nonsubmerged Use:
  - a. Galvanized Steel. For equipment and machinery, where permanently anchored into concrete, unless otherwise shown.
  - b. Diameter, Length, and Bend Dimensions. As required by equipment or machinery manufacturer. Unless otherwise required by calculations for seismic or other loadings, provide 5/8-inch minimum diameter and other geometry as shown.
  - c. Furnish minimum two nuts and a washer of same material for each bolt.
  - d. Provide sleeves as required or as shown for location adjustment.
2. Submerged Use:
  - a. Submerged use is defined as any connection below a point 1 foot 6 inches above maximum water surface elevation in a water holding basin.
  - b. As specified for nonsubmerged use, for anchoring equipment, machinery or other connection except as follows:
    - 1) 316 stainless steel.
3. For anchoring fabricated metal work or structural building columns, or other components where connections will be protected or dry.
  - a. Galvanized steel.
  - b. Minimum Size. 5/8-inch diameter by 12-inch long, unless otherwise shown or required by calculations.
  - c. Furnish two nuts and one washer per bolt of same material as bolt, unless otherwise shown.
4. For anchoring fabricated metal work or structural building, or structural frame components in areas of wet use, wash down areas, or areas outside heated buildings.
  - a. Galvanized steel.

- b. Minimum Size. 5/8-inch diameter by 12-inch long, unless otherwise shown or required by calculations.
    - c. Furnish two nuts and one washer per bolt of same material as bolt, unless otherwise shown.
  - C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors as indicated in Drawings.
    - 1. Manufacturer:
      - a. Dewalt Anchors
      - b. Hilti, Inc.
      - c. Simpson Strong-Tie
      - d. Or approved equal.

## 2.05 FLOOR PIPE SUPPORTS

- A. Approved Manufacturer and Type:
  - 1. Anvil International, adjustable pipe saddle support: Figure 264.
  - 2. Standon Model S92 Saddle Support.
  - 3. PHD Manufacturing Inc., adjustable pipe saddle support. Figure 875
  - 4. Or Approved Equivalent.
- B. Minimum vertical adjustment: 4½ inch.
- C. Provide complete with riser pipe and flange bolts for floor mounting.
- D. Provide precast concrete or grout base a minimum of 1" above floor.
- E. Provide as per recommended spacing, at minimum. Contractor shall install a minimum of one floor pipe support per pump discharge piping prior to the header piping.
- F. Contractor may also be required to construct concrete saddle pipe supports for floor piping as indicated on the Drawings. Contractor to provide all materials, formwork, and labor to construct as detailed on Drawings.

## 2.06 WALL SUPPORTS

- A. Steel brackets shall conform to MSS Type 31 for light duty, MSS Type 32 for heavy duty, and MSS Type 33 for heavy duty. Brackets shall be sized accordingly for full size and weight of piping system. All mounting hardware shall be stainless steel.
- B. Submerged piping shall be supported with Type 316 stainless steel hangers or steel bracket supports coated with two coats of bitumastic paint.

## 2.07 VERTICAL PIPE SUPPORTS

- A. Two bolt riser clamps shall be MSS SP 69 Type 8 galvanized or plastic coated.
- B. Four bolt riser clamps shall be MSS SP 69 Type 42 galvanized or plastic coated.



## 2.08 SADDLES AND SHIELDS

- A. Protection saddles shall be MSS SP 69 Type 39.
- B. Protection shields shall be MSS SP 69 Type 40.
- C. Wood insulation saddle shall be Elcen Metal Products Company, or equal.

## 2.09 PREFABRICATED OR FABRICATED PIPE SUPPORTS

- A. Pre-engineered support systems constructed of steel products factory fabricated by firms regularly engaged in the manufacture of these items shall be used for this work. Steel pipe support systems shall be blasted to a white clean condition after fabrication and hot-dip galvanized in accordance with ASTM 123, unless support is specified to be fabricated of stainless steel.
- B. Free-standing pipe connections to equipment shall be firmly attached to fabricated steel frames made of angles, channels, or I-beams. Frames shall be anchored to the structure.
- C. Exterior, free-standing overhead piping shall be supported by fabricated pipe stands, made of pipe columns anchored to concrete footings, with horizontal, welded steel angles and U-bolts or clamps securing the pipes.
- D. Special pipe supports for vertical and horizontal movement shall be as detailed on the drawings. Supports shall be fabricated by firms regularly engaged in the manufacture of these items.

## 2.10 SLEEVES AND SEALS

- A. Wall pipes shall connect piping to concrete structure. Wall pipes shall be ductile iron meeting the requirements of AWWA C115. Provide wall pipes where indicated on Drawings.
- B. Wall sleeves shall be ductile iron meeting the requirements of AWWA C151. Sleeves shall have cast waterstop collar. Cast waterstop collar shall have an outside diameter a minimum of four inches greater than the outside diameter of the wall sleeve.
- C. Approved Manufacturers:
  - 1. Sleeves for pipes through walls and floors:
    - a. Ductile Iron Water-Stop wall pipe.
    - b. Or Approved Equivalent.
  - 2. Bolted rubber annular seal:
    - a. Link Seal manufactured by Thunderline Corp.
    - b. Or Approved Equivalent.
  - 3. ANCHORS
    - a. Hollow Concrete Block and Brick Anchors:
  - 4. Acceptable Manufacturer and Type:
    - a. HIT S 12/A Combi Fastener manufactured by Hilti Corporation.

- b. Approved Equivalent.
  - 5. Accessories: HY20 Adhesive with screen tube insert.
  - 6. Use Type 316 stainless steel epoxy adhesive anchor bolts, Hilti 150 injection adhesive anchors, or equal, for building or structure attachments. Provide continuous concrete inserts, Unistrut P3200 series, or equal, where applicable.
  - 7. **MECHANICAL ANCHOR AND POWDER-ACTUATED DRIVE-PIN FASTENERS SHALL BE USED ONLY WITH PRIOR APPROVAL FROM THE ENGINEER.**
- 2.11 ANCHOR BOLT SLEEVE
- A. Fabricated Steel Sleeve.
    - 1. Material. A36 steel.
    - 2. Dimensions, welding, and sizes as shown.
- 2.12 MISCELLANEOUS MATERIALS
- A. Weld Electrodes: Provide weld electrodes that are compatible with the connected base metal(s).
    - 1. Use E70xx electrode to weld carbon steel base metals.
    - 2. Use low-alloy E80xx-W to weld weathering steel base metals.
    - 3. Use 308L electrode to weld austenitic stainless steel (types 301, 302, 304, 305 stainless steel) base metals.
    - 4. Use 316L electrode to weld type 316 and 316L stainless steel base metals.
  - B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
  - C. Stainless Steel Fastener Lubricant (Antiseizing)
    - 1. Provide for stainless steel nuts and machined bolts, anchor bolts, concrete anchors, and all other threaded fasteners.
    - 2. Lubricant shall contain substantial amounts of molybdenum disulfide, graphite, mica, talc, or copper as manufactured by:
      - a. Loc Tite Co., Permatex.
      - b. Or equal.
  - D. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- 2.13 FABRICATION, GENERAL
- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that

maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, not less than 8 inches from ends and corners of units and 24 inches o.c.

#### 2.14 MISCELLANEOUS FRAMING AND SUPPORTS

- A. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

#### 2.15 METAL FLOOR PLATE

- A. Fabricate from rolled-stainless steel floor plate of thickness indicated below:
  - 1. Thickness: As indicated.
- B. Provide stainless steel angle supports as indicated.
- C. Provide flush stainless steel bar drop handles for lifting removable sections, one at each end of each section.

#### 2.16 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
  - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
  - 1. Shop prime with primers specified in Section 09 90 00 "Painting and Coating" primers specified in Section 09 90 02 "High Performance Painting and Coating" unless indicated.
- C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION, GENERAL**

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

1. Do not begin installation until concrete or masonry receiving anchors have attained design strength.
  2. Do not install an anchor closer than six times its diameter to either an edge of concrete or masonry, or to another anchor, unless specifically shown otherwise.
- E. Apply specified antiseizing lubricant to threads prior to making up connections.
- F. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- 3.02 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS
- A. Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for overhead doors securely to, and rigidly brace from, building structure.
- C. Anchor shelf angles securely to existing construction with expansion anchors .
- D. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
- 3.03 ELECTROLYTIC PROTECTION
- A. Aluminum.
1. Where in contact with dissimilar metals, or embedded in masonry or concrete, protect surfaces as specified in Section 09 90 00 "Painting and Coating".
  2. Allow paint to dry before installation of the material.
  3. Protect painted surfaces during installation.
  4. Should coating become marred, prepare and touch up per paint manufacturer's written instructions.
- B. Where titanium equipment is in contact with concrete or dissimilar metals, provide full-face neoprene insulation gasket, 3/32-inch minimum thickness and 70 durometer hardness.
- 3.04 INSTALLATION OF BEARING AND LEVELING PLATES
- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.05 COATING

- A. Prime coat non-galvanized steel or non-stainless steel hangers and supports.
- B. Finish coat all hangers and supports, except galvanized and stainless steel hangers and supports, under provisions of Section 09 90 02 – Mechanical Painting and Coating.

3.06 REPAIRS

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

**END OF SECTION 05 50 00**

**SECTION 05 72 33**  
**ACCESS HATCH**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Work Included: Provide factory-fabricated floor access doors.

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's product data.
- B. Shop Drawings: Submit shop drawings including profiles, accessories, location, adjacent construction interface, and dimensions.
- C. Warranty: Submit executed copy of manufacturer's standard warranty.

1.03 QUALITY ASSURANCE

- A. Manufacturer: A minimum of 5 years of experience manufacturing similar products.
- B. Installer: A minimum of 2 years of experience installing similar products.
- C. Manufacturer's Quality System: Registered to ISO 9001 Quality Standards including in-house engineering for product design activities.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-vented area. Inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

1.05 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

**PART 2 - PRODUCTS**

2.01 MANUFACTURER

- A. Basis-of-Design Manufacturer: Type VSH-150-A-24-24-S-NS Hatch assembly, Web: <https://www.versahatch.com/water.html>.

2.02 ACCESS DOOR

- A. Furnish and install where indicated on plans a water reservoir access door Type VSH, size 24" width x 24" length. Length denotes hinge side. The floor access door shall be single leaf and pre-assembled from the manufacturer.

- B. Performance characteristics:
  - 1. Cover: Shall be reinforced aluminum to support a minimum live load of 150 psf.
  - 2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
  - 3. Operation of the cover shall not be affected by temperature.
  - 4. Entire door, including all hardware components, shall be highly corrosion resistant. Please consult the manufacturer when doors are to be installed in unusually harsh environments or extremely corrosive conditions.
- C. Cover: Shall be 1/4" aluminum diamond pattern. The cover shall overlap the frame a minimum of 2";
- D. Frame: Shall be 1/4" x 3"W x 4"H angle frame with external mounting flange and 9/16" diameter anchor holes (to accommodate 1/2" fasteners) on maximum 8" centers. Frame shall be a minimum of 4" above the curb;
- E. Gasket: A continuous bulb seal shall be between the lid and frame. Full face, 3"W closed cell foam EPDM gasket between frame and curb – install butyl mastic sealant bead if necessary to form waterproof seal;
- F. Hinges: Shall be heavy duty Type 316 stainless steel pintle hinges with 3/8" Type 316 stainless steel hinge pins and mounted with tamper-proof screws;
- G. Lifting Assistance: Manufacturer shall provide a gas strut lifting mechanism with a powder-coat finish to provide smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing.
- H. An exterior turn/lift handle shall be provided to open the cover
- I. A minimum of three swing bolt hold downs shall be provided to secure the hatch for weather proof seal;
- J. Hardware:
  - 1. Cover shall be equipped with an aluminum hold open arm that automatically locks the cover in the open position;
  - 2. Aluminum hasp to accommodate a supplied (keyed) padlock.
  - 3. Padlock shall be commercial-grade, weatherproof. Master ProSeries 6121 or equal.
  - 4. Hardware: Gas strut has a powder coat finish. All other hardware is type 316 stainless steel unless otherwise specified.
- K. Finishes: Factory finish shall be mill finish aluminum.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**



- A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
  - 1. Test units for proper function and adjust until proper operation is achieved.
  - 2. Repair finishes damaged during installation.
  - 3. Restore finishes so no evidence remains of corrective work.
  - 4. Stainless steel mounting bolts shall be 3/8" diameter on maximum 12" centers, epoxy set in the concrete top slab.

### 3.03 ADJUSTING AND CLEANING

- A. Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

**END OF SECTION 05 72 33**

**DIVISION 31**

**EARTHWORK**

**SECTION 31 00 00  
EARTHWORK**

**PART 1 - GENERAL**

1.01 DESCRIPTION

- A. This work is the excavation, trenching and backfilling for the placement of structures, utilities, equipment and appurtenances, handling and storing materials for fill and backfill, bracing, shoring, trench protection, subgrade preparation, final grading, site dressing and cleanup.
- B. To the extent possible, reuse existing topsoil and other materials excavated from the site.

1.02 REFERENCES

- A. The most recent publication of all the following form a part of this specification:

AASHTO T99	Moisture-Density Relations fo Soils and Soil-Aggregate Mixtures Using 5-lb Rammer and 12" Drop
ASTM D698	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5-lb Rammer and 12" Drop
AASHTO T191 ASTM D1556	Density of soil in-place by the sand-cone method
AASHTO T310 ASTM D6938	In-Place density and water content of soil and soil aggregate by Nuclear Method (Shallow Depth)
AASHTO T11 ASTM C117	Materials finer than 0.075 mm (No. 200) sieve in mineral aggregates by washing
AASHTO T27 ASTM C136	Sieve analysis of fine and coarse aggregate
AASHTO T89	Determining the liquid limit of soils
AASHTO T90	Determining the plastic limit and plasticity index of soils
ASTM D4318	Test method for liquid limit, plastic limit and plasticity index of soils

1.03 RELATED DOCUMENTS

- A. The following documents and specification sections apply directly to this Section:
  1. Division 01 Section "Payment Procedures" for a schedule of unit prices;
  2. Division 01 Temporary Facilities and Controls;

3. Division 02 - Existing Conditions Site Clearing;
4. Division 02 - Existing Conditions Dewatering;
5. Division 31 –Earthwork;
6. Division 32 - Exterior Improvements;
7. Division 33 - Utilities;
8. Division 40 – Process Interconnections

#### 1.04 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
- B. Base Course: Layer placed between the subbase course and asphalt paving.
- C. Bedding Course: Layer placed over the excavated subgrade before installing structure.
- D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations.
  1. Additional Excavation: Excavation below subgrade elevations as directed by Engineer. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
  2. Bulk Excavation: Excavations more than 10 feet in width and pits more than 30 feet in either length or width.
  3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, manholes, lagoon inlets, valve pits, lift stations, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.
- I. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

#### 1.05 SUBMITTALS

- A. Product Data: For the following:
  1. Drainage fabric (if applicable);
  2. Separation fabric (if applicable);
  3. Stabilization fabric (if applicable).

- B. Samples: For the following:
  - 1. 30 lb samples, sealed in airtight containers, of each proposed soil material from on-site or borrow sources.
  - 2. 1 ft x 1ft samples of drainage fabric.
- C. 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 or borrow soil material proposed for fill and backfill;
  - 2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for fill and backfill;
  - 3. Liquid limit, plastic limit and plasticity of soils in accordance with AASHTO T89 and T90, respectively.

#### 1.06 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 48 hours 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**

#### 2.01 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GM, GC, ML, SC, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, clayey soils, and other deleterious matter.
- C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GP, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
  - 1. Unsatisfactory soils also include satisfactory soils not maintained within 4 percent of optimum moisture content at time of compaction.
- D. Backfill and Fill: Satisfactory soil materials.
- E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed recycled concrete, and natural or crushed sand.

- F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed recycled concrete, and natural or crushed sand.
- G. Engineered (Structural) Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed recycled concrete, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1 ½ inch sieve and not more than 12 percent passing a #200 sieve.
- H. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand having a maximum ¾ inch size and must be free draining and nonplastic.
- I. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel having 100% passing the 1 ½ inch sieve and 0 to 10% passing the No. 10 sieve.
- J. Select Subgrade: Satisfactory soil materials, with no rocks larger than 2" in any dimension.

## 2.02 ACCESSORIES

- A. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides.

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

### 3.02 DEWATERING

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

### 3.03 EXPLOSIVES

- A. Blasting is not anticipated to be necessary for this project and will not be allowed.

### 3.04 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, notify geotechnical engineer and replace with satisfactory soil materials. No additional payment will be made for remedial action due to unsuitable soils.
  - 2. Meet OSHA requirements for excavations (including work performed in pre-existing excavated openings) and excavated material stockpiles. This may require design of temporary slopes and/or shoring by a licensed professional engineer.

### 3.05 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. 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 from 6 inches to 12 inches 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. Do not disturb bottom of excavations intended for bearing surface.

### 3.06 EXCAVATION FOR WALKS AND PAVEMENTS

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

### 3.07 APPROVAL OF SUBGRADE

- 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.
  - 1. No additional payment will be made for remedial action due to unsuitable soils.
- C. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

### 3.08 UNAUTHORIZED EXCAVATION

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

### 3.09 STORAGE OF SOIL MATERIALS

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

### 3.10 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
  - 1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
  - 2. Inspecting and testing underground utilities.
  - 3. Removing concrete formwork.
  - 4. Removing trash and debris.
  - 5. Removing temporary shoring and bracing, and sheeting.
  - 6. Installing permanent or temporary horizontal bracing on horizontally supported walls.

### 3.11 FILL

- A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- C. Place and compact fill material in layers to required elevations as follows:
  - 1. Under grass and planted areas, use satisfactory soil material.
  - 2. Under walks and pavements, use satisfactory soil material.
  - 3. Under steps and ramps, use engineered fill.
  - 4. Under footings and foundations, use engineered fill.



### 3.12 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 4 percent of optimum moisture content.
  - 1. Do not place backfill or fill 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 4 percent and is too wet to compact to specified dry unit weight.

### 3.13 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 8 inches of existing subgrade and each layer of backfill or fill material at 95 percent.
  - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 92 percent.
  - 3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85 percent.

### 3.14 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from 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. Cutout soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Lawn or Unpaved Areas: Plus or minus 1 inch.
  - 2. Walks: Plus or minus 1 inch.

### 3.15 FIELD QUALITY CONTROL

- A. Testing: The Engineer will perform field quality-control testing. The Contractor may also engage the services of a qualified testing firm to perform field quality-control testing

to verify the Engineer's testing results, at no additional cost to the OWNER.

- B. Allow Engineer to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. 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.
- D. Engineer and Contractor's independent firm (if applicable) will test compaction of soils in place according to ASTM D 2922. Tests will be performed at the following locations and frequencies:
  - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 square feet or less of paved area or building slab, but in no case fewer than three tests.
  - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length, but no fewer than two tests.
  - 3. Utility Structures: At each compacted backfill layer, at least one test for every 100 square feet or less, but no fewer than one test per structure.
- E. When Engineer's 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. Contractor shall be responsible for the cost of repeat testing conducted by the Engineer.

### 3.16 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 the greatest extent possible.

### 3.17 SURPLUS AND WASTE MATERIALS

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

and Engineer for location of satisfactory surplus soil to be placed.

**END OF SECTION 31 00 00**

**SECTION 31 10 00  
SITE CLEARING**

**PART 1 - GENERAL**

1.01 DESCRIPTION

- A. This work includes the identification, preparation, removal, stockpiling, salvage and disposal of existing surface materials at the project site which are impacted by or interfere with construction of the improvements.

1.02 RELATED DOCUMENTS

- A. The following documents and specification sections apply directly to this Section:
  - 1. Drawings and Special Provisions of the Contract;
  - 2. General and Supplementary Conditions;
  - 3. Division 01 – General Requirements;
  - 4. Division 02 – Existing Conditions;
  - 5. Division 31 – Earthwork;
  - 6. Division 33 – Utilities.

1.03 SUMMARY

- A. This Section includes, but not limited to, the following:
  - 1. Protecting existing trees and vegetation to remain.
  - 2. Removing trees and other vegetation as necessary.
  - 3. Clearing and grubbing.
  - 4. Topsoil stripping.
  - 5. Removing above-grade site improvements.
  - 6. Disconnecting, capping or sealing, and abandoning site utilities in place.
  - 7. Disconnecting and removing site utilities.

1.04 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of weeds, roots, and other deleterious materials.

1.05 MATERIALS OWNERSHIP

- A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.06 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- C. Notify utility locator service for area where Project is located before site clearing.

## **PART 2 - PRODUCTS**

### **2.01 SOIL MATERIALS**

- A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 "Excavation and Embankment."
  - 1. Obtain approved borrow soils materials off-site when satisfactory soil materials are not available on-site.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Locate and clearly flag trees and vegetation to remain or to be relocated.
- D. Protect existing site improvements to remain from damage during construction.
  - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

### **3.02 TREE PROTECTION**

- A. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
- B. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.
- C. Do not excavate within drip line of trees, unless otherwise indicated.
- D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Engineer.
  - 1. Replace trees that cannot be repaired and restored to full-growth status, as determined by a qualified arborist.

### 3.03 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
  - 1. Owner will arrange to shut off any publicly-owned utilities indicated to be removed.
  - 2. Contractor shall arrange to shut off any privately-owned utilities with utility companies.
- B. Existing Utilities: 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.

### 3.04 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
  - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
  - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
  - 3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
  - 4. Use only hand methods for grubbing within drip line of remaining trees.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
  - 1. Place fill material in horizontal layers not exceeding 8-inch loose depth, and compact each layer to a density equal to adjacent original ground unless otherwise specified in the Specifications.

### 3.05 TOPSOIL STRIPPING

- A. Remove weeds, debris and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
  - 1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.
  - 1. Stockpile surplus topsoil and allow for re-spreading deeper topsoil.

### 3.06 SITE GRADING

- A. Rough-grade the site to provide positive drainage away from all construction elements and away from the site in such a manner that no damage to adjacent property will result from runoff.
  - 1. Project site shall be graded sufficiently smooth to provide access to all elements of construction.

### 3.07 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
  - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

### 3.08 DISPOSAL

- A. Disposal: Remove surplus unsatisfactory soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

**END OF SECTION 31 10 00**

**SECTION 31 11 00  
CLEARING AND GRUBBING**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section includes:

1. Protection of features not designated for removal.
2. Site removals.
3. Disposal of waste materials.

B. Related Sections include:

1. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section.
2. Division 1 – General Requirement Specification Sections.
3. Division 31 – Earthwork Specification Sections.

1.02 REGULATORY REQUIREMENTS

- A. Conform to applicable codes and regulations for proper disposal of debris.
- B. Conform to applicable codes for worker safety.

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Construction Fencing: Construction fencing shall be orange plastic mesh, heavy duty, snow fencing fastened to metal or wood posts.

**PART 3 - EXECUTION**

3.01 PREPARATION

- A. Verify that existing plant life designated to remain is tagged or identified.
- B. Beginning work of this Section means acceptance of existing conditions.
- C. Identify and furnish an area for storing or placing removed material prior to the commencement of Work in this Section.

3.02 PROTECTION

- A. Locate, identify, and protect utilities that remain from damage.
- B. Protect trees, plant growth, and features designated to remain, as final landscaping.
- C. Protect bench marks, survey control points, and existing structures from damage.
- D. Prevent surface water and subsurface or groundwater from entering excavations, from ponding on prepared subgrades and from flooding site and surrounding area.



- E. Contractor shall repair or replace, to original condition or better, existing structures and improvements, flora, and landscaping damaged or injured during construction operations. Contractor shall understand the sensitive nature of working on or near developed property and shall endeavor to limit injury or damage both inside the limits of construction and outside the limits of construction.
- F. Protect existing trees and other vegetation indicated to remain from unnecessary cutting, breaking, skinning of roots, skinning and bruising of bark, smothering of trees, by stockpiling construction materials or excavated materials within the drip line, excess foot of vehicular traffic, or parking of vehicles within drip line.
- G. Protect wetlands, rivers, streams, and other waters of the state from all construction activities and contamination by erosion and runoff.
- H. Protect areas that have been finish graded from subsequent construction operations, traffic, and erosion. Remove, provide new, and compact as required, material contaminated by erosion and runoff

### 3.03 CLEARING

- A. Clear areas required for access to site and execution of Work.

### 3.04 GRUBBING

- A. Shall conform to Montana Department of Transportation (MDT) Standard Specifications for Road and Bridge Construction (2014 edition). Section 201.03.1 shall be followed except as specified below and absolutely no burning will be allowed.
  - 1. Grubbing operations may be completed by removal of stump section or by grinding
  - 2. Remove stumps, logs, roots, and other organic matter located within proposed pavements and structures to the depth indicated:
    - a. Gravel or paved surface: 48” below surface grade.
    - b. Grass areas: 12” below surface grade
    - c. Other structures or utilities: 36” below existing ground or finish grade, whichever is lower.
- B. Depressions resulting from grubbing operations shall be backfilled in accordance with other sections in Division 31.

### 3.05 DISPOSAL OF WASTE MATERIALS

- A. Remove all clearing and grubbing debris from the site in accordance with the Contract Documents and all permits and regulations. Burning shall not be allowed on Owner’s property.

**END OF SECTION 31 11 00**

**SECTION 31 11 10**  
**REMOVAL OF EXISTING PAVEMENT, CONCRETE CURB, SIDEWALK,**  
**DRIVEWAY, AND/OR STRUCTURES**  
(Reference MPWSS Section 02112)

All applicable portions of MPW Standard Specification Section 02112 shall apply with the following additions, deletions, and/or modifications.

**PART 3 - EXECUTION**

Delete the last sentence of 3.1.C and add the following:

Edges on all concrete and asphalt shall be straight lines and vertical cuts made with a saw. Concrete shall be cut with a saw to a depth of 4 inches minimum. Section deeper than 4 inches may be broken after cutting. Resulting face shall not be flatter than a 1:1 from vertical. Construction methods will not disturb the remaining concrete slabs.

All slabs to remain shall be replaced, if disturbed, at no cost to the owner.

Exercise care in removal of existing tree roots that conflict with the work. Tree roots shall be removed by saw-cutting the roots to a neat line at the extent of the excavation. Remove only the minimum amount of roots necessary in order to complete the work.

**PART 4 - MEASUREMENT AND PAYMENT**

DELETE: Entire Section and refer to Section 01 29 00

**END OF SECTION 31 11 10**

**SECTION 31 14 13**  
**SOIL STRIPPING AND STOCKPILING**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section includes:

1. Protection of features not designated for removal.
2. Topsoil Removal.
3. Stockpiling of Materials.
4. Stockpile Cleanup.
5. Estimated Excess Material Volumes.

B. Related Sections include:

1. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section.
2. Division 1 – General Requirement Specification Sections.
3. Division 31 – Earthwork Specification Sections.

1.02 DESCRIPTION

- A. Limits of construction are shown on the Drawings. Excavation shall not be allowed outside of the limits of construction where shown on the Drawings without prior written approval from ENGINEER.
- B. Materials may be temporarily stockpiled on the site within the limits of construction or where shown on the Drawings.
- C. Protect benchmarks and existing structures that are to remain from damage or displacement.

1.03 FIELD MEASUREMENTS

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

1.04 DEFINITIONS

- A. Soil Testing Laboratory: Refers to a professional soils engineering firm with soil sampling and testing services that is independent from the Contractor.
- B. Structures: Existing and new construction, including slabs, buildings, footings, tanks, and other structural elements.

1.05 SITE CONDITIONS

- A. Soil borings were taken for this project by Pioneer Technical Services. The Geotechnical Investigation Report is included in the appendix of this manual.
- B. Data indicated on the subsurface conditions are not intended as representations,

warranties of accuracy, or continuity between soil borings. It shall be expressly understood that Owner and Engineer shall not be responsible for interpretations or conclusions drawn from these reports by the Contractor. The information is made available for the convenience of the Contractor and is in no way, shape, or form considered a part of this Contract.

- C. Contractor shall determine to Contractor's own satisfaction the nature and location of subsurface obstacles and the nature of soil and water conditions which will be encountered during the work.
- D. Contractor may perform additional test borings or other exploratory operations at Contractor's own expense. Contractor shall make arrangements for any additional soils investigation with Owner.
- E. No claim for additional payment will be accepted due to the nature of subsurface conditions in which the work is to be performed.
- F. Do not commence construction of structure foundation until soil test results are confirmed.

#### 1.06 ADDITIONAL PAYMENT

- A. All excavation, removal, and disposal of earth, peat, muck, and other materials; erosion control; sheeting, shoring, and bracing; fill and backfill, placement, compaction, grading, source quality testing; stockpiling; and all other work under this Section shall be considered incidental to the Project and no claim for additional compensation of extra work will be accepted.
- B. No claim for additional payment will be accepted for excavation and fill for all or improvements required for removal of unsuitable material up to three (3) feet below bottom of proposed foundation or one (1) foot below bottom of noted geosynthetically reinforced structural fill or one (1) foot below minimum excavation limit or as noted on the Drawings, whichever results in the greater excavation and fill.
- C. Excavation and fill required for removal of unsuitable material deeper than the above limits will be paid for on a time and materials basis if conditions found in the Geotechnical Report are found to differ from actual conditions experienced on site. No additional payment will be made for conditions reflected in the Geotechnical Report.
- D. No claim for additional payment will be accepted for repairs made to subgrade due to weather related items.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION**

#### 3.01 INSPECTION

- A. Contractor shall verify which native materials are suitable for reuse at the site. Provide testing data as required and keep materials separated.
- B. Notify Engineer of any unsuitable materials.

### 3.02 PROTECTION

- A. Protect all existing structures, trees, plantings, turf, and other facilities which are not scheduled for removal.

### 3.03 TOPSOIL REMOVAL

- A. All topsoil shall be stripped to full depth and stockpiled separately to be placed on top of finished grading and all disturbed areas not covered by structures or pavement. Remove all heavy growths of grass prior to stripping topsoil.
- B. Separate all debris, large roots, and rocks greater than one (1) inch from the topsoil and remove from the site in accordance with all applicable Federal, State, and Local regulations to Contractor furnished site.
- C. Where trees are to be left standing, stop topsoil stripping a sufficient distance (at least the drip line) from a tree to prevent damage to main root system.

### 3.04 STOCKPILING OF MATERIALS

- A. Contractor may temporarily stockpile acceptable materials including topsoil, excess excavated, and delivered materials within the limits of construction where shown on the Drawings. Contractor shall obtain approval from Engineer before stockpiling excess materials.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.
- E. Apply appropriate erosion control measures to stockpile areas.
- F. Avoid stockpiling in location of future levee or berm around the site.
- G. Contractor shall remove all excess stockpiles from the site prior to substantial completion of the project.

### 3.05 STOCKPILE CLEANUP

- A. Remove stockpile; leave area in a clean and neat condition. Grade site surface to prevent freestanding surface water.
- B. Restore stockpile area in accordance with Section 32 90 00.
- C. Temporary Stockpile Area:
  - 1. Contractor shall place material from excavations onsite in the area designated on the plans.

**END OF SECTION 31 14 13**

**SECTION 31 22 00**  
**GRADING**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes general requirements and procedures for site grading including, but not limited to, the following:
  - 1. Rough Grading
  - 2. Finish Grading
  - 3. Topsoil Placement
- B. Related Sections include:
  - 1. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section.
  - 2. Division 1 – General Requirement Specification Sections.
  - 3. Division 31 – Earthwork Specification Sections.

1.02 DESCRIPTION

- A. Contractor shall grade the site as shown on the Drawings. Contours and spot elevations indicate finished surface grades.
- B. Construct uniform slopes between contours and spot elevations.
- C. Limits of construction are shown on the Drawings as indicated by the fencing boundary. Excavation, placement of fill, or general grading shall not be allowed outside of the limits of construction where shown on the Drawings.
- D. Materials may be temporarily stockpiled on the site within the limits of construction or where shown on the Drawings.
- E. Topsoil removal and rough grading of the site shall be completed prior to structure erection.
- F. Perform finish grading and topsoil placement after structure erection.
- G. Protect benchmarks and existing structures that are to remain from damage or displacement.
- H. All earthwork shall be performed in a manner and sequence that will provide drainage and proper erosion control at all times.

1.03 FIELD MEASUREMENTS

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Topsoil: Type S4 as specified in Section 31 05 13.
- B. Subsoil Fill: Type S1 or S2 as specified in Section 31 05 13.
- C. Engineered Fill: Type A4 as specified in Section 32 05 16.
- D. Aggregate Base and Surface Course: Type A3 and A2 respectively as specified in Section 32 05 16 and shown on drawings.
- E. Provide source testing data in accordance with Section 01 40 00.

## 2.02 SOURCE QUALITY CONTROL

- A. Conduct the following tests on each material proposed for use prior to start of soils work. Refer to Section 01 40 00 for source test requirements.

## **PART 3 - EXECUTION**

### 3.01 INSPECTION

- A. Verify structure and trench backfilling have been inspected.
- B. Verify subgrade base has been contoured and compacted.

### 3.02 PROTECTION

- A. Contractor shall conduct all grading operations within the limits of construction where shown on the Drawings, and within the designated grading limits as shown from contours and spot elevations.
- B. Protect all existing structures, trees, plantings, turf, and other facilities which are not scheduled for removal.
- C. Provide proper erosion and sediment control for all grading operation.
- D. Repair disturbed areas and compact to required density prior to further work.
- E. Remove material contaminated by erosion and runoff, provide new material and compact.

### 3.03 SUBSTRATE PREPARATION

- A. Eliminate uneven areas and low spots.
- B. Remove debris, roots, branches, and stones in excess of 2 inches in size. Remove subsoil contaminated with petroleum products.
- C. Scarify surface to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

### 3.04 ROUGH GRADING

- A. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth finish surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Grade surface of fill under structures and slabs to required density, free of voids, and to

required elevations.

- C. Rough grade areas adjacent to structure lines to drain away from structures and to prevent ponding or increase in soil lateral pressure on the structure.

### 3.05 FINISH GRADING

- A. Contractor shall provide the degree of finish grading that will be normally obtainable through the use of suitable equipment operated under favorable conditions and by an experienced operator. Deviations from the required tolerance shall be corrected by the Contractor at no additional cost to the Owner.

### 3.06 TOPSOIL PLACEMENT

- A. Place topsoil in areas where seeding and restoration is required to a nominal depth of 6 inches. Place topsoil during dry weather.
- B. Use imported topsoil as a supplement to stockpiled topsoil only when a 6 inch depth is unable to be maintained.
- C. Drag topsoiled areas to remove wheel tracks and provide a uniform texture and appearance.
- D. Place fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade. Finish grades shall allow for proper drainage without ponding.
- E. Remove roots, weeds, rocks, and foreign material while spreading.
- F. Manually spread topsoil close to plant life and buildings to prevent damage.
- G. Lightly compact placed topsoil.
- H. Remove surplus subsoil and topsoil from site. Contractor shall pay for loading, hauling, and spreading of all excess topsoil materials removed from the site or placed and spread on-site by direction of Owner or Engineer.
- I. Contractor shall pay for additional topsoil that is required at the site, including providing transporting and placing topsoil.
- J. Leave stockpile area and site clean and raked, ready to receive landscaping.

### 3.07 TOLERANCES

- A. Top of Topsoil: Plus or minus 1 inch.

**END OF SECTION 31 22 00**



**SECTION 31 22 10**  
**GRAVEL ROADWAY, SHOULDERS AND PARKING LOTS**

**PART 1 - GENERAL**

The work covered by this section of the specifications shall consist of furnishing, placing, watering, shaping and compacting gravel to provide a firm and stable roadway, parking lots or driveways where being replaced or improved. Existing gravel roadways, driveways and parking lots disturbed during construction shall be replaced with gravel as noted on the drawings. The typical section for gravel shall be as shown on the drawings. Minor surface repairs shall be made with crushed gravel surface course only at no cost to the Owner.

**END OF SECTION 31 22 10**

**SECTION 31 23 13**  
**SUBGRADE PREPARATION**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section Includes:

1. Scarifying, compacting and shaping the earth subgrade.
2. Perform subgrade preparation on all areas to receive concrete pavement, bituminous pavement, aggregate base course, and/or aggregate surface course.

B. Related Sections:

1. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section.
2. Division 1 – General Requirements Specification Sections.
3. Division 31 – Earthwork Specification Sections

**PART 2 - PRODUCTS**

2.01 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to approval of the Engineer.
- B. Suitable Soil Materials: On-Site excavated material or imported material meeting subsoil classification S1, S2, or S3 as defined in Section 31 05 13, free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.

**PART 3 - EXECUTION**

3.01 GENERAL

- A. The contractor shall follow the recommendations as provided in the Geotechnical Report by Pioneer Technical Services. The Geotechnical Investigation Report and associated Addenda are included in the Appendix of this Project Manual.
- B. Subgrade Preparation shall consist of producing a firm and stable subgrade prior to placement of the surface or base course.

3.02 SUBGRADE PREPARATION

- A. The Contractor shall compact and shape the subgrade for its full width as may be necessary to produce, at the time the base course is placed, the required density in the upper 12-inches of the base and the required grade and cross-section.
- B. If areas are encountered that cannot be compacted, sub-excavate unstable materials and replace with materials that can be compacted.

- C. Contractor shall be responsible for drying the subgrade soil or applying water as may be necessary to obtain the required density. Contractor shall also be responsible for grading the Work area and providing drainage so that accumulating water will drain away from the subgrade.
- D. The finished subgrade surface shall be smooth and uniform and shall not rut, shove, flex, or displace when any construction equipment is placed on it.
- E. The required grade and cross-section for subgrades shall consist of a smooth subgrade surface that conforms to the prescribed elevations for the particular subgrade being prepared, prior to constructing an additional course thereon. The required grade and cross-section for rough graded surfaces shall consist of a smooth graded surface that conforms to the prescribed elevations for that particular rough grade being prepared. The prescribed elevation for any point on the subgrade or rough graded surfaces shall be as determined from the grades staked by the Engineer.
- F. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations, vehicular traffic, or weather conditions.
- G. Subgrade preparation shall apply to all mat foundations, pipe trenches, concrete slabs, paved and graveled areas, including roads, driveways, parking areas, and sidewalks.
- H. Testing requirements for subgrade preparation shall be as follows:
  - 1. Shall conform to requirements of Section 01 40 00.

### 3.03 SPECIAL REQUIREMENTS

- A. Only hand-operated compaction equipment should be used within 5 feet of walls.
- B. Final subgrade elevation improvements for mat foundations should be smoothed using a vibratory plate, care shall be taken to prevent pumping of subgrade.

### 3.04 TOLERANCES

- A. Finish subgrade or rough graded surfaces shall not deviate by more than 1 inch from the required section and grade.

**END OF SECTION 31 23 13**

**SECTION 31 23 16**  
**EXCAVATION**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section includes:

1. Requirements for Excavation.
2. Subgrade Preparation.
3. Common Excavation.
4. Structural Excavation.
5. Estimated Excavation Quantities.
6. Disposal.

B. Related Sections:

1. The General Conditions, Supplementary Conditions, and General Requirements apply to work of this section.
2. Division 1 – General Requirements Specification Sections.
3. Division 31 – Generally all Earthwork Specification Sections.
4. 31 23 33 – Specifically Trenching & Backfilling

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM).
- B. Montana Public Works Standard Specifications (MPWSS), latest edition.

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00:

1. Test Results: Prior to start of work, submit written reports for each material sampled and tested. Include project identification, date of report, name of contractor, name of testing laboratory, source of material, manufacturer and brand name for manufactured products, specification requirements for each material, and corresponding test results.
  - a. Tests must have been taken no more than 180 calendar days before Notice to Proceed.
2. Product Data: Information on manufactured products indicating compliance with requirements of this Section.

1.04 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.
- B. Structures: Existing and new construction, including slabs, buildings, tanks, and

structural elements and systems.

- C. Acceptable Materials: Material that will provide for the indicated soil bearing capacity, soil densities, material requirements and that, in the opinion of soil testing laboratory, will not be subject to future decomposition, settlement, subsidence, expansion and are otherwise of the required soil type.
- D. Unsuitable Materials: Material that will not provide for the indicated soil bearing capacity and soil densities and that in the opinion of the soil testing laboratory will be subject to future decomposition, settlement, subsidence, expansion, and are otherwise not of the required soil type.
- E. Soil Testing Laboratory: Refers to professional soils engineering firm with soil sampling and testing services and that is independent from the Contractor. The soil testing laboratory's engineer shall be licensed in the State of Montana.
- F. Prepared Ground Surface: Ground surface after completion of clearing and grubbing, topsoil removal, excavation to grade, and scarification and compaction of subgrade.
- G. Common Excavation: Defined as the excavation of all materials that can be excavated, transported, and unloaded using heavy ripping equipment and wheeled/tracked tractors/scrapers with pusher tractors or that can be excavated and dumped into place or loaded onto hauling equipment by excavators equipped with attachments (shovel, bucket, backhoe, dragline, or clam shell) appropriate to the material type, character, and nature of the materials.
- H. Rock Excavation: Defined as the excavation of all naturally hard, compacted, cemented or bedrock materials that require the use of heavy ripping equipment (including fragmenting and/or equipment significantly larger than that defined for common excavation). The excavation and removal of isolated boulders larger than 1 cubic yard (yd<sup>3</sup>) encountered in materials otherwise conforming to the definition of common excavation shall be classified as rock excavation. The presence of isolated boulders larger than 1 yd<sup>3</sup> is not in itself sufficient cause to change the classification of the surround material;
  - 1. Heavy ripping equipment: a rear-mounted, heavy duty, single-tooth ripping attachment mounted on a track type excavator or dozer having a power rating of at least 250 flywheel horsepower unless otherwise specified

#### 1.05 SITE CONDITIONS

- A. Soil borings were taken for this project by Pioneer Technical Services. The Geotechnical Investigation Report is included in **Appendix A** of this Project Manual
- B. Data indicated on the subsurface conditions are not intended as representations, warranties of accuracy, or continuity between soil borings. It shall be expressly understood that Owner and Engineer shall not be responsible for interpretations or conclusions drawn from these reports by the Contractor. The information is made available for the convenience of the Contractor and is in no way, shape, or form considered a part of this Contract.

- C. Contractor shall determine to Contractor's own satisfaction the nature and location of subsurface obstacles and the nature of soil and water conditions which will be encountered during the work.
- D. Contractor may perform additional test borings or other exploratory operations at Contractor's own expense. Contractor shall make arrangements for any additional soils investigation with Owner.
- E. No claim for additional payment will be accepted due to the nature of subsurface conditions in which the work is to be performed.
- F. Do not commence construction of structure foundation until soil test results are confirmed.
- G. See Geotechnical Excavation Report by Pioneer Technical Services for recommended soil bearing capacities for footings and structures.

#### 1.06 CONVENTIONAL QUALITY ASSURANCE

- A. Source Quality Control Testing: Retain the services of an independent soil testing laboratory for Source Quality Control sampling and testing.
- B. Materials and installed work may require testing and retesting, as required by Engineer, at any time during progress of work.
- C. Allow free access of testing laboratory to material stockpiles and facilities at all times.
- D. Tests including retesting of rejected materials and installed work shall be at Contractor's own expense unless otherwise indicated.
- E. See Section 01 40 00 for additional requirements.

#### 1.07 SEQUENCING AND SCHEDULING

- A. Additional excess material shall be stockpiled in accordance with Section 31 14 13.

#### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Stockpile delivered materials and excavated materials at locations approved by Owner until required for backfill or fill. Place, grade, and shape stockpiles for drainage.
- B. Store materials in manner that will not impose additional loading and soil pressure on excavation limits and structures.

#### 1.09 PAYMENT

- A. All earth rock, peat, muck and all other excavation, removal and disposal required; erosion control, sheeting, shoring and bracing; fill and backfill; placement compaction, grading, source quality control testing, and all other work required under this Section shall be considered incidental to the Project and no claim for compensation or extra work will be accepted.
- B. No claim for additional payment will be accepted for excavation and fill for all structures required for removal of unsuitable material of up to three (3) feet below bottom of foundation or one (1) feet below noted structural fill or backfill or one foot below

minimum excavation limit as noted on Drawings, whichever results in the greater excavation and fill.

- C. Excavation and fill required for removal of unsuitable material deeper than the above limits will be paid for on a time and materials basis if conditions found in the Geotechnical Report are found to differ from actual conditions experienced on site. No additional payment will be made for conditions reflected in the Geotechnical Report.
- D. No claim for additional payment will be accepted for repairs made to subgrade due to weather related problems.

#### 1.10 FIELD MEASUREMENTS

- A. Survey benchmarks, control points, and intended elevations for the Work are as shown on the Drawings or will be provided by the Engineer.

#### 1.11 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.
- B. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.
- C. Contractor shall excavate for structures, pipe, and utilities at grades shown on the Drawings. Careful consideration shall be given to whether elevations shown are invert elevations or centerline elevations, Contractor shall make appropriate adjustment depending on elevation shown.

### **PART 2 - PRODUCTS**

#### 2.01 EXCAVATION MATERIALS

- A. See Section 31 05 13 for materials specifications.

#### 2.02 SOURCE QUALITY CONTROL

- A. See Section 31 23 16 and Section 01 40 00 for material quality testing requirements.

### **PART 3 - EXECUTION**

#### 3.01 INSPECTION

- A. Examine project site and conditions under which work of this Section is to be performed.
- B. Contractor shall verify which native materials are suitable for reuse at the site. Provide testing data as required and keep materials separated.
- C. Notify Engineer of any unsuitable materials.
- D. Do not over excavate without authorization from Engineer.

#### 3.02 PREPARATION

- A. An OSHA approved competent person shall review the above mentioned soil classification in the field. Excavations shall comply with the requirements of OSHA 29 CFR, Part 2926, Subpart P, "Excavations and Trenches." Excavation safety is the

responsibility of the Contractor. All excavations greater than 20 feet in depth shall be designed by a registered Professional Engineer.

B. Protection

1. Locate existing utilities in areas of work. Protect utilities that are to remain.
2. Protect structures from damage and from damage caused by groundwater, surface water, flood or floatation forces, lateral movement, settlement, undermining, washout, and other undesirable conditions created by the work.
  - a. Maintain drainage when drainage ways are obstructed by earthwork and related operations.
3. Protect areas beyond construction zone with erosion control system.
4. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when allowed by utility owner and then only after acceptable temporary utility services have been provided.
  - a. Provide temporary services, complying with Federal, State and local laws and regulations, and as acceptable to Owner, during any interruptions.
5. Maintain full access to structure exits and entrances, fire hydrants, street crossings, sidewalks, and other points as designated by Owner to prevent significant interruption of accessibility.
6. Do not bring explosives on site or use in work.
7. Maintain excavations and stockpiles to prevent caving, heaving, slides, and increased soil pressures on adjacent and underlying structures.
8. Maintain existing site drainage ways or provide new paths of drainage for site as required to perform earthwork.

C. Dry subgrade: Add water, then mix to make moisture content uniform throughout.

D. Wet subgrade: Aerate material by blading, discing, harrowing, or other methods to hasten drying process.

E. Excavation support: Install and maintain, as specified in Section 31 41 00, Shoring, as necessary to support sides of excavations and prevent detrimental settlement and lateral movement of existing facilities, adjacent property, and completed Work.

3.03 PROTECTION

A. Locate existing utilities in areas of work. Protect utilities that are to remain.

B. Protect structures from damage and from damage caused by groundwater, surface water, flood or floatation forces, lateral movement, settlement, undermining, washout, and other undesirable conditions created by the work.

1. Maintain drainage when drainage ways are obstructed by earthwork and related operations.



- C. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when allowed by utility owner and then only after acceptable temporary utility services have been provided.
  - 1. Provide temporary services, complying with Federal, State and local laws and regulations, and as acceptable to Owner, during any interruptions.
- D. Protect areas that have been finish graded from subsequent construction operations, traffic, and erosion.
  - 1. Install erosion control protection along perimeter of unfinished areas.
- E. Maintain full access to structure exits and entrances, fire hydrants, street crossings, sidewalks, and other points designated by Owner to prevent significant interruption of accessibility.
- F. Do not store explosives within one mile of any residential or commercial structure. See Section 3.06.C below for restrictions on blasting for rock excavation.
- G. Maintain excavations and stockpiles to prevent caving, heaving, slides, and increased soil pressures on adjacent and underlying structures.
- H. Repair disturbed areas and compact to required density prior to further work.
- I. Remove material contaminated by erosion and runoff, provide new material and compact.

#### 3.04 COMMON EXCAVATION

- A. Excavate designated areas to the proposed subgrade elevations indicated on the Drawings.
- B. Contractor shall advise Engineer immediately if any unsuitable materials are encountered during excavation. Unsuitable materials shall be reasonably separated from unsuitable materials and shall be considered surplus material at no additional cost to the Owner.
- C. If Contractor encounters excess excavation materials which meet the requirements of common fill as specified herein, Contractor may use those materials as common fill. Contractor shall verify with soils testing laboratory suitability of the use of on-site material.
- D. Excavating shall be done in accordance with Section 31 23 16.

#### 3.05 STRUCTURAL EXCAVATION

- A. Remove unsuitable materials in accordance to the depth recommended by soils testing laboratory beneath structures to obtain the design bearing capacity.
  - 1. Do not bear any structure partially on bedrock and partially on more compressible soils. Remove bedrock materials and replace them with clean compacted sand or gravel in accordance to the Geotechnical Report. The minimum depth of compacted sand or gravel is 6-inches.
  - 2. Do not bear any structure on wet sandy or clay material.

3. Dewater excavations for inspector to observe and determine excavation limits.
  4. When bottoms of excavations are approved by soils testing laboratory, but are slightly unstable only in relation to Contractor operations or convenience, Contractor may provide a compacted gravel course utilizing materials acceptable to the soil testing laboratory. Such work shall be considered for the Contractor's convenience and at Contractor's own expense.
- B. Slope sides of excavations as required to provide stability and to comply with Federal, State and local laws and regulations. Shore and brace excavation when required by project conditions.
1. Utilize cofferdams, steel sheet piling, shoring, underpinning, and other systems required to prevent damage to existing structures, settlement, slope stability problems, and undermining.
  2. Remove construction related protection systems after their need is complete, in a manner that will not loosen or damage soils, create slope stability problems, and otherwise damage existing and new structures.
    - a. Leave construction-related protection systems in place when their removal would create potential for damage to the soil conditions or to structures.
- C. Excavate to required elevations and dimensions within a tolerance of plus or minus 1 inch, and extending a sufficient distance as required to provide for the work, completion of the structures, observation, and testing.
1. When excavating for footings and foundations, do not disturb soil materials at and below excavation limits. Excavate by hand when necessary to prevent damage to soil materials that will remain.
  2. Trim bottoms to required lines and grades to leave solid dense base of required bearing capacity.
  3. Final removal limits shall be approved by soil testing laboratory prior to concrete placement.
- D. Removal of materials beyond required subgrade elevations or dimensions without specific approval of soils testing laboratory as well as backfilling, compaction and remedial work recommended by soils testing laboratory at the over-excavated area shall be at Contractor's own expense.
1. Under structures and their components fill unauthorized excavation utilizing one of the following systems:
    - a. Extend indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation.
    - b. Install lean concrete fill to bring elevations to required position.
    - c. Fill/compact unauthorized excavations with soil materials and to required density.

2. Elsewhere, backfill and compact unauthorized excavations as indicated for authorized excavations of same classification
- E. Protect excavation bottoms from freezing. Remove frozen materials and provide unfrozen compacted materials prior to placement of materials on them.
- F. Excavations of structures shall be widened a minimum of one foot horizontally beyond the outer edges of the building perimeter footings for each foot the excavations extend below bottom-of-footing elevations.
- G. It is anticipated the excavation bottom for each structure will consist of sand soils, lean clay or a combination of both. These soils shall be maintained within the prescribed moisture content range until successive layers are placed over them. Thus, if the placement of backfill and fill is slowed or delayed during dry or wet weather, re-conditioning of the placed backfill, fill and natural soils may be necessary.
- H. Prior to the placement of engineered fill or construction of structures, any loosened granular materials shall be surface compacted using a vibratory plate compactor. In areas where groundwater is within 3 feet of the subgrade this requirement may be waived in the field by the Engineer if it is found the compaction is pumping up water or creating a temporary “quick” condition and the soils are otherwise suitable for support of the foundations. Areas that yield or pump during surface compaction may require additional subcutting.

### 3.06 ROCK EXCAVATION

- A. Excavate designated pipe trenches and storage tank area to the proposed subgrade elevations indicated on the Drawings.
- B. Contractor shall advise ENGINEER immediately if rock excavation meeting the requirements of this Section is necessary – particularly during common excavation for the installation of distribution main, or service lines. ***The ENGINEER and Contractor shall reach agreement on the classification of excavation prior to engaging in anything but common excavation.***
- C. Blasting shall not be allowed within 500' of any occupied, residential structure. The Contractor is wholly responsible for any and all damages or injuries that occur as a result of blasting on this project.
- D. Excavating shall be done in accordance with Section 31 23 16.

### 3.07 DISPOSAL

- A. Excess soil, if any exists, shall be stockpiled on the site. Contractor shall remove unsuitable material such as muck, organic matter, trash, and refuse from the site and dispose of said material according to applicable Federal, State, and local regulations. No additional payment will be provided for off-site disposal.

**END OF SECTION 31 23 16**

**SECTION 31 23 21  
FILL AND BACKFILL**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes general requirements and procedures for site grading including, but not limited to, the following:
  - 1. Filling, Backfilling, and Compacting.
- B. Related Sections include, but are not limited to:
  - 1. The General Conditions, Supplementary Conditions, and General Requirements apply to work of this section.
  - 2. Division 1 – General Requirements Specification Sections.
  - 3. Division 31 – Earthwork Specification Sections.

1.02 REFERENCES

- A. Montana Public Works Standard Specifications (MPWSS) specifications are referenced for material requirements and specific construction requirements only.

1.03 DESCRIPTION

- A. Limits of construction are shown on the Drawings. Placement of fill shall not be allowed outside the fence boundary where shown on the Drawings unless location is authorized by the Owner.
- B. Materials may be temporarily stockpiled on the site within the limits of construction, or where shown on the Drawings.
- C. Excess materials shall be stockpiled on site at locations authorized by Owner.
- D. Protect benchmarks and existing structures that are to remain from damage or displacement.

1.04 DEFINITIONS

- A. Suitable Material: Material that will provide the indicated required soil bearing capacity, soil densities, material requirements or, in the opinion of the soils testing laboratory, will not be subject to future decomposition, subsidence, settlement, or expansion.
- B. Structures: Existing and new construction, including slabs, buildings, footings, tanks, and other structural elements.
- C. Relative Compaction:
  - 1. Ratio, in percent, of as-compacted field dry density to laboratory maximum dry density as determined in accordance with ASTM D1557.
  - 2. Apply corrections for oversize material to either as-compacted field dry density or maximum dry density, as determined by the Engineer.

- D. Optimum Moisture Content:
    - 1. Determined in accordance with ASTM standard specified to determine maximum dry density for relative compaction.
    - 2. Determine field moisture content on basis of fraction passing 3/4-inch sieve.
  - E. Relative Density: Calculated in accordance with ASTM D4254 based on maximum index density determined in accordance with ASTM D4253 and minimum index density determined in accordance with ASTM D4254.
  - F. Complete Course: A course or layer that is ready for next layer or next phase of Work.
  - G. Lift: Loose (uncompacted) layer of material.
  - H. Well-Graded:
    - 1. A mixture of particle sizes with not specific concentration or lack thereof of one or more sizes.
    - 2. Does not define numerical value that must be placed on coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.
    - 3. Use to define material type that, when compacted, produces a strong and relative incompressible soil mass free of detrimental voids.
  - I. Influence Area: Are within planes sloped downward and outward at 60-degree angle from horizontal measured from:
    - 1. 1 foot outside outermost edge at base of foundations or slabs.
    - 2. 1 foot outside outermost edge at surface of roadways or shoulder.
    - 3. 0.5 foot outside exterior of spring line of pipes.
  - J. Borrow material: Material from required excavations or from designated borrow areas on or near Site.
  - K. Select Backfill Material: Materials available on-site that Engineer determines suitable for specific use.
  - L. Imported Material: Materials obtained from sources offsite, suitable for specified use.
- 1.05 SITE CONDITIONS
- A. Soil borings were taken for this project by Pioneer Technical Services. The Geotechnical Investigation Report is included in the Appendix of this Project Manual.
  - B. Data indicated on the subsurface conditions are not intended as representations, warranties of accuracy, or continuity between soil borings. It shall be expressly understood that Owner and Engineer shall not be responsible for interpretations or conclusions drawn from these reports by the Contractor. The information is made available for the convenience of the Contractor and is in no way, shape, or form considered a part of this Contract.
  - C. Contractor shall determine to Contractor's own satisfaction the nature and location of

subsurface obstacles and the nature of soil and water conditions which will be encountered during the work.

- D. Contractor may perform additional test borings or other exploratory operations at Contractor's own expense. Contractor shall make arrangements for any additional soils investigation with Owner.
- E. No claim for additional payment will be accepted due to the nature of subsurface conditions in which the work is to be performed.
- F. Do not commence construction of structure foundation until soil test results are confirmed.

#### 1.06 SEQUENCING AND SCHEDULING

- A. Backfill against concrete structures only after concrete has attained compressive strength, specified in Section 03 30 00, Cast-In-Place Concrete. Obtain Engineer's acceptance of concrete work and attained strength prior to placing backfill.
- B. Backfill around water holding structures only after completion of satisfactory leakage tests as specified in Section 03 30 00.
- C. Construction of grade-supported slabs shall not occur immediately after below- grade walls are backfilled, so that post-compaction consolidation of the compacted backfills can be monitored to estimate how much the slabs could settle. Monitoring shall include the placement of grade stakes around the structure that shall be monitored weekly after construction. Results shall be reviewed by the Engineer to evaluate the rate at which post-construction settlements will occur. Settlement is estimated to be complete in less than 90 days.

#### 1.07 PAYMENT

- A. All excavation, removal, and disposal of earth, peat, muck, and other materials; erosion control; sheeting, shoring, and bracing; fill and backfill, placement, compaction, grading, source quality testing; stockpiling; and all other work under this Section shall be considered incidental to the Project and no claim for additional compensation of extra work will be accepted.
- B. No claim for additional payment will be accepted for excavation and fill for all structures and improvements required for removal of unsuitable material up to two (2) feet below bottom of proposed piping invert elevation or one (1) foot below bottom of noted structural fill or one (1) foot below minimum excavation limit as noted on the Drawings, whichever results in the greater excavation and fill.
- C. Excavation and fill required for removal of unsuitable material deeper than the above limits will be paid for on a time and materials basis if conditions found in the Geotechnical Report are found to differ from actual conditions experienced on site. No additional payment will be made for conditions reflected in the Geotechnical Report.
- D. No claim for additional payment will be accepted for repairs made to subgrade due to weather related items.

### 1.08 FIELD MEASUREMENTS

- A. Verify that survey benchmark, control point, and intended elevations for the Work are as shown on Drawings or will be provided by the Engineer.

### 1.09 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Control: Field inspection and testing.
- B. Compaction testing will be performed in accordance with ASTM D698, and ASTM D2922.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest at no additional cost to Owner.

### 1.10 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.
- B. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.
- C. Contractor shall excavate for piping and utilities at grades shown on the Drawings. Careful consideration shall be given to whether elevations shown are invert elevations or centerline elevations, Contractor shall make appropriate adjustment depending on elevation shown.

## **PART 2 - PRODUCTS**

### 2.01 MATERIALS

- A. Backfill around Structures: Backfill shall be as indicated on the Construction Drawings.

## **PART 3 - EXECUTION**

### 3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Notify utility company to locate utilities.
- C. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- D. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Maintain and protect above and below grade utilities that are to remain.
- F. Contractor shall verify which native materials are suitable for reuse as granular foundation, bedding, encasement, and backfill material at the site. Provide testing data as required and keep materials separated.
- G. Notify Engineer of any unsuitable materials or poor subgrade conditions.
- H. Notify Engineer when structure or tank is ready for backfilling, and whenever backfilling operations are resumed after a period of inactivity.

- I. Dewater excavations during backfilling at no cost to Owner.
- J. Dewater and dry saturated materials suitable for backfill at no cost to Owner.
- K. Compact subgrade to density requirements for subsequent backfill materials.
- L. Cut out soft areas of subgrade not capable of compaction in-place. Backfill with Type A or Type B fill and compact to density equal to or greater than requirements for subsequent fill material.
- M. Identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

### 3.02 STOCKPILING OF MATERIALS

- A. Stockpile according to Section 31 14 13.

### 3.03 FILLING, BACKFILLING, AND COMPACTING

- A. The contractor shall follow the recommendations as provided in the Geotechnical Report by Pioneer Technical Services.
- B. Surface compact excavations prior to installing fill material.
- C. Proof roll subgrade areas, where noted with, as a minimum, a tandem axle dump truck loaded to at least 25 ton weight. Truck shall traverse the structure footprint to detect areas of loose or soft soils. Loose or soft soils shall be defined as soils exhibiting “excessive rutting” from the truck tires (approximately one (1) inch wheel rut depth.
- D. Do not place material on muddy surfaces, frozen ground or on materials containing frost or ice.
- E. Do not place fill required below structures until soil conditions encountered have been approved by special inspector.
- F. Slope grade away from structures minimum 2 inches in 10 feet, unless noted otherwise.
- G. Do not place material on or in water.
- H. Do not proceed with backfilling of excavations until completion of the following:
  1. Observation, testing, approval, and recording of locations of underground utilities.
  2. Removal of concrete formwork.
  3. Removal of shoring, bracing, other protection systems, and backfilling and compaction of voids left by their removals.
  4. Removal of unsuitable materials, construction related debris, and excess materials.
  5. Walls, including interior walls that brace exterior walls and intermediate floors and roof construction is installed, cured, and obtained required 28- day compressive strength.
  6. When existing in-place soil materials are of density less than that specified, but the soil material is acceptable, perform removal, filling, discing of ground surface, moisture-conditioning to within acceptable limits of the optimum moisture content,



and compact to provide specified density and bearing capacity as recommended by soils testing laboratory.

I. Placement and Compaction

1. Place materials in compacted layers of thickness required to obtain specified soil densities. Layers shall not exceed 8 inches in loose depth for cohesive and cohesionless soil material, respectively, compacted by heavy compaction equipment and not more than 8 inches in loose depth for cohesive and cohesionless soil materials, respectively, compacted by hand operated tampers unless soil density tests substantiate specified densities will be obtained when material is placed in thicker lifts.
2. Place material in lifts uniformly to the same approximate elevation, not exceeding the final grade height, in manner required to prevent creation of unbalanced soil lateral pressures, wedging action of materials and soil pressures that exceed the design lateral soil conditions and to prevent damage to the structure.
3. Moisten or aerate each layer to the extent required to obtain the optimum moisture content required for the indicated compaction density. Prevent free water from appearing on surface during or subsequent to compaction operations.
4. Remove and replace with acceptable material, or scarify and air dry otherwise acceptable soil material that is too wet to obtain specified soil density. Assist drying by discing, harrowing, or pulverizing, until moisture content is reduced to value required for compaction.
5. Compact each layer to the required density specified for each area classification. Hand tamp or utilize hand operated vibratory equipment when required to compact material placed immediately adjacent to walls within 5 feet.
6. Do not place additional layers until density of each layer in place complies with compaction requirements. Perform corrective work as required to obtain required density. Cost associated with correction work and retesting at failed test locations shall be at Contractor's expense.
7. At door stoops place sand cushion to cross-section indicated on Drawings.

3.04 REPLACING OVEREXCAVATED MATERIAL

A. Replace excavation carried below grade lines shown or established by the Engineer as follows:

1. Beneath Existing Footings: Concrete of strength equal to respective footing.
2. Beneath Fill or Backfill: Same material as specified for overlying fill or backfill.
3. Beneath Slabs on Grade: Aggregate fill.
4. Permanent Cut Slopes (Where overlying area is not to receive fill or backfill):
  - a. Flat to Moderate Steep Slopes (3:1 or flatter): Common fill.
  - b. Steep Slopes:

- i. Correct overexcavation by transitioning between overcut areas and designed slope adjoining areas, providing such cutting does not extend offsite or outside easements and right-of-ways, or adversely impacts existing facilities or completed Work.
- ii. Backfilling overexcavated areas is prohibited, unless in Engineer's opinion, backfill will remain stable, and overexcavated material is replaced as compacted common fill.

### 3.05 PLACING FILL OVER GEOSYNTHETICS

#### A. General:

1. Place fill over geosynthetics with sufficient care so as not to damage them.
2. Place fill only by back dumping and spreading only.
3. Dump fill only on previously placed fill.
4. While operating equipment, avoid sharp turns, sudden starts and stops that could damage geosynthetics.

#### B. Hauling: Operate hauling equipment with a minimum 3 feet of covering.

#### C. Spreading:

1. Spreading equipment shall be track mounted low ground pressure, D-3 or lighter.
2. Operate spreading equipment on minimum of 12-inches of fill.
3. Spread fill in same direction as unseamed overlaps to avoid separation.
4. Limit distance material falls to maximum of 2 feet.
5. Flatten wrinkles in direction of spreading.
6. Maintain proper overlap of unseamed.
7. Avoid overstressing material and seams.

#### D. Geosynthetics Damage:

1. Mark punctures, tears, or other damage, so repairs can be made.
2. Clear overlying fill as necessary to repair damage.

### 3.06 COMPACTION REQUIREMENTS

- A. Compact materials as required in Section 01 40 00.
- B. Contractor shall re-compact all areas represented by failed density tests at their own expense.

### 3.07 TOLERANCES

#### A. Finished Grade:

1. Plus or minus 1 inch, upon completion of settlement in ditches, berms, and lawn areas.

2. Plus or minus 1 inch upon completion of settlement in roadways and driveways.

B. All areas that receive fill or backfill shall be kept within settlement tolerances through the warranty period.

### 3.08 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01 50 00.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

### 3.09 SETTLEMENT

A. The Contractor shall be responsible for all settlement of backfill, fills, and embankments which may occur within the correction period stipulated in the Supplementary Conditions.

B. The Contractor shall make, or cause to be made, all repairs or replacements made necessary by settlement within 30 days after notice from the Engineer or Owner, or sooner if required by Engineer or Owner, depending on the critical nature of the settlement.

### 3.10 SCHEDULE

A. Beneath Landscaped Areas:

1. Type A or B, to a minimum of 6 inches and a maximum of 18 inches below finish grade, compacted as specified in Section 01 40 00.

B. Beneath Well House Structure:

1. Material: As indicated on the Construction Drawings.

2. Compacted Thickness: Equal, continuous layers not exceeding 8 inches compacted thickness. In the upper 12 inches of soil below the structures place compacted lifts no greater than 8 inches.

3. Place Geogrid and Goetextile fabric as shown in the Drawings.

4. Compaction: As specified in Section 01 40 00.

C. Beneath Concrete Slabs on Grade and Adjacent to Concrete Structures and for all pipe installations:

1. Material: As indicated on the Construction Drawings, Type A or B material per Section 31 05 13 unless otherwise indicated as granular material per Section 32 05 16 placed in compliance with the Drawings.

2. Compacted Thickness: Equal, continuous layers not exceeding 8 inches compacted thickness. In the upper 12 inches of soil below the pavement place compacted lifts no greater than 8 inches.

3. Compaction: As specified in Section 01 40 00.

D. Fill to Correct Over-excavation:

1. Fill Type A, B as specified in Section 31 05 13, or granular material as specified in

Section 32 05 16 as indicated on the Construction Drawings, flush to required elevation, compacted as specified in Section 01 40 00.

E. Sub-base Preparation:

1. As indicated on the Construction Drawings, Fill Type A or B as specified in Section 31 05 13, compacted in Section 01 40 00.

F. Beneath Asphalt:

1. Compact Subsoil as specified in Section 01 40 00.
2. As indicated on the Construction Drawings, Fill Type A or B as indicated on the Construction Drawings, compacted as specified in Section 01 40 00.

G. Topsoil Fill:

1. See Section 31 05 13.

**END OF SECTION 31 23 21**

**SECTION 31 23 33**  
**TRENCHING AND BACKFILLING**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes:
  - 1. Excavating trenches for utilities.
  - 2. Compacted bedding and fill of utilities to subgrade elevations.
  - 3. Backfilling and compaction requirements for trenches.
- B. Related Sections include, but are not limited to:
  - 1. The General Conditions, Supplementary Conditions, and General Requirements apply to work of this section.
  - 2. Division 1 – General Requirements Specification Sections.
  - 3. Division 31 – Earthwork Specification Sections.

1.02 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.
- B. Soil Testing Laboratory: Refers to a professional soils engineering firm with soil sampling and testing services that is independent from the Contractor.
- C. Suitable Material: Material that will provide the indicated required soil bearing capacity, soil densities, material requirements or, in the opinion of the soils testing laboratory, will not be subject to future decomposition, subsidence, settlement, or expansion.
- D. Structures: Existing and new construction, including slabs, buildings, footings, tanks, and other structural elements.
- E. Rock Excavation: as per Section 31 23 16.

1.03 SITE CONDITIONS

- A. Soil borings were taken for this project by Pioneer Technical Services. The Geotechnical Evaluation Report is included in **Appendix A** of the Project Manual. ***Geotechnical exploration indicates that bedrock may be encountered for the Base Bid and Additive Alternate B. The Contractor is highly encouraged to undertake additional geotechnical investigations to further characterize subsurface conditions throughout the work area in preparation of the project bid.***
- B. Data indicated on the subsurface conditions are not intended as representations, warranties of accuracy, or continuity between soil borings. It shall be expressly understood that Owner and Engineer shall not be responsible for interpretations or conclusions drawn from these reports by the Contractor. The information is made available for the convenience of the Contractor and is in no way, shape, or form considered a part of this Contract.

- C. Contractor shall determine to Contractor's own satisfaction the nature and location of subsurface obstacles and the nature of soil and water conditions which will be encountered during the work.
- D. Contractor may perform additional test borings or other exploratory operations at Contractor's own expense. Contractor shall make arrangements for any additional soils investigation with Owner.
- E. No claim for additional payment will be accepted due to the nature of subsurface conditions in which the work is to be performed.
- F. Do not commence construction of structure foundation until soil test results are confirmed.

#### 1.04 ADDITIONAL PAYMENT

- A. All excavation, removal, and disposal of earth, peat, muck, and other materials; erosion control; sheeting, shoring, and bracing; fill and backfill, placement, compaction, grading, source quality testing; stockpiling; and all other work under this Section shall be considered incidental to the Project and no claim for additional compensation of extra work will be accepted.
- B. No claim for additional payment will be accepted for excavation and fill for all structures and improvements required for removal of unsuitable material up to two (2) feet below bottom of proposed piping invert elevation or one (1) foot below bottom of noted structural fill or one (1) foot below minimum excavation limit as noted on the Drawings, whichever results in the greater excavation and fill.
- C. Excavation and fill required for removal of unsuitable material deeper than the above limits will be paid for on a time and materials basis if conditions found in the Geotechnical Report are found to differ from actual conditions experienced on site. No additional payment will be made for conditions reflected in the Geotechnical Report.
- D. No claim for additional payment will be accepted for repairs made to subgrade due to weather related items.

#### 1.05 FIELD MEASUREMENTS

- A. Verify that survey benchmark, control point, and intended elevations for the Work are as shown on Drawings.

#### 1.06 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.
- B. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.
- C. Contractor shall excavate for piping and utilities at grades shown on the Drawings. Careful consideration shall be given to whether elevations shown are invert elevations or centerline elevations, Contractor shall make appropriate adjustment depending on elevation shown.

## **PART 2 - PRODUCTS**

### **2.01 GENERAL**

- A. Granular materials provided for foundation, bedding, encasement, and backfill or other purposes shall consist of any natural or synthetic mineral aggregate such as sand, gravel, crushed rock, or slag that shall meet the gradation requirements specified herein for each specific use.
- B. Granular materials provided for foundation, bedding, encasement, or backfill use shall be classified by use in accordance with the following requirements.

### **2.02 GRANULAR FOUNDATION**

- A. Granular foundation shall be placed below the bottom of the pipe invert as replacement for unsuitable or unstable soils to provide better pipe support.
- B. Granular foundation material shall be Type A5 aggregate material as specified in Section 32 05 16.

### **2.03 GRANULAR BEDDING**

- A. Granular bedding shall be placed below the pipe midpoint, prior to pipe installation to facilitate proper shaping and achieve uniform pipe support. Minimum depth as indicated on the Construction Drawings. Place approved bedding material 4-inches under the pipe, around the pipe, and to a depth of 6- inches over the pipe.
- B. Granular bedding material shall meet the requirements of Section 32 05 16 and as indicated on the Construction Drawings.

### **2.04 GRANULAR ENCASEMENT**

- A. Granular encasement shall be placed below an elevation of six (6) inches above the top of the pipe, after pipe installation, for protection of the pipe.
- B. Granular bedding material shall meet the requirements of Section 32 05 16 and as indicated on the Construction Drawings.

### **2.05 GRANULAR BACKFILL**

- A. Between pipe zone and subgrade elevation shall meet the requirements of Section 32 05 13 and as indicated on the Construction Drawings.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, maintain, and protect utilities that remain from damage.
- C. Notify utility company to locate utilities.
- D. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- E. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from

excavating equipment and vehicular traffic.

- F. Maintain and protect above and below grade utilities that are to remain.
- G. Contractor shall verify which native materials are suitable for reuse as granular foundation, bedding, encasement, and backfill material at the site. Provide testing data as required and keep materials separated.
- H. Notify Engineer of any unsuitable materials.
- I. Dewater trench and structure excavations at no cost to Owner.

### 3.02 EXCAVATING

- A. Excavate topsoil in accordance with Section 31 14 13.
- B. Excavate trench to alignment and grade as required to meet foundation and bedding requirements as specified. Trench shall be centered on pipe alignment and no more than 100 feet of trench should be excavated in advance of pipe laying operations.
- C. The trench width may vary and depend on the depth of trench, the diameter of pipe to be laid, and the nature of the material to be excavated, but in any case, shall be of ample width to allow the pipe to be laid and joined properly and the backfill to be placed and compacted properly. The minimum bottom width of unsheeted trench shall be 18 inches. The maximum clear width of trench at the top of the pipe shall be not more than 32 inches greater than the outside diameter of the pipe for pipes 30 inches diameter and larger, or 18 inches greater for pipe under 30 inches in diameter. Wider trench widths at the top of the pipe shall be subject to approval by Engineer. The width of the trench at the ground surface shall be kept to a minimum to prevent unnecessary disruption of service structures.
- D. If the trench width at the pipe zone is excavated to a greater width than the maximum, the Engineer may require the Contractor to provide a higher class of bedding and/or higher strength pipe that that required by the Contract Documents in order to satisfy pipe design requirements. In such case, no additional compensation shall be made for the higher class bedding or higher strength pipe.
- E. Trench excavation shall be made by open cut methods. Trench sides shall be as vertical as possible and the trench shall be braced, sheeted, and drained such that the work may be performed safely in accordance with OSHA requirements.
- F. Sheet piling, shoring, and bracing shall be put in place and maintained as required due to soil stability or site constraints. Shoring, sheet piling, and bracing shall be provided to prevent disturbance or settlement of adjacent surfaces, structures, foundations, utilities and other properties. Any damage to the work under contract or to existing adjacent structures or other improvements caused by settlement, water or earth pressures, slides, cave-ins, or other causes due to lack of appropriate sheet piling, shoring, or bracing shall be repaired at the Contractor's expense at no delay.
- G. Trench sheet piling, shoring, and bracing shall be kept in place until pipe has been laid, tested for defects, and repaired if necessary, and the earth around the pipe is compacted.



The sheeting, shoring, and bracing shall be removed in such a manner as not to remove the constructed pipe or adjacent structures or other improvements.

- H. It shall be the Contractor's responsibility for proper and adequate placement of sheeting, shoring, and bracing in accordance with all applicable regulations and standards.
- I. Whenever unsuitable or unstable soil for properly supporting the pipe or structures is encountered, a further depth and/or width shall be excavated and replaced with the foundation material specified herewith or other suitable foundation material and thoroughly compacted to assure a firm foundation for the pipe.
- J. Stockpile excavated material in an orderly manner, at sufficient distance from the trench to avoid overloading, to prevent slides and cave-ins.
- K. Contractor shall advise Engineer immediately if any unsuitable materials are encountered during excavation. Unsuitable materials shall be reasonably separated from unsuitable materials and shall be considered surplus material at no additional cost to the Owner.
- L. If Contractor encounters excess excavation materials which meet the requirements of common fill, Contractor may use those materials as fill in common execution and fill areas. Excess surplus materials shall be stockpiled and located on the Montana State Hospital Campus property at the direction of the OWNER.
- M. Excavate to and over-depth of a minimum of 6 inches below pipe in areas of bedrock or other extensive rock formations by jack hammer, blasting, or other approved method. Trench width shall be 1.25 times the outside diameter of the pipe.
- N. Remove unsuitable materials in accordance to the depth recommended by the soils testing laboratory beneath structures to obtain desired soil bearing capacity. Contractor shall notify Engineer prior to any additional excavation that is needed. Additional excavation shall be subject to approval by the Engineer and subject to additional payment as noted above.
- O. Removal of materials beyond required subgrade elevations or dimensions without specific approval from soils testing laboratory and Engineer as well as backfilling, compaction, and other work at the over excavated area shall be at the Contractor's own expense.
- P. Excavating and backfilling shall not be conducted in water. All excavations shall be maintained in a well-drained condition at all times. Contractor shall provide and maintain temporary drainage facilities as required, and as approved by the Engineer, at no additional cost to the Owner.
- Q. Do not interfere with 45 degree bearing splay of foundations. Underpin adjacent structures, as necessary, to prevent damage by excavation Work.
- R. Hand trim for bell and spigot pipe joints. Remove loose matter.
- S. Remove lumped subsoil, boulders, and rock up to 1/3 cubic yard, measured by volume.
- T. In the event of shrinkage of excavated soils, resulting in shrinkage of backfill along trenches, Contractor shall provide, haul, place, and compact suitable soil type S1 or S2

from source at no cost to Owner.

- U. Stockpile excavated material in an orderly manner, at sufficient distance from the trench to avoid overloading, to prevent slides and cave-ins. Remove excess material not being used from site.

### 3.03 PIPE FOUNDATION

- A. Whenever unsuitable or unstable soil for properly supporting the pipe or structures is encountered, a further depth and/or width shall be excavated and replaced with the foundation material specified herewith or other suitable foundation material and thoroughly compacted to assure a firm foundation for the pipe.
- B. Additional density testing may be required in unstable areas where unsuitable materials are found. Engineer shall determine stability of trench bottom.
- C. Trench bottom shall be cut true and even so that the barrel of the pipe will have a bearing over the full length. Bell holes shall be excavated to ensure the pipe is resting for its entire length on the bottom of the trench and required bedding.

### 3.04 BACKFILLING

#### A. Pipe Zone

1. Should the materials available within the trench section be unsuitable or insufficient for this portion of the granular bedding, encasement and backfill materials as defined in this Specification, Contractor shall provide an approved material that meets the appropriate specifications.
2. Backfill materials shall be placed with care and deposited uniformly on both sides of pipe throughout the entire trench width in maximum 8-inch lifts. Mechanically compact material to required densities.
3. Flexible pipe shall be bedded in accordance with ASTM Specification D2321, "Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe." This shall include the placement of granular bedding and encasement materials from a point four (4) inches below the bottom of the pipe to a point six (6) inches above the top of the pipe compacted to required densities.
4. Placement and compaction of bedding, encasement, and backfill materials shall be considered incidental to the installation of the pipe.

#### B. Above Pipe Zone

1. Use suitable excavated materials from the site prior to importing of select granular borrow material. Any additional suitable select granular borrow material required to be imported shall be provided by the Contractor at no additional cost to the Owner. Contractor shall separate out all unsuitable materials. Excess surplus materials shall be removed from the Site.
2. Provide replacement backfill as required to establish required subgrade elevation. Use select granular borrow for replacement backfill.

3. Place backfill materials in uniform layers no more the 8 inches loose depth. Mechanically compact each layer of material to required densities.
  4. Do not backfill unless approved compaction equipment is operating. The method of means of placement and type of compaction equipment used is at the discretion of the Contractor, however, all portions of the trench backfill must meet the compaction requirements. Tests to determine the compacted density of the backfill may be ordered by the Engineer if the compaction does not appear to be adequate.
  5. The intent of this specification is to compact the backfill enough to prevent large settlements above the pipe, but to use as little effort as possible to avoid disturbing the pipe and bedding at the pipe zone.
- C. Backfill trenches to contours and elevations with unfrozen fill materials.
  - D. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
  - E. Aggregate Fill: Place and compact materials in equal continuous layers not exceeding 8 inches loose depth.
  - F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches loose depth.
  - G. Employ a placement method that does not disturb or damage utilities in trench. Prevent floatation of pipe.
  - H. Maintain optimum moisture content of fill materials to attain required compaction density. Use vibratory or special compaction equipment when required.
  - I. Remove surplus fill materials from site.
  - J. Leave fill material stockpile areas completely free of excess fill materials. Contractor shall have the responsibility to load, haul, and spread all excess fill off-site.

### 3.05 COMPACTION REQUIREMENTS

- A. Compact according to Section 01 40 00.
- B. Contractor shall recompact all areas represented by failed density tests.

### 3.06 TOLERANCES

- A. Top Surface of Backfilling:
  1. Plus or minus 1", upon completion of settlement in ditches, berms, and lawn areas.
  2. Plus or minus 1" upon completion of settlement in roadways and driveways.
- B. Trenches shall be kept within settlement tolerances through the warranty period.

### 3.07 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Control: Field inspection and testing.
- B. Compaction testing will be performed in accordance with ASTM D698, and ASTM D2922.

- C. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest at no additional cost to Owner.

3.08 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01 50 00.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

3.09 SCHEDULE

- A. As Shown on the Construction Drawings in conformance with Geotechnical Report recommendations.

**END OF SECTION 31 23 33**

**SECTION 31 25 00**  
**EROSION AND SEDIMENTATION CONTROLS**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Prevention of sedimentation of waterways, wetlands, and storm and sanitary sewers due to construction activities.
- B. Restoration of areas eroded due to insufficient preventative measures.
- C. Related Sections include, but are not limited to:
  - 1. Division 02 – Existing Conditions
  - 2. Division 31 – Earthwork
  - 3. Division 32 – Exterior Improvements
  - 4. Division 33 – Utilities

1.02 REFERENCES

- A. Montana General Permit No. MTR100000 (or its successor), Effective Date October 12, 2009 and Expiration Date January 1, 2013 - Authorization to Discharge under the National Pollutant Discharge Elimination System.
- B. Montana Department of Transportation (MDT) Erosion and Sediment Control Field Manual – Latest Edition
- C. Montana Department of Transportation (MDT) Standard Specifications for Road and Bridge Construction – Latest Edition
- D. Montana General Permit No. MTG070000 (or its successor), Effective Date October 12, 2009 and Expiration Date January 1, 2013 – General Permit for Construction Dewatering.
- E. ASTM D 4355 – Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus; 2005.
- F. ASTM D 4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 1999a (Reapproved 2004).
- G. ASTM D 4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2004.
- H. ASTM D 4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 1991 (Reapproved 2003).
- I. ASTM D 4751 – Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2004.
- J. ASTM D 4873 – Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples, 2002.

1.03 SUBMITTALS

- A. Provide product specification sheets for the following erosion control materials to demonstrate that the Contractor’s proposed products meet the Contract Document requirements:
  - 1. Fabric proposed for silt fence
  - 2. Fiber Roll
  - 3. Gradation tests for Construction Entrance stone material

**PART 2 - PRODUCTS**

2.01 SILT FENCE

- A. As Shown on Drawings.

2.02 FIBER ROLLS

- A. Prefabricated Rolls - As shown on Drawings.

2.03 CONSTRUCTION ENTRANCE

- A. Materials As Shown on Drawings.
- B. 3-6 inch Stone

- 1. Stone shall be angular and shall be comprised of hard, durable mineral materials that have been mechanically processed.
- 2. Stone shall not be from limestone/dolomite deposits that have thinly bedded strata or strata of a shale nature.
- 3. Stone gradation shall conform to the following:

SIEVE	PERCENT PASSING (by weight)
6-inch	100
3 ½-inch	50 – 100
3-inch	10 – 75
2-inch	0 – 10
3/8 inch	0 – 1

**PART 3 - EXECUTION**

3.01 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

- A. The Contractor shall develop a Storm Water Pollution Prevention Plan as required by the Montana Department of Environmental Quality that meets both the State’s requirements and the minimum practices shown on the Drawings.
- B. The Contractor shall complete and sign the Notice of Intent and submit to the Montana

Department of Environmental Quality.

### 3.03 PERFORMANCE REQUIREMENTS

- A. Contractor shall comply with all requirements of the Montana Department of Environmental Quality along with all Federal, State, and Local permits and regulations for erosion and sediment control.
  - 1. If erosion or sedimentation occurs due to non-compliance with any of these permits, Contractor shall restore eroded areas at no cost to Owner.
  - 2. If sedimentation beyond permitted thresholds occurs in regulated waterways or wetlands, Contractor shall at no additional cost to the Owner:
    - a. Contact the authorities having jurisdiction;
    - b. Remove deposited sediments to the satisfaction of the Owner and the authorities having jurisdiction;
    - c. Install or correct preventive measures to the satisfaction of the authorities having jurisdiction; and
    - d. Pay any fines or other additional requirements of the authorities having jurisdiction; and
    - e. Meet the Contract schedule for project completion.
- B. Contractor shall not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
  - 1. Obtain and pay for permits and provide security required by authority having jurisdiction.
- C. Timing of erosion and sediment control practices: As Shown on the Drawings.
- D. Erosion Control: Contractor shall reduce wind, water, and vehicular erosion of soil on project site due to construction activities for this project, consistent with approved permits and following these requirements:
  - 1. Minimum erosion control measures as shown on the Drawings with additional practices implemented as required by the Contractor's SWPPP.
  - 2. Control movement of sediment and soil from temporary stockpiles of soil.
  - 3. Prevent development of ruts due to equipment and vehicular traffic.
  - 4. Provide good site housekeeping.
  - 5. Inspect, repair, maintain, and replace erosion control practices consistent with approved permits and as shown on the Drawings.
- E. Sediment Control: Contractor shall reduce sediment transport off- site due to construction activities for this project, consistent with approved permits and following these requirements:

1. Minimum sediment control measures as shown on the Drawings with additional practices implemented as required by the Contractor's SWPPP.
2. Reduce windblown soil from leaving the project site.
3. Reduce tracking of mud onto public roads outside of the site.
4. Reduce mud and sediment from flowing onto sidewalks and pavements.
5. Inspect, repair, maintain, and replace sediment control practices consistent with approved permits and as shown on the Drawings.

#### 3.04 CLOSE-OUT

- A. Contractor shall file a Notice of Termination with the State following site stabilization that meets the requirements of the General Permit.
- B. Contractor shall remove and clean up all temporary erosion and sediment control practices as shown on the Drawings. Site disturbance caused by removal of these practices shall be restored consistent with the surface restoration requirements shown on the Drawings. Costs for restoration shall be at Contractor's expense.

**END OF SECTION 31 25 00**



**SECTION 31 32 00**  
**SOIL STABILIZATION**

**PART 1 - GENERAL**

1.01 DESCRIPTION

A. Separation Geotextile

1. This section is applicable to the use of a geotextile to prevent mixing of subgrade soil and an aggregate cover material.

B. Stabilization Geotextile

1. This section is applicable to the use of a geotextile in wet, saturated conditions to provide the coincident functions of separation and filtration.

C. Subsurface Drainage Geotextile

1. This section is applicable to placing a geotextile against soil to allow for long term passage of water into a subsurface drain system while retaining the in-situ soil.
2. The primary function of the geotextile is filtration. Geotextile filtration properties are a function of the in-situ soil gradation, plasticity, and hydraulic conditions.

1.02 RELATED DOCUMENTS

A. The following documents and specification sections apply directly to this Section:

1. Drawings and Special Provisions of the Contract;
2. General and Supplementary Conditions;
3. Division 01 – General Requirements;
4. Division 02 – Existing Conditions;
5. Division 31 – Earthwork;
6. Division 32 – Exterior Improvements;
7. Division 33 – Utilities.

1.03 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO)  
“Standard Specification for Geotextile Specification for Highway Applications”  
Designations M 288-00 and M 288-06.

B. AASHTO Test Standards:

1. T 88 – Standard Test Method for Particle Size Analysis of Soils.
2. T 90 – Standard Test Method for Determining the Plastic Limit and Plasticity Index of Soils.
3. T 99 – Standard Practice for Determination of the Moisture Density Relations of Soils Using a 5.5 lb hammer and 12 inch drop (Standard Proctor).

- C. American Society for Testing and Materials (ASTM):
  - 1. D 123 – Standard Terminology Relating to Geotextiles.
  - 2. D 276 – Standard Test Method for Identification of Fibers in Textiles.
  - 3. D 4354 – Practice for Sampling of Geosynthetics for Testing.
  - 4. D 4355 – Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
  - 5. D 4439 – Terminology for Geotextiles.
  - 6. D 4491 – Test Methods for Water Permeability of Geotextiles by Permittivity.
  - 7. D 4533 – Test Method for Index Trapezoid Tearing Strength of Geotextiles.
  - 8. D 4632 – Test Method for Grab Breaking Load and Elongation of Geotextiles.
  - 9. D 4759 – Practice for Determining the Specification Conformance of Geosynthetics.
  - 10. D 4751 – Test Method for Determining Apparent Opening Size of a Geotextile.
  - 11. D 4873 – Guide for Identification, Storage, and Handling of Geotextiles.
- D. Federal Highway Administration (FHWA) – Geosynthetic Design and Construction Guidelines, Publication No. FHWA NHI-07-092, August 2008.
- E. Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).

#### 1.04 DEFINITIONS

- A. California Bearing Ratio (CBR): The ratio of (1) the force per unit area required to penetrate a soil mass with a 3 square inches circular piston (approximately 2 inches diameter) at the rate of .05 inches per minute. To (2) that required for corresponding penetration of a standard material.
- B. Minimum Average Roll Value (MARV): Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.
- C. Maximum Average Roll Value (MaxARV): Property value calculated as typical plus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will be below the value reported.
- D. Typical Roll Value: Property value calculated from average or mean obtained from test data.

#### 1.05 SUBMITTALS

- A. Submit under provisions of Section 01 33 00:
  - 1. Certification:
    - a. The Contractor shall provide the Engineer a certificate stating the name of the geotextile manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the

geotextile.

- b. The Manufacturer shall demonstrate transparency of their manufacturing process by showing traceability of the product from origin of raw material through finished good.
- c. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification. Documentation describing the quality control program shall be made available upon request.
- d. The manufacturer's certificate shall state that the furnished geotextile meets MARV requirements of the specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.

2. Manufacturing Quality Control (MQC) test results shall be provided upon request.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Geotextile labeling, shipment and storage shall follow ASTM D 4873.
- B. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.
- C. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.
- D. Each geotextile roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.
- E. The protective wrapping shall be maintained during periods of shipment and storage. If the wrapping is damaged prior to installation, the outer wrap of geotextile material must be discarded before installation. Replacement of damaged geotextile during shipment and storage shall not be charged to the Owner.
- F. During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 160 deg F and any other environmental condition that might damage the geotextile.

#### 1.07 QUALITY ASSURANCE SAMPLING, TESTING, AND ACCEPTANCE

- A. Geotextile:
  1. Geotextiles shall be subject to sampling and testing to verify conformance with this specification. Sampling for testing shall be in accordance with ASTM D 4354.
  2. Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality control samples obtained using Procedure B of ASTM D 4354.

B. Sewn Seams (required only where indicated on the Drawings):

1. For seams that are to be sewn in the field, the Contractor shall provide at least a 6 foot length of sewn seam for sampling by the Engineer before the geotextile is installed.
2. For seams that are sewn in the factory, the Engineer shall obtain samples of the factory seams at random from and roll of geotextile that is to be used on the project.
3. If seams are to be sewn in both directions, samples of seams from both directions shall be provided.
4. For seams that are field sewn, the seams sewn for sampling shall be sewn using the same equipment and procedures as will be used for the production seams.
5. The seam assembly description shall be submitted by the Contractor along with the sample of the seam. The description shall include the seam type, sewing thread, and stitch density.

C. Sewing Thread:

1. Sewing thread shall consist of high strength polypropylene or polyester (Nylon shall not be used).
2. The thread shall be of a contrasting color to the geotextile.

## **PART 2 - PRODUCTS**

### 2.01 MANUFACTURERS

- A. Propex Operating Company, LLC, Chattanooga, Tennessee, 37419 USA, Phone (800) 621-1273.
- B. Approved Equal.

### 2.02 MATERIALS

A. Geotex 401:

1. The geotextile construction shall be a nonwoven, staple fiber, needlepunched, polypropylene geotextile; the fibers are needled together to form a stable network that retains dimensional stability relative to each other.
2. The geotextile should be resistant to UV degradation and biological and chemical environments normally encountered in soils.
3. The geotextile should meet the following Minimum Average Roll Values (MARV) for nonwoven geotextile:

<b>Property</b>	<b>Test Method</b>	<b>Units</b>	<b>Property Requirement</b>
Grab Tensile Strength	ASTM D 4632	lbs	120
Elongation	ASTM D 4632	%	50
CBR Puncture	ASTM D 6241	lbs	310
Trapezoidal Tear	ASTM D 4533	lbs	50
Apparent Opening Size (MaxARV)	ASTM D 4751	US Std. Sieve	70
Permittivity	ASTM D 4491	sec-1	1.7
Water Flow Rate	ASTM D 4491	gpm/ft <sup>2</sup>	140
UV Resistance	ASTM D 4355	%	70 at 500 hours

2.03 GEOTEXTILE QUALITY ASSURANCE

A. Product Marking:

1. All geotextile products shall be printed at a minimum frequency of once per every 5 meters.
2. Printing shall include:
  - a. Name of source manufacturing facility.
  - b. Geotextile product name as listed with AASHTO/NTPEP.
  - c. AASHTO M288 class(es) that product meets.
3. Additionally, labels should be affixed to the exterior of the packaged roll to include:
  - a. Name of source manufacturing facility.
  - b. Geotextile product name as listed with AASHTO/NTPEP.
  - c. AASHTO M288 class(es) that product meets.
  - d. Date of manufacture.

B. Quality Control Testing:

1. All supplied geotextiles shall be tested for quality control in a tested laboratory accredited through the Geosynthetic Accreditation Institute’s Laboratory Accreditation Program (GAI-LAP).
2. All supplied geotextiles shall include certificates of analysis for all specified properties.
3. All testing laboratories shall maintain Quality Management Systems (QMS) certified compliant to the AASHTO/GTX Work Plan for Evaluation of Geotextile Materials for Highway Applications.
4. Testing laboratories shall be compliant and certified to the ISO 9001:2008 quality system standard.

C. Manufacturing Facilities:

1. The source manufacturing facility for supplied geotextiles shall maintain audited compliance through AASHTO representative auditors for Quality Management System Processes for:
  - a. Organization for Organizational Policies
  - b. Product Marking and Labeling
  - c. Manufacturing Process and Documentation Control
  - d. Quality Control of Raw Materials
  - e. Quality Control Inspection, Measurement, and Testing for Geotextile Products
  - f. Quality Control Personnel – Training and Competency Evaluation
  - g. Statistical Analysis of Test Results
  - h. Resolution of Non-Conforming Product of Test Results
  - i. Retention of Test Results and Product Traceability
  - j. Quality Control Testing Facilities
  - k. Marking, Storage, Shipping, and Handling of Finished Geotextile
  - l. Internal Quality Audits of Each Plant Producing Product
2. Source manufacturing facilities shall be compliant and certified to the ISO 9001:2008 quality system standard.
3. All manufacturing facilities shall be located within the United States or US territories.

**PART 3 - EXECUTION**

3.01 PREPARATION

A. Separation and Stabilization Geotextile:

1. Clear, grub, and excavate/fill installation site to design grade. Remove topsoil, vegetation, and other unsuitable materials.
2. Soft spots and unsuitable areas shall be identified during site preparation or subsequent proof rolling. These areas shall be excavated and backfilled with select materials and compacted using normal procedures.

B. Subsurface Drainage Geotextile:

1. Trench excavation shall be completed in accordance with details of the project plans.
2. In all instances excavation shall be performed in such a way so as to prevent large voids from occurring in the sides and bottom of the trench.

3.02 INSTALLATION

A. Separation and Stabilization Geotextile:

1. The geotextile shall be laid smooth without wrinkles or folds on the prepared subgrade in the direction of construction traffic.
2. Adjacent geotextile rolls shall be overlapped 18 inches at all joints.
3. When sewn seams are required, the seam strength, as measured by ASTM D4632 shall be equal to or greater than 90 percent of the specified grab strength.
4. On curves, the geotextile may be folded or cut to conform to the curves. The fold or overlap shall be in the direction of construction and held in place by pins, staples, or piles of fill or rock.
5. Prior to covering, the geotextile shall be inspected by a certified inspector of the Engineer to ensure that it has not been damaged during installation.
6. Damaged areas, as identified by the Engineer, shall be repaired immediately by covering the damaged area with a geotextile patch that extends an amount equal to the required overlap beyond the damaged area.
7. The subbase shall be placed by end dumping onto the geotextile, or over previously placed subbase aggregate such that at least the minimum specified lift thickness shall be between the construction equipment tires or tracks and the geotextile at all times.
8. Pretensioning Geotextile:
  - a. Proof roll with heavily loaded, rubber-tired vehicle. Wheel load of truck shall be equivalent to maximum expected for site. Vehicle to make at least four passes over first lift in each area of site.
  - b. Once design aggregate has been placed, use roadway prior to paving to prestress geotextile-aggregate system in key areas.
9. If required, staple or pin geotextile at overlaps to maintain position during construction activities. Use 10 to 12 inch long nails placed at minimum 50 feet on center for parallel rolls and 5 feet on center for roll ends.
10. Do not place overlaps along anticipated primary wheel path locations. Place overlaps at end of rolls in direction of aggregate placement with previous roll on top.
11. When geotextile intersects an existing pavement area, extend geotextile to edge of old system. For widening or intersecting existing roads where geotextiles have been used, anchor geotextile at roadway edge.
12. Compact first lift of base aggregate with a tracking dozer and then compact with smooth-drum vibratory roller to obtain minimum compacted density.
13. Compaction of permeable bases shall meet specified requirements.
14. Perform construction parallel to road alignment.
15. Fill ruts formed during construction to maintain adequate cover over geotextile. Do not blade ruts down.
16. Place remaining base aggregate in lifts not exceeding 10 inches in loose thickness

and compact to specified density.

B. Subsurface Drainage Geotextile:

1. In the placement of the geotextile for drainage applications, the geotextile shall be placed loosely with no wrinkles or folds, and with no void spaces between the geotextile and the ground surface. Successive sheets of geotextiles shall be overlapped a minimum of 18 inches, with the upstream sheet overlapping the downstream sheet.
2. In trenches equal to or greater than 12 inches in width, after placing the drainage aggregate the geotextile shall be folded over the top of the backfill material in a manner to produce a minimum overlap of 18 inches. In trenches less than 12 inches, but greater than 4 inches wide, the overlap shall be equal to the width of the trench. Where the trench is less than 4 inches the geotextile overlap shall be sewn or otherwise bonded. All seams shall be subject to the approval of the Engineer.
3. Should the geotextile be damaged during installation or drainage aggregate placement, a geotextile patch shall be placed over the damaged area extending beyond the damaged area a distance of 18 inches, or the specified seam overlap, whichever is greater.
4. Placement of drainage aggregate should proceed immediately following placement of the geotextile. The geotextile should be covered with a minimum of 12 inches of loosely placed aggregate prior to compaction. If a perforated collector pipe is to be installed in the trench, a bedding layer of drainage aggregate should be placed below the pipe, with the remainder of the aggregate placed to the minimum required construction depth.
5. The aggregate should be compacted with vibratory equipment to a minimum of 95 percent Standard AASHTO T99 density.

3.03 PROTECTION

- A. Atmospheric exposure of the geotextile to the elements following laydown shall be limited to 14 days to prevent damage.
- B. Equipment may operate on roadway without aggregate for geotextile installation under permeable bases if subgrade is of sufficient strength.
  1. For extremely soft soils, use lightweight construction vehicles for access on first lift.
  2. Limit construction vehicles in size and weight to limit rutting in initial lift to 3 inches.
  3. If rut depths exceed 3 inches, decrease construction vehicle size or weight or increase lift thickness.
- C. Turning not permitted on first lift of base aggregate. Construct turnouts at roadway edge to facilitate construction.

3.04 CLEANUP



- A. Upon completion of the soil stabilization work, clean up all waste materials and debris resulting from this operation and dispose of such waste material and debris of the site.

**END OF SECTION 31 32 00**

**SECTION 31 41 00**  
**SHORING**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section includes:

1. Work related to sheeting, shoring, bracing, and excavation support systems needed to accomplish construction of buildings, tanks, facilities, utilities, and piping.

B. Related sections include, but are not limited to:

1. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section.
2. Section 03 30 00 – Cast-in-Place Concrete
3. Division 1 – General Requirement Specification Sections
4. Division 31 – Earthwork Specification Sections.

1.02 SUBMITTALS

A. Shop Drawings and Product Data: Submit, in accordance with Section 01 33 00. In general, include drawings and supporting calculations for shoring for Engineer review and approval.

B. Submittals shall include:

1. Excavation support plan.
2. Movement monitoring plan.
3. Trench excavation plan.
4. Movement measurement and data and reduced results indicating movement trends.
5. Documentation that shoring plan or system has been designed by a registered Professional Engineer if required.

C. Design calculations of bracing and shoring showing member stresses and connections due to imposed loads. Calculations shall be sealed by a qualified professional engineer.

1.03 QUALITY ASSURANCE

A. An OSHA approved competent person shall review the soil classification presented in the Geotechnical Report in the field. Excavations shall comply with the requirements of OSHA 29 CFR, Part 2926, Subpart P, “Excavations and Trenches.” Excavation safety is the responsibility of the Contractor. All excavations greater than 20 feet in depth shall be designed by a registered Professional Engineer.

- B. Sheeting, shoring, and bracing shall conform to safety requirements of federal, state, and local agencies.
- C. Sheeting, shoring, and bracing shall not affect structural integrity of existing structures, utilities, or Work, and shall allow for sufficient clearances necessary to install associated appurtenances adjacent to new Work.
- D. Sheeting, shoring, and bracing shall not penetrate walls or slabs of new Work unless approved by the Engineer.
- E. Provide surveys to monitor movements of critical facilities.

#### 1.04 REGULATORY REQUIREMENTS

- A. Work outlined in this Section shall conform to OSHA regulations and all applicable codes and regulations for worker safety.

### **PART 2 - PRODUCTS**

#### 2.01 SHEETING, SHORING, AND BRACING

- A. Type, design, detail, and installation of sheeting, shoring, and bracing shall be determined by and be the sole responsibility of the contractor.

### **PART 3 - EXECUTION**

#### 3.01 GENERAL

- A. Design, provide, and maintain shoring, sheeting, and bracing as necessary to support the sides of excavations and to prevent detrimental settlement and lateral movement of existing facilities, adjacent property, and completed Work. Shoring, sheeting, and bracing shall also be provided as necessary to protect workers and the public.
- B. Sheeting, shoring, and bracing shall be installed to prevent solids from entering excavation below or through sheeting.
- C. Open cut excavations are to be evaluated by a registered Engineer and protected against surface water intrusion.

#### 3.02 EXCAVATION SUPPORT PLAN

- A. Prepare an excavation support plan addressing the following topics:
  - 1. Select and install shoring system such that no adverse impact occurs on existing structures, utilities, or facilities.
  - 2. Details of shoring, bracing, sloping, or other provisions for worker protection from hazards of caving ground.
  - 3. Design assumptions and calculations.
  - 4. Methods and sequencing of installing excavation support.
  - 5. Proposed locations of stockpiled excavated material.

6. Minimum lateral distance from the crest of slopes for vehicles and stockpiled excavated materials.
7. Anticipated difficulties and proposed resolutions.

### 3.03 REMOVAL OF EXCAVATION SUPPORT

- A. Remove excavation support in a manner that will maintain support as excavation is backfilled.
- B. Do not begin to remove excavation support until support can be removed without damage to existing facilities, completed Work, or adjacent property.
- C. Remove excavation support in a manner that does not leave voids in the backfill.

### 3.04 TRENCHES

- A. Provide trench excavations exceeding four (4) feet in depth with adequate safety systems.
- B. For trench excavation exceeding five (5) feet in depth, provide adequate safety systems meeting requirements of applicable state and local construction safety orders, and federal requirements.

**END OF SECTION 31 41 00**

**DIVISION 32**

**EXTERIOR IMPROVEMENTS**

**SECTION 32 05 16**  
**AGGREGATES FOR EXTERIOR IMPROVEMENTS**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section includes:

1. Aggregate materials for use in: granular foundation/bedding/encasement/backfill; concrete mixes; roadways; shoulders; parking lots; driveways or wherever a compacted aggregate surface is required.

B. Related Sections include, but are not limited to:

1. The General Conditions, Supplementary Conditions, and General Requirements apply to work of this section.
2. Division 1 – General Requirements Specification Sections.
3. Division 31 – Earthwork Specification Sections.
4. Division 32 – Exterior Improvements Specification Sections.
5. Section 31 23 21 – Fill and Backfill.
6. Section 31 23 33 – Trenching and Backfilling.
7. Section 33 31 19 – Site Piping.
8. Division 32 – Exterior Improvements

1.02 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Samples: Submit, in air-tight containers, 40 pound sample of each type of aggregate to testing laboratory. Submit Laboratory Results to Engineer.

1.03 QUALITY ASSURANCE

A. Section 01 40 00 - Quality Control: Field Samples.

B. Material Source: Submit name of imported material supplier(s). Provide materials from the same source throughout the Work. Change of source requires Engineer approval.

**PART 2 - PRODUCTS**

2.01 AGGREGATE MATERIALS

A. Coarse Aggregate (Concrete Mix and Type A1): Well graded crushed stone or gravel conforming to the requirements of ASTM C33, Gradation 67.

B. Coarse Aggregate (Surface Course and Type A2): Gravel; angular crushed, or natural stone; free of shale, clay, friable material and debris; graded in accordance with Montana Department of Transportation specifications. For all aggregate surface areas.

C. Coarse Aggregate (Base Course and Type A3): Gravel; Angular crushed, or natural

stone; free of shale, clay, friable material and debris; graded in accordance with Montana Department of Transportation referenced specifications, Section 816, Class 5.

- D. Fine Aggregate (Concrete Mix and Type A4): Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter; graded in accordance with ASTM C33.
- E. Coarse Aggregate (Pipe Bedding and Type A5): All gravel for pipe encasement shall be in accordance with Montana Department of Transportation referenced specifications, Section 816, Class 3 with the Number 200 sieve requirement modified to be 3 – 15 percent passing.
- F. Granular Fill (Base course as described in project drawings): Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D448, Size 57, with 100 percent passing a 1½ inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- G. Structural Fill (Well House Sub-grade and elsewhere as described in the project drawings): Fully compliant with MPWSS Section 02234 - 4" Minus Sub-Base Course.

## 2.02 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Control: Source testing and analysis of aggregate material.
- B. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM C136 and ASTM D698.
- C. Fine Aggregate Material - Testing and Analysis: Perform in accordance with ASTM C136 and ASTM D698.
- D. If tests indicate materials do not meet specified requirements, change material or material source and retest.
- E. Provide materials of each type of aggregate from the same source throughout the Work.

## **PART 3 - EXECUTION**

### 3.01 STOCKPILING

- A. Stockpile materials in accordance with Section 31 14 13.

### 3.02 STOCKPILE CLEANUP

- A. Cleanup stockpiles in accordance with Section 31 14 13.

## **END OF SECTION 32 05 16**

**SECTION 32 11 23**  
**AGGREGATE BASE COURSES**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes general requirements and procedures for furnishing and installing base and pavement courses, including:
  - 1. Subbase Course.
  - 2. Aggregate Base Course.
- B. Related Sections include, but are not limited to:
  - 1. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section.
  - 2. Division 1 – General Requirement Specification Sections.
  - 3. Division 31 – Earthwork Specification Sections.
  - 4. Division 32 – Exterior Improvements.

1.02 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
- B. American Concrete Institute (ACI)
- C. American Society for Testing Materials (ASTM)
- D. MDT Specifications (latest edition)

1.03 SUBMITTALS

- A. Subbase Course
  - 1. Provide appropriate material date source testing for each granular material. Include name location of source, date of testing, and sample gradations. Tests shall not be more than 180 calendar days before date of submittal.
- B. Aggregate Base Course
  - 1. Submit gradation report on sample of aggregate base to be used.

1.04 SEQUENCING AND SCHEDULING

- A. Construct aggregate base only after all of the following have been completed:
  - 1. Subgrade has been corrected for instability problems and successfully passed a rolling test performed by the Contractor and witnessed by the Engineer.
  - 2. Subgrade has been checked for conformance to line and string tolerances (stringline).
- B. Aggregate base to be completed and approved by Engineer prior to placement of bituminous surfaces.



## 1.05 QUALITY ASSURANCE

- A. Contractor shall establish and maintain the required lines and grades, including crown and cross-slope, for each course during work.
- B. In-place finished thickness will not be acceptable if exceeding following allowable variation from thickness specified herein:
  - 1. Aggregate Base Course: Plus or minus one-half inch.

## PART 2 - PRODUCTS

### 2.01 SUBBASE COURSE

- A. Subbase shall be Type A or B materials as specified in Section 31 05 13 unless otherwise indicated as granular materials which are specified in Section 32 05 16.

### 2.02 AGGREGATE BASE COURSE

- A. Aggregate Base Course shall be as indicated on the Construction Drawings and as specified in Section 32 11 23.

### 2.03 AGGREGATE SURFACE COURSE

- A. Aggregate Surface Course shall be as indicated on the Construction Drawings and as specified in Section 32 05 16.

## PART 3 - EXECUTION

### 3.01 AGGREGATE BASE COURSE

- A. Preparation:
  - 1. Verify subsoil has been inspected; gradients and elevations are correct.
  - 2. Prepare the sub-base course.
  - 3. Verify subsoil is compacted to specified density and that subgrade test results have been submitted prior to placing aggregate course.
  - 4. Subgrade to be completed and approved by Engineer prior to installation of the aggregate base course.
  - 5. Verify subgrade is dry.
- B. Construction Requirements; conform to MDT Specifications:
  - 1. Place aggregate in maximum 6-inch layers and compact to specified density. When placing over geotextile fabric, place in minimum 8 inch layers.
  - 2. Level and contour surfaces to elevations and gradients indicated.
  - 3. Compact by mechanical means as specified in Section 01 40 00.
  - 4. Install aggregate base in accordance with Detail Drawings.
  - 5. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

6. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

C. Field Quality Control:

1. The Owner shall have an independent testing laboratory sample the aggregate base materials, determine the moisture/density relationships and gradation, and perform field moisture/density tests at locations determined by Engineer.
2. If, during progress of Work, tests indicate that compacted materials do not meet specified requirements, remove defective Work, replace, and retest. Contractor shall bear all costs associated with repair and retesting of defective Work.

3.02 TOLERANCES

A. Finished Grade:

1. Line and Grade Tolerance: The final aggregate base surface will be checked for conformance to specified tolerances by the “stringline” method prior to approval to pave the surface. Grade shall be  $\pm 0.03$  feet of grade.

**END OF SECTION 32 11 23**

**SECTION 32 12 16  
ASPHALT PAVING**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section Includes:

1. Bituminous Pavement.

B. Related Work:

1. The General Conditions, Supplementary Conditions, and General Requirements apply to work of this section.
2. Division 1 – General Requirements Specification Sections.
3. Division 31 – Earthwork Specification Sections.

1.02 REFERENCES

A. Reference Standards include:

1. ASTM D946 – Penetration-Graded Asphalt Cement for Use in Pavement Construction.
2. ASTM D1559 – Test of Resistance to Plastic Flow of Bituminous Mixtures. Using Marshall Apparatus.
3. ASTM D2950 – Test for Density of Bituminous Concrete in Place by Nuclear Methods.
4. TAI – (The Asphalt Institute) – MS-2 Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.
5. TAI – (The Asphalt Institute) – MS-3 Asphalt Plant Manual.
6. TAI – (The Asphalt Institute) – MS-8 Asphalt Paving Manual.
7. TAI – (The Asphalt Institute) – MS-19 Basic Asphalt Emulsion Manual.
8. Montana Department of Transportation (MDT) Standard Specifications for Road Construction and Bridge Construction, 2008 Edition.

1.03 SUBMITTALS FOR REVIEW

A. Section 01 33 00 – Submittals: Procedures for submittals.

B. Product Data: Furnish data on aggregates, asphalt cement, bituminous mixtures, and other materials required for the mix in accordance with Section 01 33 00 and 01 40 00 at least 7 days prior to beginning paving operations.

C. Asphalt Mix Formula.

1.04 PERFORMANCE REQUIREMENTS AND QUALITY ASSURANCE

A. When referenced, perform Work in accordance with the Montana State Highway

Department standard Specifications for Road and Bridge Construction, latest edition.

- B. Paving: Designed for H20 classification.
- C. Mixing Plant and Mixing Plant Operations: Conform to the Montana State Highway Department Standard Specifications for Road and Bridge Construction, latest edition, and The Asphalt Institute (TAI) MS-3 Asphalt Plant Manual.
- D. Obtain all materials from same source throughout project unless approved by the Engineer.
- E. Paved surfaces shall be warranted against any materials and/or workmanship defects for a period of twelve months from placement.
- F. The mix design and development of the Job Mix Formula shall be generated by a laboratory accredited by the AASHTO Materials Reference Laboratory (AMRL) at the Contractor's expense.

#### 1.05 REGULATORY AND ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt when ambient air temperature (in the shade and away from artificial heat) or base surface temperature is less than 40 degrees F. or when surface is wet, dirty, or frozen.
- B. No Work will be permitted in the spring until the frost has disappeared and the subgrade is stable so as to support the equipment without rutting, shoving, pumping, or other displacement.
- C. Conform to applicable code for paving work on public property.
- D. Conform to Section 01 50 00. Minimize interference with traffic.
- E. Conform to the Montana Department of Environmental Quality Clean Air Standards and Storm Runoff Surface Water Standards.
- F. Dispose of all waste material or reject material by approved methods.

#### 1.06 SEQUENCING AND SCHEDULING

- A. Construct aggregate base only after all of the following have been completed:
  - 1. Subgrade has been corrected for instability problems and successfully passed a rolling test performed by the Contractor and witnessed by the Engineer.
  - 2. Subgrade has been checked for conformance to line and string tolerances (stringline).
- B. Aggregate base to be completed and approved by Engineer prior to placement of bituminous surfaces.
- C. The Contractor shall provide a 48 hour notice for scheduling prior to paving operations.
- D. Contractor shall allow aggregate base, asphalt base course, and curb to undergo one freeze thaw cycle before installing surface course. Aggregate base course, asphalt base course, and curb installation shall be required for final completion with surface course of asphalt required for final completion.

## PART 2 - PRODUCTS

### 2.01 GENERAL

- A. Asphalt Cement: Asphalt Cement shall be produced in accordance with Section 818 of the MDT Standard Specification and meeting the following requirements:
1. ASTM 6373 (AASHTO M320) Asphalt Binder have a PG grading of:
  2. PG 58-28
- B. Aggregate for Mix:
1. Section 32 05 16 in accordance with the Montana State Highway Department Standard Specifications for Road and Bridge Construction, latest edition.
- C. Asphalt Paving (Bituminous) Mixture (Base Course) shall have the following properties:
1. The Engineering shall approve the job mix formula submitted by the Contractor. Once the job mix formula is established, all mixtures furnished for the Project shall conform within the following maximum permissible variation:
    - a. Aggregate passing No. 4 and larger sieves..... + or - 5.0%
    - b. Aggregate passing No. 8 to No. 100 sieves..... + or - 3.0%
    - c. Aggregate passing No. 200 sieves..... + or - 2.0%
    - d. Asphalt..... + or - 0.4%
    - e. Temperature of mixture..... + or - 20°
  2. The asphalt mixture shall have the following test properties:
    - a. Marshall Stability..... 1200 lbs. (minimum)
    - b. Marshall Flow (units of 0.01 in.)..... 8 to 18
    - c. Air Voids..... 3 to 7 percent
  3. Adjustment of the job-mix base course formula may only be made with written approval of the Engineer.
- D. Asphalt Paving (Bituminous) Mixture (Wear Course) shall have the following properties:
1. The Engineering shall approve the job mix formula submitted by the Contractor. Once the job mix formula is established, all mixtures furnished for the Project shall conform within the following maximum permissible variation:
    - a. Aggregate passing No. 4 and larger sieves..... + or - 5.0%
    - b. Aggregate passing No. 8 to No. 100 sieves..... + or - 3.0%
    - c. Aggregate passing No. 200 sieves..... + or - 2.0%
    - d. Asphalt..... + or - 0.4%
  2. The asphalt mixture shall have the following test properties:
    - a. Marshall Stability..... 1200 lbs. (minimum)
    - b. Marshall Flow (units of 0.01 in.)..... 8 to 18

- c. Air Voids..... 3 to 5 percent
- 3. Adjustment of the job-mix wear course formula may only be made with written approval of the Engineer.
- E. Tack Coat:
  - 1. SS1H and CSS1H Emulsion meeting the appropriate requirements of ASTM for the specific grade of emulsion and the MDT Standard Specifications. Non-tracking tack products may also be used as approved by the Engineer.
  - 2. Water should be clean and free of impurities, either in solution or colloidal suspension. The presence of ions, both positive and negative, must be carefully monitored.
  - 3. Storage and handling of the emulsion should be performed in accordance with MS-19.
  - 4. All conventional asphalt emulsions shall be diluted with water at a 50:50 ration. Polymer modified and non-tracking emulsions shall not be diluted. Dilution of the emulsion product should be performed at the emulsion terminal or in a tank at the asphalt plant. Emulsion should not be diluted in the distributor at the project site.
  - 5. Never allow asphalt emulsion to freeze.
  - 6. Use pumps with proper clearances for handling to avoid binding and seizing. Avoid repeated pump cycling or frequent pumping.
  - 7. DO NOT mix different classes, grades, or types of emulsified asphalt in storage tanks, transports, or distributors. Make sure tanks are totally clean before changing to another class, grade, or type.
  - 8. Always pump from bottom of tank.
  - 9. Never overheat asphalt emulsion.

2.02 PAVEMENT MARKING PAINT

- A. Paint shall be J.E. Bauer Company, Traffic Paint; Tnemec, Traffic Paint; Glidden-Durkee, Romark Traffic; PPG, Traffic & Zone Marking Paint; or equal.
- B. Provide paint striping and logos as shown on the Drawings.
- C. Provide colors as selected by the Engineer from the manufacturer’s standard color range.

**PART 3 - EXECUTION**

3.01 EXAMINATION

- A. Verify that compacted subgrade is dry, stable, compacted to specified density, at proper temperature, and to proper elevations and grade slopes. Do not begin asphalt-paving construction without Engineer’s authorization.
- B. Each course shall be compacted and hardened to such a degree that it will not be displaced or otherwise damaged before another course may be placed thereon.

### 3.02 PREPARATION

- A. Notify Engineer and Owner at least 72 hours in advance of temporary disruptions of traffic along route of construction.
- B. Saw cut and tack all joints between new and existing pavement.
- C. For asphalt overlay sections, mill a one (1) foot strip along all edges of the overlay area.
- D. The Contractor shall review the proposed paving sequence with the Engineer prior to placement of bituminous course.
- E. All surfaces shall be checked and approved by the Engineer prior to paving.
- F. Existing courses must be dry prior to and during placement of any bituminous pavements.
- G. Wearing course shall not be placed when the air temperature in the shade and away from artificial heat, is 50°F or less, unless otherwise approved by the Engineer.
- H. Pavement shall not be installed on frozen or thawing ground.

### 3.03 TACK COAT

- A. All equipment shall conform to MDT Standard Specifications for Road and Bridge Construction, latest edition, Section 151.
  - 1. Tack distributor shall be designed, equipped, maintained, and operated so that tack material is applied at the specified rate per square yard with uniform pressure over the required width application.
  - 2. The distributor shall be equipped with an onboard computer that determines the relationship between the distributor travel speed and pump speed to ensure a consistent application rate.
  - 3. An accurate and calibrated thermometer with a range covering the specified application temperature for tack material shall be mounted at approximately center height of the tank with the stem extending into the tack material.
  - 4. The distributor shall have a full circulating system with a spray bar, adjustable laterally and vertically. The spray bar shall be maintained at a constant height above the pavement under variable load conditions.
  - 5. Ensure that all nozzles are of the same size and type to ensure uniform application of emulsion.
  - 6. Ensure that all nozzles are at the same angle to ensure uniform application of emulsion.
  - 7. The distributor shall be checked and calibrated. A certificate of the calibration shall be posted in the driver's compartment stating that the distributing system is in good working condition and when used with the charts and instructions furnished by the manufacturer will give the required results. The certificate shall bear the date of calibration and signature of the calibrating agency.
- B. Always maintain proper distributor spray bar height and spray nozzle angle for proper

coverage.

- C. Always maintain proper distributor speed.
  - D. Always sweep and clean surfaces to be tack coated.
  - E. Never apply more tack coating than can be covered by the same day's operation.
  - F. Never apply tack coating when ambient air temperature is consistently below 40° F or when surface is wet.
  - G. Never over-spread tack coating. If "fat spots" develop, spread out excess oil by pneumatic tire rolling before placing pavement.
  - H. Always allow enough time for tack coat to "break" before placing pavement.
  - I. Apply tack coat as directed in Section 401 of the MDT Standard Specifications for Road and Bridge Construction, latest edition and NAPA's Best Practices for Emulsion Tack Coats. Hand spray wands and crack-sealing buckets are not acceptable methods of applying tack coat emulsion except on the vertical face of an adjoining lift of pavement.
  - J. Apply bituminous tack coat to existing bituminous pavement and to the surface of each lift or course constructed, other than the final course. Apply in a uniform rate with no missed areas permitted. Application rates shall be approved by the Engineer prior to commencing Work.
  - K. The bituminous tack coat shall be applied at a uniform rate of not less than:
    - 1. 0.10 gallons per square yard, for undiluted asphalt emulsion (as supplied from the emulsion terminal); application rate shall be adjusted if necessary to attain bond between courses.
    - 2. 0.20 gallons per square yard, for diluted asphalt emulsion (with water added at the terminal or plant emulsion tank).
  - L. The temperature of emulsion shall be between 70 and 160 degrees F at the time of application.
  - M. Apply immediately prior to the placement of the next bituminous course or lift. Do not allow public traffic on tack coated areas. The tack coat shall be applied in a manner that offers the least inconvenience to traveling public.
  - N. Apply the tack coat on the same day as the proposed surfacing is to be performed. Where emulsified asphalt is specified, dilute one part of water to one part of emulsion and apply the mixture at two times the undiluted rate of application. Allow water to evaporate completely before beginning paving operations. At request of Contractor, Engineer may approve a change in the dilution ratio of the water- emulsion mixture. Sampling and testing of the emulsion product will be performed at the discretion of the Engineer.
- 3.04 ASPHALT PAVEMENT CONSTRUCTION
- A. All mixtures shall be spread and finished with a self-propelled, bituminous paver, to the



required section, leaving the mixture uniformly dense, smooth, and free from irregularities.

- B. The speed of the bituminous paver shall be controlled to place the mixture uniformly and continuously without tearing or gouging. The speed shall not exceed the Manufacturer's recommendation, and shall be coordinated with the output of the plant to provide for a smooth, continuous operation, minimizing starting and stopping.
- C. Perform test strip compaction in field under observation of Engineer to determine the percentage of the asphalt mixture's maximum density achievable. If, in the Engineer's opinion, Contractor is unable to achieve the specified density corresponding with 95 percent of the maximum Marshall density (ASTM D1559), Contractor shall achieve an asphalt compaction equaling or exceeding that obtained in the test strip.
- D. Compact pavement by rolling to specified density as follows:
  - 1. Compaction shall consist of initial or breakdown rolling, intermediate rolling, and final or finish rolling with rollers meeting all requirements of MDT Standards Specifications and which are approved by the Engineer.
  - 2. Breakdown rolling shall consist of one or more complete coverages with a rubber tired roller.
  - 3. Breakdown rolling shall be followed by intermediate rolling with either a rubber tired roller or a vibratory steel roller and shall be continued until the surface is tightly bound and shows no displacement under the roller.
  - 4. Intermediate rolling shall be completed before the mat temperature falls below 185° F.
  - 5. Final rolling shall be performed with a steel roller and shall continue until roller marks are eliminated. Contractor may be required to modify rolling sequence to best suit the construction conditions.
  - 6. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
  - 7. Compaction shall be a minimum of 92% of the daily theoretical maximum density (ASTM D-2041).
- E. Uniformly blend pavement surface into elevations at curbs, valve box castings, and other critical points of contact. Place pavement so that the pavement is 1/4" higher than the edge of the structure after the pavement has been compacted.
- F. Do not allow drainage to be impeded or casting covers to become difficult to remove.
- G. All transverse and longitudinal joints, high or low areas, and surface irregularities, shall be leveled, filled, or raked prior to compaction. Any loose material dropped on previously compacted lanes shall be removed immediately.
- H. Ensure joints made during paving operations are straight, clean, vertical, and free of broken or loose material. Joints shall be tacked and constructed with adequate bond on

abutting surfaces. Vertical construction joints in successive courses shall be placed so that joints do not fall on the same vertical plane.

- I. Rolling shall begin at the edges and proceed parallel to the road centerline, each trip overlapping the previous roller pass. On paving an echelon or abutting a previously placed lane, the longitudinal joint should be rolled first followed by the regular rolling procedure. Rolling shall begin at the low elevation and progress to the high elevation by overlapping of longitudinal passes, paralleling the centerline. Displacement resulting from reversing the direction of a roller or from other causes shall be corrected immediately.
- J. The sequence of rolling operations and the selection of type and number of rollers shall be commensurate with production, and shall be adequate to obtain the specified density before the mat temperature falls below 185° F.
- K. Install all bituminous pavement 3-inches and greater in thickness in a minimum of two lifts. Maximum thickness of a base course lift shall be 3-inches.
- L. Ensure surface of completed asphalt pavement is true to lines, profiles, and elevations indicated and matches existing grade.
- M. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.
- N. The surfaces of previously placed layers shall be swept and a tack coat applied before spreading the next layer.
- O. The overall thickness shown on the Drawings shall be the minimum finished, in- place, compacted thickness of bituminous pavement.
- P. Protect newly paved surfaces from traffic and mechanical injury until surface has cooled to 140°F.
- Q. Any low or high defective areas shall be corrected immediately. Corrective Work shall include patching, cutting out the surface and replacing with fresh, hot bituminous mixture, or by milling the surface.
- R. Clean up paving area.
- S. Ensure manhole covers are clean of all asphalt material and tack coat and returned to the condition they were prior to asphalt paving activities.

### 3.05 PAVEMENT MARKINGS

- A. Remove all dirt, oil, grease, and other foreign material from areas of pavement to be marked. Contractor is responsible for all preparation and layout.
- B. Apply paint only on thoroughly dry surfaces when atmospheric temperature is above 40 degree Fahrenheit and when weather is favorable.
- C. Apply respective markings in colors as indicated and sizes and dimensions as indicated, or match existing colors and markings.
- D. Contractor shall replace and/or restore all pavement markings after temporary patching or

Work has removed such markings.

- E. Contractor shall maintain pavement markings as required during all phases of construction.
- F. Apply painted permanent pavement markings with a maximum coverage rate of 100 square feet per gallon with a 0.015 inch minimum film thickness on bituminous and concrete paved areas, and 0.020 inch minimum film thickness on seal coated areas.
- G. Apply paint with atomizing spray type striping machine. Markings shall have clear-cut edges, true and smooth alignment, and uniform thickness. Do not permit traffic on pavement until markings are thoroughly dry. Other pavement markings shall be painted with the standard templates in an appropriate proportion.
- H. Apply respective markings in colors as indicated and sizes, locations, and dimensions as follows:
  - 1. All parking stalls to be marked with 4" wide striping, color as indicated on Drawings.
  - 2. Crosswalk markings shall be as indicated on Drawings.
  - 3. Pavement arrows, lettering, and symbol dimensions shall conform to MUTCD Standards.
  - 4. All handicapped parking stalls shall be marked with striping and symbols in accordance with City and ADA Standards. Handicapped stalls to include both van accessible and non-van accessible. Locations as directed by Owner, or as shown on the drawings. Color shall be blue.
- I. Contractor shall be responsible to replace and/or restore all pavement markings after temporary patching or other Work has removed such markings.

### 3.06 FIELD QUALITY CONTROL

- A. Section 01 40 00 – Quality Control: Field inspection and testing.
- B. Perform field and laboratory testing by an independent testing laboratory appointed and paid for by the Contractor.
- C. Determine maximum density in accordance with ASTM D2041, and compact each course in the field to a density not less than 92 percent of the Maximum Density attained by the theoretical maximum density method.
- D. Perform field density testing in accordance with ASTM D2950; minimum frequency of one test per 2,000 square feet per lift, or once per day, whichever is more frequent. Ensure that the density gauge is properly calibrated and correlated to core density tests for the mix being used.
- E. Notify testing laboratory to perform density tests when testing is to be performed during construction. Do not proceed with additional Work until results have been verified.
- F. If, during progress of Work, tests indicate that compacted materials do not meet specified requirements, remove defective Work, replace, and retest. Contractor to bare all costs

associated with defective pavement Work.

- G. Perform gradation analysis of aggregate once for each 500 tons of mix produced, as construction progresses. Test base course and wear course for oil content and air voids to differentiate different mix designs.

### 3.07 TOLERANCES

- A. Flatness: Maximum variation of 3/16 inch measured with 10-foot straight edge.
- B. Scheduled Compacted Thickness: Within 1/4 inch of specified thickness.
- C. Variation from true elevation: Within 1/4 inch.
- D. Variation from horizontal location: Within 1/4 inch.
- E. Transverse slope of surface course shall not vary from the slope shown on Drawings by more than plus or minus 1/4 inch in 12 feet.
- F. Asphalt cement content within 0.24% of approved mix design as determined by daily cutoff report.

**END OF SECTION 32 12 16**

**SECTION 32 92 19**  
**SEEDING**  
(Reference MPWSS Section 02910)

All applicable portions of MPW standard specification Section 02910 shall apply with the following additions, deletions and/or modifications.

**PART 2 - PRODUCTS**

2.01 SEED

Add following:

E. Seed mixtures shall be proportioned as follows:

1. Dryland Seed.

Seed Species or Variety	Seed Mix %	Application Rate
Western Wheatgrass	20%	21 lbs. Per acre
Pryor Slender Wheatgrass	20%	
Crituna Thickspike Wheatgrass	30%	
Sudar Stream Bank Wheatgrass	20%	
Canada Bluegrass	10%	

Note: All seed shall be 98% pure and shall have a germination percentage of 90%. Do not sow immediately following rain, when ground is to dry, or during windy periods. Apply water with fine spray after seeding. Saturate to 3 inches of soil.

2. Lawn or Turf Grass Seed.

Lawn or turf grass seed shall be a blend of at least 24 percent Kentucky Bluegrass plus a blend of at least three other bluegrasses in approximately equal proportions. Acceptable blend grasses include Adelphi, Silkens, Birka, Nuglade, Rambo, Ram Eclipsey, Quantum, Merian, Nustar or others commonly used in the area by sod producers.

2.02 TOPSOIL

Add the following:

1. Topsoil shall be the existing top 6-12 inches of silty sand surface layer of soil at the site with no admixture of refuse or any material toxic to plant growth, and it shall be reasonably free from subsoil and stumps, roots, brush, stones (1.0 inches or more in diameter), clay lumps or similar objects. Brush and other vegetation which will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary herbaceous growth such as grass and weeds do not need to be removed but shall be thoroughly broken up and intermixed with the soil during handling operations. The Contractor will be required to compact the topsoil to reduce settling and ensure a uniform grade in the disturbed areas.

## 2.04 FERTILIZER

Add the following:

C. Fertilize uniformly across all surfaces at the following rate:

### Dryland Grass

Nitrogen 25 lbs/acre

Phosphate 25 lbs/acre

### Lawn Grass

Nitrogen 50 lbs/acre

Phosphate 50 lbs/acre

## 2.05 MULCH

Add the following:

A. Mulch with a loose 1-inch layer of straw.

## **PART 3 - EXECUTION**

Add the following:

### 3.05 CARE OF SEEDED AREAS

D. All weeds including (spotted knapweed, leafy spurge, and all others identified by the State of Montana as non-native) shall be controlled by the Contractor while grass is becoming established and during the full one year warranty period after the project is complete and accepted by the Owner. Chemical control may be utilized where permitted by State Laws and regulations.

## **PART 4 - MEASUREMENT AND PAYMENT**

DELETE: Entire Section

**END OF SECTION 32 92 19**

**SECTION 32 92 23**  
**TOPSOIL AND SODDING**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections apply to this Section

1.02 GENERAL

- A. This section covers the work necessary to furnish, haul, and place approved topsoil and live sod on prepared areas at the locations shown on the Drawings or as directed by the Engineer.

1.03 SUBMITTALS

- A. The following submittals for construction shall be made in accordance with the project submittal requirements as described in the Supplementary Conditions.
  1. Topsoil particle size analysis; characterization; acidity; salinity; organic matter percentage.
  2. Sod supplier name, address and telephone number.
  3. Grass mixture contained in sod.
  4. Manufacturer's Fertilizer Data Sheets.

**PART 2 - MATERIALS**

2.01 TOPSOIL

- A. Topsoil shall consist of friable surface soil reasonably free of grass, roots, weeds, sticks, stones, or other foreign materials.
- B. The topsoil shall consist of sandy loam, with soil particles within the following percentages: clay; 0-25; silt; 25-50; sand; 50-70; decomposed organic matter; 5-10. The clay content is optional.
- C. The soil shall have a soil acidity range between a pH 5.0 to pH 7.0. The soil salinity shall not exceed 3 millimhos per centimeter at 25oC (as described by USDA Circular No. 982).
- D. The Contractor shall notify the Engineer of the source of topsoil not less than 10 days prior to excavation.

2.02 SOD

- A. Sod furnished by the Contractor shall have a good cover of living or growing grass. This shall be interpreted to include grass that is seasonally dormant during the cold or dry seasons and capable of renewing growth after the dormant period.
- B. All sod shall be obtained from areas where the soil is reasonably fertile and contains a high percentage of loamy topsoil.

- C. Sod shall be cut or stripped from living, thickly matted turf relatively free of weeds or other undesirable foreign plants, large stones, roots, or other materials which might be detrimental to the development of the sod or to future maintenance.
- D. Sod shall be 100 percent Kentucky Bluegrass.
- E. Before harvesting, the turfgrass shall be mowed to a uniform height of not more than 5/8".
- F. Sod, including the soil containing the roots and the plant growth showing above, shall be cut uniformly to a thickness not less than 2 inches.

## 2.03 WATER

- A. The water shall be sufficiently free from oil, acid, alkali, salt, or other harmful materials that would inhibit the growth of grass. It shall be subject to the approval of the Engineer prior to use.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Areas to be solid, strip, or spot sodded are shown on the Drawings. Areas requiring special ground surface preparation such as tilling and those areas in a satisfactory condition which are to remain undisturbed shall also be shown on the Drawings.
- B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Engineer and replace with new planting soil
- C. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
- D. Uniformly moisten excessively dry soil that is not workable or which is dusty.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 PREPARING THE GROUND SURFACE

- A. Placing and spreading of topsoil shall not be done when the ground is frozen, excessively wet or otherwise in a condition detrimental to the work. Surfaces designated to be covered shall be lightly scarified just prior to the spreading operation. Compaction of topsoil will not be required.
- B. After placement is completed the surface of the topsoil shall be finished to a reasonably smooth surface.
- C. After application of the topsoil and grading of areas has been completed and before applying fertilizer, areas to be sodded shall be raked or otherwise cleared of stones larger than 2 inches in any diameter, sticks, stumps, and other debris which might interfere with sodding, growth of grasses, or subsequent maintenance of grass-covered areas. If any



damage by erosion or other causes occurs after grading of areas and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

- D. All areas to receive sod or turf grass seed shall have the native material properly scarified, a minimum of 6" of approved topsoil applied and lightly rolled, prior to installation of the sod or seed.
- E. Over-compaction the topsoil at any time before or during application of the sod or seed is not acceptable.

### 3.03 APPLYING FERTILIZER

- A. Following ground surface preparation, fertilizer shall be uniformly spread at the rates specified below.
  - 1. All areas shall be fertilized with an inorganic chemical fertilizer with the following nutrients:
    - a. Nitrogen (Elemental) 40 lbs/acre
    - b. Phosphorus (P205) 60 lbs/acre
    - c. Potassium (K20) 30 lbs/acre

### 3.04 OBTAINING AND DELIVERING SOD

- A. After inspection and approval of the source of sod by the Engineer, the sod shall be cut with approved sod cutters to such a thickness that after it has been transported and placed on the prepared bed, but before it has been compacted, it shall have a uniform thickness of not less than 2 inches. Sod sections or strips shall be cut in uniform widths, not less than 10 inches, and in lengths of not less than 18 inches, but of such length as may be readily lifted without breaking, tearing, or loss of soil. Where strips are required, the sod must be rolled without damage with the grass folded inside.
- B. The sod shall be transplanted within 24 hours from the time it is stripped, unless circumstances beyond the Contractor's control make storing necessary. In such cases, sod shall be stacked, kept moist, and protected from exposure to the air and sun and shall be kept from freezing. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected. Where the soil is too dry, permission to cut sod may be granted only after it has been watered sufficiently to moisten the soil to the depth the sod is to be cut.

### 3.05 LAYING SOD

- A. Lay sod within 24 hours of harvesting unless a suitable preservation method is accepted by Architect prior to delivery time. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. After establishment, if necessary to smooth

surface, tamp and roll lightly to remove surface undulations. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across slopes exceeding 1:3.
  2. On slopes exceeding 1:6, and in V-shaped or flat-bottom ditches or gutters, the sod shall be pegged with wood pegs not less than 12 inches in length and have a cross-sectional area of not less than 3/4 square inch. The pegs shall be driven flush with the surface of the sod.
- C. Sodding shall be performed only during the seasons when satisfactory results can be expected. Frozen sod shall not be used and sod shall not be placed upon frozen soil. Sod may be transplanted during periods of drought with the approval of the Engineer, provided the sod bed is watered to moisten the soil to a depth of at least 4 inches immediately prior to laying the sod.
- D. The sod shall be moist and shall be placed on a moist earth bed. Pitch forks shall not be used to handle sod, and dumping from vehicles shall not be permitted. The sod shall be carefully placed by hand, edge to edge and with staggered joints, in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward. The sod shall immediately be pressed firmly into contact with the sod bed by tamping or rolling with approved equipment to provide a true and even surface, and insure knitting without displacement of the sod or deformation of the surfaces of sodded areas. Where the sod may be displaced during sodding operations, the workmen when replacing it shall work from ladders or treaded planks to prevent further displacement. Screened soil of good quality shall be used to fill all cracks between sods. The quantity of the fill soil shall not cause smothering of the grass. Where the grades are such that the flow of water will be from paved surfaces across sodded areas, the surface of the soil in the sod after compaction shall be set approximately 1 inch below the pavement edge. Where the flow will be over the sodded areas and onto the paved surfaces around manholes and inlets, the surface of the soil in the sod after compaction shall be placed flush with pavement edges.

### 3.06 WATERING

- A. Adequate water and watering equipment must be on hand before sodding begins, and sod shall be kept moist until it has become established and its continued growth assured. In all cases, watering shall be done in a manner which will avoid erosion from the application of excessive quantities and will avoid damage to the finished surface.

### 3.07 ESTABLISHING TURF

- A. General. The Contractor shall provide general care for the sodded areas as soon as the sod has been laid and shall continue until final inspection and acceptance of the work.
- B. Protection. All sodded areas shall be protected against traffic or other use by warning signs or barricades approved by the Engineer.
- C. Mowing. The Contractor shall mow the sodded areas with approved mowing equipment, depending upon climatic and growth conditions and the needs for mowing specific areas. In the event that weeds or other undesirable vegetation are permitted to grow to such an

extent that, either cut or uncut, they threaten to smother the sodded species, they shall be mowed and the clippings raked and removed from the area.

3.08 REPAIRING

- A. When the surface has become bullied or otherwise damaged during the period covered by this contract, the affected areas shall be repaired to re-establish the grade and the condition of the soil, as directed by the Engineer, and shall then be re-sodded.

**END OF SECTION 32 92 23**

**SECTION 32 97 00**  
**RESTORATION OF DISTURBED AREAS**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes:
  - 1. Restoration of all areas disturbed during construction.
  - 2. Restoration of all items not specifically identified for restoration, but damaged through construction.
- B. Related Sections include:
  - 1. The General Conditions, Supplementary Conditions, and General Requirements apply to work of this section.
  - 2. Division 1 – General Requirements Specification Sections.
  - 3. Division 31 – Earthwork Specification Sections.
  - 4. Division 32 – Exterior Improvements.

1.02 REFERENCES

- A. Reference Standards include:
  - 1. Montana State Highway Department Standard Specifications for Road and Bridge Construction, latest edition.

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Material Sections include:
  - 1. Topsoil and Subsoil: Per Section 32 92 23.
  - 2. Seed and fertilizer: Per Section 32 92 19.

**PART 3 - EXECUTION**

3.01 EXECUTION

- A. Observe all surface features requiring protection, removal and replacement, and/or restoration prior to construction.
- B. The Contractor shall be responsible for the preservation of all public and private property and shall protect carefully from disturbance or damage all land monuments and property marks until the Engineer has witnessed or otherwise referenced their location and shall not move them until directed.
- C. The Contractor shall be responsible for all damage or injury to property of any character during the prosecution of the Work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing the Work, or at any time due to

defective Work or materials, and said responsibility will not be released until the Project shall have been completed and accepted.

- D. When any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work, or in consequence of the non-execution thereof by the Contractor, he shall restore, at his own expense, such property to the condition similar or equal to that existing before such damage or injury was done by repairing, rebuilding, or otherwise restoring as may be directed or he shall make good such damage or injury in an acceptable manner.

### 3.02 RESTORATION

- A. Restore all areas disturbed by construction to a condition equal to or better than existed prior to construction.
- B. Replace, restore, repair, or otherwise make good any damage done to any tree, bush, or shrub that is not specifically designated for removal.
- C. Restore items such as culverts, road signs, power poles, sodding, fences, driveways, mailboxes, and like, whether or not specifically identified on the Drawings, to a condition equal to or better than existed before construction.
- D. Replace or repair all concrete or asphalt roads or driveways, removed or damaged during construction with equal or better materials. Replace or repair to match existing conditions.
- E. Stabilize subgrade sufficiently to prevent mixing of granular material with subgrade prior to application of base material.
- F. Place topsoil per Section 32 92 23 and seed areas disturbed by construction in grassed areas per Section 32 92 19.
- G. All damage to streets, driveways, berms, etc. due to the Contractor's construction techniques and equipment shall be repaired at the Contractor's expense prior to final payment.
- H. Remove all excess dirt, concrete, and other debris from work area immediately upon completion of Work and deposit on-site in a disposal area designated by Owner. Contractor shall be required to clean site to the condition prior to the start of construction before final payment will be made.
- I. All restoration shall be completed prior to opening any section of Work.

**END OF SECTION 32 97 00**

**DIVISION 33**

**UTILITIES**

**SECTION 33 01 10  
DISINFECTION OF WATER UTILITY PIPING**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes:
  - 1. Disinfection of potable water system.
  - 2. Testing and reporting results.
- B. Related Sections include, but are not limited to:
  - 1. Section 01 33 00 – Submittal Procedures.
  - 2. Section 01 40 00 – Quality Control.
  - 3. Section 01 77 00 – Closeout Procedures.
  - 4. Section 33 31 19 – Site Water Utility Distribution Piping.

1.02 REFERENCES

- A. Reference Standards include, but are not limited to:
  - 1. AWWA B300 - Standard for Hypochlorites.
  - 2. AWWA B301 - Standard for Liquid Chlorine.
  - 3. Federal Specifications BB-C-12a, O-C-114a, and O-C-602b.
  - 4. AWWA C651 – Disinfection of Water Mains.
  - 5. Montana Public Works Standard Specifications.

1.03 SUBMITTALS FOR INFORMATION

- A. Submit under provisions of Section 01 33 00.
- B. Test Reports: Indicate results comparative to specified requirements

1.04 DEFINITIONS

- A. Disinfectant Residual means the concentration of disinfectant in the treated water.
- B. PPM means parts per million.

1.05 QUALITY ASSURANCE

- A. Regulatory Agency Requirements: Comply with Montana Department of Environmental Quality (DEQ) requirements.
- B. Perform work in accordance with AWWA C651 for the disinfection of water main
- C. Testing Firm: Company specializing in testing potable water systems, approved by the DEQ. Contractor shall obtain sampling bottles from an approved laboratory and perform sampling per project requirements and sampling protocol. Contractor shall coordinate sampling and testing schedule with the laboratory. Contractor shall pay all testing fees

and lab costs.

- D. Submit bacteriologist's signature and authority associated with testing.
- E. The cleaning and disinfection work shall be conducted prior to connection to the existing water lines or to any portion that has been put into service. Unless otherwise approved, hydrostatic testing shall be completed prior to final cleaning and disinfection.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect against damage and contamination.
- B. Maintain caution labels on hazardous materials.
- C. Maintain storage room dry and with temperatures as uniform as possible between 60 and 80 degrees F.
- D. Provide necessary signs, barricades, and notices to prevent any person from accidentally consuming water or disturbing system being treated.

#### 1.07 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01 33 00 – Submittal Procedures and Section 01 77 00 – Closeout Procedures.
- B. Disinfection report:
  - 1. Type and form of disinfectant used.
  - 2. Date and time of disinfection.
  - 3. Test locations.
  - 4. Initial and final disinfectant residuals (quantity in treated water) in ppm for each test.
  - 5. Date and time of flushing start and completion.
  - 6. Disinfectant residual after flushing in ppm for each location test.
- C. Bacteriological report:
  - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
  - 2. Time and date of water sample collection.
  - 3. Name of person collecting samples.
  - 4. Test locations.
  - 5. Initial and final disinfectant residuals in ppm for each test location.
  - 6. Coliform bacteria test results for each test.

## **PART 2 - PRODUCTS**

### 2.01 ACCEPTABLE DISINFECTION CHEMICALS

- A. AWWA B300, Hypochlorite: Shall conform to Federal Specification O-C-114a, Type II,



Grade B, or Federal Specification O-C-602b.

B. AWWA B301, Liquid Chlorine: Shall conform to Federal Specification BB-C- 120a.

### **PART 3 - EXECUTION**

#### **3.01 PREPARATION**

- A. Verify that piping system has been cleaned, inspected, and pressure tested.
- B. Do not start Work until conditions are satisfactory.
- C. Select one form of chlorine for use in disinfection.
- D. Flush mains thoroughly before introduction of chlorinating material. Maintain flushing velocity in main of not less than 2.5 feet per second unless the Engineer determines that conditions do not permit the required flow to be discharged to waste.

#### **3.02 DISINFECTION OF WATER SYSTEMS**

- A. Provide and attach required tools, equipment, and materials to perform the Work of this Section. Disinfectant material shall be introduced into the water system in a manner approved by the Engineer. For wells, add the required amount of chlorination material into the casing before installation of pumping equipment. Agitate as required for thorough mixing.
- B. Use of calcium hypochlorite granules for use on solvent welded plastic or on screwed joint steel pipe is prohibited because of the danger of fire or explosion from the reaction of the joint compounds with the calcium hypochlorite.
- C. Perform disinfecting in accordance with AWWA C651 prior to start-up. Coordinate with other Contractors, Engineer, and Owner.
- D. Inject treatment disinfectant into piping system to obtain 50 to 80 ppm residual.
- E. Test for disinfectant residual at each of the following locations:
  - 1. End of piping runs.
- F. Maintain disinfectant in system for 24 hours. If disinfectant residual is less than 25 ppm, repeat system treatment.
- G. All water supply and distribution mains shall be disinfected with chlorine prior to acceptance by the owner.
- H. As chlorinated water flows past new fittings and valves, related valves shall be operated so as to disinfect appurtenances and pipe branches. All valves shall be opened and closed several times during the contact period.
- I. Drain and flush using fresh water pumped through the system.
- J. Flush heavily chlorinated water from main until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the system.
- K. Provide bacteriological test at Owner or Engineer's request.

- L. Any sections of equipment in contact with water shall be swabbed with a chlorine solution prior to installation.
- M. Properly dispose of heavily chlorinated water supply in an environmentally acceptable manner.
- N. Contractor shall pay all testing costs.

### 3.03 BACTERIOLOGICAL TESTING

- A. After disinfection and flushing, test water for bacteriological contamination. Samples for bacteriological analysis shall be collected in sterile bottles obtained from the testing laboratory and submitted for testing.
- B. Samples shall be taken from the hydrants. Duplicate samples shall be collected from each hydrant.
- C. Two or more successive test samples indicating bacteriological satisfactory water shall be obtained before facility is placed into operation.
- D. If contamination is shown to be still present in the water supply, the disinfection procedure shall be repeated.
- E. All testing costs shall be paid by Contractor.

### 3.04 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Control: Field inspection and testing.
- B. Samples for bacteriological analysis shall be collected in sterile bottles.
- C. Two or more successive test samples indicating bacteriological satisfactory water shall be obtained before any system is placed into operation.

**END OF SECTION 33 01 10.58**

**SECTION 33 05 26  
UTILITY IDENTIFICATION**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Section includes:
  - 1. Tracer Wire
  - 2. Marking tape
- B. Related Sections include, but are not limited to:
  - 1. Section 01 33 00 – Submittals.
  - 2. Section 31 23 33 – Trenching and Backfilling.
  - 3. Section 33 31 13 – Site Sanitary Sewerage Piping
  - 4. Section 33 31 19 – Site Water Utility Distribution Piping.

1.02 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Submit manufacturer's data on materials furnished indicating compliance with the specifications.

**PART 2 - PRODUCTS**

2.01 MATERIALS

- A. Tracer Wire:
  - 1. All water distribution piping and forcemains shall be installed with tracer wire meeting all the requirements of NEC as well as ASTM B-3, ASTM B170, ASTM D1248 and ASTM D1238. Approved tracer wire is Pro-Line Type Cu HDPE 30 mil manufactured by Pro- Trace/Pro-Pak Industries, or approved equal.
- B. Marking Tape:
  - 1. "Terra Tape" as manufactured by REEF Industries, Inc., or Omega Marking Company.
  - 2. Size: 3”.
  - 3. Marking Tape Schedule and Warning Notice:

<b>Pipeline</b>	<b>Warning Notice</b>	<b>Color</b>
Sanitary Sewer	Caution Buried Sewer Line Below	Green
SS		
Force Main	Caution Buried Force Main Below	Green
AIR / FDD/ IMLR / VFA / RAS / SCM / WAS		

Potable Water Main PW	Caution Water Line Buried Below	Blue
Non Potable Water NPW	Caution Non Potable Water Line Buried Below	Purple
Electric Gas	Caution Electric Line Buried Below Caution Gas Line Buried Below	Red Yellow
OTHERS	Caution ----- Buried Below	TBD

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

**A. Tracer Wire**

1. Install coated copper wire, taped to the top of pipe, and thermite welded to valve body on all water mains and forcemains

**B. Marking Tape**

1. Install the marking tape 24" below finished grade directly above and parallel with pipelines. Marking tape shall be installed for all site piping outlined in Sections 33 31 13, 33 31 19 and the Piping Schedule and shall be labeled in accordance with this section.
2. At each manhole, bring the marking tape up to the manhole to a point approximately 24 inches below finished grade.

**END OF SECTION 33 05 26**

**SECTION 33 05 30**  
**WATER SERVICE CONNECTIONS**

**PART 1 - GENERAL**

1.01 DESCRIPTION

This work is construction of water services, including water service piping, tapping mains, corporation stops, curb stops and related items.

**PART 2 - PRODUCTS**

2.01 GENERAL

- A. Furnish service pipe of the size or sizes specified. For existing services, provide lines as least as large as the existing service with a minimum size of  $\frac{3}{4}$ ". Service lines connect customers to water mains and are generally 3-inches in size and under.
- B. Furnish and install the service pipe from the main to the curb stop and curb box near the property line. Where replacing or installing new curb valves and boxes, install valves and boxes within the existing municipal right-of-way.
- C. See typical water service detail requirements located in the drawings.
- D. Lead Control – solders and flux containing more than 0.2% lead and pipe fittings containing more than 0.25% lead must not be used on service connections.

2.02 WATER SERVICE PIPE:

- A. Use only High-Density Polyethylene pipe that meets the following specifications for connecting services to new mains:
- B. HDPE pipe meeting AWWA Specification C901, "Polyethylene (PE) Pressure Pipe, Tubing and Fittings,  $\frac{1}{2}$  inch through 3 inch for Water" and ASTM D2239 (DR7). PE pipe shall meet pressures outlined in Table 6 requirements of said specification. Use class 250 with a DR of 7. Polyethylene pipe to be Phillips Drisco Ultraline 5100 or approved equal.
- C. Use copper pipe for connecting services to new mains where specifically called for by Engineer. Service pipe shall be Type K seamless copper tubing supplied in conformance with ASTM B-88-62 and AWWA Standard C800
- D. All residential water service pipe shall be 1" PE with a minimum nominal internal diameter of 1.049" and a wall thickness of 0.159" (DR7)

2.03 CORPORATION STOPS

- A. Furnish bronze corporation stops with inlet end to meet pipe tapping requirements and outlet end for compression connections to copper. Use Mueller 300 series, Ford, or an approved equal.

2.04 SERVICE CLAMPS

- A. Furnish flat, double strap, bronze metal service clamps with Neoprene gaskets and corporation stop threads. Use Romac, Ford, or equal. Assure

service clamps for PVC are designed for PVC Pipe and provide full support around the pipe circumference with a bearing area of the width along the axis of the pipe so the pipe is not distorted when the clamp is tightened.

#### 2.05 CURB STOPS

- A. Furnish compression-style curb stops with bronze plug, tee head key with Minneapolis pattern and screw box mount. Use Mueller 300 Series, Ford, or an approved equal.

#### 2.06 CURB BOXES

- A. Furnish extension type curb boxes having a 6½ foot (2 meters) extended length with Minneapolis pattern. Use Mueller, Ford, or an approved equal.

#### 2.07 METER ISOLATION VALVES

- A. Meter isolation valves shall be Ford BA13-232W angle valve, Ford B11-233 straight valve, or approved equals.

#### 2.08 METER SETTERS

- A. Where new meters are installed inside buildings, the meter setter (yolk) shall:
  1. conform to the configuration of the incoming piping;
  2. include an inlet ball valve, and outlet dual check valve;
  3. meter setters shall be Mueller Model 8A.22 – catalog number B-24180N or approved equals

#### 2.09 METER PITS

- A. The meter pits shall be a Mueller/Hunt Thermal-Coil meter box, Ford Coil Pit Setter, Ford Plastic Pit Setters, or approved equal. The box style shall be for a single meter with 15-inch or 18-inch diameter for 5/8"x3/4" & 3/4" meters and 18-inch or 20-inch diameter for 1" meter. The box style pit shall be for a single 1½" or 2" meter shall be approximately square or 36 inches in diameter. The box depth shall allow for a 6-foot bury over the service pipe. Pit locations shall be as shown on the Contract detail drawings.
- B. The meter pit inlet and outlet connections shall be male I.P. threaded;
- C. Inlet shall include a lockwing, full port angle ball valve;
- D. Outlet shall include an ASSE dual check valve;
- E. Pits shall include a sliding platform to support the meter setter and meter;
- F. Pits shall be provided complete with inlet and outlet piping, coil piping (5/8"x3/4" and 1"meters) and bracing (1½" and 2" meters), and ready to accept meter installation;
- G. Bottoms are not required on the box. Six inches of subbase coarse bedding shall be provided at the bottom of the box.
- H. A 4-inch thick insulation pad (R = 5/inch) or equivalent blanket shall be included with each pit. Pits with meters mounted near the top shall include

an insulation blanket which shall be placed securely on top of the meter after installation and testing are complete.

- I. Pit covers for meters shall allow for removal of the insulation and meter without removing the cover frame and without entering the pit.
- J. Three combination key and wrenches and/or three keys shall be furnished for all lid styles.
- K. Meter pits shall be located outside of traffic areas to the maximum extent possible. Meter pits and covers that must be located in driveways and other areas subject to regular vehicular traffic shall be designed for vehicle loading as accepted by the ENGINEER.

### **PART 3 - EXECUTION**

#### **3.01 TRENCH EXCAVATION AND BACKFILL**

- A. Provide trench excavation and backfill meeting Section 02221; TRENCH EXCAVATION AND BACKFILL FOR PIPELINES AND APPURTENANT STRUCTURES. No separate measurement and payment is made for trench excavation and backfill for water service lines. Include the cost of this work in the price bid for service lines.

#### **3.02 SERVICE LINE INSTALLATION**

- A. Provide all work and materials for the complete service line installation, including trench excavation and backfill; making the water main tap; furnishing and installing the corporation stop, curb stop and box, service clamp where necessary, and service line with fittings to make the connections to the stops. Bend the service line adjacent to the water main into a figure "S" in a horizontal plane to avoid a rigid connection. Assure all services have a minimum 6 feet bury. Maintain a minimum 18-inch vertical separation between water service lines and sewer lines.

#### **3.03 TAPPING**

- A. Tap the newly installed water mains unless specified otherwise.
- B. Perform tapping using an approved tapping machine using clean, sharp drill taps and/or shell cutters. Do not tap directly into AWWA C900 PVC pipe.  $\frac{3}{4}$ -inch (19 mm) and 1-inch (25 mm) taps may be made directly into the barrel of ductile iron pipe without using service saddles. Direct tap into the pipe barrel to the depth exposing a maximum three threads of the corporation stop. Use maximum direct tap sizes of 1-1/2-inch (38 mm) for 6-inch (15 cm) diameter mains and 2-inch (51 mm) for larger mains.
- C. Taps shall be the same diameter as the new service line to be installed;  $\frac{3}{4}$ -inch minimum.

#### **3.04 CONNECT TO EXISTING SERVICE LINE**

- A. Connect existing water service line to new water service. The type and size of existing service lines are sometimes unknown. The Contractor shall be

prepared to make connections between copper tubing and copper tubing, PE pipe, PVC pipe, galvanized pipe etc., of varying sizes.

3.05 SERVICE CONNECTION MARKER

- A. After connection to the new main is complete, Contractor shall mark each curb stop with a two foot wooden stake painted blue. The contractor shall also paint the curb stop and meter pit covers blue. This shall be done regardless of whether the curb stop has been replaced or not.

**END OF SECTION 33 05 30**



**SECTION 33 19 23**  
**WATER METERS, TRANSMITTERS AND READING EQUIPMENT**

**PART 1 - GENERAL**

1.01 INTENT OF SPECIFICATION

The contractor shall furnish; install and place into operation, fully functional solid state (characterized as electromagnetic or ultrasonic) water meter devices with appurtenant transmitting equipment for each active water service user. In addition, the contractor shall furnish, install, place into operation, integrate with the OWNER's existing billing system, and provide complete training for: a complete system of automated reading hardware and software to query all meters for the purposes of measuring water usage and for generating individual water bills.

1.02 SUBMITTALS

The water meter CONTRACTOR shall submit complete specifications, data, catalog cuts, AMA technology details and drawings covering items found under this section.

1.03 RELATED WORK SPECIFIED ELSEWHERE

All related work specified elsewhere, or in other codes or standards, will be as last revised, unless a specific date of issuance is called out in opposition to later revision date(s). Other sections of the technical specifications, not referenced below, shall also apply to the extent required for proper performance of this work.

- A. Section 00 90 00 – Special Provisions
- B. Section 31 23 33 – Trenching & Backfilling
- C. Section 33 05 30 – Water Service Connections
- D. Section 33 31 19 – Water Utility Piping, Fittings & Valves

1.04 APPROVED MANUFACTURERS

A. METERS

All meter components, including radio-read hardware and software must be manufactured, assembled and maintained by the *same* manufacturer. Manufacturers shall have a minimum of fifteen years of production and field experience with all sizes and models quoted.

Manufacturers shall provide only one model of meter to comply each with each applicable subsection of these specifications.

*All meters must utilize electromagnetic or ultrasonic sensing technology.*

Approved manufacturers include Sensus and Master Meter. Other manufacturers must be preapproved by the Engineer 10 days in advance of the Bid Date.

1. 5/8" x 3/4", 3/4" x 3/4" & 1" Solid State (all residential) Meters:
  - a. Xylem/Sensus iPerl Smart magnetic meter;
  - b. Master Meter Sonata ultrasonic meter;
  - c. Badger E-Series G2 ultrasonic meter.

2. 1½" - 3" Solid State C&I Meters:
  - a. Xylem/Sensus Cordonel magnetic meter;
  - b. Master Meter Octave ultrasonic meter;
  - c. Badger E-Series ultrasonic meter.

## 2.01 METER CASE AND REGISTERS

- A. All meters shall meet the most recent version of AWWA Standard C-700, C-701, C-702 or C-715 and shall be certified to meet NSF Standard 61; Annex G and NSF 372.
- B. Residential meters (5/8" x 3/4" thru 1") shall utilize electromagnetic or ultrasonic flow measurement technology,
  1. Solid state flow meters shall be capable of accurately reading the following flow ranges (from minimum extended low flow to maximum flow) at the accuracies indicated:
    - a. Residential meters: 0.05 - 35 gpm @ 97% or greater accuracy;
    - b. 1½" meters: 0.30 – 100 gpm @ 97% or greater accuracy;
    - c. 2" and larger meters: 0.50 – 160 gpm @ 97% or greater accuracy
  2. All residential meter housings shall be made of impact-resistant thermal plastic, HP glass reinforced polymer or high-copper alloy that meets the ANSI/NSF 61 standard. All meters shall incorporate externally threaded ends and wrench pads to aid installation. Larger meters may incorporate flanges. Bronze register retaining rings shall be standard.
  3. All meters shall be tamperproof and shall have an indicator/alarm for any attempt to tamper with the internal workings or for a severed communications cable;
  4. Maincase markings shall be cast raised (or indented) and shall indicate size, model, direction of flow, and NSF 61 certification.
  5. The size, capacity, and meter lengths shall be as specified in AWWA Standard C-700, C-701, C-702 or C-715 (latest revisions). Capacity shall be a minimum of 35 gpm. Register resolution shall be to 0.10 gallons.
  6. All 1½" and larger meter maincase bolts shall be of 300 series non-magnetic stainless steel to prevent corrosion.
  7. Maincases for all residential meters of the removable bottom cap type shall have the bottom cap secured by four (4) bolts on 3/4" size and six (6) bolts on the 1½" size. Larger meter maincases shall also be made of the same lead-free materials as discussed in item 1 above with a cover secured to the maincase with a minimum of four (4) bolts.
  8. The measuring unit shall not include any moving parts and the flow tube shall have no obstructions – transducers and reflectors shall be mounted in the side walls of the flow tube;
  9. All measuring sensors shall be high grade polymer. Inner tube shall be high grade polymer and stainless steel. There shall be an elastomeric EPDM seal or seals

between measured and unmeasured water, preventing leakage around the measuring element.

10. Maximum operating pressure shall be a minimum of 175 psi.;

- C. Ultrasonic meters shall contain an AWWA sanctioned measuring element and a roll-sealed register.
- D. All solid-state meters must have zero straight pipe requirements above and below the meter and shall read accurately in any orientation;
- E. Register boxes and lids shall be of high-strength synthetic polymer or approved equivalent. All registers shall have the size, model and date of manufacture stamped on the dial face.
- F. The registers on all solid-state meters shall be equipped with direct read, 9-digit LCD totalizer read-out.
- G. Meters shall be compatible with the manufacturer's most current AMI/AMR reading systems with the ability to integrate with future reading system upgrades;
- H. The register shall be equipped with an RF transceiver, battery and antenna with ASIC electronics within the body, allowing automatic, radio-read capabilities.
- I. All registers are to be calibrated to read in gallons with 0.10 gallon resolution.
- J. All register covers shall be of tempered glass.
- K. All registers shall be hermitically sealed to prevent intrusion of dirt or moisture.
- L. All registers shall be provided with low flow and leak indicators.
- M. All registers shall be oriented to read from the inlet side of the meter.
- N. All 1½" and larger meter registers shall be equipped with a large center sweep hand with ten clearly indicated graduations per gallon, or a digital readout with similar capabilities.
- O. Register cover and retaining ring are to be attached to main case as to make it as tamper-resistant as possible. The register must not be removable by non-utility personnel. The register must be field replaceable by utility personnel with the use of a manufacturer-supplied field tool. The field tool must not be commercially available.
- P. All meters shall contain a removable polypropylene plastic strainer screen. The strainer shall be located near the maincase inlet port, before the measuring chamber. The strainer shall also function as the device that holds the measuring chamber in place within the maincase. Straps or other types of fasteners shall not be accepted.

## 2.02 RADIO TRANSCEIVER

- A. Meters shall be equipped with radio interface registers and software that is manufactured and maintained by the meter manufacturer.
- B. The radio transceiver shall be enclosed in a high impact, UV resistant ASA plastic enclosure sealed with an electrostatic gel that eliminates moisture intrusion.

Ordinary, non-sealable plastic enclosures will not be accepted.

- C. The transceiver shall operate under one of two protocols:
  - 1. within the licensed exempted ISM frequency range of 900 - 950 MHz, using 8,000 possible channels in 6.25 kHz steps, and a valid current license to operate at a specific frequency within that range shall be obtained at no cost to the OWNER by the manufacturer on behalf of the OWNER. It shall be certified to operate in the United States under FCC CFR 47; Parts 24D, 101C and 15, or;
  - 2. operate on the cellular bandwidth with each meter uploading its data to a cloud storage site no less than 4 times per day. The overall reading system will allow the OWNER to download all meter data from the cloud storage and access/utilize the data from any cellular-equipped device.
- D. Transceiver battery shall be lithium thionyl chloride and shall last a minimum of 20-years.
- E. The register and transceiver units shall provide accurate flow measurement within operating temperatures between -22° F to +185° F with an IP-68 water submersion rating.
- F. The register shall be equipped with a real-time clock, capable of providing data logging direct from the meter, without the requirement of an RF endpoint.
- G. Transmitters for meters installed in pits where groundwater is present shall be located above the high groundwater level and inside the cover in a manner approved by the manufacturer;
- H. *Endpoint transmitters for a cellular-read system shall be installed in strict accordance with the manufacturer's requirements in order to provide interference-free service. At locations where cellular service is inadequate, transmitters with drive-by reading capabilities are required.*
- I. Transmitters shall be capable of accurately providing signals that can be easily read by a receiver passing on the nearest public road.
- J. Transmitters shall be fully compatible with the meter and the reading equipment for a seamless system of collecting, recording and equitably billing customers for water usage.
- K. Drive-by and Meter data logger shall provide at least two data logging capabilities: logging flows every minute with a minimum of 2,700 data points and; logging hourly flow readings with a minimum of 1,400 data points. Each of the two data logs shall be configurable by the Owner;
- L. Meter data logger shall log a minimum of the following system events: tampering; low battery; reverse flow; extended no flow; constant flow.
- M. The following new meter installations within residential/commercial/institutional buildings shall be equipped with the appropriate transmitter:
  - 1. Xylem/Sensus iPerl: SmartPoint 510M RT Module;

2. Master Meter Sonata: Allegro radio (embedded);
3. Badger e-Series G2: Orion Cellular Water Endpoint

### 2.03 DRIVE-BY METER READING SYSTEM

- A. *If the drive-by or AMR system is utilized*, meter-reading/interface device shall consist of a fully-integrated radio transceiver suitable for communication with a laptop or desktop PC. The transceiver device shall have the following features:
1. Two-Way, Wireless Radio transceiver such as: Sensus AR-5502 handheld computer, Master Meter 3G Mobile AMR or approved equal,
  2. FCC Part 15 Compliant,
  3. ISM 902-928 MHz Secure unlicensed spread-spectrum frequency range or range licensed by the manufacturer,
  4. Single channel and frequency hopping receiver,
  5. Lithium battery power source with minimum 20-year warranted operational life;
  6. Car power adaptor/charger.
- B. *If the cellular system is utilized*, meter-reading interface shall be any cellular capable device that can upload collected data to the OWNER's billing software.

### 2.04 STAINLESS STEEL HARDWARE

All bolts, nuts, capscrews, studs, and washers shall be Type 316 stainless steel ASTM A 193 B8M for bolts, and ASTM A194 8M for nuts.

### 2.05 UTILITY MANAGEMENT SOFTWARE

Software shall be fully compatible with *Black Mountain* billing & accounting software. CONTRACTOR shall be responsible for ensuring the operation of the software and successful communication with all installed meters prior to acceptance of the meters by the ENGINEER. The CONTRACTOR shall also ensure that the software communicates successfully with the OWNER's billing & accounting software prior to acceptance by the ENGINEER. Software shall be Sensus Autoread™ AMR System, Master Meter Harmony Encore™, or approved equal.

### 2.06 WARRANTY

All solid-state meters shall be supplied with the following minimum warranty:

- A. Residential ( $\frac{5}{8}$ " thru 1") meters:
1. New-meter accuracy ( $\pm 1.5\%$ ) guaranteed for a minimum of twenty (20) years with a minimum of 10 years non-prorated and a maximum purchaser repair/replacement expense of 40%.
  2. Structural case integrity guaranteed for a minimum of 20 years – non-prorated;
  3. Electronics (meter, output encoder, batteries, transducers, LCD) guaranteed for a minimum of 20 years with a minimum of 10 years non-prorated and a

- maximum purchaser repair/replacement expense of 40%;
4. Measuring chambers, solid state measuring elements guaranteed for a minimum of 20 years with a minimum of 10 years non-prorated and a maximum purchaser repair/replacement expense of 40%;
- B. Commercial & Industrial (1½" and larger) meters;
1. New-meter accuracy ( $\pm 1.5\%$ ) guaranteed for a minimum of ten (10) years – non-prorated;
  2. Structural case integrity guaranteed for a minimum of 10 years – non-prorated;
  3. Electronics (meter, output encoder, batteries, transducers, LCD) guaranteed for a minimum of 10 years - non-prorated;
  4. Measuring chambers, solid state measuring elements guaranteed for a minimum of 10 years – non-prorated
- C. The appearance of fogging or moisture inside the register within the warranty period (even if the meter & register are still operational) shall constitute component failure and require factory replacement in accordance with the warranty provisions outlined in 2.06.A and B above.

**END OF SECTION 33 19 23**

**SECTION 33 31 00**  
**ABANDONMENT OF PIPING AND MANHOLES**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section Includes:

1. This section includes abandonment in place of existing pipelines and manholes as indicated on the drawings for abandonment.

B. Related Sections include, but are not limited to:

1. Section 01 31 00 – Coordination and Meetings.
2. Section 01 33 00 – Submittals.
3. Section 01 40 00 – Quality Control.
4. Section 31 23 33 – Trenching and Backfilling.

1.02 REFERENCES

A. Reference Standards include, but are not limited to:

1. ASTM C150 – Standard Specification for Portland Cement.
2. ASTM C494 – Standard Specification for Chemical Admixture for Concrete.
3. ASTM C618 – Standard Specification for Fly Ash and raw or Calcined Natural Pozzolan for use as Mineral Admixture in Portland Cement Concrete.
4. ASTM C940 – Standard test Method for Expansion and Bleeding of Freshly Mixed grout for Replaced Aggregate Concrete in the Laboratory.
5. ASTM C1017 – Standard Specification for Chemical Admixture for Use in Producing Flowing Concrete.
6. ASTM C1107 – Standard Specification for Packaged Dry, Hydraulic Cement Grout (NonShrink).

1.03 DEFINITIONS

- A. Abandonment. Pipeline abandonment consists of filling or plugging portions of existing pipelines with flowable fill or grout plugs, as indicated on the Drawings.
- B. Bank Run Sand. Bank run sand shall be a locally available sand material to be used in abandoning existing manholes.
- C. Flowable Fill. Flowable fill shall be controlled low-strength material consisting of fluid mixture of cement, fly ash, aggregate, water and with admixtures as necessary to provide workable properties. Placement of flowable fill may be by grouting techniques in pipelines or other restricted areas, or as mass placement by chutes or tremie methods in unrestricted locations with open access. Long- term hardened strength shall be within specified range.

- D. Backgrouting. Secondary stage pressure grouting to ensure that voids have been filled within abandoned pipes. Backgrouting will only be required at critical locations indicated on the Drawings or if there is evidence of incomplete flowable fill placements. Backgrouting will be accomplished with non-shrink grout similar to Dayton 1107 Advantage Grout or SikaGrout-328 or approved equal.

#### 1.04 SUBMITTALS

- A. Submit flowable fill mix design report.
  - 1. Flowable fill type and production method. Describe if fill will be mixed to final proportions and consistency in batch plant or if constituents will be added in transit mixer at placement location.
  - 2. Aggregate gradation of fill. Aggregate gradation of mix shall be used as pilot curve for quality control during production.
  - 3. Fill mix constituents and proportions including materials by weight and volume, and air content. Give types and amounts of admixtures including air entrainment or air generating compounds.
  - 4. Fill densities and viscosities, including wet density at point of placement.
  - 5. Initial time of set.
  - 6. Bleeding and shrinkage.
  - 7. Compressive strength.
- B. Submit sand gradation to be used in abandoning manholes.
- C. Submit technical information for equipment and operational procedures including projected injection rate, grout pressure, method for controlling grout pressure, bulkhead and vent design and number of stages for grout application.

#### 1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with Section 01 40 00.

#### 1.06 PROJECT CONDITIONS

- A. Verify all dimensions of and between existing structures and locations of existing piping and equipment required for the proper abandoning of existing piping.
- B. Contractor shall be responsible for verification of location of all existing piping and structures. Potholing and or excavation to expose existing piping, conduits, etc. may be required prior to installation of new piping or connection to existing piping. Adjustments to the locations of new piping may be required due to locations of existing piping and sequencing of construction that will be required. Adjustments required shall be at no additional cost to the Owner.



## **PART 2 - PRODUCTS**

### **2.01 FLOWABLE FILL**

- A. Design Mix Criteria. Provide design of one or more mixes to meet design criteria and conditions for placement. Present information required by submittals, to include the following:
1. Cement: ASTM C150 Type I or II. Volume and weight per cubic yard of fill. Provide minimum cement content of 50 pounds per cubic yard.
  2. Fly ash: ASTM C618, Class C or F. Volume and weight per cubic yard of fill. Provide minimum fly ash content of 200 pounds per cubic yard.
  3. Potable water: Volume and weight per cubic yard of fill. Amount of water determined by mix design testing.
  4. Aggregate gradation: 100 percent passing 3/8-inch sieve and not more than 10 percent passing No. 200 sieve. Mix design report shall define pilot gradation based on following sieve sizes: 3/8 inch, No. 4, 8, 16, 30, 50 100 and 200. Do not deviate from pilot gradation by more than plus or minus 10 percentage points for any sieve for production material.
  5. Aggregate source material: Screened or crushed aggregate, pit or bank run fine gravels or sand, or crushed concrete. If crushed concrete is used, add at least 30 percent natural aggregate to provide workability.
  6. Admixtures: use admixtures meeting ASTM C494 and ASTM C1017 as needed to improve pumpability, to control time of set and to reduce bleeding.
  7. Fluidifier: Use fluidifier meeting ASTM C937 as necessary to hold solid constituents in suspension. Add shrinkage compensator if necessary.
  8. Performance additive: Use flowable fill performance additive, if needed, to control fill properties.
- B. Flowable Fill Requirements:
1. Unconfined compressive strength: minimum 75 psi and maximum 150 psi at 56 days as determined based on an average of three tests for same placement. Present at least three acceptable strength tests for proposed mix design in mix design report.
  2. Placement characteristics: self-leveling.
  3. Shrinkage characteristics: non-shrink.
  4. Water bleeding for fill to be placed by grouting method in pipes: not to exceed 2 percent according to ASTM C940.
  5. Minimum wet density: 90 pounds per cubic foot.
- C. Grout Plugs
1. Cement-based dry-pack grout conforming to ASTM C1107, Grade B or C.

2. **Manufactured Plug:** Commercially available plug or cap specifically designed and manufactured to be used with pipe being abandoned.

## 2.02 BANK RUN SAND

- A. **Bank Run Sand:** Durable bank run sand classified as SP, SW, or SM by Unified Soil Classification System (ASTM D2487) meeting following requirements:
  1. Less than 15 percent passing number 200 sieve when tested in accordance with ASTM D1140. Amount of clay lumps or balls may not exceed 2 percent.
  2. Material passing number 40 sieve shall meet the following requirements when tested in accordance with ASTM D4318: Plasticity index: not exceeding 7.
  3. Engineer shall consider locally available materials not meeting the above criteria on a case by case basis.

## **PART 3 - EXECUTION**

### 3.01 CUTTING AND CAPPING OF MAINS

- A. Do not begin cut, plug, and abandonment operations until replacement pipe has been constructed and tested, all service connections have been installed, and main has been approved for use.
- B. Install plug, clamp, and concrete reaction block and make cut at location shown on drawings.
- C. Pipe to be abandoned shall not be valved off and shall not be cut or plugged other than as shown on drawings.
- D. After pipe to be abandoned has been cut and capped, check for other sources feeding abandoned pipe. When sources are found, notify Engineer immediately. Cut and cap abandoned pipe at point of other feed as directed by Engineer.
- E. Plug or cap ends or opening in abandoned pipe in manner approved by Engineer. Install concrete around cap and over pipe to ensure it's not penetrable by groundwater.
- F. Remove and dispose of surface identifications such as cleanouts, curb boxes, and valve boxes.
- G. Backfill excavations in accordance with Section 31 23 33.

### 3.02 PREPARATION FOR ABANDONMENT VIA FLOWABLE FILL

- A. Have fill mix design reports and other submittals required by Submittals accepted by Engineer prior to start of placement. Notify Engineer at least 24 hours in advance of grouting with flowable fill.
- B. Select fill placement equipment and follow procedures with sufficient safety and care to avoid damage to existing underground utilities and structures. Operate equipment at pressure that will not distort or imperil portion of work, new or existing.
- C. During placement of fill, compensate for irregularities in existing pipe, such as

obstructions, open joints, or broken pipe to ensure no voids remain unfilled.

- D. Perform demolition work prior to starting fill placement. Clean placement areas of debris that may hinder fill placement. Remove excessive amounts of sludge and other substances that may degrade performance of fill. Do not leave sludge or other debris in place if filling more than 2 percent of placement volume.
- E. Remove free water prior to starting fill placement.

### 3.03 EQUIPMENT FOR FLOWABLE FILL

- A. Mix flowable fill in automated batch plant and deliver it to site in ready-mix trucks. Performance additives may be added at placement site if required by mix design.
- B. Use concrete or grout pumps capable of continuous delivery at planned placement rate.

### 3.04 INSTALLATION OF FLOWABLE FILL

- A. Abandon existing piping underneath roadway and paved areas by completely filling pipe with flowable fill.
- B. Continuously place flowable fill from end to end with no intermediate pour points.
- C. Have filling operation performed by experienced crews with equipment to monitor density of flowable fill and to control pressure.
- D. Temporarily plug pipes which are to remain in operation during pouring/pumping to keep lines free of flowable fill.
- E. Pump flowable fill through bulkheads or use other suitable construction methods to contain flowable fill in lines to be abandoned. These pipes will act as injection points or vents for placement of flowable fill.
- F. Place flowable fill under pressure flow conditions into properly vented open system until flowable fill emerges from vent pipes. Pump flowable fill with sufficient pressure to overcome friction and to fill pipe from downstream end, to discharge at upstream end.
- G. Inject flowable fill through replaced ballast using grouting equipment and series of grout pipes discharging at bottom of placement, allowing fill to rise through ballast effectively filling all voids. Alternatively, sequentially place individual pieces of ballast at same time as flowable fill is placed. Do not fill with ballast more than 50 percent of volume at any level, to prevent nesting and void formation.
- H. Remediate placement of flowable fill which does not fill voids in pipe, or where voids develop due to excessive shrinkage or bleeding of fill, by using pressure grouting either from inside pipe or from surface.
- I. Plug each end of pipe being abandoned.

### 3.05 FORCE MAIN ABANDONMENT

- A. Clean inside surface of force main at least 12 inches from ends to achieve firm bond and seal grout plug or manufactured plug to pipe surface. Similarly, clean and prepare exterior pipe surface if manufactured cap is to be used.

- B. When using grout plug, place temporary plug or bulkhead approximately 12 inches inside pipe. Fill pipe end completely with dry-pack grout mixture.
- C. When using manufactured plug or cap, install fitting as recommended by manufacturer's instructions, to form water tight seal.
- D. Backfill to surface, above pipe or structures left in place, with flowable fill in restricted areas, compacted bank run sand in unrestricted areas to be paved or select fill in unrestricted areas outside of pavement. Place and compact backfill, other than flowable fill, in compliance with Section 31 23 33.
- E. Collect and dispose of excess flowable fill material off site.

### 3.06 ABANDONING MANHOLES

- A. Contractor shall remove top slabs and first section of manholes to be abandoned and any other specified pumps or accessories prior to abandoning.
- B. Contractor shall abandon manholes after piping has been grouted and abandoned.
- C. Manholes shall be filled with bank run sand material and compacted in 1-foot lifts.
- D. Material as specified in Section 31 05 13 shall be compacted over abandoned material and prepared for improvement as shown on the Construction Drawings.

### 3.07 PROTECTION OF PERSONS AND PROPERTY

- A. Provide safe working conditions as required by OSHA and applicable state and local laws for employees throughout demolition and removal operations. Observe safety requirements for work below grade.
- B. Maintain safe access to adjacent property and buildings. Do not obstruct roadways, sidewalks or passageways adjacent to work.

**END OF SECTION 33 31 00**

**SECTION 33 31 19**  
**WATER UTILITY PIPING, FITTINGS & VALVES**

**PART 1 - GENERAL**

1.01 SUMMARY

A. Section Includes:

1. Piping Materials and Fittings
2. Polyethylene Encasement
3. Valves
4. Reaction Backing (Thrust Blocking)
5. Bedding and Backfilling
6. Fire Hydrants
7. Flush Type Hydrants
8. Appurtenances
9. Pipe Installation
10. Pipe Thrust Restraint
11. Testing Gravity Lines
12. Testing Pressure Mains
13. Precast Concrete Utility Manholes

B. Related Sections include, but are not limited to:

1. Section 00 95 10 – Special Provisions.
2. Section 01 31 00 – Coordination and Meetings.
3. Section 01 33 00 – Submittals.
4. Section 01 40 00 – Quality Control.
5. Section 31 05 13 – Soils for Earthwork.
6. Section 31 23 33 – Trenching and Backfilling.
7. Section 33 01 10.58– Disinfection of Utility Piping Systems.
8. Section 40 27 00 – Process Piping General

1.02 REFERENCES

A. Reference Standards include, but are not limited to:

1. ASTM A536 – Ductile Iron Castings.
2. ASTM B88 – Seamless Copper Water Pipe.
3. ASTM D3139 – Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.
4. ANSI/AWWA C104/A21.4 - Cement-Mortar Lining for Gray-Iron and Ductile-Iron Pipe and Fittings for Water.
5. ANSI/AWWA C105/A21.5 - Polyethylene Encasement for Gray and Ductile Cast-Iron Piping for Water and Other Liquids.
6. ANSI/AWWA C110/A21.10 - Gray-Iron and Ductile-Iron Fittings, 3" through 48", for Water and Other Liquids.

7. ANSI/AWWA C111/A21.11 - Rubber Gasket Joints for Gray-Iron and Ductile-Iron Pressure Pipe and Fittings.
8. ANSI/AWWA C150/A21.50 - American National Standard for Thickness Design of Ductile-Iron Pipe.
9. ANSI/AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
10. ANSI/AWWA C153/A21.53 - Ductile-Iron Compact Fittings, 3" through 12", for Water and Other Liquids.
11. AWWA C509 - Resilient-Seated Gate Valves, 3" through 12" NPS, for Water and Sewage Systems.
12. AWWA C550 - Standard for Protective Epoxy Interior Coating for Valves and Hydrants.
13. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
14. AWWA C605 - Underground Installation of PVC Pressure Pipe and Fittings.
15. AWWA C800 - Standard for Underground Service Line, Valves, and Fittings.
16. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. through 12 In., for Water.
17. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. through 48 In., for Water Transmission and Distribution.
18. ASTM D1784 - Rigid Poly (Vinyl Chloride) Compounds and Chlorinated Poly (Vinyl Chloride) Compounds.
19. ASTM D1785 - Poly (Vinyl Chloride) Plastic Pipe, Schedules 40, 80, and 120.
20. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
21. ASTM D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe fittings, Schedule 80.
22. ASTM F477 – Elastometric Seals (Gaskets) for Joining Plastic Pipe
23. NSF Standard No. 14, 60, and 61 - National Sanitation Foundation.
24. WW-T-779c – Federal Specifications

### 1.03 SUBMITTALS

- A. Submit Shop Drawings per Section 01 33 00 for all pipe and fittings indicating: Name of Manufacturer, Materials, Standard Dimensions, References, Joint Data, maximum loadings, and thrust restraints.
- B. Provide a list of materials and corresponding suppliers.
- C. Submit Affidavit of Compliance certifying that materials furnished have been tested and are in compliance with specification requirements.

1. Submit design calculations for structural design of pipe thickness where pipe class or thickness is not specifically called out.
  - D. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.
  - E. Manufacturer's Instructions: For valves, hydrants, and specialties, furnish in accordance with Sections 01 60 00 and 01 77 00 manufacturer's printed instruction for delivery, handling, storage, assembly, installation, adjustment, special tool requirements, and maintenance requirements.
  - F. In accordance with Section 01 77 00, provide records of measured depths of water mains, service leads, valves, connections, transition couplings, adapters, thrust blocking; measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements; measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work; field changes of dimension and detail.
- 1.04 QUALITY ASSURANCE
- A. Perform Work in accordance with Section 01 40 00.
  - B. Valves: Manufacturer's name and pressure rating marked on valve body.
- 1.05 FIELD MEASUREMENTS
- A. The Drawings indicate required pipe sizes and the general arrangement for major piping. Locations shall be verified in the field by the Contractor. Valves, fittings, and appurtenances shall be of such dimensions to allow for the installation of this piping substantially as shown on the Drawings. In the event it should become necessary to change the location of any of the work due to interference with other work, Contractor shall consult with the Engineer prior to making any changes and all such changes shall be made at no additional cost to the Owner.
  - B. Prior to roughing in any facilities or installation of piping and equipment, consult all related drawings including general, mechanical, electrical, etc., and inform self of materials, locations of structures, pipes, duct banks, electrical conduits, etc., which may impact the installation.
  - C. Discrepancies discovered before or after work has started, shall be brought to the attention of the Engineer immediately, and the Engineer reserves the right to require minor changes in the work to eliminate such discrepancies.
  - D. Pipe connections to equipment shall be subject to approval of Engineer and coordinated to meet the manufacturer's recommendations and requirements.
  - E. No work that connects directly to equipment shall be installed before complete shop drawings of said equipment have been reviewed and approved by the Engineer.
- 1.06 PROJECT CONDITIONS
- A. Verify dimensions of and between existing structures and locations of existing piping and equipment for the proper installation of all new piping and equipment.

- B. Contractor shall be responsible for verification of location of all existing piping and structures. Potholing and or excavation to expose existing piping, conduits, etc. may be required prior to installation of new piping or connection to existing piping. Adjustments to the locations of new piping may be required due to locations of existing piping and sequencing of construction that will be required. Adjustments required shall be at no additional cost to the Owner.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivered materials shall be stockpiled and stored at locations approved by the Owner until required for installation. Materials shall be transported, delivered, stored, and handled in accordance with Manufacturer's instructions and the requirements of Section 01 61 00.
- B. Contractor shall inspect materials upon delivery for loss or damage in transit. Contractor shall be responsible for the replacement of damaged materials; damaged materials shall be removed from the Site.

#### 1.08 REGULATORY REQUIREMENTS

- A. All products that may come into contact with water intended for use in a public water system shall meet American National Standards Institute (ANSI)/National Sanitation Foundation (NSF) International Standards 60 and 61, as appropriate. A product will be considered as meeting these standards if so certified by NSF, the Underwriters Laboratories, or other organization accredited by ANSI to test and certify each product.

### **PART 2 - PRODUCTS**

#### 2.01 DUCTILE IRON PIPE (DIP) AND FITTINGS

- A. The pipe and fittings furnished shall be of the Ductile Iron type as specified for each particular use or installation and shall be minimum Pressure Class 350 for pipe 4"-12" and minimum Pressure Class 250 for pipe 14" and greater, unless otherwise noted.
- B. Materials:
  - 1. Ductile iron pipe shall conform to the requirements of AWWA C151/ANSI A21.51 with mechanical joints.
  - 2. Mechanical or push-on joints shall conform to the requirements of AWWA C111/ANSI A21.11.
  - 3. The weight, class, or nominal thickness and casing period shall be shown on each pipe. The manufacturer's mark, year produced, and letters "DI" or "Ductile" shall be cast or stamped on the pipe.
  - 4. Mechanical joint fittings shall conform to the requirements of AWWA C110/ANSI A21.10 rated at 250 psi or 350 psi for sizes larger than 16" in diameter, and AWWA C110/ANSI A21.10 or AWWA C153/ANSI 21.53 rated at 350 psi for sizes up to and including 16". No plain end fittings shall be allowed.
  - 5. Rubber gaskets shall conform to the requirements of AWWA C111. Gaskets used for



air piping shall be EPDM.

6. All pipe joints and fittings shall have conductive gaskets with copper inserts or copper strap welded to the pipe and connected with silicone bronze bolt. The conductors shall be rated at 600 amps sustained current.
  7. All ductile iron pipe and fittings shall be lined with cement mortar in accordance with AWWA C104/ANSI A21.4, unless otherwise noted. Ductile iron pipe and fittings used for air piping shall not be cement lined.
  8. All ductile iron pipe and fittings shall be polyethylene encased in accordance with AWWA C105.
- C. Air line piping shall not be lined with cement.
- D. All exterior surfaces of pipe and fittings shall have a tar or bituminous seal coating conforming to AWWA C151. Spotty or thin seal coating, or poor coating adhesion, shall be cause for rejection of the materials.
- E. Retainer glands for restrained joints shall be American, US Pipe, or EBAA Iron, Inc. Mega Lug type, ductile iron, and be designed to meet or exceed the pressure classification of the corresponding pipe. Restraint glands for mechanical joint pipe shall be EBAA Iron, Inc. Megalug, Series 1100, or equal. Push joint pipe shall be restrained using restraint harnesses EBAA Iron, Inc. Megalug, Series 1700, or equal. Joint restraint systems shall be rated for at a minimum the design pressure of the pipe with a 2 to 1 safety factor.
- F. Restrained joint pipe may be used in lieu of joint restraint systems for push on and mechanical joint pipe. Restrained joint pipe shall be US Pipe TR Flex or American Flex Ring pipe, or equal.
- G. Nuts, bolts, and tie rod restraints shall be 304 stainless steel. Tee bolts for mechanical joints and fittings shall be “Cor-Blue” by NSS industries, or equal.
- H. See Section 33 05 26 for Utility Identification and tracer wire requirements.

## 2.02 POLYVINYL CHLORIDE (PVC) PIPE

- A. The PVC pipe and fittings furnished shall be of the type as specified below for each particular use or type of installation.
- B. Water Service Piping (1.5" to 2" diameter):
  1. As specified in the piping schedule presented in the Construction Drawings.
  2. Pipe, fittings, and valves shall be manufactured from a PVC compound which meets the requirements of Type I, Grade 1 PVC in accordance with ASTM D1784. Compound from which pipe is produced shall have a design stress rating of 2,000 psi at 23 degrees C, listed by the PPI.
  3. Pipe, fittings, and valves shall be Schedule 80.
  4. Pipe, fittings, and valves shall be installed in compliance with manufacturer's recommendations and in accordance with ASTM D2274.

C. Pressure Piping (4" diameter through 12" diameter)

1. PVC pressure pipe in sizes 4" – 12" in diameter shall conform to all applicable requirements of ANSI/AWWA C900 as indicated in the drawings. Pipe utilized for potable water shall be NSF certified for use in the transport of potable water.
2. The pipe and fittings shall meet cast iron pipe equivalent outside diameters and shall be minimum Class 150 (DR18) or Class 200 (DR14) pipe as indicated on the drawings, and shall meet the requirements of Table 2 of AWWA C900 or C909 as applicable. DR25 pipe will not be accepted.
3. All fittings/valves connected to C900 water pipe shall employ the use of retainer glands. Retainer glands for mechanical joint pipe shall be EBAA Iron, Inc. Megalug, Series 1100, or equal. Push joint pipe shall be restrained using restraint harnesses EBAA Iron, Inc. Megalug, Series 1700, or equal. Joint restraint systems shall be rated for at a minimum the design pressure of the pipe with a 2 to 1 safety factor.
4. Flanges for connecting plain end PVC pipe to equipment shall be Uni- flange series 900, ROMAC, or equal.
5. Pipe, fittings, and valves shall be installed in compliance with manufacturer's recommendations.

D. All water distribution piping shall be installed with tracer wire meeting all the requirements of NEC as well as ASTM B-3, ASTM B170, ASTM D1248 and ASTM D1238. Approved tracer wire is Pro-Line Type Cu HDPE 30 mil manufactured by Pro-Trace/Pro-Pak Industries, or approved equal;

E. All water distribution piping shall be installed with detectable warning tape (blue) meeting all the requirements of ASTM D2103, ASTM D882-75B, ASTM 671-76 and ASTM D2578. Approved detectable warning tape is Hytech Detectable tape as manufactured by Northtown Pipe Protection Products or approved equal.

2.03 POLYETHYLENE ENCASEMENT

- A. Conform to and install per ANSI/AWWA C105/A21.5.
- B. Install on all underground metallic items, including: ductile iron pipe, ductile iron fittings, metal body valves, other metal pipe and fittings, fire hydrants, stainless steel couplings, transition couplings, and service and testing tapping saddles.

2.04 REACTION BACKING (THRUST BLOCKS)

- A. Conform to details shown on Drawings for bends, tees, fire hydrants, dead end plug, and service tap connections.
- B. 3,000 psi concrete for pipe, fittings, and plugs unless specifically shown otherwise on Drawings.
- C. All thrust blocking shall be completely encased with a minimum of 3/4 cubic yards of 3/4" minus gravel or structural fill.

2.05 BEDDING AND BACKFILLING

- A. Materials: As specified in Section 31 23 33 for backfill and pipe bedding.
- B. Aggregate Bedding: Fill Type A1 for over-excavation and Fill Type A5 for standard bedding as shown on the Construction Drawings.
- C. Material: Fill Type S1 or S2 as specified in Section 31 05 13.

## 2.06 VALVES

- A. Resilient Wedge Gate Valves: 4" to 12".
  - 1. Minimum working pressure of 200 psi for 4" to 12" valves.
  - 2. Valve body and rubber-encapsulated wedge constructed of ductile iron or cast iron.
  - 3. Resilient seat gate, bubble-tight closure design.
  - 4. Meet or exceed the ANSI/AWWA C509 standards.
  - 5. Bronze stem and stem nut.
  - 6. Fusion Bonded Epoxy-coated interior and exterior in accordance with AWWA C550.
  - 7. Equipped with non-rising stem with 2" square operating nut, open left (counter clockwise) rotation.
  - 8. Provide adjustable valve box, riser, and cover. Provide stem extensions for all actuators. Extension length will vary with the depth of bury for each valve and shall extend to within one (1) foot of top of valve box. Provide all necessary appurtenances for complete operation of valve.
  - 9. Provide polyethylene encasement conforming to ANSI/AWWA C105/A21.5 for buried valves.
  - 10. Connections: MJ x MJ joint if buried, FL x FL joint if above-ground.
  - 11. Provide gaskets and stainless steel nuts and bolts.
  - 12. Markings shall be cast on the bonnet or body of each valve and shall show the manufacturer's name or mark, year valve casting was made, size of valve, the letters "C509", and the designation working water pressure.
  - 13. Manufacturer shall furnish an affidavit stating that the valve and all materials conform to the applicable AWWA requirements and all tests specified under the respective standard have been performed and have been met. Valves shall be NSF 61 certified.
  - 14. Gate valves shall be Resilient Wedge Model A-2362 as manufactured by Mueller Company or approved equal.

## 2.07 FIRE HYDRANTS

Fire hydrants shall meet the following requirements:

- A. Compression-type, post type dry barrel design meeting all applicable parts of ANSI/AWWA C502;

- B. 5¼" main valve opening – three way (two 2½" hose nozzles & one 4½" pumper nozzle)
- C. Dry top design with O-ring sealed oil reservoir;
- D. Traffic feature with stainless steel safety stem coupling;
- E. Main valve closes with pressure for positive seal, with reversible rubber seal providing a spare for long service life;
- F. Bury depth shall be 6.0 feet minimum;
- G. Field replaceable hose and pumper nozzles;
- H. Large radius, full flow nozzle openings for low friction loss;
- I. Contoured show designed for full flow
- J. Dual bronze drain valves to completely drain barrel;
- K. 250 psig maximum working pressure, 500 psig static test pressure for 3-way hydrants;
- L. Hydrants shall be set in 4 cubic feet of crushed stone to allow for proper drainage of the hydrant, crushed stone shall be encased in filter fabric to prevent fouling of drain stone. Recommendation of the AWWA should be followed for installation of hydrants.
- M. Fire hydrants shall be: Super Centurion Model A-423 as manufactured by Mueller Company; or approved equal.
- N. Fire hydrant barrel shall be factory coated municipal yellow and the bonnet/top nut shall be field coated in accordance with the calculated flows to be described by the local fire agency.

#### 2.08 FLUSH TYPE HYDRANTS

- A. Flush type fire hydrants shall be self-draining, non-freezing, compression type with 2<sup>1</sup>/<sub>8</sub>" main valve opening. Inlet connection shall be 3" MJ show and outlet shall be 2½" Hose Gage.
- B. Flush type hydrants shall have: cast iron box; sealed lid; cast iron barrel; brass main valve assembly and pentagon operating nut; A575 steel stem. Principal interior operating parts shall be brass and removable from the hydrant for servicing without excavating the hydrant.
- C. Bury depth shall be 6.0 feet minimum.
- D. Hydrants shall be set in 4 cubic feet of crushed stone to allow for proper drainage of the hydrant, crushed stone shall be encased in filter fabric to prevent fouling of drain stone. Recommendation of the AWWA should be followed for installation of hydrants.
- E. Ground hydrants shall be 2<sup>1</sup>/<sub>8</sub> Standard Flush Hydrant (Cat. #412-507928) manufactured by Mueller Company, or approved equal.

#### 2.09 AIR RELEASE VALVES

- A. Furnish automatic float-operated valves designed to release accumulated air from a piping system while the system is in operation.

- B. Valve shall be constructed to meet AWWA standard C512 and all valve components shall be certified to ANSI/NSF 61 – Drinking Water System Components – Health Effects. Manufacturer shall have a quality management system that is certified to ISO 9001:2000 Standards.
- C. The valve body shall be threaded with NPT inlets and outlets. The body inlet connection shall be hexagonal for a wrench connection. The valve shall have two additional NPT connections for the addition of gauges, testing, and draining. The cover shall be bolted to the valve body and sealed with a flat gasket. Resilient seats shall be replaceable and provide drop tight shut off to the full valve pressure rating. Floats shall be unconditionally guaranteed against failure including pressure surges. Mechanical linkage shall provide sufficient mechanical advantage so that the valve will open under full operating pressure. Simple lever designs shall consist of a single pivot arm and a resilient orifice button. Compound lever designs shall consist of two levers and an adjustable threaded resilient orifice button.
- D. The valve body and cover shall be constructed of ASTM A126 Class B cast iron for working pressures up to 300 psig.. Higher pressure rated valves shall be constructed of ASTM A536 Grade 65-45-12 ductile iron. The orifice, float and linkage mechanism shall be constructed of Type 316 stainless steel. Non-metallic floats or linkage mechanisms are not acceptable. The orifice button shall be Viton for simple lever valves and Buna-N for compound lever designs. The exterior of the valve shall be coated with a universal alkyd primer.
- E. The manufacturer shall demonstrate a minimum of five (5) years experience in the manufacture of air valves. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.
- F. Air Release Valves shall be APCO Series 200A as manufactured by DeZurik, Series 38 as manufactured by Val-Matic or approved equal.
- G. Air Release Valves shall be installed within 48" diameter, insulated concrete manhole structure in accordance with Detail 2 on Sheet GC-5 of the project drawings.

#### 2.10 VALVE BOXES

- F. Valve boxes shall be three-piece cast iron with a round base, Mueller H-10357 or Tyler Union.
- G. The top of the valve boxes shall be 5¼" in diameter.
- H. Valve box height shall be suitable for the burial depth of the valve and shall have sufficient length to permit at least 6" of adjustment above and below grade when the valve is laid to the specified depth. Adjustment shall be screw type.
- I. Covers shall have the word "Potable Water" cast on top.
- J. All buried valves shall have a full operator extension.

#### 2.11 APPURTENANCES

- F. Bolts: Stainless steel underground bolts, including all bolts on fittings, valves, and

transition couplers. Tee bolts for mechanical joints and fittings shall be “Cor-Blue” by NSS industries, or equal.

- G. Tie Bolts: Cretex Gasketed Pipe Joint Ties, or approved equivalent.
- H. Service and Tapping Saddles:
  - 1. All stainless steel tapped outlet, band clamps, nuts, bolts, and washers.
  - 2. Heavy gauge type 304 stainless steel shell construction, passivated welds, double bolt type with minimum band width of 6”, and rubber “O”-ring gasket pad meeting ASTM D2000.
  - 3. Meet or exceed the ANSI/AWWA C800 standards, 200 psig.
  - 4. Service saddle shall be Style 101NU as manufactured by Romac Company or approved equal.
- I. Tapping Sleeve:
  - 1. Stainless steel full wrap around body.
  - 2. All stainless steel tapped outlet, nuts, bolts, washers.
  - 3. Gasket to provide seal around full circumference of pipe.
  - 4. Approved manufacturers:
    - a. Romac Industries, Inc.
    - b. The Ford Meter Box Company.
    - c. Approved equivalent.
- J. Stainless Steel Couplings:
  - 1. All type 304 stainless steel middle ring, followers, nuts, bolts, and washers construction.
  - 2. Minimum length as required for joining cast iron pipe sizes as shown on plans.
  - 3. Minimum rated working pressure of 250 psi.
  - 4. Buna N rubber “O”-ring gaskets.
  - 5. Approved manufacturers:
    - a. Dresser Industries, Style 38.
    - b. Approved equivalent
- K. Transition Couplings:
  - 1. Long pattern, sleeve type, ductile iron couplings, meeting the requirements of ANSI/AWWA C110/A21.10 and rated for 250 psig.
  - 2. Epoxy or nylon coated inside and out.
  - 3. Where pipes of dissimilar metal are joined, ensure dielectric insulation to prevent galvanic corrosion.

4. Install with stainless steel bolts.
5. Provide polyethylene encasement.
6. Approved manufacturers:
  - a. Power Seal
  - b. Ford
  - c. Romac
  - d. Approved equivalent

## 2.12 TRENCH INSULATION

- F. Trench insulation shall be extruded rigid board material. The insulation shall have a thermal conductivity of not more than 0.28 BTU per hour per square foot per degree Fahrenheit per inch of thickness as tested in accordance with ASTM C177. The insulation shall not absorb moisture to an extent greater than 2.5 percent by volume as tested in accordance with ASTM D2127. The compression strength of the insulation shall be greater than 20 psi as tested in accordance with ASTM D1621. The density of the insulation shall be between 0.9 and 1.3 pounds per cubic feet as tested in accordance with ASTM D1622.

## 2.13 PRECAST CONCRETE MANHOLES

- F. Furnish/install manholes from precast concrete sections having frames, covers and steps meeting MPWSS or the specific detail drawings included in this project document package.
- G. Furnish/install manholes meeting ASTM C478; "Precast Reinforced Concrete Manhole Sections", specifically including mandatory rejection requirements;
- H. All barrel and cone sections shall be properly sealed with Ram-Nek preformed, flexible plastic joint sealant, neoprene gaskets or approved equal;
- I. Furnish/install non-corroding steps, 12" in width, ½" steel rod encased with polypropylene, on no greater than 16" vertical centers. Assure steps can withstand 400 lb. vertical loading and 1,000 lb. pull out force;
- J. Furnish/install frames and covers meeting MPWSS Standard Drawings 02720-8 and 02720-9. Furnish 2-hole type covers unless specified otherwise in the project drawings;
- K. Furnish/install reinforced, precast concrete bases or field-poured on undisturbed earth. Use concrete meeting Section 03 30 00

## **PART 3 - EXECUTION**

### 3.09 GENERAL

- F. Contractor shall verify location of piping and piping systems as shown on the Drawings.
- G. Contractor shall be aware that it may be necessary to move a piping run a reasonable amount or shift it slightly up or down to avoid an existing obstruction or other piping runs. Contractor shall not receive additional compensation due to slight shift or

movement of piping runs.

- H. Not all fittings may be shown on the Drawings, the fittings shown are meant to give a graphical representation only. Additional fittings required for differences in vertical and/or horizontal alignment may be required. Contractor shall not receive additional compensation due to additional fittings required to meet vertical and horizontal alignments.
- I. The Drawings show two (2) dimensional graphical representation of piping systems, Contractor shall note there may need to be additional pipe length due to the vertical elevation differences that may not be represented on the drawings.
- J. All buried piping with less than six (6) feet of cover shall be insulated. Trench insulation shall be provided above the pipe with a minimum thickness of 4" as shown on the drawings for all piping.
- K. Contractor has ability to modify the inverts of the potable water to avoid pipe conflicts. The potable water lines have been set constant elevations throughout the site. Contractor shall have the ability to modify invert elevations as long as six (6) feet of cover has been maintained.
- L. All joints shall be properly restrained in accordance with these specifications.
- M. Contractor shall provide dewatering as necessary, piping shall not be laid in water or wet conditions.
- N. See Section 31 23 33 for all trench excavation and backfill requirements, and piping system bedding requirements.
- O. See Division 40 for all exposed process piping and valves.

### 3.10 PREPARATION AND STORAGE

- F. Store pipe on-site on flat surface so barrel is evenly supported. Do not stack higher than 6 feet. Cover pipe with opaque material for extended storage.
- G. Remove scale and dirt on inside and outside before assembly. Inspect for damage to pipe and other materials before installation.

### 3.11 INSTALLATION – PIPE, VALVES, AND APPURTENANCES

- F. The type, kind, and class of pipe to be used shall be as shown on the Drawings. All pipes shall be laid and to the required line and grades.
- G. Install all pipe and appurtenances in strict accordance with manufacturer's recommendations.
- H. All foreign material or dirt shall be removed from the inside of the pipe before it is lowered into its position in the trench and it shall be kept clean by approved means during and after laying.
- I. Pipe materials shall be handled carefully. Damage to protective coatings, linings, and joint fittings shall be cause for rejection of the materials. Prior to installation each pipe section, fitting, or valve shall be thoroughly inspected by the Contractor to detect damage



or defects. Contractor shall inform Engineer of such damage or defects. Any defective, damaged, or gravity piping which has had its grade or joint disturbed after layer shall be replaced.

- J. Cut pipe in a neat and workmanlike manner without damaging the pipe. Cutting of pipe for connections or pipe run lengths or inserting of fittings and valves shall be done in accordance with pipe manufacturer recommendations. Rough edges shall be removed and where rubber gasket joints are used, the outer edge shall be beveled by grinding or filing to produce a smooth fit.
- K. Trench preparation shall proceed in advance of pipe installation only so far as can be backfilled the same day, or as permitted by the Owners specifications.
- L. Excavate, and backfill excavations and trenches in accordance with Section 31 23 33.
- M. Keep trenches free from surface and ground water until pipe jointing is complete.
- N. All fittings shall be set on cast in place or precast concrete blocks in order to prevent the weight from being transmitted to the pipe. Before concrete is placed around fittings and appurtenances, the appurtenance and pipe shall be wrapped with polyethylene to completely isolate the concrete from the water main construction.
- O. Form and place concrete for thrust blocking at each bend, tee, or change of direction. Thrust blocks shall bear on undisturbed earth. Thrust blocks shall be completely encased with a minimum of 3/4 cubic yards of 3/4" minus gravel or structural fill.
- P. Securely close open ends of pipe and fittings when Work is not in progress.
- Q. Pipe Installation:
  - 1. Install piping to lines, grades, and dimensions shown on Drawings.
  - 2. Take up and relay any pipe disturbed from its required grade or alignment.
  - 3. Install pipe to allow for expansion and contraction without stressing pipe.
  - 4. Install pipe such that maximum deflections from straight line or grade do not exceed manufacturer's specifications. Install bend fittings where maximum deflections are exceeded.
  - 5. Notify Engineer and Owner at least 48 hours in advance of service disruptions and connections.
- R. Prior to pipe placement the bedding conditions shall be such as to provide uniform and continuous support for the pipe. For belled pipe, bell holes shall be excavated as necessary to make the joint connections and provide proper support. Pipe shall not be laid in water or unsuitable bedding conditions. See Section 31 23 33 for bedding requirements.
- S. Piping shall be carefully lowered into laying position by the use of suitable restraining devices. The pipe shall not be dropped or dumped into the trench. All foreign matter or dirt shall be removed from the inside of the pipe and fittings before they are placed into position. Pipe joints shall be kept clean prior to and during installation. The joint surface

shall be inspected prior to placement to ensure that there is no foreign matter, coating blisters, projections, rough edges, or damaged gaskets that may impact the integrity of the joint connection.

- T. As each length of pipe is placed in laying position the pipe shall be secured in place with approved backfill material and the appropriate compaction as specified in Section 31 23 33.
- U. Bell and spigot piping shall be laid with the bell ends facing upgrade and the laying shall start at the downgrade end and proceed upgrade, unless otherwise permitted by the Engineer.
- V. When pipe laying is not in progress the open ends shall be closed by watertight plugs or other approved means. In the presence of water, the pipe end shall remain sealed until the trench has been properly drained or dewatered.
- W. At connections to existing piping, Contractor shall remove all dirt and debris that is allowed to enter the existing lines.
- X. Inspection: Do not cover pipe and fittings until all bedding, joints, and polyethylene wrap have been inspected.
- Y. Replace any pipe, fittings, or appurtenances found defective after installation has been completed.
- Z. PVC pipe used for force main and water main shall be installed in accordance with AWWA C605, AWWA Standard for Underground Installation of PVC Pressure Pipe and Fittings for Water.

### 3.12 PIPE THRUST RESTRAINT

- F. Provide all crosses, tees, bends, caps, and other thrust points in the piping system with suitable means of overcoming thrust.
- G. Concrete reaction blocking and retainer glands or tie rods shall be used subject to the Engineer's approval. All rods, nuts, bolts, and hardware shall be stainless steel. At tees, 90° bends, and dead ends both mechanical type joint restraint and concrete reaction blocking shall be required. All concrete reaction blocking shall be completely encased with a minimum of 3/4 cubic yards of 3/4" minus gravel or structural fill.
- H. Concrete reaction blocking shall be placed so that pipe and fitting joints are accessible for repair, and in such a manner as to provide bearing against undisturbed earth. Pressure testing shall not proceed until concrete reaction blocking has reached its design strength. High early strength concrete may be used.
- I. The following table is based upon the results of the Ductile Iron Pipe Research Association thrust restraint design program for a test pressure of 150 psig, backfill soil density of 90 pounds per cubic foot, and polyethylene wrapped pipe. The table shows the minimum length of pipe to be restrained for various types of fittings where joint retainer glands are used. The minimum concrete reaction block size is shown in parentheses under the minimum length.

<b>Pipe Diameter (inches)</b>	<b>Dead End Tee Branch 90 Degree Bend</b>	<b>Wye 45 Degree Bends or less</b>
4	26 LF (3.1 SF)	11 LF (2.0 SF)
6	26 LF (3.1 SF)	11 LF (2.0 SF)
8	34 LF (5.3 SF)	14 LF (3.0 SF)
10	42 LF (8.1 SF)	17 LF (4.4 SF)
12	50 LF (13.4 SF)	20 LF (6.6 SF)
14	58 LF (17.2 SF)	23 LF (9.2 SF)
16	64 LF (21.4 SF)	27 LF (11.6 SF)
18	71 LF (25.2 SF)	30 LF (15.2 SF)
20	79 LF (30.2 SF)	33 LF (18.1 SF)
24	93 LF (38.5 SF)	39 LF (26.1 SF)
30	112 LF (52.5 SF)	46 LF (34.5 SF)
36	132 LF (65.4 SF)	56 LF (40 SF)
42	167 LF (82.5 SF)	70 LF (49 SF)

3.13 POLYETHYLENE ENCASEMENT

- F. Where required all piping, fittings, valves, and appurtenances shall be fully encased in polyethylene film tubing.
- G. The polyethylene tubing shall be of appropriate size for the size of pipe being installed. Install polyethylene tubing prior to lowering pipe into trench.
- H. Tubing length shall be long enough to provide a minimum of one (1) foot overlap at all joints, fittings, and appurtenances. After completing the pipe jointing and positioning the tubing material, the overlap shall be secured into place with plastic adhesive tape wrapped circumferentially around the pipe at least three (3) full turns.
- I. The fit shall be snug over the pipe with no excess or bunched up material. Repair all rips, punctures, or other damage with taping and overlapping patching.

### 3.14 TESTING WATER MAINS, VALVES & FITTINGS:

#### F. Hydrostatic and Leakage Testing

1. Perform hydrostatic and leakage testing in accordance with AWWA C600. Once the pipe is laid and backfilled, test for at least 2 hours, all newly laid pipe, or any valved section, to a hydrostatic pressure of at least 1.5 times the normal operating pressure at the test point or 1.25 times the normal operating pressure at the highest point along the test section.
2. Slowly fill the pipe with water, purging all air, and apply the test pressure using a pump hooked up so that the pressure and leakage can be measured. To purge the pipe of air during the test, it is necessary to tap the pipe at its highest points if permanent air vents, water services, hydrants, etc. are not located at the high points, Use corporation stops for this purpose. Furnish the pump connections gauges, stops, and all necessary apparatus for testing.
3. Disassemble and reassemble all joints showing leakage after thorough cleaning. Remove and replace all cracked or defective pipes or fittings discovered in during the pressure test with sound material and repeat the test.
4. Conduct the leakage test concurrently with the pressure test for 2 hours. Leakage is defined as the quantity of water supplied into the pipe, or any valved section thereof, necessary to maintain pressure within 5 PSI of the pressure test after the pipe has been filled with water and purged of air.
5. The pipe installation will be rejected if the leakage exceeds that determined by the following formula:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

In which L equals the allowable leakage in gallons per hour; S is the length of pipe tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge.

6. Should any test of installed pipe disclose leakage exceeding that specified above, locate and repair the defective joints until the leakage is within the specified allowance.
7. Conduct the pressure and leakage tests with the Engineer present.
8. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallon per hour per inch of nominal valve size is allowed. Repair all visible leaks regardless of the amount of leakage.
9. Pressure test tapping sleeves after installation and before tapping.

#### G. Test Failure and Remedy

1. In the event of test failure on any test section, testing shall be continued until all leakage has been detected and corrected to meet the requirements. Repair work shall be subject to approval of the Engineer. Introduction of sealant substances by means of the test water will not be permitted.

2. Unsatisfactory repairs or test results may result in an order to remove and replace pipe as the Engineer considers necessary for test conformance. All repair and replacement work shall be at the Contractor' expense.

H. Operational Inspection

1. Before substantial completion of the work and in the presence of the Engineer and the Contractor, representatives of the Owner shall operate all valves, hydrants, and water services to ascertain that the entire facility is in good working order; that all valve boxes are centered and valves are opened; that all hydrants operate and drain properly; that all curb boxes are plumb and centered; and that water is available at all curb stops.

3.15 FLUSHING WATER MAINS

- A. Before chlorination, except when hypochlorite tablets are used, flush the mains thoroughly after the pressure and leakage test are completed.
- B. It is understood that such flushing removes only the lighter solids and cannot be relied upon to remove heavy material allowed to get into the main during laying. Use a minimum flushing velocity in the main of 2.5 feet per second. If no hydrant is installed at the end of the main, provide a tap of the size to produce a velocity in the main of at least 2.5 feet per second. Table 2 shows the rates of flow required to produce a velocity of 2 feet per second in various size pipes.

**TABLE 1**  
**REQUIRED FLOW AND OPENINGS TO FLUSH PIPELINES<sup>1/</sup>**  
 (40 psi (276 kPa) Residual Pressure in Water Main)

Pipe Diam. <u>Inches</u>	Flow Req'd To Produce 2.5 fps (approx.) Velocity in Main, <u>gpm</u>	Size of Tap (inch)			<u>Hydrant Outlet</u>	
		1"	1½"	2"	Number	Size <u>in. (mm)</u>
4	100	1			1	2-1/2
6	200	1			1	2-1/2
8	400	2	1	1	2-1/2	
10	600	3	2	1	2-1/2	
12	900	2		2	2-1/2	
16	1600	4			2	2-1/2

1. With a 40 psi pressure in the main with the hydrant flowing to atmosphere, a 2½" hydrant outlet will discharge approximately 1000 gpm and a 4½" hydrant nozzle will discharge approximately 2500 gpm
2. Number of taps on pipe based on discharge through 5 feet of galvanized iron (GI) pipe with one 90° elbow.

- C. Exercise extreme care and conduct a thorough inspection during the water main laying to prevent and detect small stones, pieces of concrete, particles of material, or other foreign material that may have entered the mains. To remove this material, flush and inspect all hydrants on the lines to assure that the entire valve operating mechanism of each hydrant is in good condition.
- D. In 24" or larger diameter mains, in addition to flushing, broom-sweep the main, removing all sweepings before chlorinating the main.

### 3.16 DISINFECTION OF POTABLE WATER SYSTEM

#### A. General

- 1. Disinfect the water mains subject to the Engineer's approval in accordance with AWWA C651, "Disinfecting Water Mains", and these specifications, before placing the main in service. Keep the interior of all pipe, fittings and appurtenances free from dirt, heavy and foreign particles.

#### B. Forms of Chlorine

- 1. The forms of chlorine that may be used, subject to the approval of the Engineer, are:
  - a. Liquid chlorine containing 100 percent available chlorine under pressure in steel containers. Meet AWWA B301 requirements and use only in combination with appropriate gas-flow chlorinators and ejectors.
  - b. Sodium hypochlorite in liquid form containing approximately 5 to 15 percent available chlorine. Meet AWWA B300 requirements.
  - c. Calcium hypochlorite in granular form or in 5g tablets containing approximately 65 percent available chlorine by weight. Meet AWWA B300 requirements.

#### C. Methods of Chlorination

- 1. Three (3) methods of chlorination may be used. The tablet method gives an average chlorine dose of approximately 25 mg./L; the continuous feed method gives a 24 hour chlorine residual of not less than 10 mg./L; and the slug method provides a three hour exposure of not less than 50 mg./L free chlorine.
  - a. Tablet Method
    - i. This method may be used if the pipes and appurtenances are kept clean and dry during construction.
    - ii. During construction, place calcium hypochlorite granules at the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500-foot (150 meter) intervals. Use the quantity of granules shown in Table 2.
    - iii. Warning: Do not use this procedure on solvent welded plastic or on screwed joint steel pipe because of fire or explosion hazard from the reaction of the joint compounds with the calcium hypochlorite.

**TABLE 2**

**OUNCES OF CALCIUM HYPOCHLORITE GRANULES TO BE PLACED AT BEGINNING OF MAIN AND AT EACH 500-FOOT (150 METER) INTERVAL**

<u>Pipe Diameter (in.)</u>	<u>Calcium Hypochlorite Granules (oz.)</u>
4	0.5
6	1.0
8	2.0
12	4.0
16 and larger	8.0

- iv. During construction, place 5g calcium hypochlorite tablets in each section of pipe and also place one tablet in each hydrant, hydrant branch and other appurtenance. Use the number of 5g tablets for each pipe section required to provide a minimum chlorine concentration of 25 mg/L. Appendix B provides information on the number of tablets required for commonly used sizes of pipe. Attach tablets to the inside of the pipe using an adhesive such as Permatex No.1 or equal. Assure no adhesive is on the tablet except on the broad side attached to the surface of the pipe. Attach all the tablets at the inside top of the main, with approximately equal numbers of tablets at each end of a given pipe length. If the tablets are attached before the pipe section is placed in the trench, mark their position on the section so it can be readily determined that the pipe is installed with the tablets at the top.
  - v. When installation has been completed, fill the main with water at a velocity not exceeding 1 fps(0.3 mps). Take precautions to assure that air pockets are eliminated. Leave this water in the pipe for at least 24 hours. If the water temperature is less than 41° F (5°C), leave the water in the pipe for at least 48 hours. Position valves so that the chlorine solution in the main being treated will not flow into water mains in active service.
- b. Continuous Feed Method
- i. Before chlorinating, fill the main with water to eliminate air pockets and flush as specified above.
  - ii. Use water from the existing distribution system or other approved source of supply to flow at a constant, measured rate into the newly laid water main. At a point not more than 10 feet (3 meters) downstream from the beginning of the new main, assure water entering the new main receives chlorine fed at a minimum 25 mg/L free chlorine. To assure that this concentration is provided, measure the chlorine concentration at regular intervals.
  - iii. Appendix B provides information on the amounts of chlorine compound required for various pipe sizes.
  - iv. During chlorine application, position valves so that the chlorine solution in the main being treated does not flow into water mains in active service. Do not stop chlorine application until the entire main is filled with chlorinated

water. Retain the chlorinated water in the main for at least 24 hours, operating all valves and hydrants in the section treated to disinfect the appurtenances. At the end of the 24- hour period, the treated water in all portions of the main must have a minimum free chlorine residual of 10 mg/L free chlorine.

- v. The preferred equipment for applying liquid chlorine is a solution feed vacuum operated chlorinator to mix the chlorine gas in solution water, in combination with a booster pump for injecting the chlorine gas solution water into the main to be disinfected. It is recommended that direct feed chlorinators not be used. Hypochlorite solutions maybe applied to the water main with a chemical feed pump designed for feeding chlorine solutions.
  - vi. If approved, an optional continuous feed method utilizing calcium hypochlorite granules may be used. Place the granules in the pipe sections as specified under the Tablet Method.
- c. Slug Method
- i. Before chlorinating, preliminary flush the main as specified herein.
  - ii. Use water from the existing distribution system or other approved source of supply to flow at a constant measured rate into the newly laid water main.
  - iii. Not more than 10 feet (3 meters) downstream from the beginning of the new main, add chlorine to the water entering the new main at a constant rate that the water will have a minimum 100 mg/L free chlorine. Measure this concentration at regular intervals. Apply the chlorine continuously and for the time required to develop a solid column or “slug” of chlorinated water that will, as it moves through the main, expose all interior surfaces to a 100 mg/L for at least 3 hours.
  - iv. Measure the free chlorine residual in the slug as it moves through the main. If at any time it drops below 50 mg/L stop the flow and relocate the chlorination equipment at the head of the slug, and as flow is resumed, add chlorine to restore the free -chlorine in the slug to not less than 100 mg/L.
  - v. As the chlorinated water flows past fittings and valves, operate related valves and hydrants to disinfect appurtenances and pipe branches.

### 3.17 BACTERIOLOGICAL TESTING

- A. After final flushing and before the water main is placed in service, test a sample, or samples, collected from the main(s) for turbidity and organisms. Collect at least one sample from the new main and one from each branch.
- B. Re-disinfection
  - 1. If the initial disinfection fails to produce approved bacteriological or turbidity samples, re-flush and resample the main. If check samples show bacterial contamination, re-chlorinate the main until approved results are obtained.
- C. Swabbing



1. Where connections are made to existing piping and the connections are not disinfected along with the newly installed main, swab or spray the interior of all pipe and fittings used in making the connections with a 1 percent hypochlorite solution before installation.

### 3.18 POTABLE WATER SEPARATION

- A. Unless otherwise specified in Contract Documents, the potable water lines shall generally be placed with the minimum specified cover. However, a greater depth may be required to clear process piping, storm, and sanitary sewers and sewer services, and no additional compensation shall be provided for such adjustments.
- B. In locations where sewer is in direct conflict with existing water main and water services the water main and water services shall be lowered to provide at least 18" of vertical distance between the top of the water main or service and the bottom of the sanitary or relocated in accordance with the Drawings. No additional compensation will be made for lowering the water main.
- C. Water mains crossing above process piping, storm, or sanitary sewers shall be laid to provide a separation of at least 18" between the bottom of the water main and the top of the sewer. When local conditions prevent a vertical separation as described, the following construction shall be used:
  1. Sewers passing over or under water mains shall be constructed of materials equal to water main standards of construction for a distance of at least 10 feet on either side of the water main.
  2. Water main passing under sewers shall, in addition, be protected by providing:
    - a. A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water main.
    - b. Adequate structural support for the sewers to prevent excessive deflection of joints and settling on and breaking of the water mains.
    - c. A length of water pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the sewer.
  3. Water mains shall be laid at least 10 feet horizontally from any process piping, sanitary sewer, or storm sewer, whenever possible. When local conditions prevent a horizontal separation of 10 feet, a water main may be laid closer to a storm or sanitary sewer provided that:
    - a. The bottom of the water main is at least 18" above the top of the sewer.
    - b. Where this vertical separation cannot be obtained, the sewer shall be constructed of materials and with joints that are equivalent to water main standards of construction and shall be pressure tested to assure water tightness prior to backfilling.
- D. No deviation shall be made from the required line or grade except with the consent of the Engineer.

3.19 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements.

3.20 DATA FOR AS-BUILT RECORDS

- A. Record stationing and/or ties of all fittings, valves, all other underground appurtenances installed, utility crossings or conflicts, over-excavation or hazardous soils on sheets provided for such purposes by the Engineer. Include invert or centerline elevations.

**END OF SECTION 33 31 19**

## SECTION 33 51 36

### TEMPORARY WATER MAIN AND SERVICE CONNECTION

#### PART 1 - DESCRIPTION

Provide, install, connect, test, disinfect, support, restrain, disconnect, and remove a complete temporary water main in accordance with the plans and specifications and in compliance with Section 8.1.5 of Montana DEQ Circular 1). The temporary water main shall be of the necessary dimension to deliver adequate domestic flow and shall include all pipe, all joints and connections to new and existing pipes, all valves, fittings, pipe joint restraint systems, blocking, and incidentals, as may be required to complete the work. The temporary water main will be laid on the ground and anchored and not buried unless otherwise directed by the Engineer.

The abbreviations AWWA, ASA, ASTM, and ANSI, as used in this specification, refer to the following organizations or technical societies:

- AWWA—American Water Works Association
- ASA—American Standards Association
- ASTM –American Society for Testing and Materials
- ANSI—American National Standards Institute
- NSF—National Science Foundation

Where reference is made to specifications of the above organizations, it is to be construed to mean the latest standard in effect on the date of the proposal.

#### 1.01 REFERENCES

##### A. ANSI/AWWA:

1. ANSI/AWWA C651 – Disinfect Water Mains;
2. ANSI/AWWA C906-15 – Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100 mm.) Through 63 In. (1600 mm.), for Waterworks;
3. AWWA M55 – Manual of Water Supply Practices, PE Pipe Design and Installation.

##### B. National Sanitation Foundation:

1. NSF/ANSI 61 – Drinking Water System Components – Health Effects;
2. NSF/ANSI 14 – Plastic Piping System Components and Related Materials;

##### C. American Society of Testing and Materials (ASTM):

1. ASTM D1784 – Standard Specification for Rigid PVC Compounds and Chlorinated PVC Compounds;
2. ASTM D2239 – Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter;
3. ASTM D2241 – Standard Specification for Poly Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series);
4. ASTM D2387 – Standard Test Method for Obtaining Hydrostatic Design Bases

for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products;

5. ASTM D2774 – Standard Specification for Underground Installation of Thermoplastic Pressure Pipe;
6. ASTM D3035 – Standard Specification for Polyethylene (PE) Pipe (DR-PR) Based on Controlled Outside Diameter; ASTM D3139 – Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals;
7. ASTM D3261 – Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing;
8. ASTM D3350 – Standard Specification for Polyethylene Plastic Pipe and Fittings Materials; ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe;
9. ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter;
10. ASTM F905 – Standard Practice for Qualification of Polyethylene Saddle-Fused Joints;
11. ASTM F1055 – Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing;
12. ASTM F1290 – Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings;
13. ASTM F2164 – Standard Practice for Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems Using Hydrostatic Pressure;
14. ASTM F2206 – Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE);
15. ASTM F2263 – Standard Test Method for Evaluating the Oxidative Resistance of Polyethylene (PE) Pipe to Chlorinated Water;
16. ASTM F2620 – Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.

## 1.02 SUBMITTALS

### A. Quality Assurance/Control Submittals

1. Temporary water layout for each individual project segment – including:
  - pipe material;
  - size;
  - fittings & service connections
  - method of restraint and protection
2. Provide manufacturers recommended installation and pipe joining procedures for the products.
3. Submit product data for pipe including Product manufacturer’s specifications, pipe and fittings materials of construction and dimensions of pipe and fittings.

4. Submit certification of conformance with NSF 61 by an acceptable certifying organization.

#### 1.03 DELIVERY, STORAGE AND HANDLING

- A. Handle the pipe in accordance with the manufacturer's instructions using approved strapping and equipment rated for the loads encountered. Do not use chains, wire rope, fork lifts or other methods or equipment that may gouge or damage the pipe or endanger persons or property. Field storage is to be in compliance with manufacturer's recommendations.
- B. Any pipe that has gouges, scrapes, or other damage to the pipe that results in a loss of 10% or more of the pipe wall thickness shall be removed and not used. Inspect the pipe for defects before installation and joining. Defective, damaged, or unsound pipe will be rejected.

### **PART 2 - MATERIALS**

2.01 The temporary water main shall be Polyvinyl Chloride (PVC) or High-Density Polyethylene (HDPE) pipe with Iron Pipe Size (IPS) outside diameters up to 16". All materials used in this project are to be new and unused unless otherwise specified on the plans, specifications or the proposal. The Contractor shall submit descriptive information and evidence that the materials and equipment the Contractor proposed for incorporation into the Work are of the kind and quality that meet the material requirements listed herein.

#### 2.02 DUCTILE-IRON FITTINGS

- A. Fittings for HDPE, PVC C-900, or PVC C-905
  1. This section covers ductile-iron fittings 3 inches through 48 inches in size designed and manufactured for use with gray-iron, ductile-iron, HDPE, PVC C-900 or PVC C-905 pipe. Standard, compact and anchor fittings included herein are of the following types of joints: Flanged and Mechanical Joint
  2. Unless otherwise modified or supplemented herein, the latest revision of AWWA Standard C-110 for Gray- Iron and Ductile-Iron Fittings, 3-inch through 48-inch for Water and Other Liquids" and AWWA Standard C- 153 for Ductile-Iron Compact Fittings, is to govern the design, manufacture, and testing of all fittings under this specification.
  3. For 3 through 24-inch size range, the pressure rating of all fittings is to be a minimum of 250 psi. The working pressure for all fittings of size greater than 24-inch is to be a minimum of 150 psi, unless a change in pressure rating is directed by purchase documents.
  4. Fittings are to be furnished with the types of end combination specified.
  5. Flanged fittings are to be faced and drilled in accordance with ANSI Specification B 16.1, Class 125. Anchor fittings are to be furnished in size and type or length as specified.
  6. The exterior of all fittings shall be provided with a petroleum asphaltic coating in accordance with the latest revision of AWWA Standard C110. The interior of flanged fittings supplied under this specification shall be either cement-mortar

lined in accordance with the latest revision of AWWA Standard C104 or lined with a petroleum asphaltic material in accordance with the latest revision of AWWA Standard as specified. The interior of all other fittings supplied under this specification shall be cement-mortar lined in accordance with the latest revision of AWWA Standard C104.

7. Where standard ductile iron mechanical joint fittings are coupled to plain-end (square-cut) HDPE pipe, mechanical joint adapters must be used.

## 2.03 POLYETHYLENE PIPE

- A. All polyethylene pipe shall be made from HDPE material having a material designation code of PE3608 or higher. The material shall meet the requirements of ASTM D3350 and shall have a minimum cell classification of PE345464C. The pipe material shall also meet NSF-61.

1. The pipe and fittings shall meet the requirements of AWWA C906.
2. The polyethylene pipe shall be rated for use at a pressure of 160 psi. Polyethylene pipe for use in a "High Pressure Zone" shall be rated for use at a pressure class of 200 psi. The outside diameter of the pipe shall be based upon the DIPS (Ductile Iron Pipe Size) sizing system.
3. The high density polyethylene pipe manufacturer shall provide either a certification that stress regression testing has been performed on the specific product, or a stress life curve per ASTM D2837. The stress regression testing shall have been done in accordance with ASTM D2837, and the manufacturer shall provide a product supplying a minimum Hydrostatic Design Basis (HDB), as determined in accordance with ASTM D2837.
4. The manufacturer's certificate shall state that the pipe was manufactured from one specific resin in compliance with these specifications. The certificate shall state the specific resin use, its source, and list its compliance to these specifications.
5. The pipe shall be produced with the nominal physical properties outlined in this specification, and to the dimensions and tolerances specified in ASTM F714.
6. The pipe service identification color for the exterior shell shall be blue for pipes used as potable water mains. The coloring agent used must be resistance to the effects sunlight and must allow the color to be stable for a period of at least six months in full sunlight.

### B. HDPE Pipe Joints

1. Butt Fusion: Sections of high-density polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 400°F, alignment and 75 psi interfacial fusion pressure.
2. Saddle Fusion: Saddle fusion shall be done in accordance with ASTM F2620 or PPI TR-41 or the manufacturer's recommendations and PPI TR-41. Saddle fusion joints shall be made by qualified fusion technicians. Qualifications of the fusion

technician shall be demonstrated by evidence of fusion training within the past year on the equipment to be utilized on this project.

3. Electrofusion: Electrofusion joining shall be done in accordance with the manufacturer's recommended procedure. Other sources of electrofusion joining information are ASTM F1290 and PPI TN-34. The process of electrofusion requires an electric source, a transformer, commonly called an electrofusion box that has wire leads, a method to read electronically (by laser) or otherwise input the barcode of the fitting, and a fitting that is compatible with the type of electrofusion box used. The electrofusion box must be capable of reading and storing the input parameters and the fusion results for later download to a record file. Qualification of the fusion technician shall be demonstrated by evidence of electrofusion training within the past year on the equipment to be utilized for this project.
4. Weld Strength: Fusion joining shall be 100% efficient offering a joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion and extrusion welding shall not be used.
5. Trial Fusion: At the beginning of each day, a trial fusion will be performed to verify fusion procedure and equipment settings for the actual jobsite conditions. Allow trial fusions to cool completely before cutting straps and testing by bending the straps until the ends touch. The test specimen dimensions shall conform to ASTM D2657.

C. HDPE Service Connections

1. Service connections shall be electrofusion saddles with a brass or stainless steel threaded outlet, sidewall fusion branch saddles, tapping tees, or mechanical saddles.

2.04 POLYVINYL CHLORIDE PIPE

A. Polyvinyl Chloride Pipe, 4-inch through 12-inch (C-900)

1. This section covers 4" through 12" diameter polyvinyl chloride (PVC) pressure pipe made from class 12454A or 12454B compounds as determined by ASTM Standard D1784 and providing for a hydrostatic test basis (HDB) of 4,000 psi. All pipe furnished shall be in conformance with AWWA Standard C900, or latest revision thereof.
2. Except as noted on the plans or procurement specifications for specific jobs, all C900 PVC pipe shall be Class 150 (DR 18) having a sustained pressure requirement of 500 psi (ASTM D2241) and a minimum burst pressure of 755 psi (ASTM D1599). C900 PVC pipe installed in the SAWS High Pressure Zone shall be class 200 (DR 14) having a sustained pressure requirement of 650 psi (ASTM D1598) and a minimum burst pressure of 985 psi (ASTM D1599). Pipe pressure class shall be written on the pipe and as per most current applicable AWWA standards.
3. Dimensions and tolerances for each nominal pipe sizes shall be in accordance with Section 2.2, Table 1 of AWWA Standard C900.
4. Pipe shall be furnished in standard laying lengths of 20 feet (plus or minus one inch) unless otherwise noted. Each pipe shall have an integral bell formed on the

pipe end, and be designed to be at least as strong as the pipe wall (ASTM D2472).

5. An elastomeric gasket shall be designed with a retainer ring, which "locks" the gasket into integral bell groove and shall be installed at the point of manufacturer. Gasket shall be in conformance with ASTM F477.
6. Each length of pipe furnished shall bear identification markings in conformance with Section 2.6 of AWWA Standard C900.
7. Pipe shall be bundled in pallets for ease of handling and storage. Pipe bundles (units) shall be packaged to provide structural support to insure that the weight of upper units shall not cause deformation to pipe in lower units. No pipes bundles shall be accepted which show evidence of ultraviolet radiation "sunburn" on exposed pipe as may be caused from extended unprotected storage conditions.
8. The manufacturer shall take adequate measures during pipe production to assure compliance with AWWA C900 by performing quality-control tests and maintaining results of those tests as outlined in Section 3 of that Standard. Submission of product shall constitute certification of compliance with this standard.
9. User references and a claims history shall be provided for further investigation, prior to rendering a final decision on the acceptance of the product to be furnished.

#### B. Joint Restraint System

1. This section covers pipe joint restraint systems to be used on domestic water mains for PVC C-900 pipe sizes 4-inch through 12-inch diameter and PVC C-905 pipe sizes 16-inch through 24-inch diameter. Joint restraint systems are classified as "compression," "mechanical joint" or "non-metallic restrained joint" for the specific type of pipe joint to be restrained.
2. General Requirements
  - a. Underwriter Laboratories (U.L) and Factory Mutual (FM) certifications are required on all restraint systems.
  - b. Unless otherwise noted, restraint systems to be used on PVC C-900 and C-905 pipe shall meet or exceed A.S.T.M. Standard F1674-96, "Standard Test Methods for Joint Restraint Products for Use with PVC Pipe," or the latest revision thereof. Restraint systems used on ductile pipe shall meet or exceed U.L. Standard 194
  - c. Non-metallic restrained joint pipe and couplings shall be utilized specifically for C-900 PVC pipe and fittings in sizes 4-inch-12-inch.
  - d. Each restraint system shall be packaged individually and include installation instructions.
3. Specific Requirements
  - a. Restrainer for PVC C-900/C-905 & Ductile Iron Push-on Type Connections:
    - 1) Pipe restraints shall be utilized to prevent movement for push-on D.I. or PVC (C-900&C-905) (compression type) bell and spigot pipe connections or where a transition or flexible coupling has been



used to join 2 sections of plain-end pipe D.I. or PVC (C-900&C-905). The restrainer may be adapted to connect a plain end D.I. or PVC pipe to a ductile iron mechanical joint (MJ) bell fitting. The restrainer must not be directionally sensitive.

- 2) The pipe shall be restrained by a split retainer band. The band shall be cast ductile iron, meeting or exceeding ASTM A-536-80, Grade 65-45-12. The inside face or contact surface of the band shall be of sufficient width to incorporate cast or machined non-directionally sensitive serration to grip the outside circumference of the pipe. The serration shall provide full (360 °) contact and maintain pipe roundness and avoid any localized points of stress. The split band casting shall be designed to “bottom-out” before clamping bolt forces (110ft-lb minimum torque) can over-stress the pipe, but will provide full non-directionally sensitive restraint at the rated pressures.
  - 3) Bolts and nuts used to attach the split retainer ring shall comply with ANSI B-18.2/18.2.2, SAE Grade 5.
  - 4) Tee-bolts, nuts and restraining rods shall be fabricated from high-strength, low-alloy steel per AWWA C-111- 90.
  - 5) The split ring type non-directionally sensitive restrainer system shall be capable of a test pressure twice the maximum sustained working pressure listed in section D and be for both D.I. and/or PVC C-900.
  - 6) Restraint systems sizes 6 through 12-inch shall be capable of use for both ductile iron and/or PVC C-900.
  - 7) The restraint system may consist of 2 types: the two split retainer rings and for new construction use only the 1 split and 1 solid cast backup ring.
- b. Compression Ring Fitting Restrainer for Ductile Iron Pipe & PVC C-900.
- 1) Compression ring with follower gland type of restrainer may be utilized in conjunction with Mechanical Joint (MJ) bell end ductile iron pipe fittings for restraining PVC C-900 and ductile iron pipe.
  - 2) The system shall utilize a standard MJ gasket with a color-coded compression ring and replacement gland conforming to ASTM A-536-80, Grade 65-45-12. Standard MJ fitting Tee-bolts and nuts shall be fabricated from high strength steel conforming to ANSI AWWA C-111/A-21.11 and AWWA C-153/A-21.53-88.
  - 3) Standard MJ gasket shall be virgin SBR meeting ASTM D-2000 3 BA 715 or 3 BA 515.
  - 4) The restraint system shall be capable of a test pressure twice the maximum sustained working pressure listed in section D.
- c. Non-metallic restrained joint pipe and couplings for PVC C-900 Type Connections:

- 1) Gasketed restrained coupling connections shall join two sections of factory grooved PVC (C-900) pipe. The restrainer coupling or must not be directionally sensitive.
- 2) The coupling shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F-477 and shall be DR-14 Class 200 C-900 PVC in all applications, meeting or exceeding the performance requirements of AWWA C-900, latest revision. The inside face or contact surface of the coupling connection shall be of sufficient width to incorporate a factory machined non-directionally sensitive groove in both pipe and coupling to grip the outside circumference of the pipe. The couplings shall provide full (360 °) contact and maintain pipe roundness and avoid and localized points of stress. The coupling shall be designed with an internal stop to align the precision-machined grooves in the coupling and pipe prior to installation of a non- metallic thermoplastic restraint spleen, and will provide full non-directionally sensitive restraint at the rated pressures.
- 3) High-strength flexible thermoplastic spleens shall be inserted into mating precision–machined grooves in the pipe and coupling to provide full non-directional restraint with evenly distributed loading.
- 4) The non-metallic restrained joint pipe and couplings for PVC C-900 type non-directionally sensitive restrainer system shall be capable of a test pressure twice the maximum sustained working pressure listed in Section D and be for PVC (C-900) pipe sizes 4 through 12-inch.
- 5) Non-metallic restrained joint pipe and couplings for PVC C-900 restrained systems sizes 4 through 12-inch shall be capable of use for both Class 150 (DR 18) and 4 through 8-inch for Class 200 (DR 14) PVC C-900 pipe.
- 6) The non- metallic restrained joint pipe and couplings for PVC C-900 restraint system shall consist of a pipe and couplings system produced by the same manufacturer meeting the performance qualifications of Factory Mutual (FM) and Underwriters Lab (UL).

d. Maximum Sustained Working Pressure Requirement

<b>Table 1</b>		
<b>Nominal Diameter</b>	<b>PVC C-900 / C-905</b>	<b>Ductile Iron</b>
4 & 6 in.	200 p.s.i.	350 p.s.i.
8 in.	200 p.s.i.	250 p.s.i.
10 & 12 in.	200 p.s.i.	200 p.s.i.
14 & 16 in.	200 p.s.i. (C-900)/ 235 p.s.i. (C-905)	200 p.s.i.
20 & 24 in.	200 p.s.i. (C-900) / 235 p.s.i. (C-905)	200 p.s.i.

4. Tests

- a. The Owner may, at no cost to the Contractor, subject random joint restraint system products to testing by an independent laboratory for compliance with these standards. Any visible defect of failure to meet the quality standards herein will be ground for rejecting the entire order.

2.05 COPPER TUBING AND BRASS FITTINGS FOR COPPER SERVICE LINES

A. Copper Tubing

1. This section covers copper tubing in nominal sizes of 3/4", 1", 1-1/2" and 2".
2. General Requirements
  - a. Copper service tubing shall be annealed seamless Type "K" and meet ASTM B-88 bearing NSF Standard 61 approval and be rated at 150 psi working pressure.
  - b. 3/4" and 1" copper tubing shall be furnished in sixty-foot coils or one hundred- foot coil as specified; 1-1/2" shall be furnished in twenty-foot lengths, forty-foot coils or sixty-foot coils as specified, and 2" shall be furnished in twenty-foot lengths or forty foot coils as specified.
  - c. Copper tubing is the only allowable material for small service lines.

B. Brass Fittings

1. This section covers waterworks brass goods, such as, corporation stops, curb stops, couplings, connectors, nipples, etc.
2. General Requirements
  - a. The brass composition shall conform to ASTM Specifications B-62, or latest revision thereof, fittings shall conform to ANSI/AWWA Specifications C-800, or latest revision thereof.
  - b. All brass components in contact with potable water must be "lead free" and marked by stamping, etching or casting "NL" in the main body made from either CDA/UNS Brass Alloys C89520 in accordance with ASTM B584; or C89833. Brass saddles shall be made from CDA/UNS C83600.
  - c. Any brass component not in contact with potable water shall be made of 85-5-5-5 brass as defined per ASTM B62, ASTM B584 and AWWA C-800.
  - d. All service fittings shall be certified as suitable for contact with drinking water by an ANSI accredited organization in accordance with ANSI/NSF standard 61, Drinking Water Systems Components-Health effects section 8. Proof of certification is required. The lead content of the wetted components in contact with potable water shall also be verified by an ANSI accredited testing facility.
  - e. All brass fittings and valves shall have the manufacturers name and/or trademark integrally stamped, or cast into it indicating that the product is manufactured from the low-lead alloy as specified. Another marking such

as “NL”, “EBII”, “FD” or other commonly accepted identifier, indicating the alloy as “No-lead”; shall also be cast or stamped into the fitting or valve.

- f. Painting, printing, sticker, or decals attesting to the components “no-lead” certification shall not be permitted.
- g. All casting shall have a natural, clean uniform and smooth surface, and be free from internal porosity. All machining shall be done in a workmanlike manner and within the acceptable tolerances.

### **PART 3 - CONSTRUCTION METHODS**

#### **3.01 INSTALLATION**

- A. Install temporary water main as required to provide safe domestic drinking water service – as per the Contractor’s submittal. Secure temporary water main with suitable anchoring devices as needed.
- B. Use approved traffic ramps for temporary water main crossings of existing driveways and established rights-of-way. Cutting and restoring pavement to bury the main at driveway crossings shall only be allowed if approved by the Engineer. Install a valve on the temporary water main at both ends of each driveway crossing.
- C. Ramp and maintain temporary water main at sidewalk crossings. Make connections to the existing water mains as shown on the plans.

#### **3.02 PIPE LAYING**

- A. General Requirements
  - 1. The Contractor is to start his work at a tie-in point, unless otherwise indicated on the plans. Pipe is to be laid with bell ends facing the direction of lying, unless otherwise authorized or directed. Under no circumstances is pipe to be laid in water and no pipe is to be laid under unsuitable weather or trench conditions. All valves and fire hydrants must be installed as soon as pipe laying reaches their established location. Pipe is to be installed to the required lines and grades with fittings, valves, and hydrants placed at the required locations.
  - 2. The temporary water main shall be laid on top of the existing ground and anchored, as necessary, unless otherwise directed by the Engineer.
  - 3. Spigots are to be centered in bells or collars, all valves and hydrant stems are to be set plumb, and fire hydrant nozzles are to face as shown on the plans or as directed. No valve or other control on the existing system is to be operated for any purpose by the Contractor unless a representative of SAWS is present.
  - 4. The Contractor is to maintain a neat and orderly work area. Complete cleanup is to be maintained at all times as closely behind the pipe laying operations as possible, but in no case is such cleanup be permitted to lag more than 1,000-ft. behind the pipe laying, unless otherwise directed.
  - 5. The Contractor is to maintain service to water connections, whether connected to the existing or proposed water lines, at all times for the duration of the construction, unless directed otherwise by the Engineer.

B. Tie-in to Existing Mains

1. The Contractor shall make tie-ins from temporary water main to existing water main as required or as specifically directed by the Engineer. The Contractor shall be responsible for all shutdowns and isolation of the existing mains; cutting pipe for the connection; dewatering the excavation; customer notification of the shutdown; and all other requirements as directed by the Inspector in order to provide completion of this effort in a safe and secure manner. During construction, the planned shutdown and tie-in work shall be coordinated through and approved by the Inspector with a minimum of two weeks prior notice of such activity and accomplished at a time which will be at the least inconvenience to the customers. No additional compensation will be provided for tie-ins accomplished after normal working hours.
2. Tie-in to existing mains of asbestos cement (AC) pipe (if applicable), the Contractor shall observe and comply with all federal, state and local laws, ordinances and regulations regarding the management of asbestos containing materials. At the minimum, work involving AC pipe should be overseen by a person who has received asbestos training and is familiar with the National Emissions Standards for Hazardous Air Pollutants (NESHAP). If greater than 3 linear feet of pipe is to be removed, written notification to the Montana Department of Environmental Quality (MDEQ) 10 days prior commencing with the removal of AC pipe is required. At each location shown in the plans and/or identified by the Contractor to involve AC pipe, the Contractor will be required to coordinate with MDEQ for the removal of the necessary amount of AC pipe required to make the connection without creating any friable material.

C. Cutting-in Valves.

1. The work involved in cutting a valve into an existing main is to consist of excavation and backfilling with approved selected material; hauling and disposition of surplus excavation and other materials; installation of the valve, valve box assembly, all pipe cut used to complete cut-in; reaction blocking; polyethylene wrapping where required.

D. Tapping Sleeves and Valves

1. Size on size taps are not permitted.
2. The work involved in the installation of a tapping sleeve and valve is to consist of excavation, backfilling the excavation with approved selected material, installing the tapping sleeve, reaction blocking, tapping valve, valve box assembly, concrete collar where subjected to street traffic, and a cast iron lid. New taps will not be permitted closer than 2 feet of a joint or existing tap. The use of a shell type cutter shall be required with tapping sleeves and valves. Whenever working on potable or recycled water system, disinfect the shell cutter with bleach prior to start of work. The cutting edge is to be sharp and round. Inspector will reject defective cutters.
3. Air test tapping sleeves to 50 psi prior to tapping main line.
4. The valve box shall be placed in such a manner to prevent shock or stress from being transmitted to the valve. Valve boxes shall be centered over the valve's operating nut with the box cover flush with the finished pavement surface or

located at another level as directed by the Inspector. Valve boxes located in streets or other areas subject to vehicular traffic shall be provided with concrete collars as shown in the accompanying standard drawings. Collars around such valve boxes shall be formed and finished off neatly, and in a sound workmanlike manner.

E. Cutting-in Tees

1. The work involved in cutting in a tee is to consist of excavation, shut-down and isolation of existing main to which the new main is to be connected, cutting pipe for connection, dewatering the excavation, customer notification of service interruption where required, installation of all pipe used to complete the connection, all necessary tie-ins (connection to existing or new main), fittings, approved reaction blocking required and backfilling the excavation with approved selected materials or flowable backfill if required. Where the installation of a valve is required, payment will be for valve accordance with this specification.

F. Pipe Joint Restraint System

1. Pipe joint restraints shall be utilized to prevent movement for PVC push-on bell and spigot pipe connections. The restrainer may be adapted to connect a plain end PVC pipe to a ductile iron mechanical joint (MJ) bell fitting. Joint restraint is to be non-directional and installed to fully restrain system. All pipe and fitting systems with restrained joints shall be identified by applying an adhesive-backed warning tape to the top of the pipe and for the full length of the pipe, regardless of the type of pipe. For plastic pipes the warning tape shall be applied directly to the top of the pipe. For metal pipes and fittings, the warning tape shall be applied to the top of the polyethylene film wrap.

a. Gate Valves, Valve Boxes, Adjustments

- 1) Gate valve installation shall include valve, reaction blocking, cast iron boot, valve box extension (having ductile iron riser pipe), valve box, concrete collar (where subjected to vehicular traffic), and valve box lid. Gate valves constructed in the terrace shall be constructed with No. 3 bars all around.
- 2) The valve box shall be placed in such a manner to prevent shock or stress being transmitted to the valve. All valves located 6 feet and deeper shall include valve key extensions inside the valve box. The Contractor has the option to install fully adjustable valve box and valve key extension systems, on all valves located between 6 feet and 13 feet. Adjustable valve box and valve key extension systems shall be centered over the valve's operating nut with the box cover flush with the finished pavement surface or located at another level as directed by the Engineer. Valve boxes located in streets or other area subject to vehicular traffic shall be provided with concrete collars as shown in these standard drawings.
- 3) Collars around such valve boxes shall be formed and finished off neatly and in a sound workmanlike manner. Valve pits shall be located so that the valve operating nut is readily accessible for operation through the opening in the valve box. The valve box shall be set flush with the finished pavement surface or at other

finish elevations as may be specified. Pits shall be constructed in such a manner to permit minor valve repairs and provide protection to the valve and pipe from impact (where penetrating through pit walls).

- 4) In Pressure Zones 9-16, all valves 6 inches and larger shall be supported on a concrete pad in accordance with details shown in the plans.
  - 5) Existing valve boxes located within the limits of new street construction which are in conflict are to be adjusted to match proposed finish grades.
  - 6) Valve boxes installed as part of a new valve and mainline construction project are considered “new valves.” Adjustments to “new valves” are incidental to the installation of the valve. No separate pay will be given to adjust “new valves” to finished grade.
- b. Air Release Assembly
- 1) Temporary air relief valves and appurtenant items are to be installed at necessary high points unless otherwise directed.
- c. Blow-offs
- 1) Temporary blow-off assemblies shall be installed where necessary and/or at locations designated by the Engineer/Owner and at the end of all dead-end mains.
- d. Anchorage and Blocking
- 1) Suitable reaction blocking or anchorage is to be provided at all dead ends, plugs, caps, tees, crosses, valves and bends as shown on the plans. All mechanical restraints are to be bidirectional. Anchor blocks are to be constructed solidly behind the fitting and symmetrical with the axis of resultant thrust except where this is not possible as in the case of gravity anchorage for vertical bends. Special ties and anchor fittings may be utilized in conjunction with blocking when shown on the plans or as directed.
  - 2) Thrust blocking is to be a minimum of Class “A” (3,000 psi), concrete placed between solid ground and the fitting except as otherwise shown on the plans. The area of bearing in contact with solid ground is to be that shown on the plans or as directed.
  - 3) The blocking is to be placed so that pipe and fitting joints will be accessible. Pipe polywrap is to be placed between the pipe or fitting and the concrete.
  - 4) The reaction block on the unused branch of a tee is to be poured separately from the block across the back of the tee. If they are poured simultaneously, a rigid partition is to be placed between the blocks.

### 3.03 DISINFECTION

All elements of the temporary water piping network that conveys potable water must be disinfected in accordance with AWWA C651-14 standard procedures. The Contractor's temporary water piping submittal must include the backflow prevention setup; disinfection dosage; holding time; flushing procedure and; method of testing to ensure compliance with the applicable AWWA standards.

### 3.04 SERVICE SUPPLY LINES

- A. Temporary service supply lines and fittings shall conform to material specifications and shall be installed by the contractor as specified herein, or as directed by the engineer and in accordance with plans. Service supply lines in High Pressure Zones should be installed with two strap service saddle clamps.
- B. Designation of Service Supply Lines
  - 1. A service supply line located between the temporary water main and the inlet side of the water meter is designated as a "water service line". A service supply line located between the outlet side of the water meter to the point of connection within the limits of the Customers lot or property is designated as "Customer's yard piping". Services 2" and smaller are designated "small services"; services 4" and larger are designated "large services".
  - 2. Reconnect any services shown on the plans and along the alignment of the temporary water main to the temporary water main, so the existing main can be taken out of service.
  - 3. Service Line Installation: Unless otherwise notified, service reconnects shall be installed as described herein, and in plans. Unless otherwise indicated, existing meter and meter box relocation shall be included in the service line installation.
  - 4. Small Service Lines: Copper tubing shall be used for ¾" through 2" service lines. Brass fittings for ¾" and 1" service lines shall be of the flared or compression type for the use with Type 'K' soft annealed copper tubing. Brass fittings for 1½" and 2" lines shall be of the flared or compression type for use with type 'K' soft annealed copper tubing, except as modified by this specification.
  - 5. Copper tubing shall be cut squarely by using an approved cutting tool and by avoiding excessive pressure on the cutting wheels which might bend or flatten the pipe walls. Following the copper tubing cut, but before flaring, a reamer shall be used to remove the inside rolled lip from the tubing. Flared ends shall be expanded by the use of a flaring tool using care to avoid splitting, crimping, or overstressing the metal. Pipe adjacent to the fittings shall be straight for at least 10 inches. Bending of tubing shall be accomplished by using an appropriate sized bending tool. No kinks, dents, flats, or crimps will be permitted, and should such occur, the damaged section shall be cut out and replaced. When compression fittings are used, the copper tubing shall be cut squarely prior to insertion into the fitting. Final assembly shall be in accordance with the manufacturers' recommendations.

### PART 4 - MEASUREMENT

- A. This Item will be measured as follows: "Temporary Water" for the temporary water pipe of the various type and size necessary for the delivery of safe drinking water to the Town's users, will be measured by lump sum.



## **PART 5 - PAYMENT**

- A. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for on a lump sum basis. Payment for "Temporary Water" shall include all required items to install the temporary water main as shown in the plans, tie-in the temporary water main to the existing water main, transfer services to the temporary water main, maintain the temporary water main during construction of the new water main, and remove the temporary water main after the new main has been tied-into the existing water main and the services have been connected to the new main. The lump sum price shall be full compensation for all labor, equipment materials, tool, excavation, embedment material, backfill, compaction, water tie-ins, hydrostatic testing, disinfection, tapping sleeves and valves, fittings, piping, valves, air release assemblies, temporary water main removal, hauling and disposition of surplus material, and incidentals necessary to complete the work in accordance with the plans and specifications.

**END OF SECTION 33 51 36**

## Stuff removed from this spec section

- B. Plastics Pipe Institute (PPI):
  - 1. PPI Handbook of Polyethylene Pipe;
  - 2. PPI TR-33 – Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe; PPI TR-34 – Disinfection of Newly Constructed Polyethylene Water Mains;
  - 3. PPI TR-41 – Generic Saddle Fusion Joining Procedure for Polyethylene Gas Piping;
    - PPI TN-42 – Recommended Minimum Training Guidelines for PE Pipe Butt Fusion Joining Operators for Municipal and Industrial Projects.

**APPENDIX A**

**GEOTECHNICAL REPORT**



RESTORING OUR ENVIRONMENT ● DESIGNING OUR FUTURE

# City of Alberton Geotechnical Report

Alberton, Montana

Prepared for:  
**Anderson-Montgomery Consulting Engineers**  
1064 N. Warren Street  
Helena, Montana 59601

Prepared by:  
**Pioneer Technical Services, Inc.**  
1309 Cole Street  
Helena, Montana 59601

April 2023

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<b>Revision No.</b>	<b>Author</b>	<b>Version</b>	<b>Description</b>	<b>Date</b>
Rev 0	Sean Harris	Draft	Internal Review	2/8/2022
Rev 1	Sean Harris / Mike Browne	Draft	Client Review	3/30/2023
Rev 2	Mike Browne	Final	Revised pavement and chemical properties	4/10/2023

## 1 INTRODUCTION

Anderson-Montgomery Consulting Engineers (Anderson-Montgomery) contracted Pioneer Technical Services, Inc. (Pioneer) to complete a geotechnical investigation for the Town of Alberton's proposed water system infrastructure improvements including a 200,000-gallon water storage tank and replacement of the town's water distribution pipes.

The purpose of the geotechnical investigation was to explore subsurface conditions at the site and provide information on soil characteristics, foundation recommendations, soil bearing capacity, lateral earth loads, asphalt section recommendations, soil corrosivity concerns, seismic zone, groundwater conditions, material specifications, and discussion of any unusual conditions. This report provides conclusions of the investigation, results of laboratory testing and analyses, and design recommendations.

## 2 INVESTIGATION

### 2.1 Site Description

The water storage tank property is owned by the Town of Alberton and is located on the mountainside northwest of the town. The water distribution system improvements will replace many of the water pipes throughout town.

### 2.2 Geotechnical Investigation

Pioneer drilled six boreholes (BH-01 through BH-06) to depths between 11.5 and 30 feet below the ground surface as shown on Figure 1. Boreholes BH-01 and BH-02 are located near the proposed water tank. Boreholes BH-03 through BH-06 are located along the water distribution system. The drilling work was performed on September 6 and 7, 2022, by Boland Drilling under subcontract to Pioneer. The boreholes were advanced using a track-mounted drill rig using a ODEX casing advancer system and rock coring. An engineer from Pioneer logged the borehole lithology and collected samples for laboratory testing.

*In-situ* strengths were collected via Standard Penetration Tests (SPTs) using a 2-inch outside diameter split-spoon sampler which was driven into the soil using a standard 140-pound safety hammer falling from a height of 30 inches. Geotechnical samples were collected from each SPT interval and field classified according to ASTM International D2488 (Standard Practice for Description and Identification of Soils [Visual – Manual Procedure]).

#### 2.2.1 Soil Lithology

Geologically the site is located in the Mount Shields Formation of the Belt Supergroup. The dominant rock type of the Mount Shields formation is a maroon quartzite with black hematite staining. Shallow bedrock matching the description for the Mount Shields Formation was

observed during the geotechnical investigation. Alluvium and colluvium, consisting of clay, silt, sand, and gravel overlie the quartzite within the town of Alberton (MBMG, et al., 2007).

Appendix A contains the detailed borehole logs and Appendix B presents photographs of the investigation and soil samples. The stratification lines shown on the borehole logs represent the approximate boundary between soil types as observed within the boreholes. The actual *in-situ* transition is variable because of the nature and depositional characteristics of natural soil. Interpolation of subsurface conditions beyond the location of the boreholes may be unreliable as soil conditions can change rapidly in both lateral and vertical directions.

### 2.2.2 Groundwater Conditions

Groundwater was not encountered in BH-01 or BH-02, near the existing water storage tank, at the time of drilling.

Groundwater was not encountered in BH-03 through BH-06 at the time of drilling. Review of local well logs on the Montana Bureau of Mines and Geology Ground-Water Information Center website indicate the static groundwater levels for nearby wells were 15 to 47 feet below ground surface at the time the wells were installed. The groundwater level likely fluctuates seasonally but is not expected to be a construction concern.

## 2.3 Laboratory Testing

Soil samples were transported and analyzed at Pioneer’s materials testing laboratory located in Helena, Montana. The samples were collected from select depths and were tested for their index (physical) and chemical properties.

### 2.3.1 Index Properties

A summary of the laboratory testing results is presented in Table 1. Appendix C provides the complete laboratory testing results.

**Table 1: Laboratory Index Data**

BORE HOLE NO.	DEPTH (ft)	USCS SYMBOL	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	GRADATION ANALYSIS			STANDARD PROCTOR		CBR (%)
						GRAVEL (%)	SAND (%)	FINES (%)	OPTIMUM MOISTURE (%)	MAX DRY DENSITY (pcf)	
03	5-6.5	SC-SM	27	21	6	-	-	-	-	-	-
04	5-6.5	ML	42	27	15	0	9	91	-	-	-
04	0-10	CL	41	23	18	12	23	65	15.8	108.8	2.8
05	0-7.5	-	-	-	-	-	-	-	10.3	123.2	-
06	0-1.5	SC-SM	21	17	4	11	45	44	-	-	-
06	0-10	SM	18	16	2	12	52	36	9.6	126.0	9.7

CBR: California Bearing Ratio

Moisture contents ranged from 1% to 12% with an average moisture content of 4%.



### 2.3.2 Chemical Properties

Corrosivity testing (soluble sulfate, pH, and resistivity) was conducted to determine if the native soil may potentially be corrosive to buried concrete or metal associated with the proposed construction. The pH and soluble sulfate testing were subcontracted to Alpine Analytical, Inc. located in Helena, Montana. A summary of corrosivity testing results is presented in Table 2.

**Table 2: Corrosivity Testing**

BOREHOLE NO.	DEPTH (feet)	pH (s.u.)	RESISTIVITY (ohm-cm)	CONDUCTIVITY (mmhos/cm)	SOLUBLE SULFATE (%)
BH-03	0-10	8.48	870 <sup>1</sup>	-	0.0034
BH-05	0-7.5	8.33	-	-	0.0012
BH-01 <sup>2</sup>	0-1.5	8.0	18,000 <sup>3</sup>	0.05	-
BH-01 <sup>2</sup>	5-6.5	8.4	31,000 <sup>3</sup>	0.03	-
BH-03 <sup>2</sup>	0-1.5	8.3	10,000 <sup>3</sup>	0.10	-
BH-04 <sup>2</sup>	0-1.5	8.3	44,000 <sup>3</sup>	0.02	-
BH-05 <sup>2</sup>	5-6.5	8.4	73,000 <sup>3</sup>	0.01	-
BH-06 <sup>2</sup>	5-6.5	8.1	28,000 <sup>3</sup>	0.04	-

ohm-cm: ohm-centimeter. s.u.: Standard Unit. Mmhos/cm: milli-mhos per centimeter.

1) Lab measured resistivity value.

2) Additional testing to further refine steel corrosion exposure.

3) Inadequate sample volume to conduct laboratory resistivity. Samples were previously oven for moisture content determination. Resistivity values estimated from conductivity values.

Criteria from the American Water Works Association (AWWA, 2010) and by the Portland Cement Association (PCA, 2007) were used to evaluate soil corrosiveness.

The pH, resistivity, moisture content, and conductivity testing indicate:

- The silty, clayey sand sampled in BH-03 is considered corrosive to buried metallic elements. Cathodic protection should be used for on-site metallic utilities. Alternatively, use of high-density polyethylene (HDPE) or polyvinyl chloride (PVC) utility pipes is recommended in lieu of metallic products.
- The native site soils at locations other than BH-03 are not considered corrosive to buried metallic elements. No special precautions are warranted.

The sulfate testing results indicate the on-site soil has negligible exposure to concrete sulfate attack. Type I or Type I/II cement is acceptable for all cast-in-place structural concrete exposed to the native soil.

## 3 ANALYSES AND RECOMMENDATIONS

### 3.1 Proposed Construction

The proposed construction includes the following:

- 200,000-gallon steel water tank founded on a shallow ring foundation. The existing water tank is located on hillside northwest of Alberton and has a North American Vertical Datum (NAVD88) base elevation of 3,201.50 feet. The proposed water tank will be located near the existing water tank and have same base elevation. Specifically, the proposed tank will be positioned such that the southeast quadrant is located at BH-02 location while the remainder of the water tank extends towards BH-01 located to the northwest. The manufacturer suggests a 2-foot-thick sand cushion under the tank foundation.
- A new water distribution system throughout Town of Alberton. Distribution system will predominantly consist of open trench excavation and pipe replacement. Directional drilling and/or jack and bores will be used at select locations to route utilities under Montana Department of Transportation (MDT) Route 507 (Railroad Avenue). The water distribution design includes use of C900 PVC pipes for the waterlines in town while HDPE pipe will be used at the directional drilling/jack and bore locations under Railroad Avenue. Some of the piping under the water tank and some mechanical connections in town will be ductile iron.
- New aggregate and/or asphalt pavement roadway sections will be constructed at trench excavation locations.

### **3.2 Subsurface Materials Discussion**

The stratigraphy beneath the proposed water tank primarily consists of silty sand and silty gravel (completely weathered quartzite) overlying quartzite bedrock. The depth to bedrock was 7.0 feet (approximate elevation 3208.0) in BH-01 and 2.5 feet (approximate elevation 3197.7) in BH-02. Pioneer understands the tank will be located between BH-01 and BH-02.

Soil lithology in BH-04 and BH-05 are positioned along the proposed water distribution system on the north side of down, which is located on the mountain side. Colluvium soils (silt, silty sand, and well-graded sand with gravel) were logged from near the ground surface to depths of 8.0 and 6.0 feet in BH-04 and BH-06 respectively. Quartzite bedrock was encountered at a depth of 8.0 feet in BH-04 and 6.0 feet in BH-05.

Along Railroad Avenue BH-03 and BH-06 are positioned along the proposed water distribution system. Colluvium and alluvium soils (silty sand with gravel, silty-clayey sand, and poorly graded sand) were logged from near the ground surface to the bottom of the boreholes at 11.5-foot depth.

The quartzite bedrock at the tank location and BH-04 and BH-05 is fractured, varies in weathering between very severely weathered to very slight weathering, and has an estimated field hardness of moderately hard to very hard. The quartzite bedrock may be problematic/difficult to excavate during construction pending design excavation depths. The proposed water tank and utility construction may require excavation and/or trenching through the quartzite bedrock. Use of hydraulic hammer on heavy equipment or other rock excavation techniques may be required to excavate to design grades. The bedrock was highly fractured, which is an indicator that the bedrock may be able to be excavated by scratching at it with excavation equipment or bulldozer ripper.

### 3.3 Tank Foundation

To minimize differential settlement, Pioneer recommends the entirety of the tank foundation be founded directly on the quartzite bedrock with a two-foot sand cushion (per manufacture recommendations) between the bedrock and foundation. Specific recommendations include the following:

1. Excavate to depth of at least 2 feet below bottom of water tank. Rock excavation will likely be warranted. Ensure entirety of tank footprint will be positioned directly on bedrock.
  - a. Tank perimeter be a minimum of 10 feet away from edge of downgradient slope. Extend excavation horizontally a minimum of 5-foot beyond tank perimeter or per civil plans, whichever is greater.
  - b. Bedrock excavation surface must be level.
  - c. Clean bedrock excavation surface to remove all soil and rock spoils.
  - d. Provide opportunity for Engineer to inspect excavation.
  - e. Balancing the excavation with cut and fills directly under the water tank is not permitted. Entirety of tank footprint must be in fresh bedrock excavation.
  - f. Cut and fill excavation outside tank footprint to meet civil design grading is acceptable.
2. Compaction of bedrock excavation surface not required.
3. Provide, place, and compact structural fill to design grade. Moisture condition structural fill to plus or minus 2% optimum moisture content, place in 8-inch (maximum) loose lifts, and compact each lift to a standard relative compaction of at least 98% (ASTM D698). Structural fill is intended to meet manufacture sand cushion requirements and should meet the gradation requirements listed in Table 3.
4. Form and construct the concrete foundation.

**Table 3: Structural Fill  
(MPW 3/4-inch Minus Crushed Base Course)**

SIEVE SIZE	PERCENT PASSING
3/4 - inch	100
No. 4	40 - 70
No. 10	25 - 55
No. 200	2 - 10

Pioneer recommends the following criteria for structural design of the mat slab:

1. Moduli of subgrade reaction ( $k_s$ ) of 400 pounds per square inch per inch (pci) of deflection.
2. Moduli of elasticity ( $E_s$ ) value of 14,000 pounds per square inch (psi) and Poisson's ratio ( $\nu$ ) of 0.30 for the structural fill.
3. Friction coefficient ( $\mu$ ) of 0.40 for sliding against the prepared structural fill/base course.
4. Allowable bearing capacity of 10,000 pounds per square foot (psf) provided structural fill recommendations are followed.

5. Pioneer anticipates total settlement of the mat slab designed and placed as recommended will be less than 1 inch.

Ensure there is positive drainage away from the open excavation to keep all surface water from draining into the excavation. This recommendation also applies to final grading, where positive drainage (2% minimum) must be in place around the finish grade of tank.

### 3.4 Pavement Design

The proposed road surface improvements include pavement typical sections for Railroad Avenue and the city streets of Alberton. Railroad Avenue typical section design was performed in general accordance to American Association of State Highway Transportation Officials (AASHTO, 1993) and MDT pavement design requirements (MDT, 2018) flexible pavement design methodology. Town of Alberton typical section design was performed in general accordance to American Association of State Highways and Transportation (AASHTO) and Town of Alberton Subdivision Regulations (Mineral County, 2011).

#### 3.4.1 Traffic Design Parameters

The MDT maintains a Transportation Data Management System that includes traffic data for Railroad Avenue. Railroad Avenue average daily traffic (ADT) parameters are listed in Table 4.

**Table 4: Railroad Avenue Average Daily Traffic**

Year	Average Daily Traffic (VPD)	Annual Growth (%)
2013	1060	4
2014	840	-21
2015	840	0
2016	727	-13
2017	711	-2
2018	703	-1
2019	640	-9
2020	649	1
2021	717	10
2022	792	10
<b>Average</b>	<b>768</b>	<b>-2</b>

VPD: Vehicles Per Day

The MDT ADT values are included in Appendix D.

#### 3.4.2 Design Structural Number

The AASHTO flexible pavement design method was used to determine a design structural number ( $SN_{design}$ ). The structural number represents the overall structural requirement needed to sustain the design's traffic loading. The structural number value represents the structural strength of a given typical section consisting of pavement, base course, and subbase material. The parameters for the  $SN_{design}$  include:

1. Initial Serviceability ( $p_0$ ) value of 4.2. Initial Serviceability is a measure of the pavement's smoothness or rideability immediately after construction. The MDT Pavement Design Manual (MDT, 2018) recommends an Initial Serviceability of 4.2.
2. Terminal Serviceability ( $p_t$ ) value of 2.5. Terminal Serviceability is the minimum tolerable serviceability of a pavement. The MDT Pavement Design Manual (MDT, 2018) recommends a Terminal Serviceability of 2.5.
3. Reliability Level (R) of 75. Reliability Level is the probability that a pavement structure will survive the design period traffic. The MDT Pavement Design Manual (MDT, 2018) recommends a value of 75% for secondary and urban routes.
4. Overall Standard Deviation ( $S_o$ ) of 0.45. Overall Standard Deviation accounts for all variability associated with design and construction inputs, including variability in material properties, roadbed soil properties, traffic estimates, climatic conditions, and quality of construction. The MDT Pavement Design Manual (MDT, 2018) recommends a value of 0.45 for Overall Standard Deviation.
5. Roadbed Soil Resilient Modulus ( $M_R$ ) of 4,500 and 11,145 psi based on Town of Alberta and Railroad Avenue CBR values, respectively. The  $M_R$  is a material property used to characterize the support characteristics of the roadbed soil in flexible pavement design. In general terms, it is a measure of the soil's deformation in response to repeated applications of load much smaller than a failure load.

A summary of traffic design parameters and calculated Equivalent Single Axle Load (ESAL) values are listed in Table 5.

**Table 5: Traffic Parameters**

Traffic Parameter	Railroad Avenue	Town of Alberta Streets	
	Asphalt Surface	Asphalt Surface	Aggregate Surface
Design Life	20 years	20 years	20 years
ADT	792 VPD	200 VPD <sup>1</sup>	50 VPD <sup>1</sup>
Growth Rate	2% <sup>1</sup>	2% <sup>1</sup>	2% <sup>1</sup>
Percent Trucks	5% <sup>1</sup>	5% <sup>1</sup>	5% <sup>1</sup>
Design FHWA Class Truck	13 <sup>1</sup>	6 <sup>1</sup>	6 <sup>1</sup>
Load Equivalency Factor	1.4533 ESAL per Truck	0.4653 ESAL per Truck	0.4653 ESAL per Truck
ESALs <sup>2</sup>	255,195	20,633	5,158

1: Assumed parameter. Please review parameter and provide suggested data value if warranted.

2: ESALs: 18-kip Equivalent Single Axle Load

Based on these criteria, the required  $SN_{design}$  for Railroad Avenue is 2.14. The  $SN_{design}$  for Town of Alberton asphalt and aggregate streets is 2.00 and 1.57, respectively. The calculated  $SN_{design}$  is included in Appendix D.

### 3.5 Calculated Structural Number (SN)

For the design to be effective, the calculated structural number should be greater than the  $SN_{design}$ . To obtain a calculated structural number, the drainage coefficient (m) and a structural coefficient (a) are multiplied by a typical section layer thickness (D) and summed as:

$$SN = a_1D_1m_1 + a_2D_2m_2 + \dots a_nD_nm_n.$$

The drainage coefficient is a coefficient based on the effect of drainage within the pavement section. The drainage coefficient for each layer is conservatively assumed as 1.0 (MDT, 2018). Pioneer selected structural coefficients for plant mix asphalt, crushed base course, and subbase materials from the MDT pavement design manual (MDT, 2018). Pioneer's proposed typical section design for the subdivision roads and corresponding structural number calculation are presented in Table 6 and in Appendix D.

**Table 6: Calculated Typical Design Thickness**

LOCATION	DESIGN STRUCTURAL NUMBER	MATERIAL TYPE	LAYER THICKNESS	LAYER COEFFICIENT <sup>1</sup>	CALCULATED STRUCTURAL NUMBER <sup>2</sup>
			Inches (feet)	Per inch	
Railroad Ave. <sup>3</sup>	2.14	Asphalt	3.6 (0.3)	0.41	1.48
		Base Course	12 (1.0)	0.14	1.68
		Subbase Course	0	0.07	0
		Geotextile	No	-	-
		<b>Total</b>	<b>15.6 (1.3)</b>	<b>-</b>	<b>3.16</b>
Alberton Asphalt Surfaced Streets, Option 1	2.00	Asphalt	3.0	0.41	1.23
		Base Course	4.0	0.14	0.56
		Subbase Course	8.0	0.07	0.42
		Geotextile	No	-	-
		<b>Total</b>	<b>15.0</b>	<b>-</b>	<b>2.35</b>
Alberton Asphalt Surfaced Streets, Option 2	2.00	Asphalt	3.0	0.41	1.23
		Base Course	8.0	0.14	1.12
		Subbase Course	0	0.07	0
		Geotextile	No	-	-
		<b>Total</b>	<b>11.0</b>	<b>-</b>	<b>2.35</b>
Alberton Aggregate Surfaced Streets	1.57	Asphalt	0	0.41	0
		Base Course	12	0.14	1.68
		Subbase Course	0	0.07	0
		Geotextile	No	-	-
		<b>Total</b>	<b>12.0 (1.0)</b>	<b>-</b>	<b>1.68</b>

- 1) Per MDT 2018 Pavement Design Manual, Exhibit 5-6 Structural Coefficients for New Pavements.
- 2) For the design to be effective, the calculated structural number must be greater than the design structural number.
- 3) Asphalt and base course thickness

Alberton Asphalt Surfaced Streets Option 1 and 2 both meet design requirements. Option 1 utilizes base course and subbase course and matches Town of Alberton regulations (Mineral County, 2011). Option 2 is a design alternative that meets the same structural requirements but solely utilizes base course. From a constructability perspective, often it is simpler to use one thicker base course layer as opposed to a two layered system consisting of subbase course and base course.

### **3.5.1 Construction Recommendations**

To construct the proposed typical sections, Pioneer recommends the following:

1. Excavate to design grade:
  - a. Remove topsoil and dispose on site if feasible or haul away from site.
  - b. Excavate asphalt and existing base course. Existing base course may be stockpiled for reuse as subbase course (if needed to meet design grades) or hauled away from the site. From a pavement design perspective, existing base is considered contaminated with fines and is not suitable for reuse as 'new base course' in the new pavement section.
2. Subgrade:
  - a. Provide an opportunity for an engineer to inspect the bottom of the excavations. Use loaded dump truck or loader to proof roll subgrade. Sub-excavate soft spots or unsatisfactory materials that are observed.
  - b. Moisture condition native subgrade to within plus or minus 2% of optimum moisture and compact subgrade to a standard relative compaction (ASTM D698) of at least 95%.
3. Subbase Course: If additional fill is warranted to meet design grades, salvaged existing base course or imported or borrowed fill meeting the current edition of Montana Public works (MPW) Standard Specifications for subbase may be used (MPW, 2021). Subbase should be moisture conditioned (plus or minus 2% of optimum moisture), placed in 8-inch (maximum) loose lifts, and compact each lift to a standard relative compaction of at least 95% (ASTM D698).
4. Base Course: Provide and place new crushed base course meeting the current edition MDT standard specifications for Grade 6A Crushed Base Course (MDT, 2022). The gradation limits of Grade 6A Crushed Base Course are listed in Table 7 for reference. Base course should be moisture conditioned (plus or minus 2% of optimum moisture), placed in 8-inch (maximum) loose lifts, and compact each lift to a standard relative compaction of at least 95% (ASTM D698).
5. Asphalt: Provide and place commercial 3/8-inch Grade S Plant Mix Surfacing (PMS) with binder material meeting PG 64-28 conforming to current edition MDT Standard Specifications (MDT, 2022). Place asphalt and compact to at least 93% of its Rice density. Maximum lift thickness is 3 inches.

**Table 7: MDT Grade 6A Crushed Base Course**

SIEVE SIZE	PERCENT PASSING
1.5 - inch	100
3/4 - inch	74 - 96
3/8 - inch	40 - 76
No. 4	24 - 60
No. 40	6 - 34
No. 200	0 - 8

### 3.6 Seismic Considerations

The seismic coefficients were estimated using ASCE7-16 and Risk Category IV (ASCE7-16 is based on the 2018 International Building Code). The seismic coefficients values are presented in Table 8. The seismic coefficients data sheet is included in Appendix E.

**Table 8: Seismic Coefficients**

Site Class Definition	B
Seismic Design Category	C
Mapped Spectral Response Acceleration Parameter, $S_s$ for 0.2 second	0.385g
Mapped Spectral Response Acceleration Parameter, $S_1$ for 1.0 second	0.132g
Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter, $S_{MS}$	0.374g
Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter, $S_{M1}$	0.106g
Design Spectral Response Acceleration Parameter, $S_{Ds}$	0.231g
Design Spectral Response Acceleration Parameter, $S_{D1}$	0.071g

The proposed tank site is not prone to liquefaction.

### 3.7 Underground Utilities and Trench Stability

For utility trench excavations, the trench soil meets the Occupational Safety and Health Administration's 29 CFR Part 1926 requirements for a Type C soil. The steepest unsupported slope within a Type C soil is set at 1.5 horizontal to 1 vertical.

Use Type I bedding soil beneath and up to 6 inches above the top of the pipe. Type I bedding soil is ¾-inch minus granular soil having a soluble sulfate content less than 0.1% and a resistivity greater than 3,000 ohm-centimeters. The on-site soil can be reused as trench backfill above the bedding soil.

Soil compaction in utility trenches deeper than 5 feet should be performed using a remote trench compactor or a Felco-style bucket on an excavator and observed by an inspector. Perform compaction testing on each lift from a depth of 5 feet to the top of the trench. Place the trench soil in 8-inch (maximum) loose lifts and compact to a standard relative compaction of at least 95%.



Flowable fill may be used to backfill utility trenches as warranted based on civil design or locations specified compaction cannot be achieved. Flowable fill should be placed in accordance and meet the specifications of MPW Section 02225 Flowable Fill.

## 4 EARTHWORK TESTING

Pioneer recommends that a qualified inspector perform compaction testing for subgrade, structural fill, base course, backfill, and asphalt. Table 9 lists the suggested minimum compaction testing frequency.

**Table 9: Compaction Testing Frequency**

LOCATION	FREQUENCY
Beneath Strip Footings	1 test per 25 linear feet of footing per lift
Beneath Column Footings	1 test per footing per lift
Beneath Mat Slab	1 test per 400 square feet per lift
Foundation Wall Backfill	1 test per 50 linear feet per lift
Pavement Section	1 test per 300 lineal feet per lift or 1 test per 2,500 square feet per lift

Table 10 summarizes the material compaction specifications presented in other sections of this report. Compaction testing should be performed on subgrade, structural fill, base course, backfill, and asphalt. Frozen soil, ice particles, and soil with organics, debris, or deleterious materials are not suitable for use as fill. Appropriate winter construction techniques must be used, as warranted, to protect subgrade, fill, and cast concrete from frost. Fill cannot be placed on top of frozen soil. Maximum loose lift thickness is 8 inches.

**Table 10: Required Relative Compaction**

LOCATION	REQUIRED MINIMUM RELATIVE COMPACTION	STANDARD
Beneath Foundation Footings	98%	ASTM D698
Foundation Wall Backfill	95%	ASTM D698
Pavement Sections	95%	ASTM D698
Asphalt	93%	AASHTO T209

Concrete testing frequency should be performed according to project specifications and/or structural engineer requirements.

## 5 BASIS OF RECOMMENDATIONS

The analyses and recommendations submitted in this report are based on the boreholes completed during the subsurface investigation and general site familiarity. Often, variations occur within the soil stratigraphy, the nature and extent of which do not become evident until additional exploration or construction is conducted. Pioneer recommends geotechnical involvement be continued throughout the project to ascertain the recommendations presented herein (Geotechnical Report) have been properly interpreted both during design and construction. These services will reduce the potential for misinterpretation of geotechnical design

recommendations. Pioneer also recommends a geotechnical engineer be notified during the foundation excavation construction phase to evaluate the foundation soil and verify its resemblance to those encountered during the site investigation.

This report is based on Pioneer's understanding of the preliminary design location associated with the proposed water tank and roadway upgrades for the Town of Alberton, Montana. If the locations or proposed elevation profiles change, please consult Pioneer to verify that these recommendations are still applicable.

This report is for the exclusive use of Anderson-Montgomery and their design team. In the absence of Pioneer's written approval, Pioneer makes no representation and assumes no responsibility to other parties regarding this report. The data, analyses, and recommendations may not be appropriate for other structures or purposes. Other parties contemplating other structures or purposes should contact Pioneer.

Services performed by Pioneer's personnel for this project have been conducted with the level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar budget and time restraints. No warranty, expressed or implied, is made.

### **Professional Certification**

I hereby certify that this report was prepared by me and that I am a duly Licensed Professional Engineer under the laws of the State of Montana.



Michael Browne, P.E.  
Geotechnical Engineer



A handwritten signature in blue ink that reads "Sean Harris".

Sean Harris, E.I.  
Staff Geotechnical Engineer

## 6 REFERENCES

AASHTO, 1993. AASHTO Guide for Design of Pavement Structures, 1993.

AWWA, 2010. Polyethylene Encasement for Ductile-Iron Pipe Systems, American Water Works association, AWWA Standard, ANSI/AWWA C105/A21.5-10, October 1, 2010.

MBMG, 2007. Geologic map of the Plains 30' x 60' quadrangle, Western Montana. Open file 554. Montana Bureau of Mines and Geology. Jeffrey D. Lonn, Larry N. Smith, and Robin B. McCulloch. Accessed November 2022.

MDT, 2022. Montana Department of Transportation Standard and Supplemental Specifications, Version 3.1, September 22, 2022.

MDT, 2018. Pavement Design Manual, Montana Department of Transportation, Materials Bureau, 2018.

Mineral County, 2011. Subdivision Regulations for Mineral County and the Towns of Alberton and Superior Montana, June 30, 2011.

MPW, 2021. Montana Public Works Standard Specifications, Seventh Edition, Montana Contractors' Association, April.

PCA, 2007. Concrete Technology, Effects of Substances on Concrete and Guide to Protective Treatments.

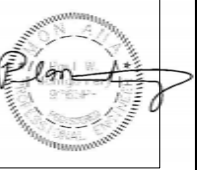
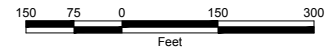
## FIGURES

**Figure 1. Borehole Locations**

X:\ALBERTON\_WATER\DESIGN\DRAWINGS\Sheets\General\G-7.dwg SAVED: 2/1/23 PRINTED: 3/27/23 BY: ADAM



**Borehole Locations**



Revision	Date	By
Draft	12-5-22	PWM

Revision Draft  
 Plot Scale 1:2  
 Drawn By A. Eckhart, P.E.  
 Approved By P. Montgomery, P.E.  
 Checked By A. Eckhart, P.E.  
 Designed By P. Montgomery, P.E.

Engineer  
  
 Anderson-Montgomery  
 CONSULTING ENGINEERS  
 1064 N. Warren  
 Helena, Mt 59601  
 Phone (406) 449-3303  
 Fax (406) 449-3304

Owner  
 Town of Alberton

Project Title  
 Alberton  
 Water System  
 Improvements  
 Project

Sheet Title  
 Geotechnical  
 Borehole  
 Locations











Sheet  
**Fig. 1**

# **Appendix A**



## **Borehole Logs**

## GENERAL NOTES

### DRILLING & SAMPLING SYMBOLS:

SS:  Split Spoon - 1-3/8" I.D., 2" O.D., unless otherwise noted	CA:  Casing Advancer
ST:  Thin-Walled Tube - 3" O.D., unless otherwise noted	DA:  Drill Auger
CB:  California Sampler - 2" I.D., 2.5" O.D., unless otherwise noted	HA:  Hand Auger
DB:  noted Diamond Bit Coring - 4", NX, unless otherwise noted	RB:  Rock Bit
BS:  Bulk Sample or Auger Sample	GS:  Grab Sample

The number of blows required to advance a standard 2-inch O.D. split- spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". The field blow counts are reported for each 6-inch interval, or portion thereof if greater than 50 blows are required to advance the full 6-inch interval. For over-sized split spoon samplers, non-standard hammers, or non-standard drop heights, the field penetration values are reported on the bore log. The values must be corrected to obtain the N-value.

WL: Water Level	WS: While Sampling	NE: Not Encountered
WCI: Wet Cave in	WD:  While Drilling	
DCI: Dry Cave in	BCR: Before Casing Removal	
AB: After Boring	ACR:  After Casing Removal	

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

**DESCRIPTIVE SOIL CLASSIFICATION:** Soil classification is based on the Unified Soil Classification System, Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: gravel or sand. Cobbles and boulders are not part of the USCS system but are included, when present, as percentages. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; depending on their plasticity, they are described as clays or silts. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

#### CONSISTENCY OF FINE-GRAINED SOILS

<u>Unconfined Compressive Strength, Qu, psf</u>	<u>Standard Penetration or N-value (SS) Blows/Ft.</u>	<u>Consistency</u>
< 500	< 2	Very Soft
500 - 1,000	2 - 4	Soft
1,001 - 2,000	5 - 8	Medium Stiff
2,001 - 4,000	9 - 15	Stiff
4,001 - 8,000	16 - 30	Very Stiff
8,000 +	30 +	Hard

#### RELATIVE DENSITY OF COARSE-GRAINED SOILS

<u>Standard Penetration or N-value (SS) Blows/Ft.</u>	<u>California Barrel (CB) Blows/Ft.</u>	<u>Relative Density</u>
0 - 4	0 - 6	Very Loose
5 - 10	7 - 18	Loose
11 - 30	19 - 58	Medium Dense
31 - 50	59 - 98	Dense
50 +	99 +	Very Dense

#### RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 15
With	15 - 29
Modifier	> 30

#### USCS\* GRAIN SIZE TERMINOLOGY

<u>Major Component of Sample</u>	<u>Particle Size</u>
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75 mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

\*For AASHTO grain size the #4 sieve is replaced with the #10 sieve

#### RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 5
With	5 - 12
Modifiers	> 12

#### PLASTICITY DESCRIPTION

<u>Term</u>	<u>Plasticity Index</u>
Non-Plastic	0
Slightly	1 - 5
Low	6 - 10
Medium	11 - 20
High	21 - 40
Very Highly	> 40



## GENERAL NOTES

### Description of Rock Properties

#### WEATHERING

Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.
Very slight	Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.
Slight	Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderate	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Moderately severe	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick.
Severe	All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.
Very severe	All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.
Complete	Rock reduced to "soil". Rock "fabric" not discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.

#### FIELD HARDNESS (for engineering description of rock not to be confused with Moh's scale for minerals)

Very Hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately Hard	Can be scratched with knife or pick. Gouges or grooves to 1/4 in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist's pick.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very Soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

#### Joint, Bedding and Foliation Spacing in Rock <sup>a</sup>

Spacing	Joints	Bedding/Foliation
Less than 2 in.	Very close	Very thin
2 in. - 1 ft.	Close	Thin
1 ft. - 3 ft.	Moderately close	Medium
3 ft.-10 ft.	Wide	Thick
More than 10 ft.	Very wide	Very thick

Rock Quality Designation (RQD) <sup>b</sup>		Joint Openness Descriptors	
ROD, as a percentage	Diagnostic description	Openness	Descriptor
Exceeding 90	Excellent	No Visible Separation	Tight
90 - 75	Good	Less than 1/32 in.	Slightly Open
74 - 50	Fair	1/32 to 1/8 in.	Moderately Open
49 - 25	Poor	1/8 to 3/8 in.	Open
Less than 25	Very poor	1/2 in. to 1 1/4 in.	Moderately Wide
		Greater than 1 1/4 in.	Wide

a. Spacing refers to the distance normal to the planes, of the described feature, which are parallel to each other or nearly so.

b. RQD (given as a percentage) = length of core in pieces 4 in. and longer/length of run.

References: American Society of Civil Engineers Manuals and Reports on Engineering Practice - No. 56, American Society of Civil Engineers, 1976.  
 U.S. Department of the Interior, Bureau of Reclamation, Engineering Geology Field Manual.  
 AASHTO M145, 2010.





# UNIFIED SOIL CLASSIFICATION SYSTEM

## Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests <sup>A</sup>

				Soil Classification	
				Group Symbol	Group Name <sup>B</sup>
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines	$Cu \geq 4$ and $1 \leq Cc \leq 3$	GW	Well-graded Gravel <sup>F</sup>
		Gravels with Fines More than 12% fines	$Cu < 4$ and/or $1 > Cc > 3$	GP	Poorly graded gravel <sup>F</sup>
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines	Fines classify as ML or MH	GM	Silty Gravel <sup>F,G,H</sup>
		Sands with Fines More than 12% fines	Fines classify as CL or CH	GC	Clayey Gravel <sup>F,G,H</sup>
		Clean Sands Less than 5% fines	$Cu \geq 6$ and $1 \leq Cc \leq 3$	SW	Well-graded Sand <sup>I</sup>
		Sands with Fines More than 12% fines	$Cu < 6$ and/or $1 > Cc > 3$	SP	Poorly graded Sand <sup>I</sup>
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	$PI > 7$ and plots on or above "A" line	CL	Lean Clay <sup>K,L,M</sup>
		inorganic	$PI < 4$ or plots below "A" line	ML	Silt <sup>K,L,M</sup>
		organic	Liquid limit - oven dried < 0.75	OL	Organic Clay <sup>K,L,M,N</sup>
		organic	Liquid limit - not dried < 0.75	OH	Organic Silt <sup>K,L,M,Q</sup>
	Silts and Clays Liquid Limit 50 or more	inorganic	$PI$ plots on or above "A" Line	CH	Fat Clay <sup>K,L,M</sup>
		inorganic	$PI$ plots below "A" line	MH	Elastic Silt <sup>K,L,M</sup>
		organic	Liquid limit - oven dried < 0.75	OH	Organic Clay <sup>K,L,M,P</sup>
		organic	Liquid limit - not dried < 0.75	OH	Organic Silt <sup>K,L,M,Q</sup>
Highly organic soils	Primarily organic matter, dark in color, and organic odor		PT	Peat	

<sup>A</sup> Based on the material passing the 3-in. (75-mm) sieve

<sup>B</sup> If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

<sup>C</sup> Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

<sup>D</sup> Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

$$E \quad Cu = D_{60} / D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

<sup>F</sup> If soil contains  $\geq 15\%$  sand, add "with sand" to group name.

<sup>G</sup> If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

<sup>H</sup> If fines are organic, add "with organic fines" to group name.

<sup>I</sup> If soil contains  $\geq 15\%$  gravel, add "with gravel" to group name.

<sup>J</sup> If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

<sup>K</sup> If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

<sup>L</sup> If soil contains  $\geq 30\%$  plus No. 200, predominantly sand, add "sandy" to group name.

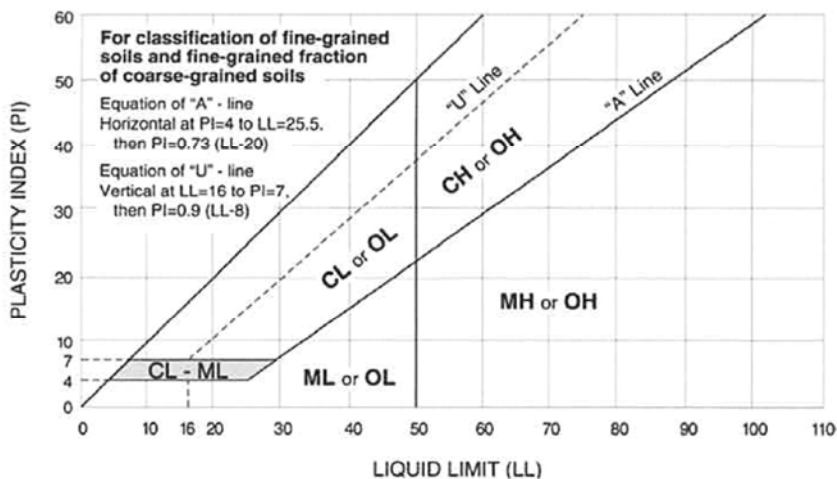
<sup>M</sup> If soil contains  $\geq 30\%$  plus No. 200, predominantly gravel, add "gravelly" to group name.

<sup>N</sup>  $PI \geq 4$  and plots on or above "A" line.

<sup>O</sup>  $PI < 4$  or plots below "A" line.

<sup>P</sup>  $PI$  plots on or above "A" line.

<sup>Q</sup>  $PI$  plots below "A" line.



# LOG OF BORING

**Boring BH-01**



(2) MDT LOG OF BORING - MDT\_REVISED\_2009+(CPT\_IMPORT).GDT - 3/27/23 18:00 - C:\USERS\SHARRIS\PIONEER\TECHNICAL SERVICES\PIONEER\GEO TECH - ALBERTON\_2022\LOGS\ALBERTON.CLONE.ME.MDT TEMPLATE (4).GPJ

<b>Project:</b> Alberton		<b>Rig:</b> ODEX	<b>Boring Location</b> N 1,044,914.2 ft	<b>Station:</b>
<b>Project Number:</b> 2201070		<b>Hammer:</b> Cathead	<b>Coordinates:</b> E 725,663.6 ft	<b>Offset:</b>
<b>UPN:</b>		<b>Boring Diameter:</b> 8 in	<b>System:</b> MT S.P. (E)	<b>Top of Boring Elevation:</b> 3215 ft
<b>Date Started:</b> 9/6/22	<b>Date Finished:</b> 9/6/22	<b>Drilling Fluid:</b> None	<b>Location Source:</b> Handheld GPS, Uncorrected	<b>Elevation Source:</b> Plans
<b>Driller:</b> Boland		<b>Abandonment Method:</b> Backfilled with Cuttings		<b>Township Range and Section:</b>
<b>Logger:</b> S. Harris				

Depth (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests	
															Elev. (ft)
5			65		16 - 25 - 18		Silty SAND with gravel (SM), dense, dry, brown, subrounded.	2							
3210.0			65		39 - 42 - 37		Silty SAND with gravel (SM), very dense, dry, white, subrounded. Rock flour.	2.5							
10			65		20/0.0ft		QUARTZITE, Purple, fine grained, hard field hardness, (Missoula Fm.). Heavily fractured.	7.0							
3205.0			100												
15			75	0											
3200.0			90	0											
20															
3195.0															
								22.0							

Boring Depth: 22.0 ft, Elevation: 3193.0 ft

<b>Water Level Observations</b>	<input type="checkbox"/> During Drilling: Not Encountered <input checked="" type="checkbox"/> After Drilling:	Remarks:
<input checked="" type="checkbox"/> After Drilling:		

# LOG OF BORING

**Boring BH-02**



(2) MDT LOG OF BORING - MDT\_REVISED\_2009+(CPT\_IMPORT).GDT - 3/27/23 18:00 - C:\USERS\HARRIS\PIONEER\TECHNICAL - ALBERTON\_2022\LOGS\ALBERTON.CLONE.ME\_MDT\_TEMPLATE (4).GPJ

<b>Project:</b> Alberton		<b>Rig:</b> ODEX	<b>Boring Location</b> N 1,044,869.4 ft	<b>Station:</b>
		<b>Hammer:</b> Cathead	<b>Coordinates:</b> E 725,735.7 ft	<b>Offset:</b>
<b>Project Number:</b> 2201070	<b>UPN:</b>	<b>Boring Diameter:</b> 8 in	<b>System:</b> MT S.P. (E)	<b>Top of Boring Elevation:</b> 3200.2 ft
<b>Date Started:</b> 9/6/22	<b>Date Finished:</b> 9/6/22	<b>Drilling Fluid:</b> None	<b>Location Source:</b> Handheld GPS, Uncorrected	<b>Elevation Source:</b> Plans
<b>Driller:</b> Boland		<b>Abandonment Method:</b> Backfilled with Cuttings		<b>Township Range and Section:</b>
<b>Logger:</b> S. Harris				

Depth (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
5							Silty GRAVEL with sand (GM), dry, brown to gray, subrounded to subangular.	2.5						
3195.2			100		50/0.3ft			3						
10							QUARTZITE, Purple, fine grained, (Missoula Fm.). Weathered; 1/2" pieces to rock flour.	1						
3190.2			100		50/0.0ft									
15														
3185.2			100		20/0.0ft									
20														
3180.2			100		20/0.0ft									
25														
3175.2			100		20/0.0ft									
30														
3170.2			100		20/0.0ft			30.0						

Boring Depth: 30.0 ft, Elevation: 3170.2 ft

<b>Water Level Observations</b>	<input type="checkbox"/> During Drilling: Not Encountered <input checked="" type="checkbox"/> After Drilling:	Remarks:
<input checked="" type="checkbox"/> After Drilling:	<input type="checkbox"/> During Drilling:	

# LOG OF BORING

**Boring BH-03**



(2) MDT LOG OF BORING - MDT\_REVISIED\_2009+(CPT\_IMPORT).GDT - 3/27/23 18:00 - C:\USERS\SHARRIS\PIONEER\TECHNICAL SERVICES\PIONEER\GEO\TECH - ALBERTON\_2022\LOGS\ALBERTON.CLONE.ME.MDT TEMPLATE (4).GPJ

<b>Project:</b> Alberton		<b>Rig:</b> ODEX	<b>Boring Location:</b> N 1,043,956.4 ft	<b>Station:</b>
<b>Project Number:</b> 2201070		<b>Hammer:</b> Cathead	<b>Coordinates:</b> E 726,249.7 ft	<b>Offset:</b>
<b>UPN:</b>		<b>Boring Diameter:</b> 8 in	<b>System:</b> MT S.P. (E)	<b>Top of Boring Elevation:</b> 3042.65 ft
<b>Date Started:</b> 9/7/22	<b>Date Finished:</b> 9/7/22	<b>Drilling Fluid:</b> None	<b>Location Source:</b> Handheld GPS, Uncorrected	<b>Elevation Source:</b> Plans
<b>Driller:</b> Boland		<b>Abandonment Method:</b> Backfilled with Cuttings		<b>Township Range and Section:</b>
<b>Logger:</b> S. Harris				

Depth (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
5			40		10 - 14 - 11		Silty SAND with gravel (SM), medium dense, dry, dark brown.	5						
3037.7			35		1 - 24 - 27		Silty, Clayey SAND (SC-SM), dense, wet, dark brown. Very fine grained; no smell.	4.5		27	21			
10			100		4 - 7 - 5			12						
3032.7								11.5						

Boring Depth: 11.5 ft, Elevation: 3031.2 ft

<b>Water Level Observations</b>	<input type="checkbox"/> During Drilling: Not Encountered <input checked="" type="checkbox"/> After Drilling:	Remarks:
<input checked="" type="checkbox"/> After Drilling:		

# LOG OF BORING

**Boring BH-04**



(2) MDT LOG OF BORING - MDT\_REVISED\_2009+(CPT\_IMPORT).GDT - 3/27/23 18:00 - C:\USERS\SHARRIS\PIONEER\TECHNICAL SERVICES\PIONEER\GEOTECH - ALBERTON\_2022\LOGS\ALBERTON.CLONE.ME.MDT TEMPLATE (4).GRP

<b>Project:</b> Alberton		<b>Rig:</b> ODEX	<b>Boring Location</b> N 1,044,253.2 ft	<b>Station:</b>
<b>Project Number:</b> 2201070		<b>Hammer:</b> Cathead	<b>Coordinates:</b> E 726,808.3 ft	<b>Offset:</b>
<b>UPN:</b>		<b>Boring Diameter:</b> 8 in	<b>System:</b> MT S.P. (E)	<b>Top of Boring Elevation:</b> 3099.7 ft
<b>Date Started:</b> 9/7/22	<b>Date Finished:</b> 9/7/22	<b>Drilling Fluid:</b> None	<b>Location Source:</b> Handheld GPS, Uncorrected	<b>Elevation Source:</b> Plans
<b>Driller:</b> Boland		<b>Abandonment Method:</b> Backfilled with Cuttings		<b>Township Range and Section:</b>
<b>Logger:</b> S. Harris				

Depth (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
5			40		2 - 10 - 8		FILL, Sandy Lean CLAY with sand (CL), very stiff, dry, brown, fine to coarse grained.	2.0	4	71	23	65		
3094.7			85		5 - 6 - 4		SILT (ML), stiff, slightly moist. Low to medium plasticity.			42	27	91		
10			100		20/0.0ft		QUARTZITE, Purple, (Missoula Fm.). Weathered rock.	8.0						
3089.7								10.0						

Boring Depth: 10.0 ft, Elevation: 3089.7 ft

<b>Water Level Observations</b>	<input type="checkbox"/> During Drilling: Not Encountered <input checked="" type="checkbox"/> After Drilling:	Remarks:
<input checked="" type="checkbox"/> After Drilling:		

# LOG OF BORING

**Boring BH-05**



(2) MDT LOG OF BORING - MDT\_REVISIED\_2009+(CPT\_IMPORT).GDT - 3/27/23 18:00 - C:\USERS\HARRIS\PIONEER\TECHNICAL SERVICES\PIONEER\GEOTECH - ALBERTON\_2022\LOGS\ALBERTON.CLONE.ME.MDT TEMPLATE (4).GRP

<b>Project:</b> Alberton		<b>Rig:</b> ODEX	<b>Boring Location</b> N 1,043,439.0 ft	<b>Station:</b>
<b>Project Number:</b> 2201070		<b>Hammer:</b> Cathead	<b>Coordinates:</b> E 727,950.8 ft	<b>Offset:</b>
<b>UPN:</b>		<b>Boring Diameter:</b> 8 in	<b>System:</b> MT S.P. (E)	<b>Top of Boring Elevation:</b> 3066.8 ft
<b>Date Started:</b> 9/7/22	<b>Date Finished:</b> 9/7/22	<b>Drilling Fluid:</b> None	<b>Location Source:</b> Handheld GPS, Uncorrected	<b>Elevation Source:</b> Plans
<b>Driller:</b> Boland		<b>Abandonment Method:</b> Backfilled with Cuttings		<b>Township Range and Section:</b>
<b>Logger:</b> S. Harris				

Depth (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
0.3					9 - 7 - 6	TOPSOIL.		0.3	6					
2.0						Silty SAND (SM), medium dense, dry, brown. Traces of gravel.		2.0						
6.0					12 - 26 - 80/0.3ft	Well-Graded SAND with gravel (SW), very dense, dry, brown.		6.0	4					
10.0					20/0.0ft	QUARTZITE, (Missoula Fm.). Weathered rock; 1/4" to 1/2" pieces from auger.		10.0						

Boring Depth: 20.0 ft, Elevation: 3046.8 ft

<b>Water Level Observations</b>	<input type="checkbox"/> During Drilling: Not Encountered <input checked="" type="checkbox"/> After Drilling:	Remarks:
<input checked="" type="checkbox"/> After Drilling:		

# LOG OF BORING

**Boring BH-06**



(2) MDT LOG OF BORING - MDT\_REVISED\_2009+(CPT\_IMPORT).GDT - 3/27/23 18:00 - C:\USERS\SHARRIS\PIONEER\TECHNICAL SERVICES\PIONEER GEOTECH - ALBERTON\_2022\LOGS\ALBERTON.CLONE.ME.MDT TEMPLATE (4).GPJ

<b>Project:</b> Alberton		<b>Rig:</b> ODEX	<b>Boring Location</b> N 1,042,952.9 ft	<b>Station:</b>
<b>Project Number:</b> 2201070		<b>Hammer:</b> Cathead	<b>Coordinates:</b> E 728,472.1 ft	<b>Offset:</b>
<b>UPN:</b>		<b>Boring Diameter:</b> 8 in	<b>System:</b> MT S.P. (E)	<b>Top of Boring Elevation:</b> 3048.2 ft
<b>Date Started:</b> 9/7/22	<b>Date Finished:</b> 9/7/22	<b>Drilling Fluid:</b> None	<b>Location Source:</b> Handheld GPS, Uncorrected	<b>Elevation Source:</b> Plans
<b>Driller:</b> Boland		<b>Abandonment Method:</b> Backfilled with Cuttings		<b>Township Range and Section:</b>
<b>Logger:</b> S. Harris				

Depth (ft)	Operation	Sample Type	Recovery (%)	RQD (%)	Blow Count	Lithology	Material Description	Depth (ft)	MC (%)	LL	PL	-200 (%)	DD	Remarks and Other Tests
5			90		12 - 7 - 3		Silty, Clayey SAND (SC-SM), stiff, moist, black.	3.5		21	17	44		
3043.2			90		2 - 2 - 3		Silty SAND (SM), loose, dry, brown, fine grained.	7		18	16	36		
10			70		15 - 21 - 16		Poorly-Graded SAND with gravel (SP), medium dense, dry, grayish brown, subangular.	9.0		2				
3038.2								11.5						

Boring Depth: 11.5 ft, Elevation: 3036.7 ft

<b>Water Level Observations</b>	<input type="checkbox"/> During Drilling: Not Encountered <input checked="" type="checkbox"/> After Drilling:	Remarks:
<input checked="" type="checkbox"/> After Drilling:		

# Appendix B

## Photograph Log





Picture # 1: BH-01 Drill Rig Setup

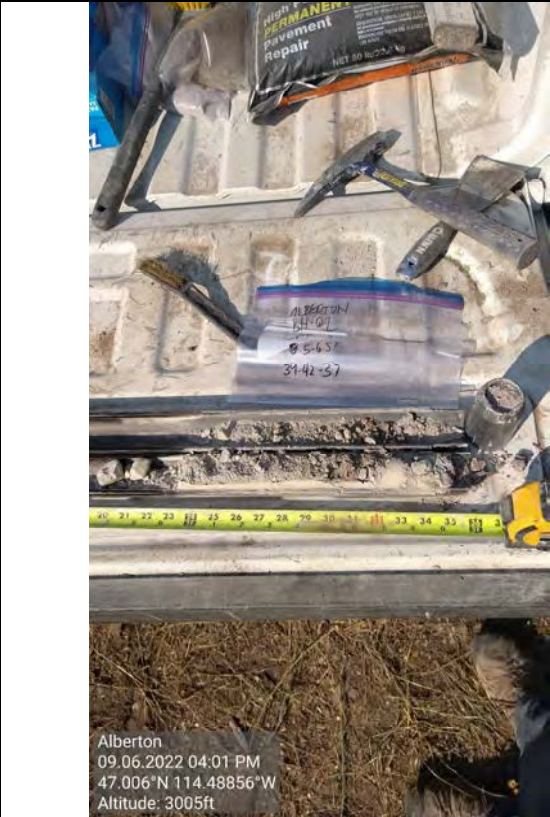
Picture # 2: BH-02 Drill Rig Setup



Picture # 3: BH-04 Drill Rig Setup



Picture # 4: BH-01 SPT 0-1.5 feet



Picture # 5: BH-01 SPT 5-6.5 feet



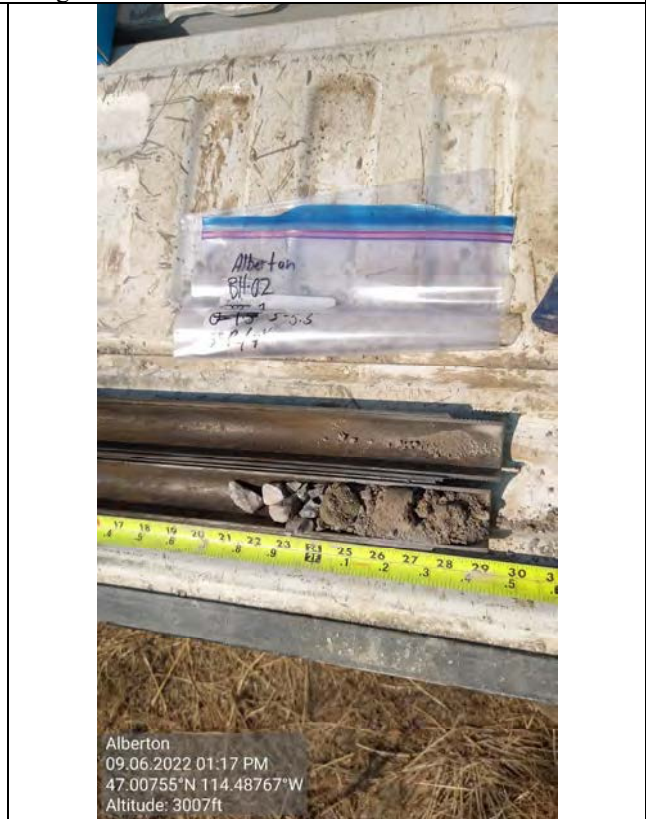
Picture # 6: BH-01 Rock core sampled from 15-17 feet below ground surface



Picture # 7: BH-01 Rock core sampled from 17-22 feet below ground surface



Picture # 8: BH-02 SPT 0-1.5 feet



Picture # 9: BH-02 SPT 5-5.3 feet



Picture # 10: BH-02 SPT 10-10.3 feet



Picture # 11: BH-03 SPT 0-1.5 feet



Picture # 12: BH-03 SPT 5-6.5 feet



Picture # 13: BH-03 SPT 10-11.5 feet



Picture # 14: BH-04 SPT 0-1.5 feet



Picture # 15: BH-04 SPT 5-6.5 feet



Picture # 16: BH-05 SPT 0-1.5 feet



Picture # 17: BH-05 SPT 5-6.5 feet



Picture # 18: BH-06 SPT 0-1.5 feet



Picture # 19: BH-06 SPT 5-6.5 feet



Picture # 20: BH-06 SPT 10-11.5 feet

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# **Appendix C**

## **Laboratory Data**



201 East Broadway, Suite C  
 Helena, Montana 59601  
 Phone (406)457-8252 Fax (406)442-1158  
 www.pioneer-technical.com

**Moisture Analysis - AASHTO T265; ASTM D2216**

**Project Name:** City of Alberton

**Project Number:** 2201070

Lab No:	26897	26898	26899	26900	26901	26903	26905	26908	26909	26912
BH or Loc:	BH-01	BH-01	BH-02	BH-02	BH-03	BH-03	BH-04	BH-05	BH-05	BH-06
Depth:	0-1.5'	5-6.5'	5-5.3'	10-10.3'	0-1.5'	10-11.5'	0-1.5'	0-1.5'	5-6.5'	5-6.5'
Date Tested:	9/22/2022	9/22/2022	9/22/2022	9/22/2022	9/22/2022	9/22/2022	9/22/2022	9/22/2022	9/22/2022	9/22/2022

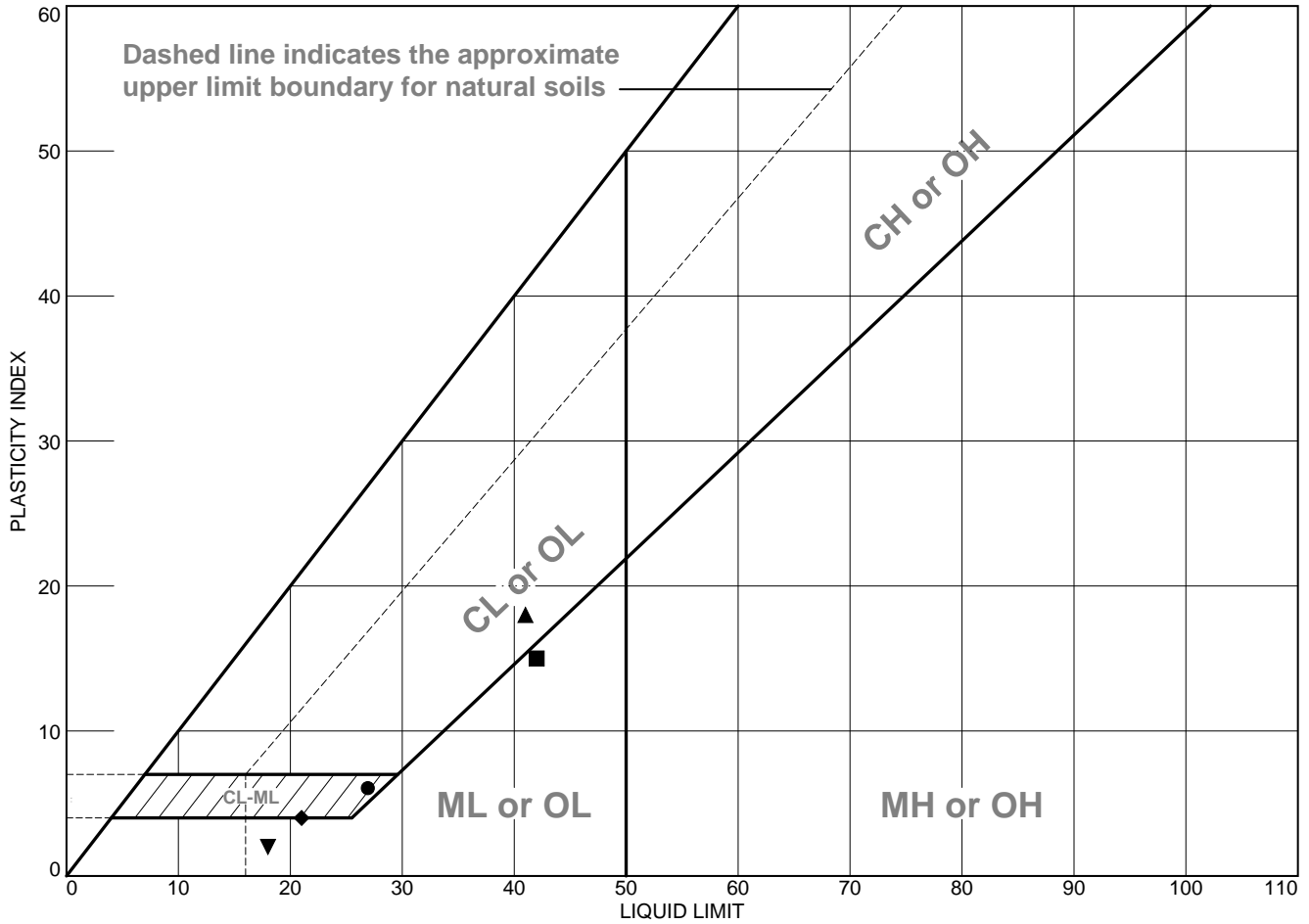
Pan No:										
Wet Wt, & Pan (g):	468.3	461.3	280	341.3	359.4	544.9	427.5	374.6	474.8	350.6
Dry Wt, & Pan (g):	459.4	453.7	274.3	339.1	345.6	496.2	415.5	357.7	459	333.5
Loss of Moisture	8.9	7.6	5.7	2.2	13.8	48.7	12	16.9	15.8	17.1
Wt. of Pan (g):	81.8	82.1	82.4	84.5	82.1	82	82.8	82.4	80.4	81.5
Wt. of Dry Soil (g):	377.6	371.6	191.9	254.6	263.5	414.2	332.7	275.3	378.6	252
<b>M. Content (%)</b> :	<b>2.4</b>	<b>2.0</b>	<b>3.0</b>	<b>0.9</b>	<b>5.2</b>	<b>11.8</b>	<b>3.6</b>	<b>6.1</b>	<b>4.2</b>	<b>6.8</b>

Lab No:	26913									
BH or Loc:	BH-06									
Depth:	10-11.5'									
Date Tested:	9/22/2022									

Pan No:										
Wet Wt, & Pan (g):	394.4									
Dry Wt, & Pan (g):	388.7									
Loss of Moisture	5.7									
Wt. of Pan (g):	83.2									
Wt. of Dry Soil (g):	305.5									
<b>M. Content (%)</b> :	<b>1.9</b>									



# LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty, lean clay	27	21	6			CL-ML
■	silt	42	27	15	95	91	ML
▲	sandy lean clay	41	23	18	76	65	CL
◆	silty, clayey sand	21	17	4	75	44	SC-SM
▼	silty sand	18	16	2	74	36	SM

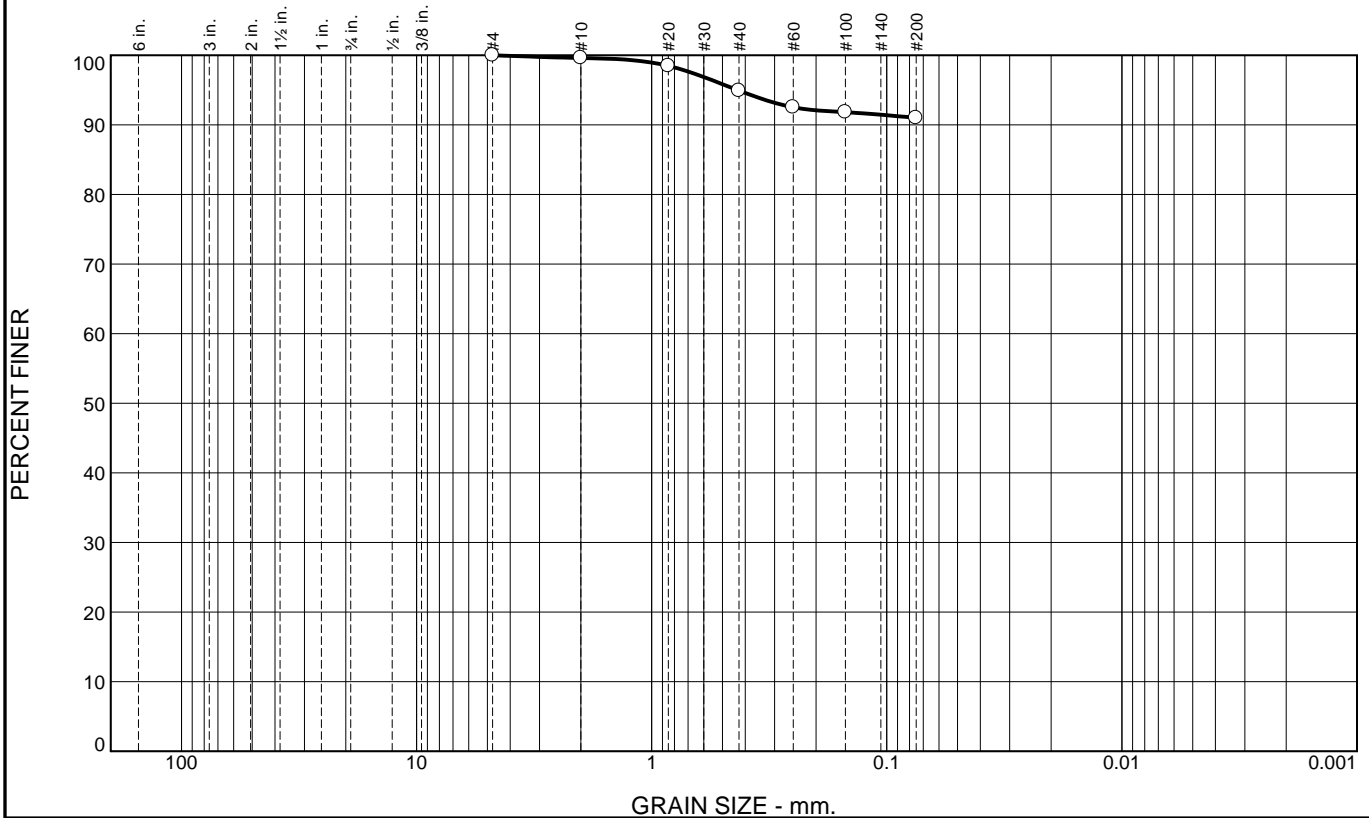
**Project No.** 2201070      **Client:** Anderson-Montgomery Engineers  
**Project:** Alberton  
  
**● Location:** BH-03      **Depth:** 5-6.5'      **Sample Number:** 26902  
**■ Location:** BH-04      **Depth:** 5-6.5'      **Sample Number:** 26906  
**▲ Location:** BH-04      **Depth:** 0-10'      **Sample Number:** 26907  
**◆ Location:** BH-06      **Depth:** 0-1.5'      **Sample Number:** 26911  
**▼ Location:** BH-06      **Depth:** 0-10'      **Sample Number:** 26914

**Remarks:**



Figure

# Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	0	5	4	91	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100		
#10	100		
#20	98		
#40	95		
#60	93		
#100	92		
#200	91		

**Soil Description**  
silt

**Atterberg Limits**  
 PL= 27      LL= 42      PI= 15

**Coefficients**  
 D<sub>90</sub>=      D<sub>85</sub>=      D<sub>60</sub>=  
 D<sub>50</sub>=      D<sub>30</sub>=      D<sub>15</sub>=  
 D<sub>10</sub>=      C<sub>u</sub>=      C<sub>c</sub>=

**Classification**  
 USCS= ML      AASHTO= A-7-6(16)

**Remarks**  
 F.M.=0.19

\* (no specification provided)

**Location:** BH-04  
**Sample Number:** 26906

**Depth:** 5-6.5'

**Date:**



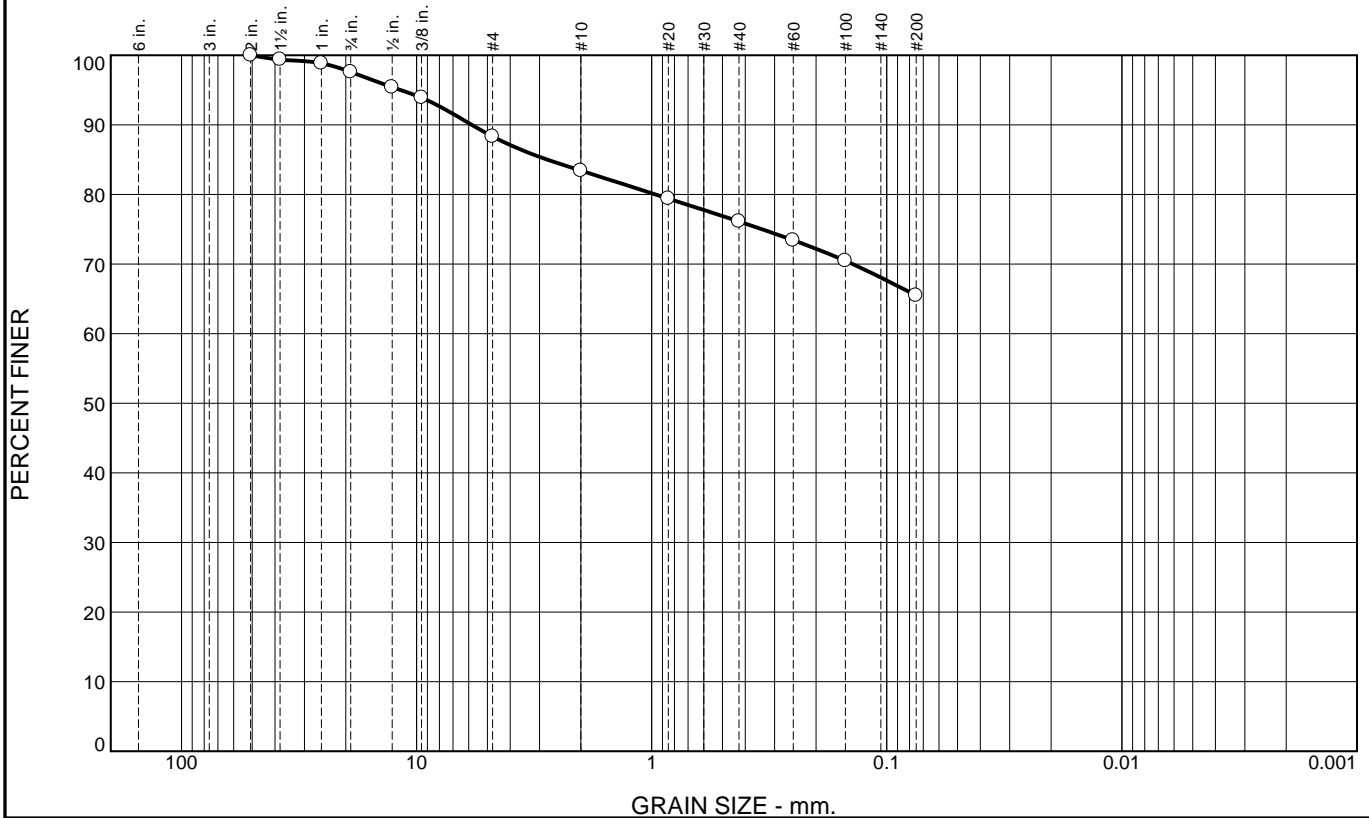
**Client:** Anderson-Montgomery Engineers

**Project:** Alberton

**Project No:** 2201070

**Figure**

# Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	2	10	5	7	11	65	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1.5"	99		
1"	99		
¾"	98		
½"	95		
3/8"	94		
#4	88		
#10	83		
#20	79		
#40	76		
#60	73		
#100	70		
#200	65		

\* (no specification provided)

**Soil Description**  
sandy lean clay

**Atterberg Limits**  
PL= 23      LL= 41      PI= 18

**Coefficients**  
D<sub>90</sub>= 5.8203      D<sub>85</sub>= 2.7743      D<sub>60</sub>=  
D<sub>50</sub>=              D<sub>30</sub>=              D<sub>15</sub>=  
D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
USCS= CL      AASHTO= A-7-6(10)

**Remarks**  
F.M.=1.33

Location: BH-04  
Sample Number: 26907

Depth: 0-10'

Date:



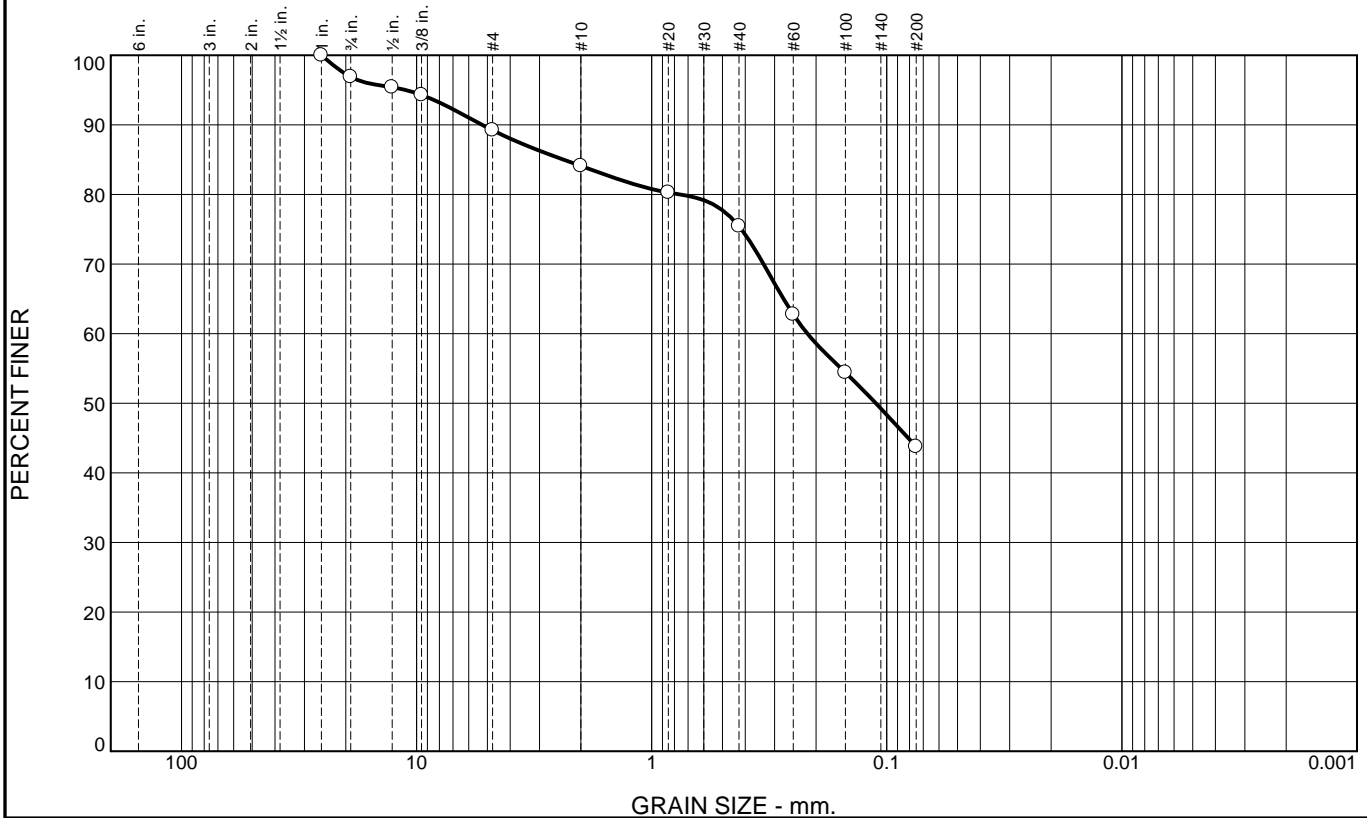
Client: Anderson-Montgomery Engineers

Project: Alberton

Project No: 2201070

Figure

# Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	3	8	5	9	31	44	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100		
3/4"	97		
1/2"	95		
3/8"	94		
#4	89		
#10	84		
#20	80		
#40	75		
#60	63		
#100	54		
#200	44		

**Soil Description**

silty, clayey sand

**Atterberg Limits**

PL= 17      LL= 21      PI= 4

**Coefficients**

D<sub>90</sub>= 5.2574      D<sub>85</sub>= 2.3691      D<sub>60</sub>= 0.2174  
D<sub>50</sub>= 0.1113      D<sub>30</sub>=                      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS= SC-SM      AASHTO= A-4(0)

**Remarks**

F.M.=1.52

\* (no specification provided)

**Location:** BH-06  
**Sample Number:** 26911

**Depth:** 0-1.5'

**Date:** 09/22/22



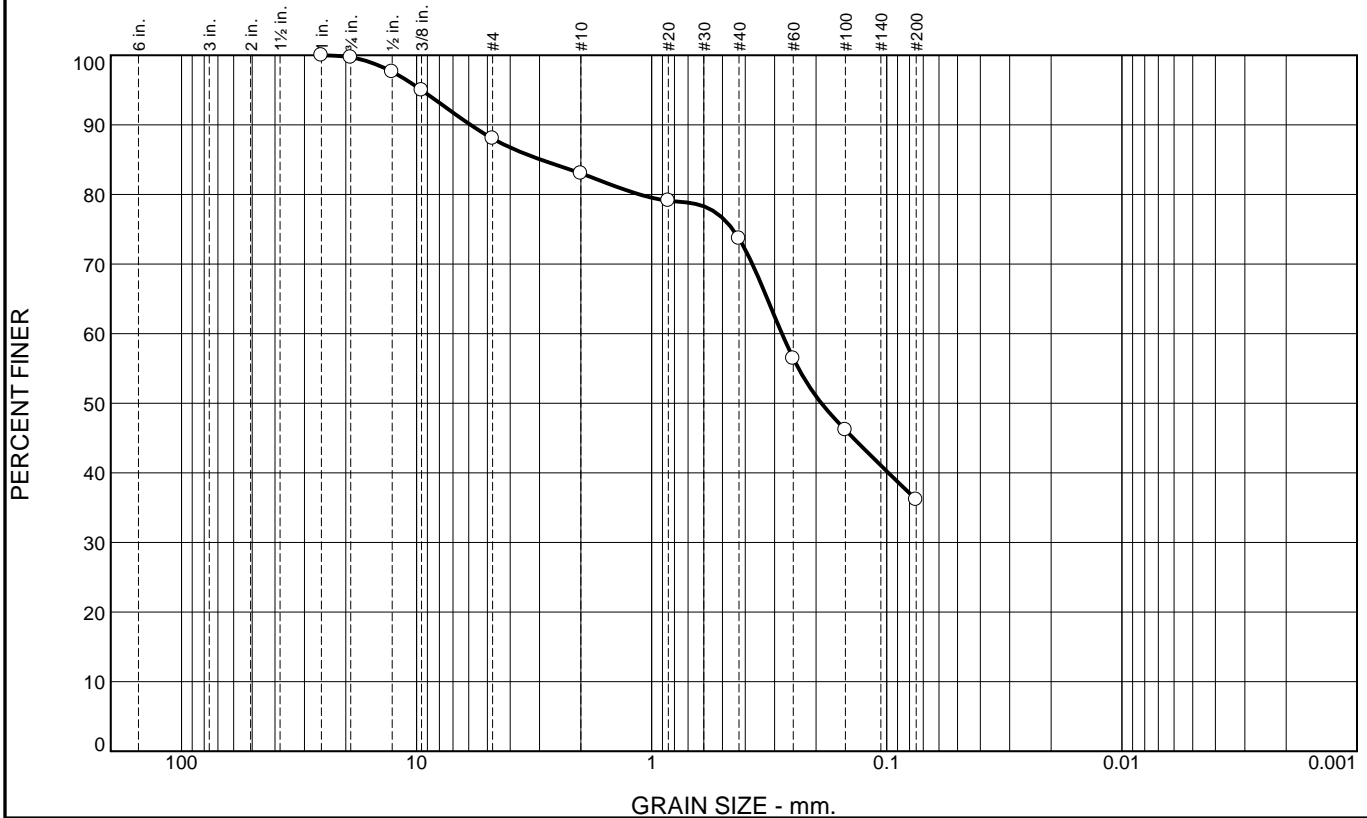
**Client:** Anderson-Montgomery Engineers

**Project:** Alberton

**Project No:** 2201070

**Figure**

# Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	12	5	9	38	36	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100		
3/4"	100		
1/2"	98		
3/8"	95		
#4	88		
#10	83		
#20	79		
#40	74		
#60	56		
#100	46		
#200	36		

**Soil Description**  
silty sand

**Atterberg Limits**  
 PL= 16      LL= 18      PI= 2

**Coefficients**  
 D<sub>90</sub>= 5.8945      D<sub>85</sub>= 2.9580      D<sub>60</sub>= 0.2793  
 D<sub>50</sub>= 0.1897      D<sub>30</sub>=              D<sub>15</sub>=  
 D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= SM      AASHTO= A-4(0)

**Remarks**  
 F.M.=1.66

\* (no specification provided)

**Location:** BH-06  
**Sample Number:** 26914

**Depth:** 0-10'

**Date:**

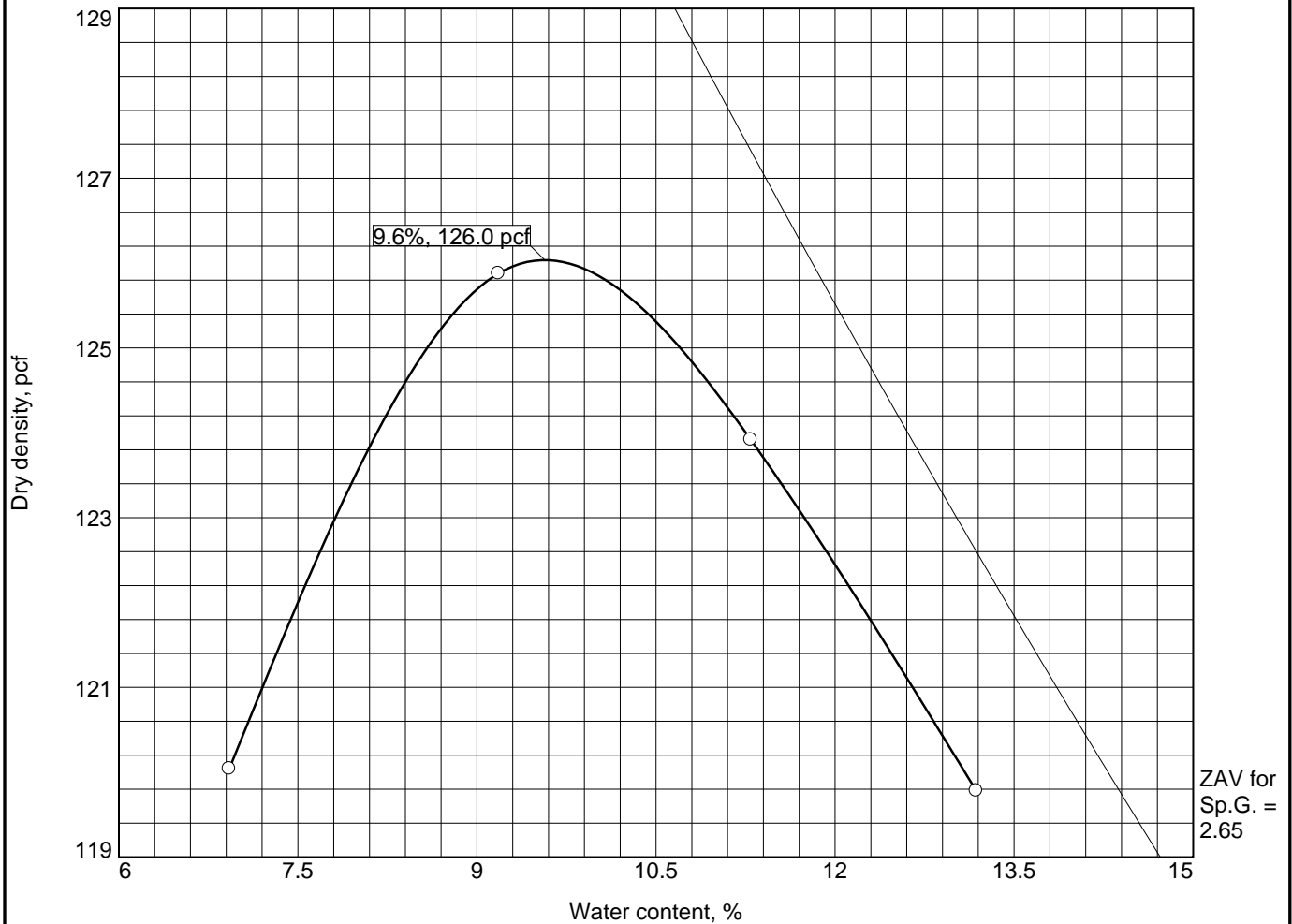


**Client:** Anderson-Montgomery Engineers

**Project:** Alberton


**Project No:** 2201070

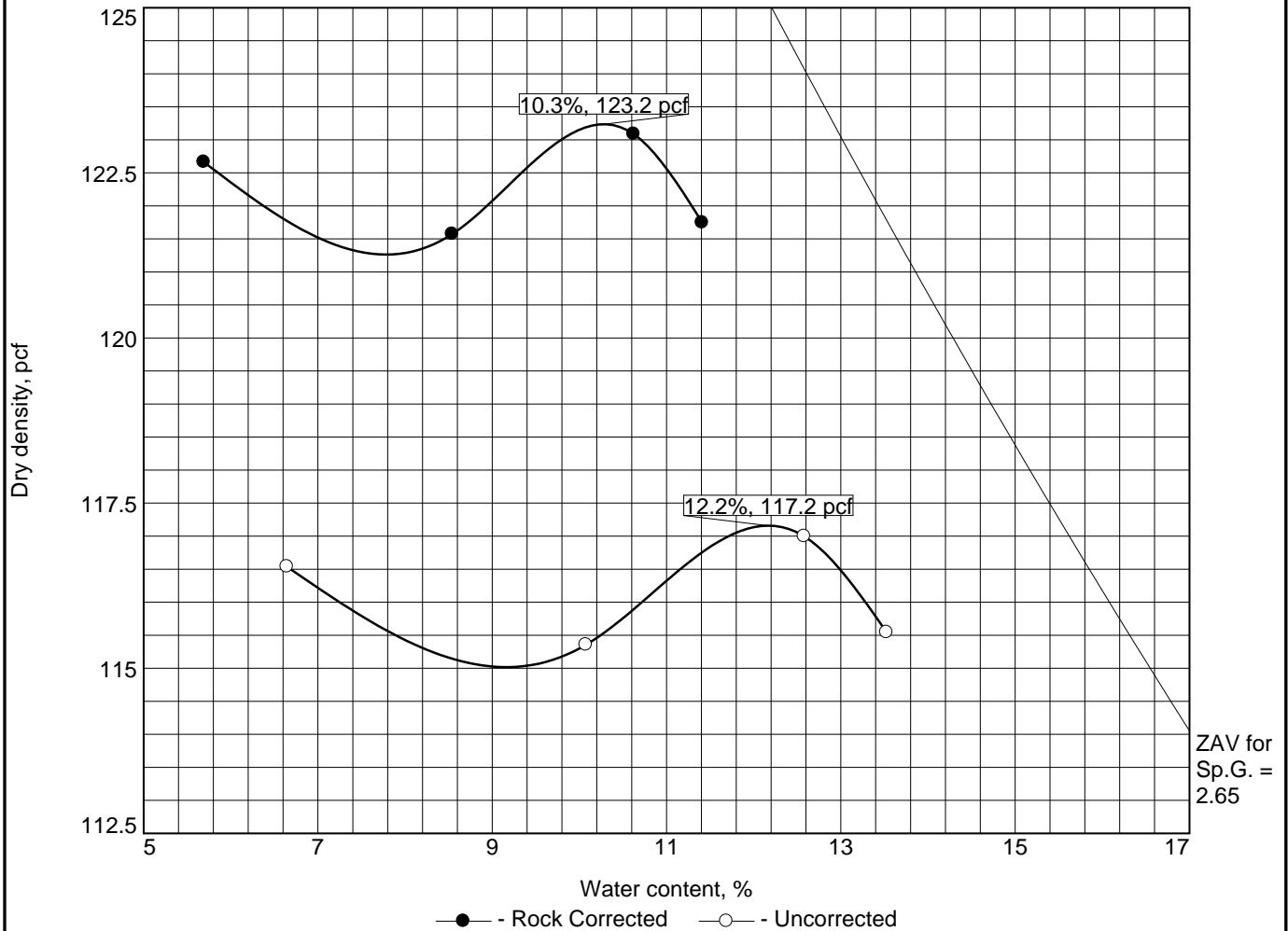
**Figure**



Test specification: AASHTO T 99-15 Method D Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
0-10'				2.65				

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 126.0 pcf Optimum moisture = 9.6 %		silty sand
<b>Project No.</b> <b>Project:</b> Alberton	<b>Client:</b> Anderson-Montgomery Engineers  <b>Date:</b> 9-28-22	<b>Remarks:</b>
<b>Location:</b> BH-06	<b>Sample Number:</b> 26914	
		<b>Figure</b>



Test specification: ASTM D 698-12 Method B Standard  
 ASTM D4718-15 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
0-7.5'				2.65			16.9	

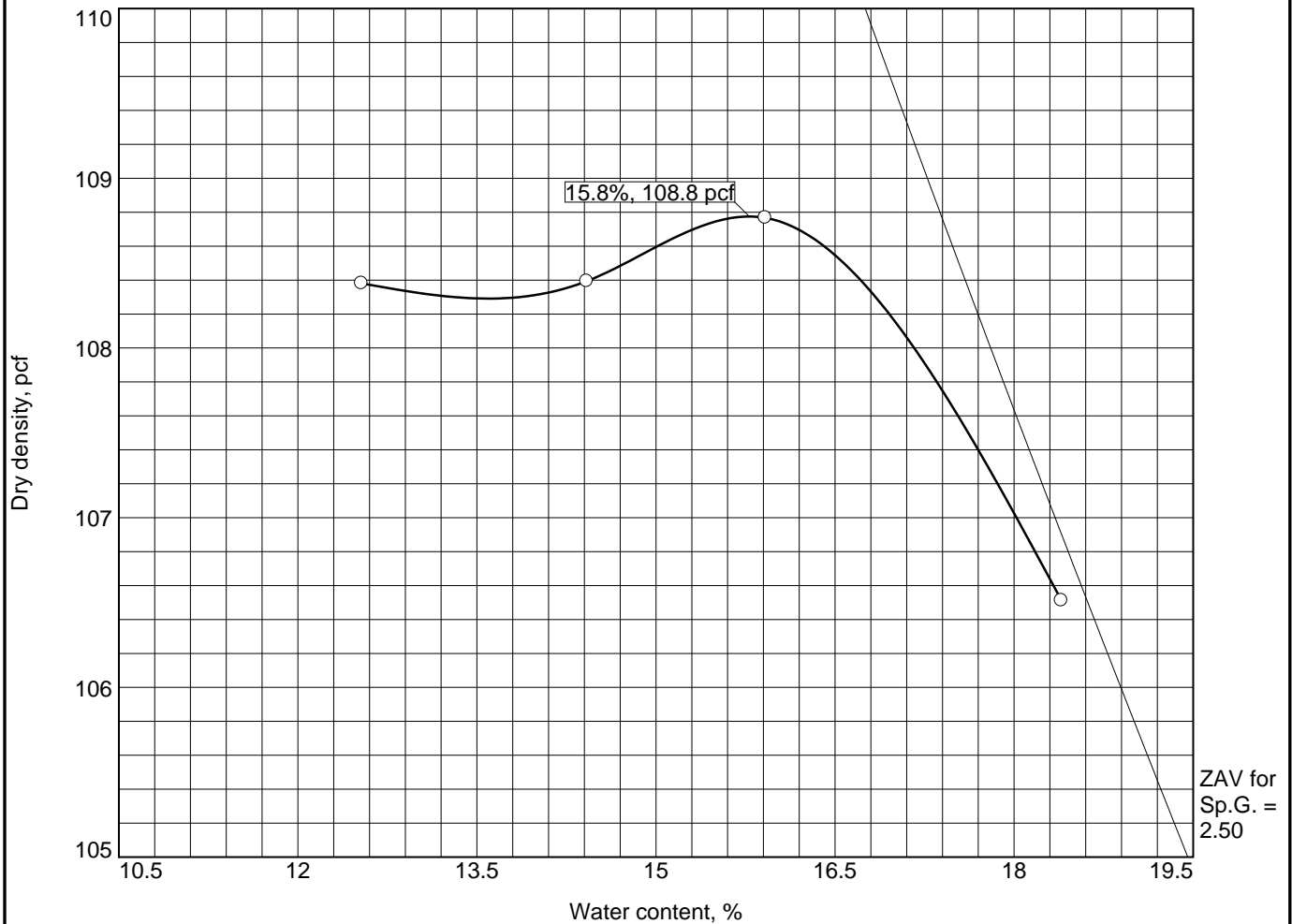
ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 123.2 pcf	117.2 pcf	Clay w/ gravel
Optimum moisture = 10.3 %	12.2 %	

**Project No.** 2201070      **Client:** Anderson-Montgomery Engineers  
**Project:** Alberton  
**Date:**  
**Location:** BH-05      **Sample Number:** 26910

**Remarks:**



Figure



Test specification: AASHTO T 99-15 Method D Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
0-10'				2.65				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108.8 pcf Optimum moisture = 15.8 %	Clay with Gravel

<b>Project No.</b>	<b>Client:</b> Anderson-Montgomery Engineers
<b>Project:</b> Alberton	<b>Date:</b> 9-27
<b>Location:</b> BH-04	<b>Sample Number:</b> 26097

**Remarks:**

**Figure**





# CALIFORNIA BEARING RATIO TEST

ASTM D 1883 / AASHTO T 193



201 East Broadway, Suite C  
Helena, Montana 59601  
Phone (406)457-8252 Fax (406)442-1158  
www.pioneer-technical.com

PROJECT Alberton  
26914  
0  
0

DATE: 9/28/2022

## SAMPLE DESCRIPTION

USCS Classification: 0

## SAMPLE LOCATION

Boring Number: BH-06  
Depth: 0

## MOISTURE-DENSITY RELATIONSHIP

Procedure: AASHTO T99

Maximum Dry Density: 126.0 lb/ft<sup>3</sup>

Optimum Moisture: 9.6 %

Dry Density at Molding: 120.8 lb/ft<sup>3</sup>

Relative Compaction: 95.8 %

Moisture Content at Molding: 8.9 %

## SWELL TEST

Soaking Period: 96 hrs

Surcharge Weight: 10 lbs

Surcharge Pressure: 50.9 psf

Average Moisture Content After Soaking: 12.6 %

Swell, % of Initial Height of Specimen: -0.2 %

Moisture Content of Top 1" After Soaking: 12.4 %

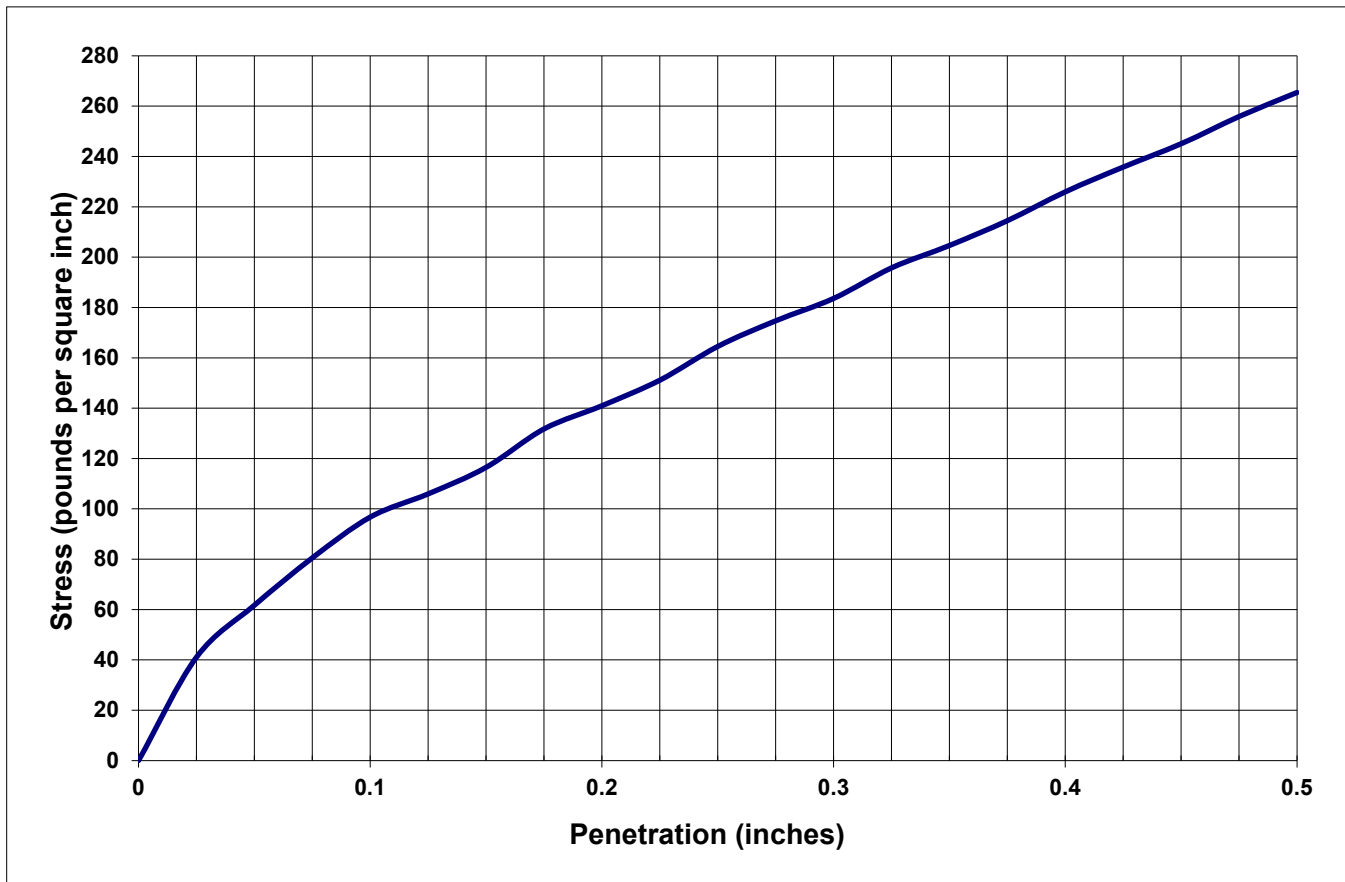
## CALIFORNIA BEARING RATIO TEST

Surcharge Weight: 10 lbs

Surcharge Pressure: 50.9 psf

CBR @ 0.1" penetration: 9.7

CBR @ 0.2" penetration: 9.4



# CALIFORNIA BEARING RATIO TEST

ASTM D 1883 / AASHTO T 193



201 East Broadway, Suite C  
Helena, Montana 59601  
Phone (406)457-8252 Fax (406)442-1158  
www.pioneer-technical.com

PROJECT Alberton  
26907  
0  
0

DATE: 9/28/2022

## SAMPLE DESCRIPTION

USCS Classification: Clay with Gravel

## SAMPLE LOCATION

Boring Number: BH-04  
Depth: 0

## MOISTURE-DENSITY RELATIONSHIP

Procedure: AASHTO T99

Maximum Dry Density: 108.8 lb/ft<sup>3</sup>

Optimum Moisture: 15.8 %

Dry Density at Molding: 106.2 lb/ft<sup>3</sup>

Relative Compaction: 97.6 %

Moisture Content at Molding: 18.0 %

## SWELL TEST

Soaking Period: 96 hrs

Surcharge Weight: 10 lbs

Surcharge Pressure: 50.9 psf

Average Moisture Content After Soaking: 21.3 %

Swell, % of Initial Height of Specimen: 1.0 %

Moisture Content of Top 1" After Soaking: 21.1 %

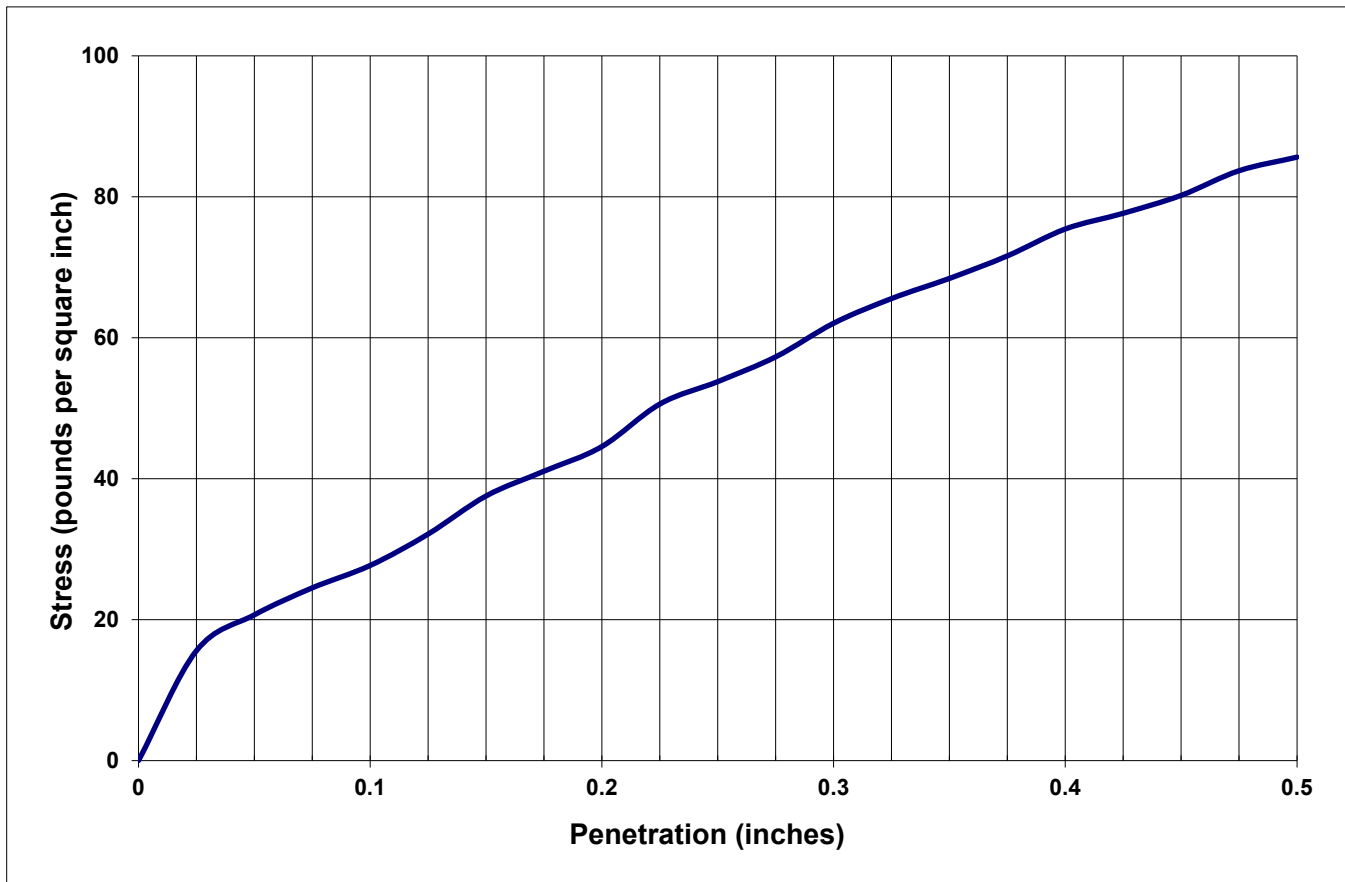
## CALIFORNIA BEARING RATIO TEST

Surcharge Weight: 10 lbs

Surcharge Pressure: 50.9 psf

CBR @ 0.1" penetration: 2.8

CBR @ 0.2" penetration: 3.0





201 East Broadway, Suite C  
 Helena, Montana 59601  
 Phone (406)457-8252 Fax (406)442-1158  
 www.pioneer-technical.com

**Determining Minimum Laboratory Soil Resistivity: AASHTO T 288-12**

**Project Name:** City of Alberton

**Project Number:** 2201070

**Sample Location:** BH-03

**Sample Number:** 26904

**Sample Depth:** 0-10'

Soil Box Information:

Cross Sectional Area (A): 4cm x 3.2cm = 12.8cm<sup>2</sup>

Pin Separation (L): 12.8cm

A/L: 1cm

Water Added (mL)	Measured Resistance (Ω)	Resistivity = Measured Resistance x 1 cm (Ω x cm)
150	1k +4.0	4000
100	1k + 1.1	1100
100	1k + 0.9	900
100	100 + 8.7	870
100	100 + 9.7	970

**Minimum Resistance:** 100 + 8.7 (Ω)

**Minimum Resistivity:** 870 (Ω x cm)



1315 Cherry, Helena, MT 59601  
(406)449-6282

Client: Pioneer Technical Services

Date Reported: 11-Oct-22

Sample ID: BH-03, 0-10'

Project ID: Alberton

Chain of Custody #: 4575

Laboratory ID: 04L111

Sample Matrix: Soil

Date / Time Sampled: None Given

Date / Time Received: 03-Oct-22 @ 08:15

Parameter	Result	PQL	Analyzed Date/Time	By	Method Reference
Soluble Sulfate, %	0.0034	0.00005	06-Oct-22 @ 16:28	CE	EPA 300.0
pH, s.u.	8.48	0.01	07-Oct-22 @ 14:05	CE	MT 232-04

**Comments:**

PQL - Practical Quantitation Limit

**References:**

*Methods for Chemical Analysis of Water and Wastes*, US EPA, 600/4-79-020

Method of Sampling and Testing MT232-04, *Soil Corrosion Test* (Montana Method).

Reviewed by: CE



1315 Cherry, Helena, MT 59601  
(406)449-6282

**Client: Pioneer Technical Services**

**Date Reported: 11-Oct-22**

**Sample ID: BH-05, 0-7.5'**

**Project ID: Alberton**

**Chain of Custody #: 4575**

**Laboratory ID: 04L112**  
**Sample Matrix: Soil**

**Date / Time Sampled: None Given**  
**Date / Time Received: 03-Oct-22 @ 08:15**

<b>Parameter</b>	<b>Result</b>	<b>PQL</b>	<b>Analyzed Date/Time</b>	<b>By</b>	<b>Method Reference</b>
Soluble Sulfate, %	0.0012	0.00005	06-Oct-22 @ 16:38	CE	EPA 300.0
pH, s.u.	8.33	0.01	07-Oct-22 @ 14:05	CE	MT 232-04

**Comments:**

**PQL** - Practical Quantitation Limit

**References:**

*Methods for Chemical Analysis of Water and Wastes*, US EPA, 600/4-79-020  
Method of Sampling and Testing MT232-04, *Soil Corrosion Test* (Montana Method).

Reviewed by: CE



1315 Cherry, Helena, MT 59601  
(406)449-6282

Client: Pioneer Technical Services

Date Reported: 03-Apr-23

Sample ID: BH-01, 5-6.5ft

Project ID: Alberton

Chain of Custody #: 55

Laboratory ID: 05C368  
Sample Matrix: Soil

Date / Time Sampled: None Given  
Date / Time Received: 31-Mar-23 @ 09:52

Parameter	Result	PQL	Date/Time	Analyzed By	Method Reference
pH, s.u.	8.4	0.01	03-Apr-23 @ 14:45	CE	MT 232-04

**Comments:**

PQL - Practical Quantitation Limit

**References:**

*Methods for Chemical Analysis of Water and Wastes*, US EPA, 600/4-79-020  
Method of Sampling and Testing MT232-04, *Soil Corrosion Test* (Montana Method).

Reviewed by: CE



1315 Cherry, Helena, MT 59601  
(406)449-6282

Client: Pioneer Technical Services

Date Reported: 03-Apr-23

Sample ID: BH-01

Project ID: Alberton

Chain of Custody #: 55

Laboratory ID: 05C369  
Sample Matrix: Soil

Date / Time Sampled: None Given  
Date / Time Received: 31-Mar-23 @ 09:52

Parameter	Result	PQL	Date/Time	Analyzed By	Method Reference
pH, s.u.	8.0	0.01	03-Apr-23 @ 14:45	CE	MT 232-04

**Comments:**

PQL - Practical Quantitation Limit

**References:**

*Methods for Chemical Analysis of Water and Wastes*, US EPA, 600/4-79-020  
Method of Sampling and Testing MT232-04, *Soil Corrosion Test* (Montana Method).

Reviewed by: CE



1315 Cherry, Helena, MT 59601  
(406)449-6282

**Client: Pioneer Technical Services**

**Date Reported: 03-Apr-23**

**Sample ID: BH-03, 0-1.5**

**Project ID: Alberton**

**Chain of Custody #: 55**

**Laboratory ID: 05C370**  
**Sample Matrix: Soil**

**Date / Time Sampled: None Given**  
**Date / Time Received: 31-Mar-23 @ 09:52**

Parameter	Result	PQL	Date/Time	Analyzed		Method Reference
				By		
pH, s.u.	8.3	0.01	03-Apr-23 @ 14:45	CE	MT 232-04	

**Comments:**

**PQL** - Practical Quantitation Limit

**References:**

*Methods for Chemical Analysis of Water and Wastes*, US EPA, 600/4-79-020  
Method of Sampling and Testing MT232-04, *Soil Corrosion Test* (Montana Method).

Reviewed by: CE





1315 Cherry, Helena, MT 59601  
(406)449-6282

Client: Pioneer Technical Services

Date Reported: 03-Apr-23

Sample ID: BH-04, 0-1.5ft

Project ID: Alberton

Chain of Custody #: 55

Laboratory ID: 05C371  
Sample Matrix: Soil

Date / Time Sampled: None Given  
Date / Time Received: 31-Mar-23 @ 09:52

Parameter	Result	PQL	Date/Time	Analyzed By	Method Reference
pH, s.u.	8.3	0.01	03-Apr-23 @ 14:45	CE	MT 232-04

**Comments:**

PQL - Practical Quantitation Limit

**References:**

*Methods for Chemical Analysis of Water and Wastes*, US EPA, 600/4-79-020  
Method of Sampling and Testing MT232-04, *Soil Corrosion Test* (Montana Method).

Reviewed by: CE



1315 Cherry, Helena, MT 59601  
(406)449-6282

**Client: Pioneer Technical Services**

**Date Reported: 03-Apr-23**

**Sample ID: BH-05, 5-6.5**

**Project ID: Alberton**

**Chain of Custody #: 55**

**Laboratory ID: 05C372**  
**Sample Matrix: Soil**

**Date / Time Sampled: None Given**  
**Date / Time Received: 31-Mar-23 @ 09:52**

Parameter	Result	PQL	Analyzed		Method Reference
			Date/Time	By	
pH, s.u.	8.4	0.01	03-Apr-23 @ 14:45	CE	MT 232-04

**Comments:**

**PQL** - Practical Quantitation Limit

**References:**

*Methods for Chemical Analysis of Water and Wastes, US EPA, 600/4-79-020*  
Method of Sampling and Testing MT232-04, *Soil Corrosion Test* (Montana Method).

Reviewed by: CE



1315 Cherry, Helena, MT 59601  
(406)449-6282

**Client: Pioneer Technical Services**

**Date Reported: 03-Apr-23**

**Sample ID: BH-06, 5-6.5**

**Project ID: Alberton**

**Chain of Custody #: 55**

<b>Laboratory ID:</b> 05C373	<b>Date / Time Sampled:</b> None Given
<b>Sample Matrix:</b> Soil	<b>Date / Time Received:</b> 31-Mar-23 @ 09:52

Parameter	Result	PQL	Date/Time	Analyzed		Method Reference
				By		
pH, s.u.	8.1	0.01	03-Apr-23 @ 14:45	CE		MT 232-04

**Comments:**

PQL - Practical Quantitation Limit

**References:**

*Methods for Chemical Analysis of Water and Wastes*, US EPA, 600/4-79-020  
Method of Sampling and Testing MT232-04, *Soil Corrosion Test* (Montana Method).

Reviewed by: CE

## **Appendix D**

# **Traffic Parameters**

## **Railroad Avenue**

Location ID	31-2-016	MPO ID	
Type	SPOT	HPMS ID	
On NHS		On HPMS	No
LRS ID		LRS Loc Pt.	
SF Group	RMA_RMC_12	Route Type	Secondary
AF Group	RMA_RMC_12	Route	S-507
GF Group	RMA_RMC_12	Active	Yes
Class Dist Grp	5327	Category	Portable Volume
Seas Class Grp	RMA_RMC_12		
WIM Group	MA		
QC Group	Short-Term		
Funct'l Class	Major Collector	Milepost	
Located On	ROUTE 507		
Loc On Alias			
	btwn 4th & 5th (Alberton)		
Less Detail ▼			
County	MINERAL	FIPS County Code	
Community	ALBERTON	# Lanes	0
Jurisdiction	MDT	Surface Type	PAVED
District		Count Cycle	
Control Section		Ctrl Section MP	
Perm Station	No	DOT ID	
WIM Station	No	Latitude	47.003488
Virtual	No	Longitude	-114.479452
Mega-Site	No	Speed Limit	
MPO		LTPP	
		State Owned	Yes
Owner ID	mdt	Rural/Urban	Rural
Days Since Last Count Check			
Corridor Mile	0.735500000		
Department Route	S-507		
System	Secondary		
Border			
Reference Point	000+0.736		
CMS ID	00160231		
Corridor Route	C000507		
CMS County	31		
CMS Mapsheet	2		
CMS Station	016		
Car Day Spd Lmt			
Car Night Spd Lmt			
Trk Day Spd Lmt			
Trk Night Spd Lmt			
Station Directions	EB-WB		

AADT							
Year	AADT	DHV-30	K %	D %	PA	BC	Src
2022	792	88	11				
2021	717 <sup>3</sup>		18		639 (89%)	10 (1%)	Grown from 2020
2020	649 <sup>3</sup>		18		639 (98%)	10 (2%)	Grown from 2019
2019	640	114	18		630 (98%)	10 (2%)	
2018	703 <sup>3</sup>		15		689 (98%)	14 (2%)	Grown from 2017

AADT <sup>?</sup>							
Year	AADT	DHV-30	K %	D %	PA	BC	Src
2017	711	104	15		697 (98%)	14 (2%)	
2016	727 <sup>3</sup>				713 (98%)	14 (2%)	Grown from 2015
2015	840	103	14		716 (85%)	14 (2%)	
2014	840		12	53	827 (98%)	13 (2%)	[LegacyMontanaCatchUp]
2013	1,060						

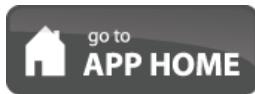
VOLUME TREND <sup>?</sup>	
Year	Annual Growth
2022	10%
2021	10%
2020	1%
2019	-9%
2018	-1%
2017	-2%
2016	-13%
2015	0%
2014	-21%
2013	4%

### Description

The equivalent load most commonly used in pavement design in the U.S. is the 18,000 lb (80 kN) equivalent single axle load (ESAL). This tool calculates the total number of ESALs that have or will traverse a pavement for the purposes of pavement analysis or design.

### Terms of Use

*The user accepts ALL responsibility for decisions made as a result of the use of this design tool. American Concrete Pavement Association, its Officers, Board of Directors and Staff are absolved of any responsibility for any decisions made as a result of your use. Use of this design tool implies acceptance of the terms of use.*



### Traffic Calculation

No. of Years to Project Traffic (yrs):  [Help](#)

Determine Past and Future ESALs

Two-Way Average Daily Traffic (ADT):  [Help](#)

Directional Distribution Factor (%):  [Help](#)

Design Lane Distribution Factor (%):  [Help](#)

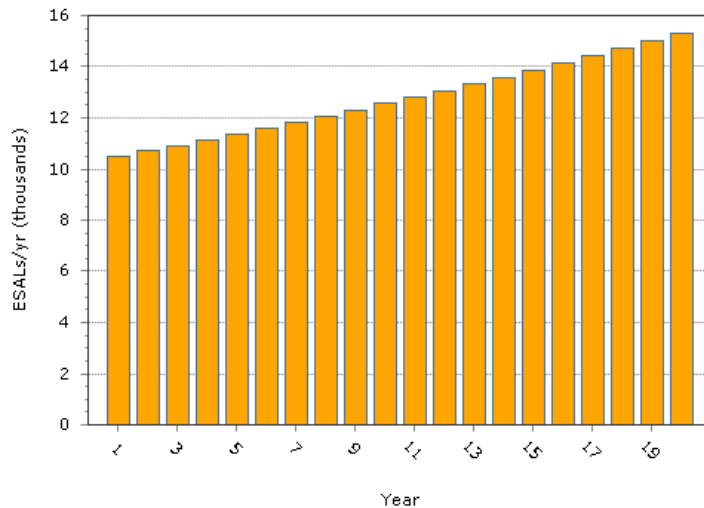
Growth Rate (%):  [Help](#)

Percent Trucks (%):  [Help](#)

Truck Factor (ESALs/Truck):  [Help](#)

### ESAL Calculation

Total ESALs: 255,195



• Have a question about concrete pavements?  
 • Want guidance from a professional engineer?  
 • Need assistance with inputs?

[Click here to contact your local ACPA Chapter or State Paving Association](#)



**TYPICAL PAVEMENT SECTION**  
**ALBERTON RAILROAD AVE. ASPHALT**

<b>INPUT PARAMETERS</b>	
ESALs	255,195
Subgrade CBR, (%)	3.00
Subgrade Resilient Modulus, MR (psi)	11,145
Reliability, R (%)	75
Standard Normal Deviate, $Z_R$	-0.674
Overall Standard Deviation, $S_o$	0.45
Initial Serviceability, $p_o$	4.2
Terminal Serviceability, $p_t$	2.5
Design Serviceability Loss, (PSI)	1.7
<i>Required Structural Number</i> <sup>1</sup>	<b>2.14</b>
Asphalt Concrete Layer Coefficient, $a_1$	0.41
Base Course Layer Structural Coefficient, $a_2$	0.14
Base Course Layer Drainage Coefficient, $m_2$	1.00
Sub-Base Course Layer Structural Coefficient, $a_3$	0.07
Sub-Base Course Layer Drainage Coefficient, $m_3$	1.00

<b>DESIGN EQUATION</b>
5.407 = left side
5.406 = right side

<b>PAVEMENT SECTION</b>	
<b>Asphalt Concrete Thickness, <math>D_1</math> (in)</b>	<b>3.6</b>
<b>Granular Base Course Thickness, <math>D_2</math> (in)</b>	<b>12.0</b>
<b>Granular Sub-Base Course Thickness, <math>D_3</math> (in)</b>	<b>0.0</b>
<b>Propex Geotex 601 Nonwoven Geotextile</b>	<b>No</b>
<i>Calculated Structural Number</i>	<b>3.16</b>

1. Required Structural Number calculated per design equation presented in Figure 3.1 from 1993 AASHTO Guide for Design of Pavement Structures:

$$\log_{10}(W_{18}) = Z_R \times S_o + 9.36 \times \log_{10}(SN + 1) - 0.20 + \frac{\log_{10}\left(\frac{\Delta PSI}{4.2 - 1.5}\right)}{0.40 + \frac{1094}{(SN + 1)^{5.19}}} + 2.32 \times \log_{10}(M_R) - 8.07$$

2. Compact subgrade to standard relative compaction of at least 95%, place nonwoven geotextile, then place and compact sub-base and base course to standard relative compaction of at least 95%.

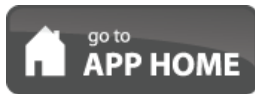
## **Alberton Asphalt Surface Streets**

### Description

The equivalent load most commonly used in pavement design in the U.S. is the 18,000 lb (80 kN) equivalent single axle load (ESAL). This tool calculates the total number of ESALs that have or will traverse a pavement for the purposes of pavement analysis or design.

### Terms of Use

*The user accepts ALL responsibility for decisions made as a result of the use of this design tool. American Concrete Pavement Association, its Officers, Board of Directors and Staff are absolved of any responsibility for any decisions made as a result of your use. Use of this design tool implies acceptance of the terms of use.*



### Traffic Calculation

No. of Years to Project Traffic (yrs):  [Help](#)

Determine Past and Future ESALs

Two-Way Average Daily Traffic (ADT):  [Help](#)

Directional Distribution Factor (%):  [Help](#)

Design Lane Distribution Factor (%):  [Help](#)

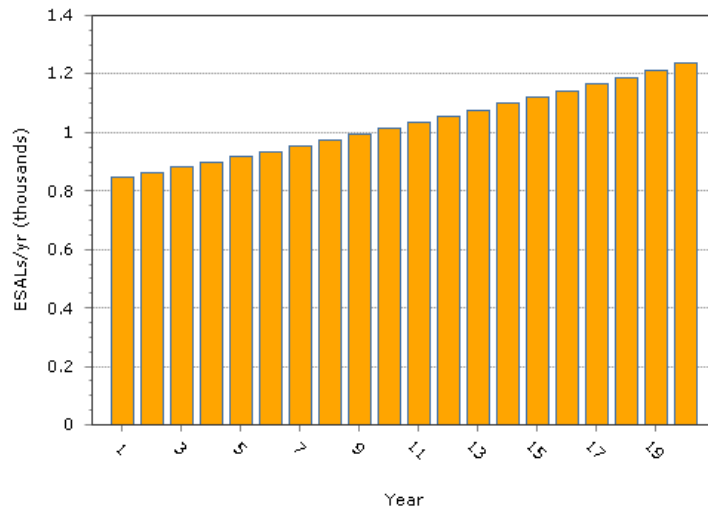
Growth Rate (%):  [Help](#)

Percent Trucks (%):  [Help](#)

Truck Factor (ESALs/Truck):  [Help](#)

### ESAL Calculation

Total ESALs: 20,633



• Have a question about concrete pavements?  
 • Want guidance from a professional engineer?  
 • Need assistance with inputs?

[Click here to contact your local ACPA Chapter or State Paving Association](#)

## TYPICAL PAVEMENT SECTION

### ALBERTON CITY STREETS OPTION 1: MINERAL COUNTY (subbase)

<b>INPUT PARAMETERS</b>	
ESALs	20,633
Subgrade CBR, (%)	3.00
Subgrade Resilient Modulus, MR (psi)	4,500
Reliability, R (%)	75
Standard Normal Deviate, $Z_R$	-0.674
Overall Standard Deviation, $S_o$	0.45
Initial Serviceability, $p_o$	4.2
Terminal Serviceability, $p_t$	2.5
Design Serviceability Loss, (PSI)	1.7
<i>Required Structural Number</i> <sup>1</sup>	<b>2.00</b>
Asphalt Concrete Layer Coefficient, $a_1$	0.41
Base Course Layer Structural Coefficient, $a_2$	0.14
Base Course Layer Drainage Coefficient, $m_2$	1.00
Sub-Base Course Layer Structural Coefficient, $a_3$	0.07
Sub-Base Course Layer Drainage Coefficient, $m_3$	1.00

<b>DESIGN EQUATION</b>
4.315 = left side
4.315 = right side

<b>PAVEMENT SECTION</b>	
<b>Asphalt Concrete Thickness, <math>D_1</math> (in)</b>	<b>3.0</b>
<b>Granular Base Course Thickness, <math>D_2</math> (in)</b>	<b>4.0</b>
<b>Granular Sub-Base Course Thickness, <math>D_3</math> (in)</b>	<b>8.0</b>
<b>Propex Geotex 601 Nonwoven Geotextile</b>	<b>No</b>
<i>Calculated Structural Number</i>	<b>2.35</b>

1. Required Structural Number calculated per design equation presented in Figure 3.1 from 1993 AASHTO Guide for Design of Pavement Structures:

$$\log_{10}(W_{18}) = Z_R \times S_o + 9.36 \times \log_{10}(SN + 1) - 0.20 + \frac{\log_{10}\left(\frac{\Delta PSI}{4.2 - 1.5}\right)}{0.40 + \frac{1094}{(SN + 1)^{5.19}}} + 2.32 \times \log_{10}(M_R) - 8.07$$

2. Compact subgrade to standard relative compaction of at least 95%, place nonwoven geotextile, then place and compact sub-base and base course to standard relative compaction of at least 95%.

**TYPICAL PAVEMENT SECTION**  
**ALBERTON CITY STREETS OPTION 2: No Subbase**

<b>INPUT PARAMETERS</b>	
ESALs	20,633
Subgrade CBR, (%)	3.00
Subgrade Resilient Modulus, MR (psi)	4,500
Reliability, R (%)	75
Standard Normal Deviate, $Z_R$	-0.674
Overall Standard Deviation, $S_o$	0.45
Initial Serviceability, $p_o$	4.2
Terminal Serviceability, $p_t$	2.5
Design Serviceability Loss, (PSI)	1.7
<i>Required Structural Number</i> <sup>1</sup>	<b>2.00</b>
Asphalt Concrete Layer Coefficient, $a_1$	0.41
Base Course Layer Structural Coefficient, $a_2$	0.14
Base Course Layer Drainage Coefficient, $m_2$	1.00
Sub-Base Course Layer Structural Coefficient, $a_3$	0.07
Sub-Base Course Layer Drainage Coefficient, $m_3$	1.00

<b>DESIGN EQUATION</b>
4.315 = left side
4.315 = right side

<b>PAVEMENT SECTION</b>	
<b>Asphalt Concrete Thickness, <math>D_1</math> (in)</b>	<b>3.0</b>
<b>Granular Base Course Thickness, <math>D_2</math> (in)</b>	<b>8.0</b>
<b>Granular Sub-Base Course Thickness, <math>D_3</math> (in)</b>	<b>0.0</b>
<b>Propex Geotex 601 Nonwoven Geotextile</b>	<b>No</b>
<i>Calculated Structural Number</i>	<b>2.35</b>

1. Required Structural Number calculated per design equation presented in Figure 3.1 from 1993 AASHTO Guide for Design of Pavement Structures:

$$\log_{10}(W_{18}) = Z_R \times S_o + 9.36 \times \log_{10}(SN + 1) - 0.20 + \frac{\log_{10}\left(\frac{\Delta PSI}{4.2 - 1.5}\right)}{0.40 + \frac{1094}{(SN + 1)^{5.19}}} + 2.32 \times \log_{10}(M_R) - 8.07$$

2. Compact subgrade to standard relative compaction of at least 95%, place nonwoven geotextile, then place and compact sub-base and base course to standard relative compaction of at least 95%.

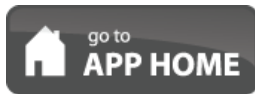
## **Alberton Aggregate Surface Streets**

### Description

The equivalent load most commonly used in pavement design in the U.S. is the 18,000 lb (80 kN) equivalent single axle load (ESAL). This tool calculates the total number of ESALs that have or will traverse a pavement for the purposes of pavement analysis or design.

### Terms of Use

*The user accepts ALL responsibility for decisions made as a result of the use of this design tool. American Concrete Pavement Association, its Officers, Board of Directors and Staff are absolved of any responsibility for any decisions made as a result of your use. Use of this design tool implies acceptance of the terms of use.*



### Traffic Calculation

No. of Years to Project Traffic (yrs):  [Help](#)

Determine Past and Future ESALs

Two-Way Average Daily Traffic (ADT):  [Help](#)

Directional Distribution Factor (%):  [Help](#)

Design Lane Distribution Factor (%):  [Help](#)

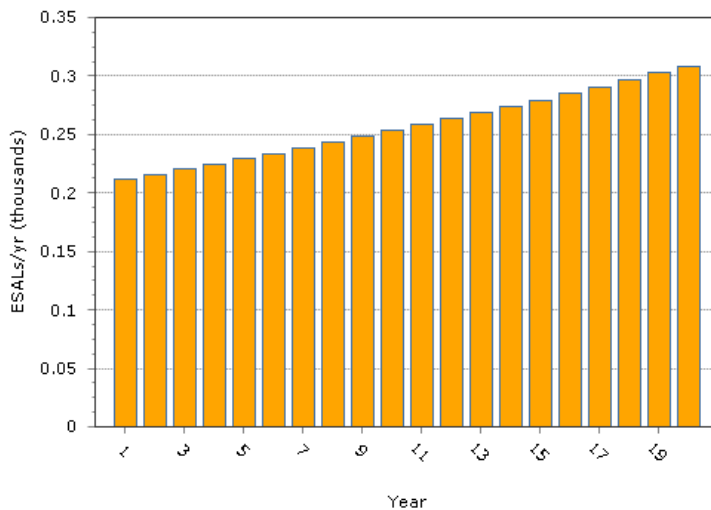
Growth Rate (%):  [Help](#)

Percent Trucks (%):  [Help](#)

Truck Factor (ESALs/Truck):  [Help](#)

### ESAL Calculation

Total ESALs: 5,158



• Have a question about concrete pavements?  
 • Want guidance from a professional engineer?  
 • Need assistance with inputs?

[Click here to contact your local ACPA Chapter or State Paving Association](#)

## TYPICAL PAVEMENT SECTION

### ALBERTON AGGREGATE SECTION

#### INPUT PARAMETERS

ESALs	5,158
Subgrade CBR, (%)	3.00
Subgrade Resilient Modulus, MR (psi)	4,500
Reliability, R (%)	75
Standard Normal Deviate, $Z_R$	-0.674
Overall Standard Deviation, $S_o$	0.45
Initial Serviceability, $p_o$	4.2
Terminal Serviceability, $p_t$	2.5
Design Serviceability Loss, (PSI)	1.7
<i>Required Structural Number</i> <sup>1</sup>	<b>1.57</b>
Asphalt Concrete Layer Coefficient, $a_1$	0.41
Base Course Layer Structural Coefficient, $a_2$	0.14
Base Course Layer Drainage Coefficient, $m_2$	1.00
Sub-Base Course Layer Structural Coefficient, $a_3$	0.07
Sub-Base Course Layer Drainage Coefficient, $m_3$	1.00

#### DESIGN EQUATION

3.712 = left side  
3.712 = right side

#### PAVEMENT SECTION

<b>Asphalt Concrete Thickness, <math>D_1</math> (in)</b>	<b>0.0</b>
<b>Granular Base Course Thickness, <math>D_2</math> (in)</b>	<b>12.0</b>
<b>Granular Sub-Base Course Thickness, <math>D_3</math> (in)</b>	<b>0.0</b>
<b>Propex Geotex 601 Nonwoven Geotextile</b>	<b>No</b>
<i>Calculated Structural Number</i>	<b>1.68</b>

1. Required Structural Number calculated per design equation presented in Figure 3.1 from 1993 AASHTO Guide for Design of Pavement Structures:

$$\log_{10}(W_{18}) = Z_R \times S_o + 9.36 \times \log_{10}(SN + 1) - 0.20 + \frac{\log_{10}\left(\frac{\Delta PSI}{4.2 - 1.5}\right)}{0.40 + \frac{1094}{(SN + 1)^{5.19}}} + 2.32 \times \log_{10}(M_R) - 8.07$$

2. Compact subgrade to standard relative compaction of at least 95%, place nonwoven geotextile, then place and compact sub-base and base course to standard relative compaction of at least 95%.



## **Appendix E**

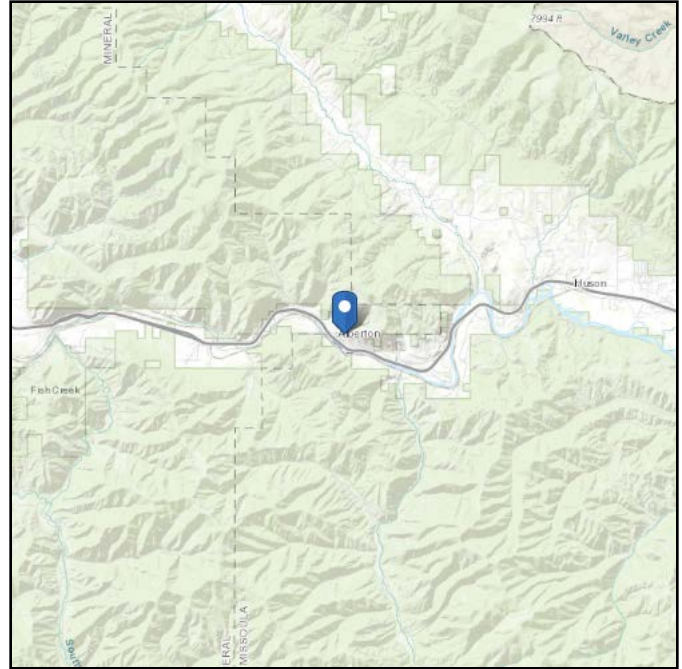
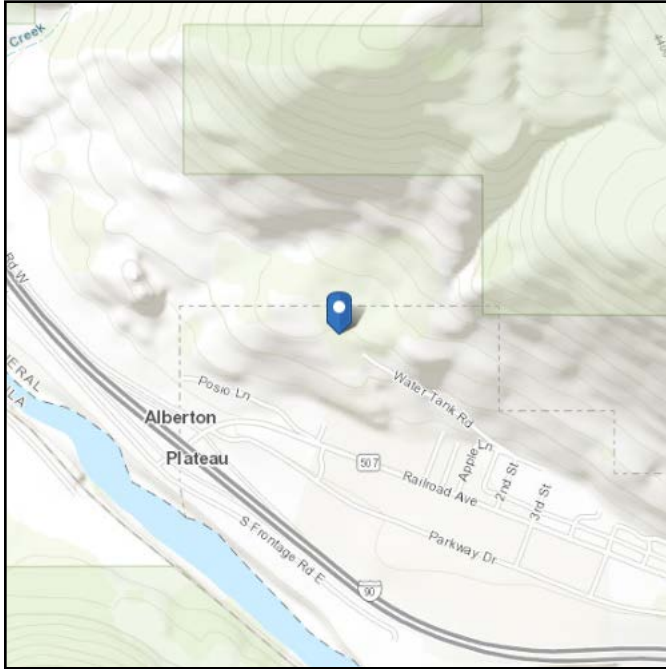
### **Seismic Data**

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** IV  
**Soil Class:** B - Rock

**Latitude:** 47.00862  
**Longitude:** -114.488331  
**Elevation:** 3275.09 ft (NAVD 88)



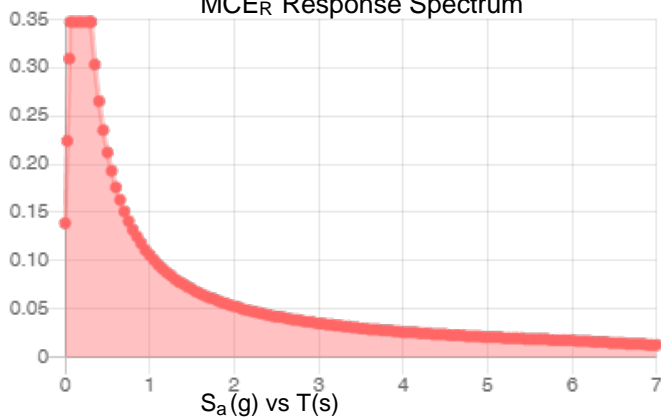
**Site Soil Class:**

**Results:**

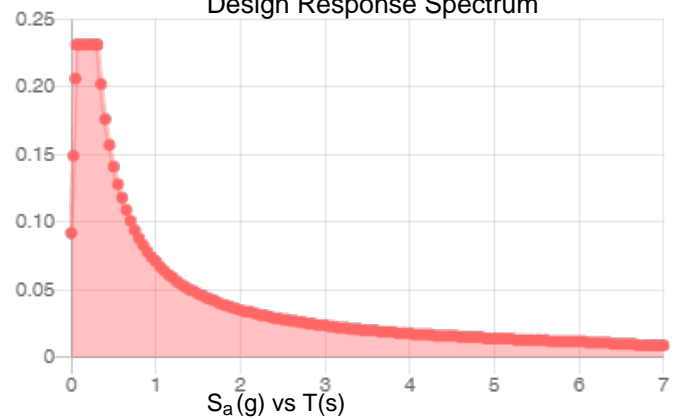
$S_S$ :	0.385	$S_{D1}$ :	0.071
$S_1$ :	0.132	$T_L$ :	6
$F_a$ :	0.9	PGA :	0.169
$F_v$ :	0.8	PGA <sub>M</sub> :	0.152
$S_{MS}$ :	0.347	$F_{PGA}$ :	0.9
$S_{M1}$ :	0.106	$I_e$ :	1.5
$S_{DS}$ :	0.231	$C_v$ :	0.828

**Seismic Design Category: C**

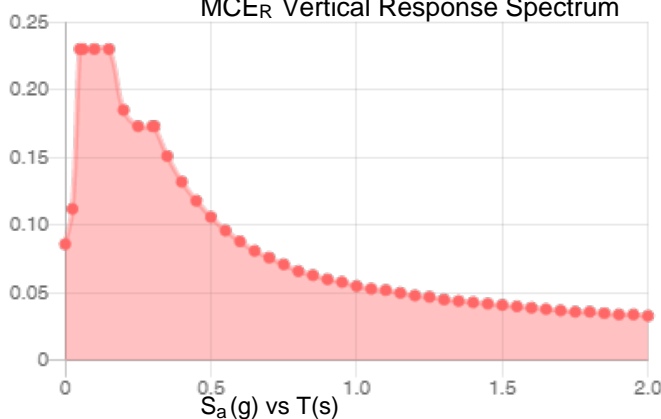
MCE<sub>R</sub> Response Spectrum



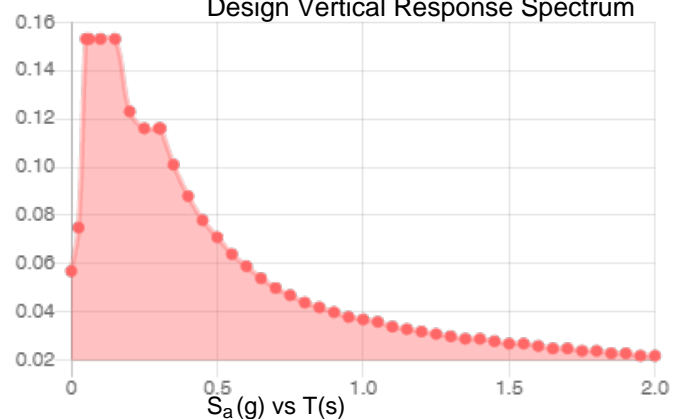
Design Response Spectrum



MCE<sub>R</sub> Vertical Response Spectrum



Design Vertical Response Spectrum



**Data Accessed:**

**Thu Nov 17 2022**

**Date Source:**

**USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.**

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

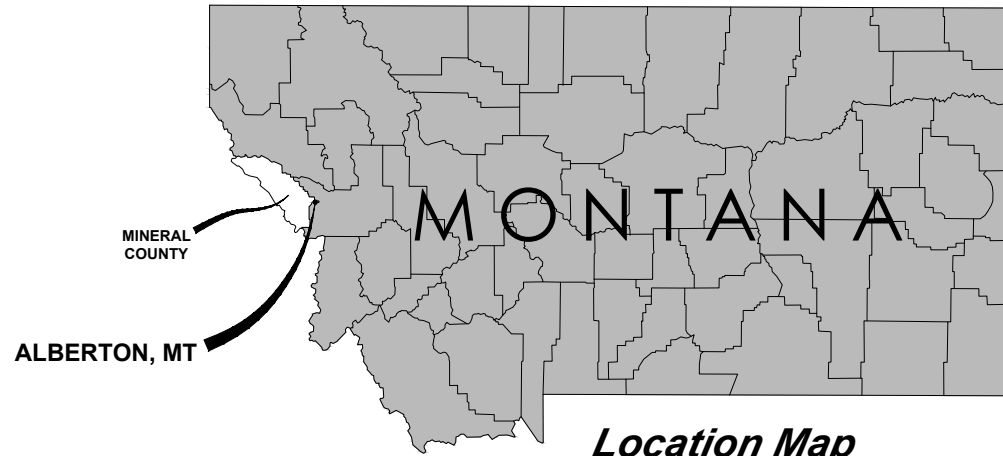
In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

**APPENDIX B**

**PROJECT DRAWINGS**

# Water System Improvements Project

## Alberton, Montana



**Location Map**  
Not To Scale

### PROJECT OWNER:

Anna LeDuc - Mayor  
 Leslie Hottinger - Town Clerk  
 Sharon Briggs - Councilmember  
 Marvin Garding - Councilmember  
 Jacci Spade - Councilmember  
 Kyle Cirincione - Councilmember

### FUNDING SOURCES:

Alberton ARPA Local Fiscal Recovery Grant = \$113,926  
 Alberton ARPA Minimum Allocation Grant (AM-22-0064) = \$209,541  
 Alberton ARPA Competitive Grant (AC-22-0075) = \$1,417,650  
 Montana Coal Endowment Program (CG-23-628) = \$750,000  
 Montana DNRC Renewable Resource Grant (RRG-22-1853a) = \$125,000  
 Montana SRF Loan = \$444,500  
 Montana SRF Forgiven Principal = \$750,000  
 Alberton Local Contribution = \$150,000

### WORKSCOPE

#### BASEBID A:

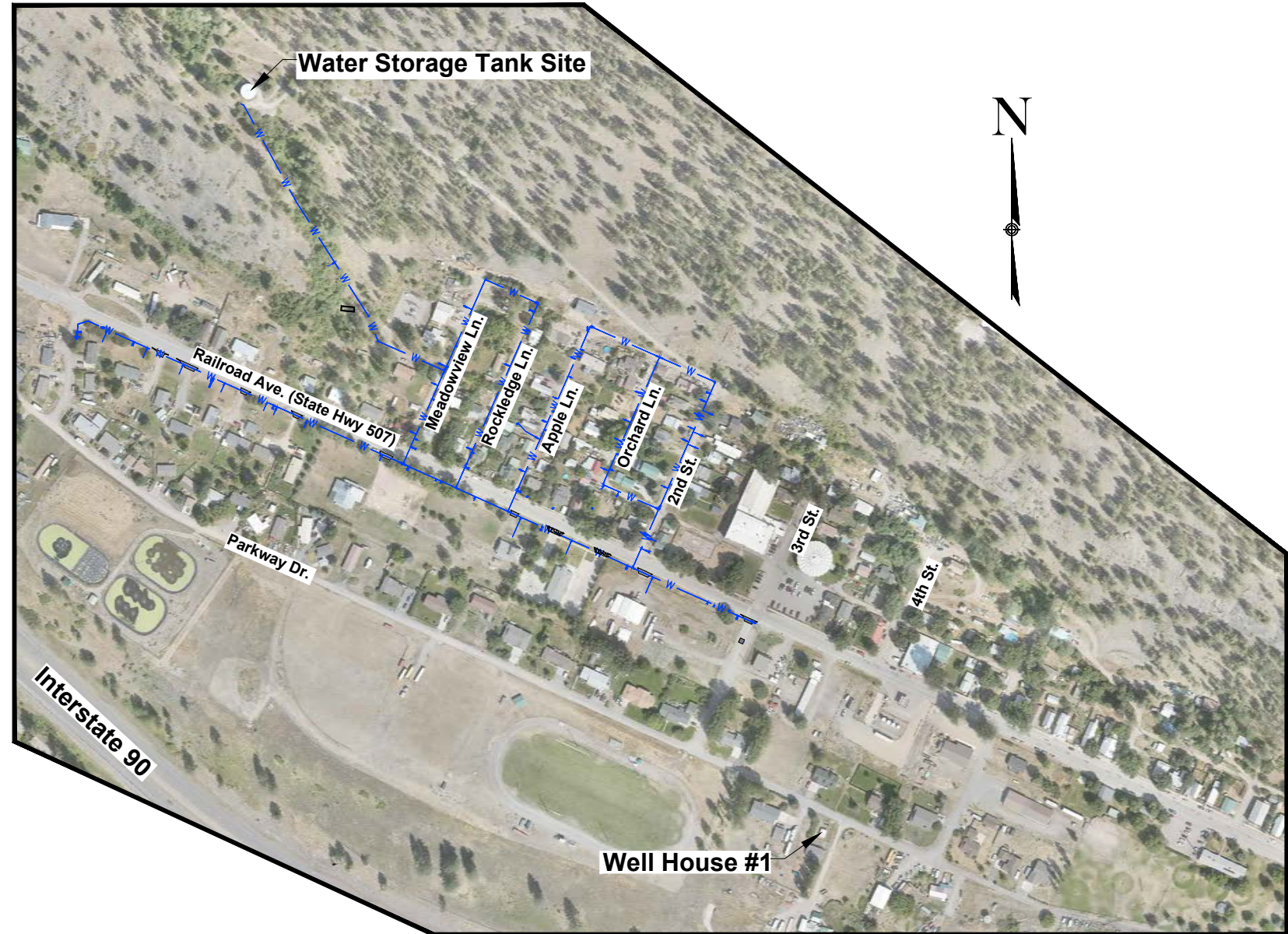
- 5,970 lineal feet of 12", 10", 8", and 6" water distribution pipe, valves, fittings, utility crossings;
- Six HDD crossings (12" to 6" HDPE, totaling 235 lineal feet) of state highway 507;
- 60 individual service connections, curb boxes, pipe, utility crossings;
- 12 fire hydrant & valve assemblies;

#### ADDITIVE ALTERNATE B:

- 210 individual water meters including radios, reading equipment & software
- 28 water meter pits

#### ADDITIVE ALTERNATE C:

- Spring source reclamation including 1 new structure, piping improvements, and security fencing



### TOWN OF ALBERTON

### PROJECT CONTACTS:

#### ANDERSON MONTGOMERY CONSULTING ENGINEERS:

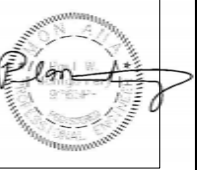
Paul Montgomery, P.E. (406) 449-3303 (Office); (406) 459-8463 (Cell); Paul@a-mce.com  
 Adam Eckhart, P.E. (406) 449-3303 (Office); (406) 431-3010 (Cell); Adam@a-mce.com

#### TOWN OF ALBERTON:

Ingrid Ashley, Operator (406) 210-6169; albertonsandwops@gmail.com  
 Anna LeDuc, Mayor (406) 722-3404; albertonmayor@gmail.com  
 Leslie Hottinger, Clerk (406) 722-3404; townofalberton@blackfoot.net

#### FUNDING AGENCIES:

Montana Coal Endowment Program: Lindsey Siebrasse (406) 841-2708; Lindsey.Siebrasse@mt.gov  
 ARPA/DNRC RRLG: Samantha Kemp (406) 459-9437; Samantha.Kemp@mt.gov  
 Montana SRF Program - MDEQ: John McDunn (406) 444-6782; JMcDunn@mt.gov



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

Engineer

Anderson-Montgomery  
CONSULTING ENGINEERS

1064 N. Warren  
Helena, Mt 59601  
Phone (406) 449-3303  
Fax (406) 449-3304

Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

Sheet Title

Cover

Sheet

**G-1**

X:\ALBERTON\_WATER\DESIGN\DRAWINGS - RE-BID\Sheets\General\G-2.dwg - PRINTED: 3/20/24 - BY: ADAM

DESIGN CRITERIA		
Design Year	2043	
Current Average Daily Flow	187,200	GPD
Design Average Daily Flow	237,600	GPD
Design Peak Hour Flow	576,000	GPD

General	
G-1	Cover
G-2	Design Criteria & Index
G-3	Key Sheet
G-4	Legend
G-5	Abbreviations & Notes
G-6	Process Flow Diagram
G-7	Geotechnical Borehole Locations

General Civil	
GC-1	Location and Survey Control Coordinates
GC-2	General Civil Details
GC-3	General Civil Details
GC-4	General Civil Details
GC-5	General Civil Details
GC-6	General Civil Details
GC-7	General Civil Details
GC-8	Fencing Details

Distribution	
D-1	Storage Tank to Distribution
D-2	Storage Tank to Distribution Continued
D-3	Railroad Ave.
D-4	Railroad Ave. Continued
D-5	Railroad Ave. Continued
D-6	Railroad Ave. Continued
D-7	Meadowview Ln.
D-8	Rockledge Ln.
D-9	Apple Ln.
D-10	Rosehill Ln. & Orchard Ln.
D-11	2nd St.
D-12	Meadowview Ln. to Rockledge Ln.
D-13	Riverview St.

Meter Pits	
M-1	Water Meter Location Map
M-2	Water Meter Location Map
M-3	Water Meter Location Map
M-4	Water Meter Location Map
M-5	Water Meter Location Map
M-6	Water Meter Location Map
M-7	Water Meter Location Map
M-8	Water Meter Location Map
M-9	Water Meter Location Map
M-10	Water Meter Location Map

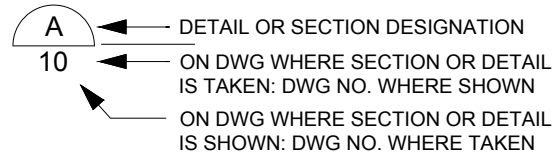
Spring Source	
SS-1	Site Plan
SS-2	Fence Site Plan
SS-3	Details
SS-4	Spring Source Replacement Details

LEGEND	
BASE BID A	
ALTERNATE B - Meter Pits (Items Shown on Sheet)	
ALTERNATE C - Spring Source (Items Shown on Sheet)	

**DRAWING IDENTIFICATION SYSTEM:**

LETTER	DISCIPLINE
G	GENERAL
GC	GENERAL CIVIL
D	DISTRIBUTION
M	METER PITS
SS	SPRING SOURCE

**DETAIL DESIGNATION:**



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision  
 Final Re-Bid  
 Plot Scale  
 1:2  
 Drawn By  
 A. Eckhart, P.E.  
 Approved By  
 P. Montgomery, P.E.  
 Checked By  
 A. Eckhart, P.E.  
 Designed By  
 P. Montgomery, P.E.

Engineer  
  
 Anderson-Montgomery  
 CONSULTING ENGINEERS  
 1064 N. Warren  
 Helena, Mt 59601  
 Phone (406) 449-3303  
 Fax (406) 449-3304

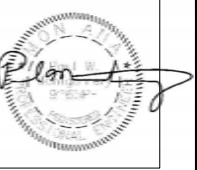
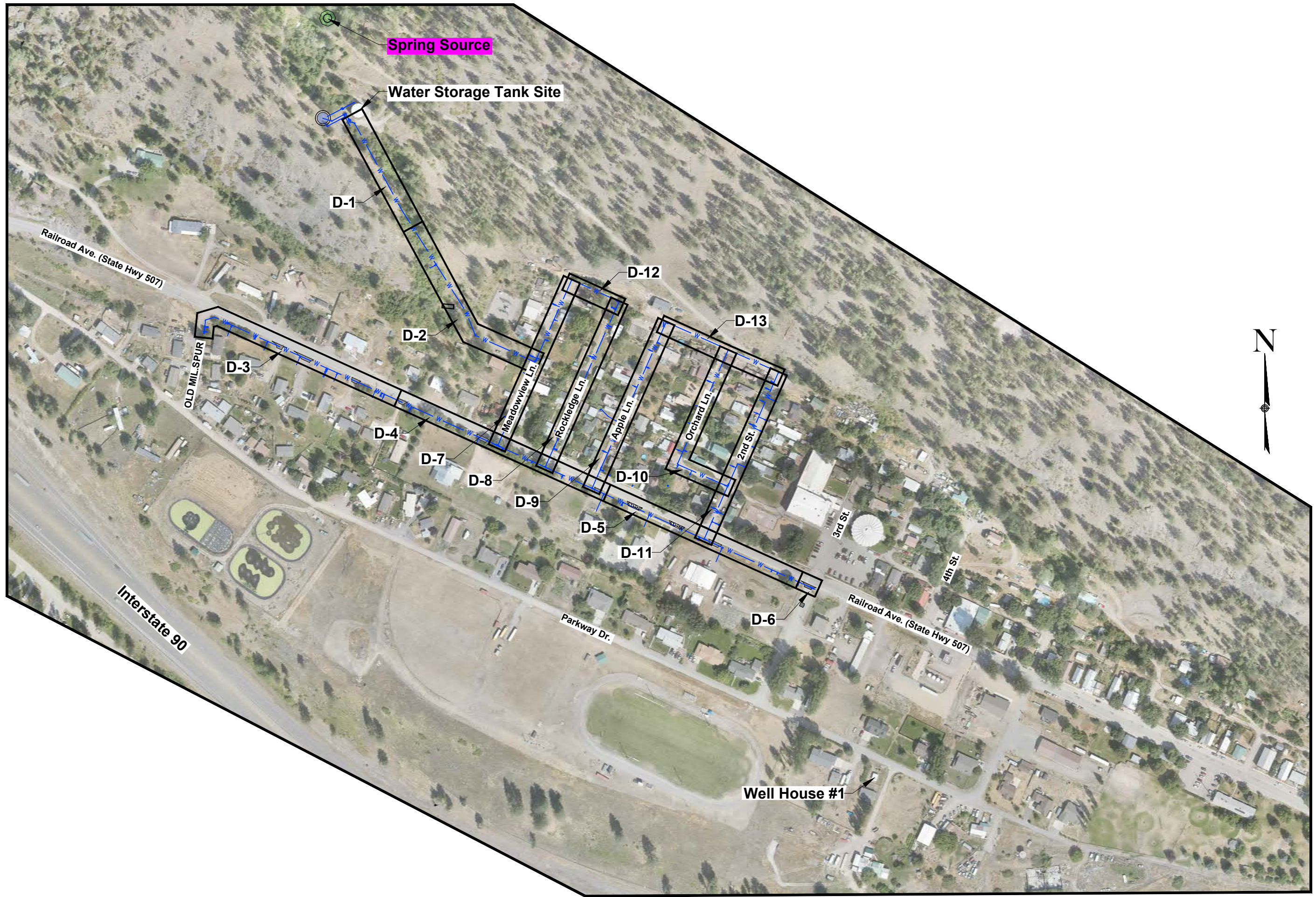
Owner  
  
 Town of  
 Alberton

Project Title  
  
 Alberton  
 Water System  
 Improvements  
 Project

Sheet Title  
  
 Design  
 Criteria &  
 Index

Sheet  
  
**G-2**

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Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision  
Final Re-Bid  
Plot Scale  
1:2  
Drawn By  
A. Eckhart, P.E.  
Approved By  
P. Montgomery, P.E.  
Checked By  
A. Eckhart, P.E.  
Designed By  
P. Montgomery, P.E.

Engineer

Anderson-Montgomery  
CONSULTING ENGINEERS  
1064 N. Warren  
Helena, Mt 59601  
Phone (406) 449-3303  
Fax (406) 449-3304

Owner  
  
Town of Alberton

Project Title  
  
Alberton  
Water System  
Improvements  
Project

Sheet Title  
  
Key Sheet

Sheet  
  
**G-3**





## PIPE AND FITTING SYMBOLS

DOUBLE LINE	SINGLE LINE	DESCRIPTION	DOUBLE LINE	SINGLE LINE	DESCRIPTION
		EXISTING PIPE (SCREENED)			NEW PIPE
		EXISTING PIPE TO BE ABANDONED			CONCENTRIC REDUCER
		EXISTING PIPE TO BE REMOVED			ECCENTRIC REDUCER
		WELDED JOINT			UNION
		GROOVED END JOINT (FLEXIBLE)			BLIND FLANGE
		MECHANICAL JOINT			CAP
		RESTRAINED MECHANICAL JOINT (ROMAC)			CROSS
		FLANGED JOINT			TEE
		FLANGE COUPLING ADAPTER			ELBOW, 45°
		MECHANICAL COUPLING			LATERAL (WYE)
		ELBOW UP			ELBOW, 90°
		ELBOW DOWN			
		TEE UP			
		TEE DOWN			

## VALVE SYMBOLS

DOUBLE LINE	SINGLE LINE	DESCRIPTION	DOUBLE LINE	SINGLE LINE	DESCRIPTION
		GLOBE			SAMPLE VALVE NO THREAD OUTLET
		GATE			HOSE VALVE
		BALL			NON FREEZE HOSE VALVE, X=NO IN SPECS
		PLUG			NON FREEZE HOSE VALVE, X=NO IN SPECS
		BUTTERFLY			SAMPLING STATION
		CORP STOP			AIR RELIEF
		CURB BOX			SURGE CONTROL
		SWING CHECK			AIR/VACUUM
		DOUBLE DISK CHECK			REGULATED SIDE PRESSURE REDUCING
		BALL CHECK			PRESSURE REDUCING VALVE
					FLOW CONTROL VALVE / NEEDLE VALVE

## CIVIL SYMBOLS

DESCRIPTION	EXISTING	PROPOSED	DESCRIPTION	EXISTING	PROPOSED
CONCRETE			CABLE TV		
GRAVEL			CURB		
PAVEMENT			DRAINAGE DITCH		
CURB AND SIDEWALK			ROAD		
PROPERTY LINE			BUILDING		
EASEMENT			DROP INLET		
RIGHT OF WAY			EASEMENT PIN		
GRAVEL ROAD			POWER POLE		
CONTOURS			POWER POLE WITH GUY WIRE		
DRAINAGE			LIGHT POLE		
WATER			SURVEY POINT		
WATER SERVICE LINE			CONTROL POINT		
WATER SERVICE			TELEPHONE PED		
SANITARY SEWER			TELEPHONE BOX		
STORM DRAIN			ELECTRICAL BOX		
FENCE LINE (BARB WIRE)			CURB BOX		
FENCE LINE (CHAIN LINK)			DRILL HOLE OR TEST PIT		
SIGN			METER PIT		
OVERHEAD POWER			REDUCER		
UNDERGROUND FIBER OPTIC			FIRE HYDRANT ASSEMBLY		
UNDERGROUND TELEPHONE, PEDESTAL			FROST FREE HYDRANT		
UNDERGROUND GAS			HOSE BIB		
UNDERGROUND POWER, TRANSFORMER			FROST FREE HOSE BIB		
NATURAL GAS AND/OR PROPANE					
HOT WATER					
COLD WATER					
NON-POTABLE WATER					
PLANT AIR					

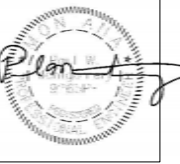
- NOTES:**
- CONTACT THE ENGINEER FOR SYMBOLS NOT LISTED.
  - THIS IS A STANDARD LEGEND SHEET. THEREFORE, SOME SYMBOLS MAY APPEAR ON THIS SHEET AND MAY NOT BE UTILIZED ON THIS PROJECT.

**ADDITIVE ALTERNATE B:**

- 210 individual magnetic water meters including radios, reading equipment & software

**ADDITIVE ALTERNATE C:**

- Spring source reclamation including 1 new structure, piping improvements, and security fencing



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Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

Engineer

1064 N. Warren  
Helena, Mt 59601  
Phone (406) 449-3303  
Fax (406) 449-3304

Owner

Town of  
Alberton

Project Title

Alberton  
Water System  
Improvements  
Project

Sheet Title

Legend

Sheet

**G-4**

**ABBREVIATIONS:**

<p>∅ DIAMETER                  @ AT                  AA ALL AROUND                  AB ANCHOR BOLT, AGGREGATE BASE                  AC ASBESTOS CEMENT OR ACRE                  AFF ABOVE FINISHED FLOOR                  ADA AMERICANS WITH DISABILITIES ACT                  AH AHEAD                  AL ALUMINUM                  ANC ANCHOR                  ANSI AMERICAN NATIONAL STANDARDS INSTITUTE                  APPROX APPROXIMATELY                  ARV AIR RELEASE VALVE                  AVE AVENUE                  AWWA AMERICAN WATER WORKS ASSOCIATION</p>	<p>FG FINISH GRADE                  FH FIRE HYDRANT                  FL FLOOR, FLANGE OR FLOW LINE                  FOC FACE OF CURB OR FACE OF CONCRETE                  FM FORCE MAIN                  FPT FEMALE PIPE THREAD                  FS FINISHED SURFACE                  FTG FOOTING                  FT FOOT OR FEET</p>	<p>R RADIUS                  RCB REINFORCED CONCRETE BOX                  RCP REINFORCED CONCRETE PIPE                  RCPA REINFORCED CONCRETE PIPE ARCHED                  RDCR REDUCER                  RFC ROTATED FOR CLARITY                  ROW RIGHT-OF-WAY                  RPA ROBERT PECCIA &amp; ASSOCIATES                  RPC RED PLASTIC CAP                  RPP REINFORCED POLYPROPYLENE                  RR RAILROAD                  RT RIGHT                  RW RIGHT-OF-WAY OR RACEWAY                  R/W RIGHT-OF-WAY                  RWL RAIN WATER LEADER</p>
<p>BC BUILDING CORNER                  BF BLIND FLANGE                  BFF BELOW FINISH FLOOR                  BFV BUTTERFLY VALVE                  BGS BELOW GROUND SURFACE                  BK BACK                  BLDG BUILDING                  BLVD BOULEVARD                  BM BENCH MARK                  BOC BACK OF CURB                  BOD BIOCHEMICAL OXYGEN DEMAND                  BV BALL VALVE                  BVC BEGIN VERTICAL CURVE</p>	<p>G GAS                  GA GAUGE                  GALV GALVANIZED                  GPD GALLONS PER DAY                  GPM GALLONS PER MINUTE                  GPS GLOBAL POSITIONING SYSTEM,                  GALLONS PER SECOND                  GALVANIZED STEEL PIPE                  GATE VALVE</p>	<p>S SLOPE                  SBB SLUDGE BUFFER BASINS                  S/C SERVICE CONNECTION                  SCH SCHEDULE                  SD STORM DRAIN                  SDI STORM DRAIN INLET                  SDR STANDARD DIMENSION RATIO                  SEB SMALL END BELL                  SECT SECTION                  SF SQUARE FOOT/FEET                  SIM SIMILAR                  SOFT SQUARE FOOT/FEET                  SS SANITARY SEWER OR STAINLESS STEEL                  SSMH SANITARY SEWER MANHOLE                  SSP SPIRAL STEEL PIPE                  ST STREET                  STA STATION                  STD STANDARD                  STL STEEL OR STEEL PIPE                  SUPER SUPERNATENT                  SY SQUARE YARDS</p>
<p>C CHANNEL OR CENTER                  CARV COMBINATION AIR RELEASE VALVE                  CATV CABLE TELEVISION                  CF CUBIC FEET                  CFS CUBIC FEET PER SECOND                  CI CAST IRON OR CURB INLET                  CIP CAST IRON PIPE OR CAST-IN-PLACE                  CIPP CURED-IN-PLACE PIPE                  CL CENTERLINE                  CLR CLEAR                  CMP CORRUGATED METAL PIPE                  CMU CONCRETE MASONRY UNIT                  CO CLEANOUT                  CONC CONCRETE                  COS CERTIFICATE OF SURVEY                  CP CONTROL POINT                  CPE CORRUGATED POLYETHYLENE PIPE                  CPLG COUPLING                  CPVC CHLORINATED POLYVINYL CHLORIDE                  CSP CORRUGATED STEEL PIPE                  CV CHECK VALVE                  CY CUBIC YARDS                  C1D1 CLASS 1 DIVISION 1</p>	<p>HD HEAVY DUTY OR HOT-DIPPED                  HDPE HIGH DENSITY POLYETHYLENE PIPE                  HDR HEADER                  HGT HEIGHT                  HP HORSEPOWER                  HT HEIGHT                  HWY HIGHWAY                  HYD HYDRANT</p>	<p>I&amp;C INSTRUMENTATION &amp; CONTROL                  IBC INTERNATIONAL BUILDING CODE                  ID INSIDE DIAMETER                  IN INCH                  INFL INFLUENT                  INT INTERIOR OR INTERSECTION                  INV INVERT</p>
<p>DEC DECAN                  DEMO DEMOLISH                  DEPT DEPARTMENT                  DH DRILL HOLE (SOIL BORING)                  DI DUCTILE IRON OR DRAIN INLET                  DIA DIAMETER                  DIMJ DUCTILE IRON MECHANICAL JOINT                  DIP DUCTILE IRON PIPE                  DL DRAIN LINE                  DR DRAIN OR DIMENSION RATIO                  DWAS DIGESTED WASTE ACTIVATED SLUDGE                  DWG DRAWING</p>	<p>JB JOINT</p>	<p>T TELEPHONE                  TBC TOP BACK OF CURB                  TBLAY TOP BACK OF LAYDOWN CURB                  TBM TEMPORARY BENCH MARK                  TDW TREATED DISINFECTED WATER                  TEMP TEMPERATURE OR TEMPORARY                  THD THREAD                  TOA TOP OF ASPHALT                  TOC TOP OF CONCRETE                  TOG TOP OF GRATE                  TOS TOP OF SIDEWALK                  TOW TOP OF WALL                  TP TEST PIT                  TS TECHNICAL SPECIFICATIONS                  TV CABLE TELEVISION                  TW TREATED WATER                  TWAS THICKENED WASTE ACTIVATED SLUDGE                  TYP TYPICAL</p>
<p>EA EACH                  EFF EFFLUENT                  ELEV ELEVATION                  EOC EDGE OF CONCRETE                  EOP EDGE OF PAVEMENT                  EOS EDGE OF SIDEWALK                  EPDM ETHYLENE PROPYLENE DIENE                  M-CLASS RUBBER                  END VERTICAL CURVE                  EVC EACH WAY                  EW EXTERIOR                  EXT EXISTING</p>	<p>K KILOMETER                  KW KILOWATT</p>	<p>UBC UNIFORM BUILDING CODE                  UG UNDERGROUND                  UGP UNDERGROUND POWER                  UPC UNIFORM PLUMBING CODE</p>
<p>FAB FABRICATION                  FC FLEXIBLE COUPLING                  FCA FLANGED COUPLING ADAPTER                  FDN FOUNDATION                  FETS FLARED END TERMINAL SECTION                  FF FINISHED FLOOR</p>	<p>L ANGLE, LONG                  LB(S) POUND(S)                  LD LOCAL DISCONNECT                  LEB LARGE END BELL                  LF LINEAL FOOT OR LINEAR FEET                  LT LEFT</p>	<p>V VENT, VOLT OR VALVE                  VERT VERTICAL                  VFA VOLATILE FATTY ACID                  VLV VALVE                  VPC VERTICAL POINT OF CURVATURE                  VPT VERTICAL POINT OF TANGENCY                  VTR VENT THROUGH ROOF</p>
<p>MAX MAXIMUM                  MC MECHANICAL COUPLING                  MCC MOTOR CONTROL CENTER                  MDT MONTANA DEPT. OF TRANSPORTATION                  MECH MECHANICAL                  MFR MANUFACTURER                  MH MANHOLE                  MIN MINIMUM OR MINUTE                  MJ MECHANICAL JOINT                  MPT MALE PIPE THREAD                  MPWSS MONTANA PUBLIC WORKS STANDARD                  SPECIFICATIONS                  MTL MATERIAL                  MWS MAXIMUM WATER SURFACE</p>	<p>U OVERALL LENGTH                  ON CENTER                  OD OUTSIDE DIAMETER                  OF OUTSIDE FACE OR OVERFLOW                  OHP OVERHEAD POWER</p>	<p>W WATER OR WEST                  W/ WITH                  W/O WITHOUT                  WAS WASTE ACTIVATED SLUDGE                  WLC WATER LEVEL CONTROL                  WS WATER SURFACE OR WATER STOP                  WSO WATER SERVICE OUTLET                  WSP WELDED STEEL PIPE                  WV WATER VALVE                  WW WASTEWATER                  WWF WELDED WIRE FABRIC</p>
<p>PC POINT OF CURVATURE                  PE PLAIN END                  PH PHONE                  PI POINT OF INTERSECTION                  PL PROPERTY LINE OR PLATE                  PLCS PLACES                  PROP PROPERTY OR PROPOSED                  PSI POUNDS PER SQUARE INCH                  PSIG POUNDS PER SQUARE INCH, GAUGE                  PT POINT OF TANGENCY                  PVC POLYVINYL CHLORIDE PLASTIC                  PVI POINT OF VERTICAL INTERSECTION                  PWR POWER</p>	<p>N NORTH                  NEC NATIONAL ELECTRICAL CODE                  N.I.C. NOT IN CONTRACT                  NO. NUMBER                  NPT NATIONAL PIPE THREAD                  NPW NON-POTABLE WATER                  NTS NOT TO SCALE</p>	<p>X USED AS A VARIABLE                  XING CROSSING</p>
<p>YD YARD                  YPC YELLOW PLASTIC CAP</p>	<p>YD YARD                  YPC YELLOW PLASTIC CAP</p>	<p>YD YARD                  YPC YELLOW PLASTIC CAP</p>

**ABBREVIATION NOTES:**

- CONTACT THE ENGINEER FOR ABBREVIATIONS NOT LISTED.
- THIS IS A STANDARD ABBREVIATIONS SHEET. THEREFORE, SOME ABBREVIATIONS MAY APPEAR ON THIS SHEET AND MAY NOT BE UTILIZED ON THIS PROJECT.

**GENERAL NOTES:**

- CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS FOR CONSTRUCTION, DEWATERING AND STORMWATER DISCHARGES.
- AS CONSTRUCTED ELEVATIONS SHALL BE WITHIN 0.25' OF ELEVATION SPECIFIED ON THE PLAN DRAWINGS.
- CONTRACTOR SHALL PROTECT AND PRESERVE ALL EXISTING SITE FEATURES (INCLUDING VEGETATION, SURFACES, STRUCTURES, SURVEY MONUMENTATION, MAILBOXES, CULVERTS, SIGNAGE, DRAINAGE, ETC.) TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. ANY DAMAGE TO EXISTING SITE FEATURES SHALL BE REPAIRED TO ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- "OR APPROVED EQUAL" IS IMPLIED WHENEVER A SPECIFIC PRODUCT IS REFERENCED.

**NOTES FOR WATER MAINS:**

- THE TOWN AND RESIDENTS SHALL BE NOTIFIED PRIOR TO CHANGE OR DISRUPTION OF WATER OR SEWER SYSTEM OPERATION.
- WATER MAIN PIPING SHALL BE C900 PVC OR DUCTILE IRON.
- ALL MAIN FITTINGS, INCLUDING WYES, REDUCERS AND ELBOWS EQUAL TO OR GREATER THAN 22-1/2° SHALL BE RESTRAINED MECHANICAL JOINT. ALL MECHANICAL JOINT RESTRAINTS SHALL BE "MEGALUG", UNIFLANGE OR EQUAL JOINT RESTRAINT SHALL BE IN ADDITION TO MEETING THRUST BLOCK REQUIREMENTS FOR ALL TEES AND 90° BENDS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. TRENCHES FOR THE INSTALLATION OF WATER MAINS SHALL BE PROPERLY BACKFILLED AS QUICKLY AS POSSIBLE, BUT NO MORE THAN 48-HOURS AFTER INITIAL DIGGING. TRENCHES WITHIN MDT R.O.W. SHALL BE BACKFILLED AND COMPACTED AT THE END OF EACH DAY AS PER MDT STANDARDS. NON-SHRINK BACKFILL (FLOWABLE FILL) SHALL BE REQUIRED WHERE STANDARD COMPACTION EQUIPMENT CANNOT BE USED.
- WHEN WORKING NEAR AND/OR EXPOSING EXISTING UTILITIES AND SERVICE LINES, WORKERS SHALL UTILIZE HAND-DIGGING IN ORDER TO AVOID DAMAGE TO THOSE UTILITIES. IF DAMAGE OCCURS, THE COST OF REPAIR AND ANY PENALTIES WILL BE AT THE CONTRACTORS EXPENSE.
- ALL EXISTING CONCRETE DIRECTLY AFFECTED BY WATERMAIN INSTALLATION SHALL BE REPAIRED WITH FIBERMESH REINFORCED M4000 CONCRETE. SIDEWALKS DAMAGED BY CONTRACTOR'S EQUIPMENT SHALL BE REPLACED TO CONTRACT SPECIFICATIONS AT NO ADDITIONAL COST TO OWNER, AS NOTED ON THE PLAN SHEETS.
- A MINIMUM OF 18" OF VERTICAL AND 10' OF HORIZONTAL SEPARATION MUST BE MAINTAINED BETWEEN NEW WATERMAIN AND EXISTING SANITARY OR STORM SEWER COLLECTION PIPES. AT ALL CROSSINGS, ONE FULL LENGTH OF WATER PIPE MUST BE LOCATED SO BOTH JOINTS ARE AS FAR FROM THE EXISTING SANITARY OR STORM SEWER COLLECTION PIPES AS POSSIBLE.
- RE-CONNECT ALL ACTIVE SERVICE LINES AT OR NEAR THE POINT OF CONNECTION TO THE EXISTING WATERMAIN OR AT THE EXISTING CURB STOP. REPLACEMENT OF CURB STOPS IS NOT REQUIRED.

**UTILITY NOTES:**

- BEFORE BEGINNING AN EXCAVATION, THE CONTRACTOR SHALL NOTIFY, THROUGH ONE-CALL NOTIFICATION CENTER, ALL OWNERS OF UNDERGROUND FACILITIES IN THE AREA OF THE PROPOSED EXCAVATION. THE PHONE NUMBER IS: **1-800-424-5555**. THE WEBSITE IS: [www.callbeforeyoudig.org](http://www.callbeforeyoudig.org). UPON REQUEST, THE CONTRACTOR SHALL PROVIDE VERIFICATION THAT ONE-CALL HAS BEEN NOTIFIED.
- AFTER AN OWNER OF AN UNDERGROUND FACILITY HAS LOCATED AND MARKED THE UNDERGROUND FACILITIES, THE CONTRACTOR SHALL DETERMINE IF WEATHER, TIME, OR OTHER FACTORS MAY HAVE AFFECTED LOCATION MARKS, WARRANTING RELOCATION OF THE FACILITIES.
- IF EXCAVATION HAS NOT OCCURRED WITHIN 30 DAYS OF THE LOCATE AND MARK, THE CONTRACTOR SHALL REQUEST THAT THE FACILITY BE RELOCATED AND REMARKED BEFORE EXCAVATING UNLESS OTHER ARRANGEMENTS HAVE BEEN MADE WITH THE UNDERGROUND UTILITY OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH RELOCATING AND REMARKING A FACILITY THAT IS NOT EXCAVATED WITHIN 30 DAYS OF THE LOCATE AND MARK.
- THE CONTRACTOR MAY NOT BEGIN EXCAVATING BEFORE THE LOCATING AND MARKING IS COMPLETE OR BEFORE THE CONTRACTOR IS NOTIFIED THAT LOCATING AND MARKING IS UNNECESSARY.
- THE CONTRACTOR SHALL LOCATE AND MARK THE AREA TO BE EXCAVATED IF REQUESTED BY THE UNDERGROUND FACILITY OWNER OR THEIR REPRESENTATIVE. IF THE CONTRACTOR DISCOVERS AN UNDERGROUND FACILITY THAT HAS NOT BEEN LOCATED AND MARKED, THE CONTRACTOR SHALL STOP EXCAVATING IN THE VICINITY OF THE FACILITY AND NOTIFY THE FACILITY OWNER OR THE ONE-CALL NOTIFICATION CENTER. IF THIS OCCURS THE CONTRACTOR SHALL PROCEED WITH OTHER ELEMENTS OF THE PROJECT, AT NO COST TO THE PROJECT OWNER, UNTIL THE UNDERGROUND FACILITY OWNER HAS NOTIFIED THE CONTRACTOR THAT EXCAVATION CAN PROCEED.
- PRIVATE INDIVIDUAL UNDERGROUND FACILITIES HAVE NOT BEEN LOCATED AND ARE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR SHOULD THEY BE DAMAGED. THESE INDIVIDUAL UNDERGROUND FACILITIES MAY INCLUDE BUT ARE NOT LIMITED TO: INDIVIDUAL ELECTRIC, NATURAL GAS, PROPANE, TELEPHONE, SEWER, SATELLITE DISH, AND WATER SERVICE LINES. TELECOMMUNICATION UTILITIES SHALL BE CONTACTED IN ADVANCE TO COORDINATE UTILITY LOCATION AND CONSTRUCTION WORK.

**EQUIPMENT NOTES:**

- SPECIFICALLY IDENTIFYING EQUIPMENT MANUFACTURERS DOES NOT DISQUALIFY OTHER "OR EQUAL" MANUFACTURERS FROM SUBMITTING.



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

Engineer

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 Phone (406) 449-3303  
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Owner

**Town of  
 Alberton**

Project Title

**Alberton  
 Water System  
 Improvements  
 Project**

Sheet Title

**Abbreviations  
 & Notes**

Sheet

**G-5**



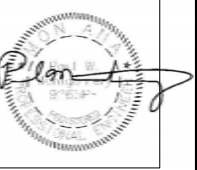
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**Borehole Locations**

**NOTES:**

- GEOTECHNICAL REPORT INCLUDED IN APPENDIX A OF THE CONTRACT DOCUMENTS.



Revision	Date	By
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Final Draft	12-14-23	PWM
Final	2-5-24	PWM
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Revision  
Final Re-Bid  
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A. Eckhart, P.E.  
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P. Montgomery, P.E.

Engineer



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Owner  
  
Town of Alberton

Project Title  
  
Alberton  
Water System  
Improvements  
Project

Sheet Title  
  
Geotechnical  
Borehole  
Locations

Sheet  
  
**G-7**

# CITY OF ALBERTON

SITE MAP - SHEET INDEX  
 LOCATED IN SECTIONS 2 AND 3,  
 TOWNSHIP 14 NORTH, RANGE 23 WEST,  
 PRINCIPAL MERIDIAN MONTANA;  
 MINERAL COUNTY, MONTANA



Revision	Date	By
Draft	8-11-23	PWM
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Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

Sheet Title

Location and Survey Control Coordinates

Sheet

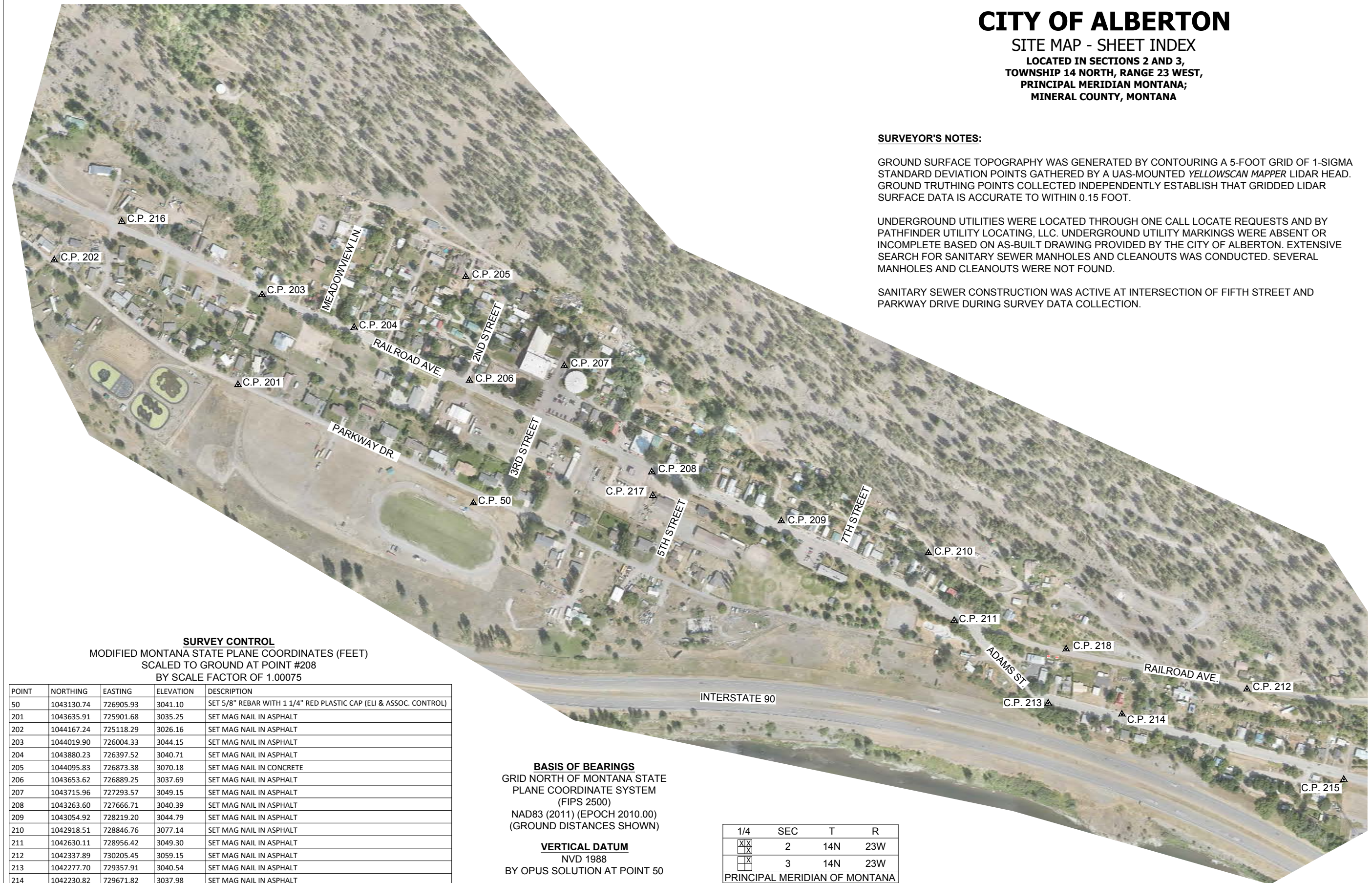
GC-1

### SURVEYOR'S NOTES:

GROUND SURFACE TOPOGRAPHY WAS GENERATED BY CONTOURING A 5-FOOT GRID OF 1-SIGMA STANDARD DEVIATION POINTS GATHERED BY A UAS-MOUNTED YELLOWSCAN MAPPER LIDAR HEAD. GROUND TRUTHING POINTS COLLECTED INDEPENDENTLY ESTABLISH THAT GRIDDED LIDAR SURFACE DATA IS ACCURATE TO WITHIN 0.15 FOOT.

UNDERGROUND UTILITIES WERE LOCATED THROUGH ONE CALL LOCATE REQUESTS AND BY PATHFINDER UTILITY LOCATING, LLC. UNDERGROUND UTILITY MARKINGS WERE ABSENT OR INCOMPLETE BASED ON AS-BUILT DRAWING PROVIDED BY THE CITY OF ALBERTON. EXTENSIVE SEARCH FOR SANITARY SEWER MANHOLES AND CLEANOUTS WAS CONDUCTED. SEVERAL MANHOLES AND CLEANOUTS WERE NOT FOUND.

SANITARY SEWER CONSTRUCTION WAS ACTIVE AT INTERSECTION OF FIFTH STREET AND PARKWAY DRIVE DURING SURVEY DATA COLLECTION.



### SURVEY CONTROL MODIFIED MONTANA STATE PLANE COORDINATES (FEET) SCALED TO GROUND AT POINT #208 BY SCALE FACTOR OF 1.00075

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
50	1043130.74	726905.93	3041.10	SET 5/8" REBAR WITH 1 1/4" RED PLASTIC CAP (ELI & ASSOC. CONTROL)
201	1043635.91	725901.68	3035.25	SET MAG NAIL IN ASPHALT
202	1044167.24	725118.29	3026.16	SET MAG NAIL IN ASPHALT
203	1044019.90	726004.33	3044.15	SET MAG NAIL IN ASPHALT
204	1043880.23	726397.52	3040.71	SET MAG NAIL IN ASPHALT
205	1044095.83	726873.38	3070.18	SET MAG NAIL IN CONCRETE
206	1043653.62	726889.25	3037.69	SET MAG NAIL IN ASPHALT
207	1043715.96	727293.57	3049.15	SET MAG NAIL IN ASPHALT
208	1043263.60	727666.71	3040.39	SET MAG NAIL IN ASPHALT
209	1043054.92	728219.20	3044.79	SET MAG NAIL IN ASPHALT
210	1042918.51	728846.76	3077.14	SET MAG NAIL IN ASPHALT
211	1042630.11	728956.42	3049.30	SET MAG NAIL IN ASPHALT
212	1042337.89	730205.45	3059.15	SET MAG NAIL IN ASPHALT
213	1042277.70	729357.91	3040.54	SET MAG NAIL IN ASPHALT
214	1042230.82	729671.82	3037.98	SET MAG NAIL IN ASPHALT
215	1041952.74	730618.42	3011.56	SET MAG NAIL IN ASPHALT
216	1044331.55	725405.84	3049.54	SET 5/8" REBAR WITH 1 1/4" RED PLASTIC CAP (ELI & ASSOC. CONTROL)
217	1043162.95	727671.07	3045.32	SET 5/8" REBAR WITH 1 1/4" RED PLASTIC CAP (ELI & ASSOC. CONTROL)
218	1042508.30	729434.13	3060.26	SET 5/8" REBAR WITH 1 1/4" RED PLASTIC CAP (ELI & ASSOC. CONTROL)

**BASIS OF BEARINGS**  
 GRID NORTH OF MONTANA STATE  
 PLANE COORDINATE SYSTEM  
 (FIPS 2500)  
 NAD83 (2011) (EPOCH 2010.00)  
 (GROUND DISTANCES SHOWN)

**VERTICAL DATUM**  
 NVD 1988  
 BY OPUS SOLUTION AT POINT 50

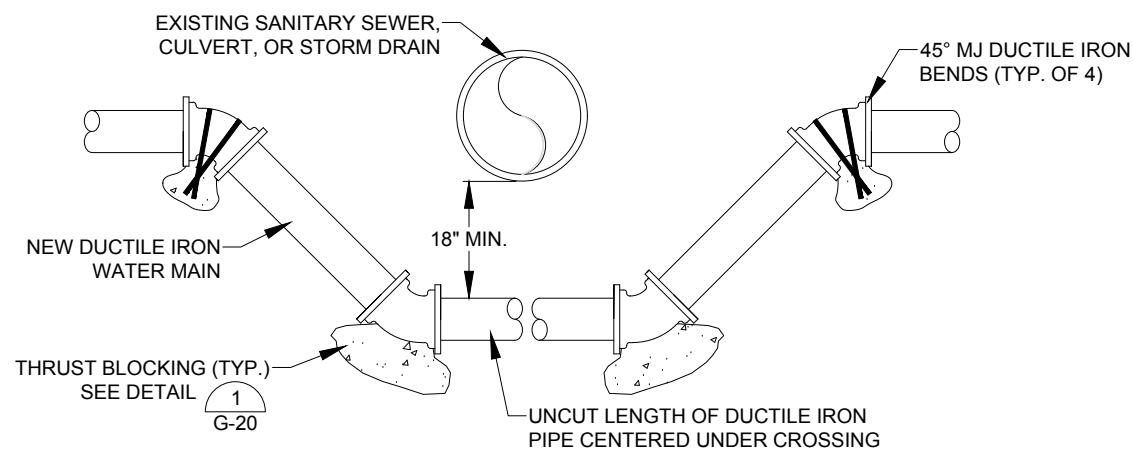
**SURVEY TIMELINE**  
 INITIAL SURVEY DATE: 08/22 & 09/22  
 PLAT DRAWN: NOVEMBER 14, 2022

1/4	SEC	T	R
X	2	14N	23W
X	3	14N	23W

PRINCIPAL MERIDIAN OF MONTANA  
 CITY OF ALBERTON  
 MINERAL COUNTY, MONTANA

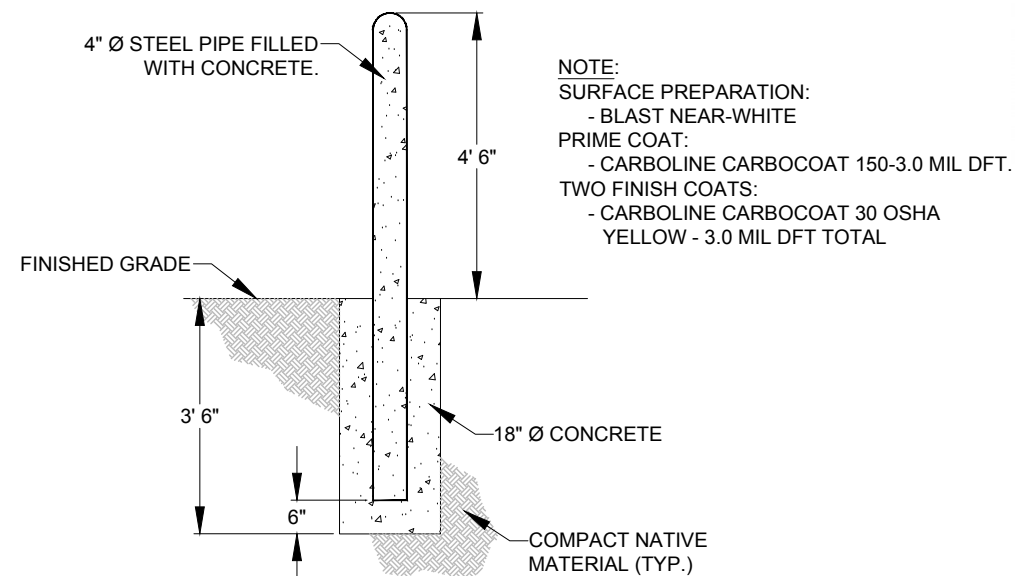


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**NOTE:**  
DURING CROSSINGS, STRUCTURAL SUPPORT OF THE SEWER OR STORM DRAIN SHALL BE PROVIDED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING DAMAGE TO ANY EXISTING PIPES. IF AN EXISTING PIPE IS DAMAGED DUE TO CONTRACTOR NEGLIGENCE, THE PIPE SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.

**Vertical Pipe Adjustment** 1  
NO SCALE



**NOTE:**  
SURFACE PREPARATION:  
- BLAST NEAR-WHITE  
PRIME COAT:  
- CARBOLINE CARBOCOAT 150-3.0 MIL DFT.  
TWO FINISH COATS:  
- CARBOLINE CARBOCOAT 30 OSHA YELLOW - 3.0 MIL DFT TOTAL

**NOTE:**  
• BUILDING FACE, CONCRETE PADS, OR OTHER DRIVING HAZARDS SHALL BE A MINIMUM OF 12" FROM THE CENTERLINE OF PIPE BOLLARD.  
• BOLLARDS LOCATED INSIDE BUILDINGS SHALL BE REMOVABLE.

**Typical Pipe Bollard Detail** 2  
NO SCALE

**NOTES:**

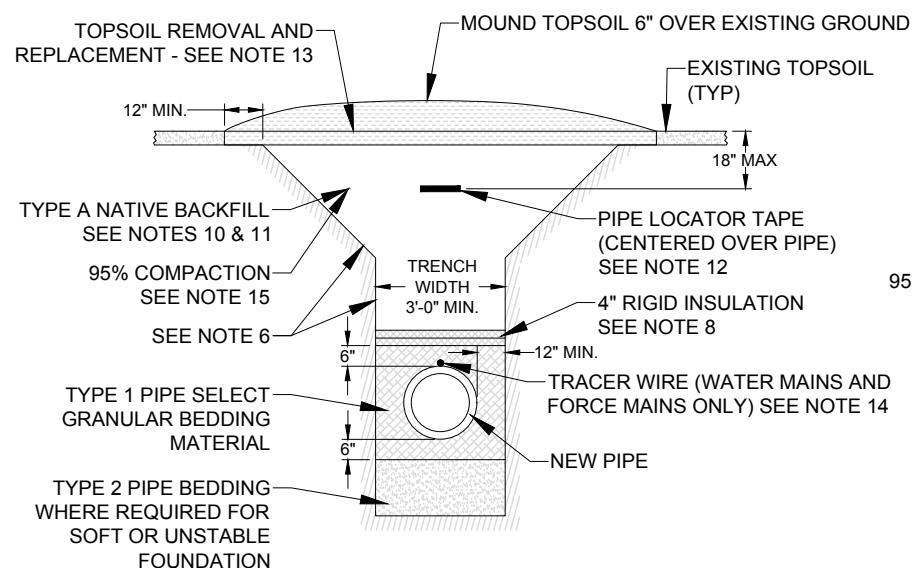
- WHERE TRENCH PASSES THROUGH UNIMPROVED SURFACES: THE TOPSOIL SHALL BE REMOVED AND REPLACED A MINIMUM OF 12" FROM THE EDGE OF THE TRENCH OPENING.
- WHERE TRENCH PASSES THROUGH EXISTING GRAVEL: THE GRAVEL SHALL BE REMOVED AND REPLACED A MINIMUM OF 12" FROM THE EDGE OF THE TRENCH OPENING.
- WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT: THE PAVEMENT SHALL BE CUT ALONG A NEAT VERTICAL LINE A MINIMUM OF 12" FROM THE EDGE OF THE TRENCH OPENING, JUST PRIOR TO PAVING.
- WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT: SAWCUT THE ASPHALT ALONG A NEAT VERTICAL LINE PER LIMITS SHOWN ON THE PLANS, JUST PRIOR TO PAVING. WHERE IMPORTED TRENCH BACKFILL IS NOT USED, SEPARATION/STABILIZATION FABRIC, PROPEX GEOTEX 801 NON-WOVEN GEOTEXTILE FABRIC OR APPROVED EQUAL WILL BE USED.
- VERIFY THAT COMPACTION METHODS ARE COMPARABLE WITH PIPE MANUFACTURER'S RECOMMENDATIONS. ANY DAMAGE TO THE PIPE WILL BE THE CONTRACTOR'S RESPONSIBILITY.

**NOTES CONTINUED:**

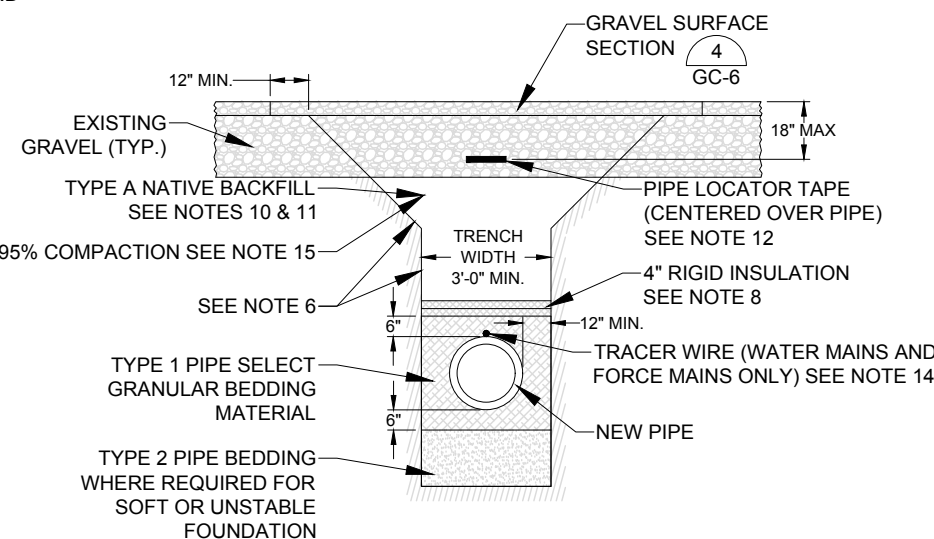
- TRENCH SHALL BE CONSTRUCTED TO OSHA SPECIFICATIONS FOR EXCAVATION. DRAWINGS DO NOT SHOW TRENCH DIMENSIONS OR BACK-SLOPES THAT MAY BE REQUIRED. CONTRACTOR REQUIRED TO DETERMINE WHICH OSHA SPECIFICATIONS ARE APPLICABLE.
- ALL SPOILS SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED LOCATION.
- INSTALL 4" OF RIGID INSULATION THE FULL WIDTH OF THE TRENCH IN ALL AREAS WHERE 6' OF COVER CANNOT BE OBTAINED BY OBSERVING SURROUNDING TOPOGRAPHY.
- ALL ROCKS GREATER THAN 12" IN ANY DIMENSION SHALL BE HAULED OFF SITE AND DISPOSED OF PROPERLY.
- NO ROCKS OR LUMPS LARGER THAN 2" IN ANY DIMENSION SHALL BE ALLOWED WITHIN 6" OF THE PIPE.
- USE SUITABLE NATIVE MATERIAL FOR BACKFILL. SEE TECHNICAL SPECIFICATIONS FOR CONDITIONS REQUIRING IMPORTED TRENCH BACKFILL.

**NOTES CONTINUED:**

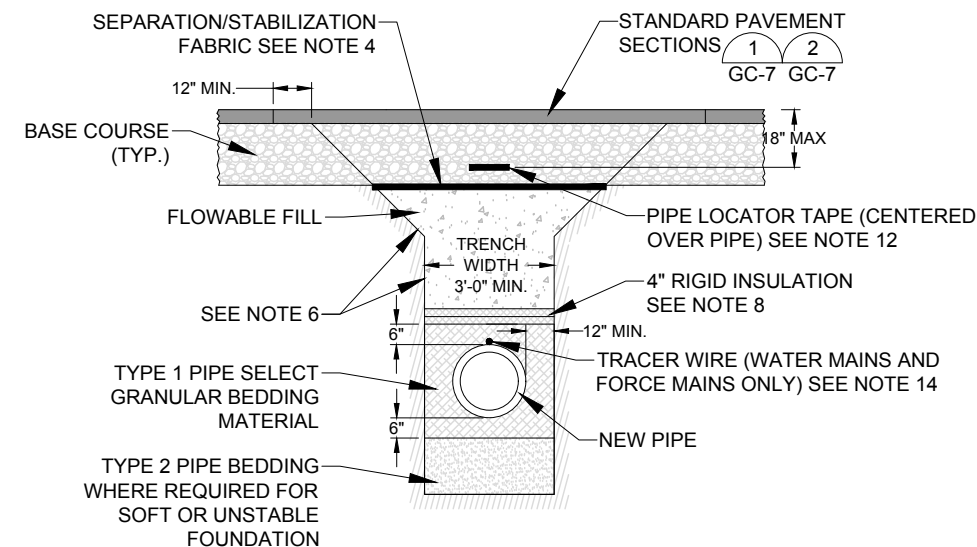
- USE LABELED AND COLOR-CODED TAPE FOR THE APPROPRIATE UTILITY PIPE, PLACED 18" MAXIMUM BELOW FINISHED SURFACE.
- SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS WHICH ARE NOT PAVED, CONCRETED, SODDED, OR GRAVELED PER SPECIFICATIONS.
- FOR WATER MAINS AND FORCE MAINS TRACER WIRE SHALL BE TAPED TO TOP OF ALL PLASTIC PIPE (PVC, POLYTHYLENE, AND HDPE) AND BROUGHT UP FIRE HYDRANTS AND VALVE PIPE CASINGS.
- COMPACTION REFERS TO PERCENT OF MAXIMUM DENSITY DETERMINED BY A STANDARD PROCTOR. ASTM D698-91. TRENCHES EXCEEDING 10 FEET IN DEPTH SHALL BE COMPACTED TO 98% OF MAXIMUM DENSITY PER ASTM D698-91.
- FINISHED GRADE MUST MATCH THE ORIGINAL EXISTING GRADE WHERE PIPE IS INSTALLED UNLESS OTHERWISE NOTED.
- REFER TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.



**UNIMPROVED SURFACE**

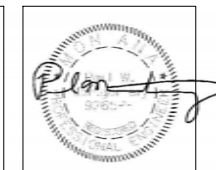


**GRAVELED SURFACE**



**PAVED SURFACE**

**Pipe Bedding & Backfill Details** 3  
NO SCALE



Revision	Date	By
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Revision  
Final Re-Bid  
Plot Scale  
1:2  
Drawn By  
A. Eckhart, P.E.  
Approved By  
P. Montgomery, P.E.  
Checked By  
A. Eckhart, P.E.  
Designed By  
P. Montgomery, P.E.

Engineer  
**Anderson-Montgomery**  
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Owner  
**Town of Alberton**

Project Title  
**Alberton Water System Improvements Project**

Sheet Title  
**General Civil Details**

Sheet  
**GC-2**

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**NOTES:**

- KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES
- POUR THRUST BLOCKING AGAINST 3/4" MINUS GRAVEL OR STRUCTURAL FILL. 3/4" MINUS GRAVEL OR STRUCTURAL FILL SHALL BE AGAINST UNDISTURBED EARTH.
- REQUIRED VOLUMES AND BEARING AREAS SHALL BE AS SHOWN IN THE TABLE AND ADJUSTED, IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS OF 2,000 LBS/SQFT.
- THRUST BLOCK VOLUMES FOR VERTICAL BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 PSIG AND THE WEIGHT OF CONCRETE = 4,050 LBS PER CUBIC YARD. TO COMPUTE VOLUMES FOR DIFFERENT TEST PRESSURES USE THE FOLLOWING EQUATION:  
ACTUAL VOLUME = (TEST PRESSURE/150) X (TABLE VOLUME).
- BEARING AREAS FOR HORIZONTAL BEND THRUST BLOCKS ARE BASED ON TEST PRESSURE OF 150 PSIG AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 LBS/SQFT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES US THE FOLLOWING EQUATION:  
 $B_1 = B(13.33)(P_1 / 2000)$  WHERE:  
 $P_1$  = ACTUAL TEST PRESSURE, PSIG  
 $B$  = COMPUTED BEARING AREA  
 $B_1$  = BEARING AREA FROM TABLE
- VERTICAL BENDS HAVING DOWNWARD RESULTANT THRUSTS AND HORIZONTAL BENDS, HAVE THE SAME THRUST BLOCK REQUIREMENTS.
- BEARING AREAS, VOLUMES, AND SPECIAL BLOCKING DETAILS SHOWN ELSEWHERE IN THESE PLANS TAKE PRECEDENCE OVER THIS STANDARD DETAIL.
- THRUST BLOCK BEARING AREA SHALL NOT BE LESS THAN 1.0 SQFT.
- TEST PRESSURES ARE INDICATED IN THE SPECIFICATIONS AND THE ALLOWABLE SOIL BEARING STRESS IS 2,000 LBS/SQFT.
- THE USE OF RESTRAINED JOINT SYSTEMS WILL BE ACCEPTED AS AN ALTERNATIVE TO CONVENTIONAL CONCRETE THRUST BLOCKING.
- CONTRACTOR SHALL PROVIDE THRUST BLOCKING FOR ALL BURIED FITTINGS AND VALVES.**

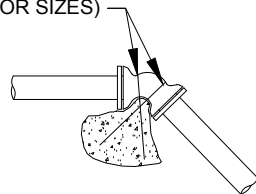
VOLUME OF THRUST BLOCK IN CUBIC YARDS (VERTICAL BENDS)			
FITTING SIZE (INCHES)	BEND ANGLE		
	45°	22-1/2°	11-1/4°
4	0.8	0.3	0.1
6	2.0	0.8	0.3
8	3.0	1.1	0.4
10	4.5	1.7	0.7
12	5.4	2.4	1.0
14	8.6	3.2	1.3
16	11.1	4.2	1.7
18	14.1	5.3	2.2
20	17.3	6.6	2.7
24	24.2	9.2	3.8

BEARING AREA OF THRUST BLOCKS IN SQFT. (HORIZONTAL BENDS)								
FITTING SIZE (INCHES)	TEE, WYE, PLUG, OR CAP	90° BEND, PLUGGED CROSS	TEE, PLUGGED RUN		BEND ANGLE			
			A <sub>1</sub>	A <sub>2</sub>	45°	22-1/2°	11-1/4°	
4	1.3	1.8	1.3	1.8	1.0	1.0	--	
6	3.0	4.2	3.0	4.2	2.3	1.2	1.0	
8	5.3	7.6	5.3	7.6	4.1	2.1	1.0	
10	8.3	11.8	8.3	11.8	6.4	3.3	1.6	
12	12.0	17.0	12.0	17.0	9.2	4.7	2.4	
14	16.3	23.1	16.3	23.1	12.5	6.4	3.2	
16	21.4	30.2	21.4	30.2	16.3	8.3	4.2	
18	27.0	32.0	27.0	32.0	20.7	10.5	5.3	
20	33.4	47.2	33.4	47.2	25.5	13.0	6.5	
24	40.3	55.0	40.3	55.0	35.7	18.0	9.0	

NOTE:  
\* EACH AREA (A/2) IS HAVE OF TABULATED TOTAL AREA  
\*\* RESTRAINED PLUG

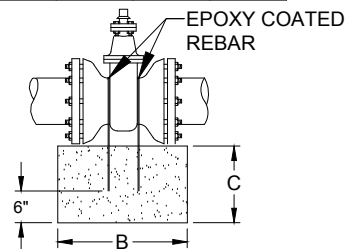
VERTICAL BEND REBAR		
FITTING SIZE	ROD SIZE	EMBEDMENT
12" AND LESS	#6	30"
14" - 16"	#8	36"
18" - 20"	#10	36"
24"	#11	42"

NOTE:  
EPOXY COATED REBAR OVER FITTING AND EMBEDDED IN CONCRETE (SEE TABLE FOR SIZES)

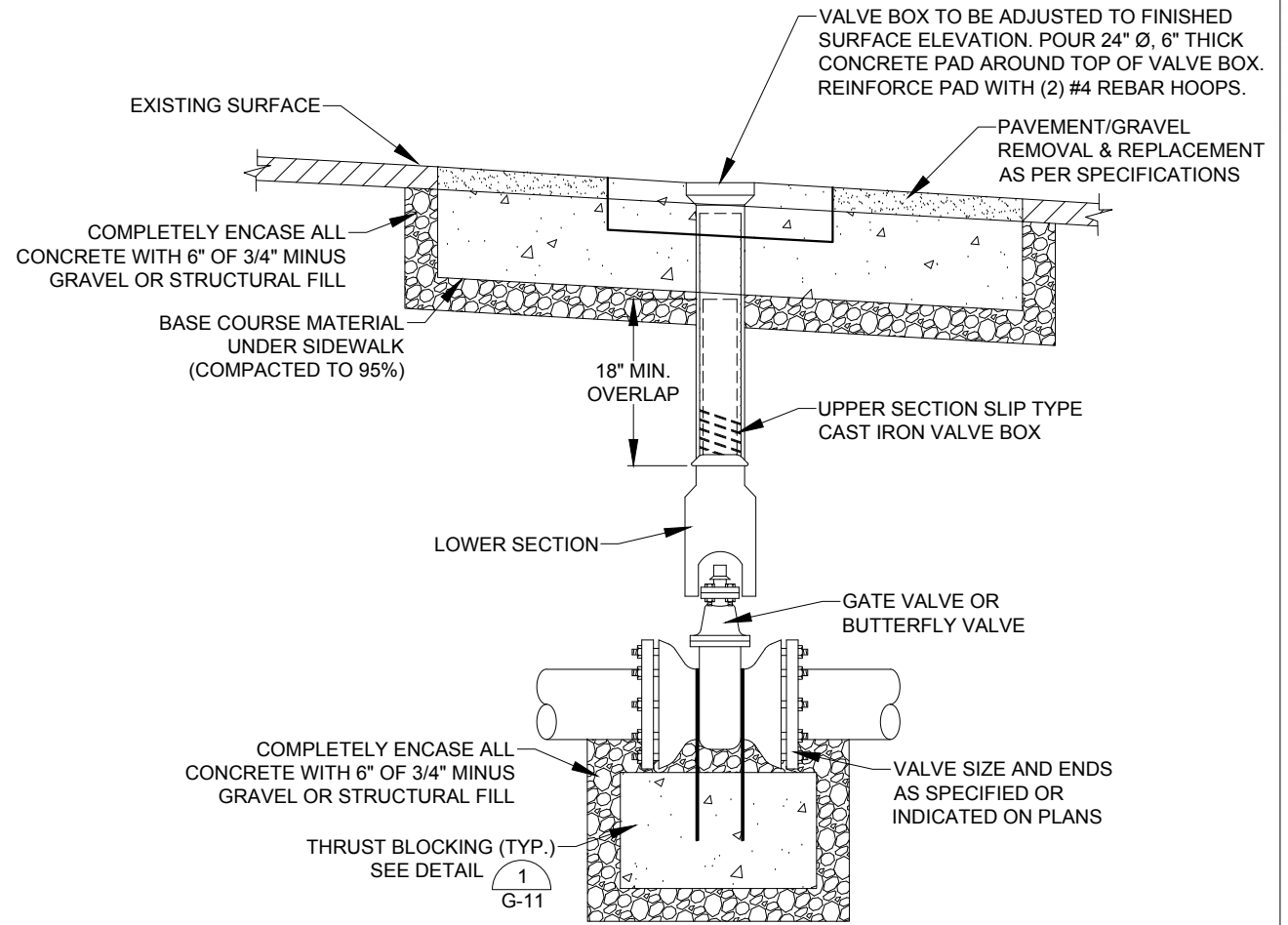


VALVE THRUST BLOCK DIMENSIONS							
VALVE SIZE	REBAR SIZE	100 PSI			150 PSI		
		A	B	C	A	B	C
4"	#6	2.0'	2.0'	2.0'	2.0'	2.0'	2.0'
6"	#6	2.0'	2.0'	2.0'	2.0'	2.0'	2.0'
8"	#6	2.0'	2.0'	2.0'	2.0'	2.0'	2.0'
10"	#6	2.0'	2.0'	2.0'	2.5'	2.5'	2.0'
12"	#6	2.3'	2.0'	2.0'	3.0'	3.0'	2.7'
14"	#8	2.3'	2.0'	2.3'	3.4'	3.0'	3.0'
16"	#9	3.0'	3.0'	2.9'	4.3'	3.0'	3.0'
18"	#10	3.7'	3.0'	3.0'	5.4'	3.0'	3.0'
20"	#10	3.9'	3.3'	3.3'	5.7'	3.3'	3.3'
24"	#11	4.3'	4.0'	4.0'	6.4'	4.0'	4.0'

NOTE:  
DIMENSION 'A' IS WIDTH OF THRUST BLOCK (PERPENDICULAR TO PAGE)

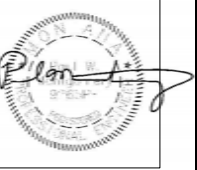
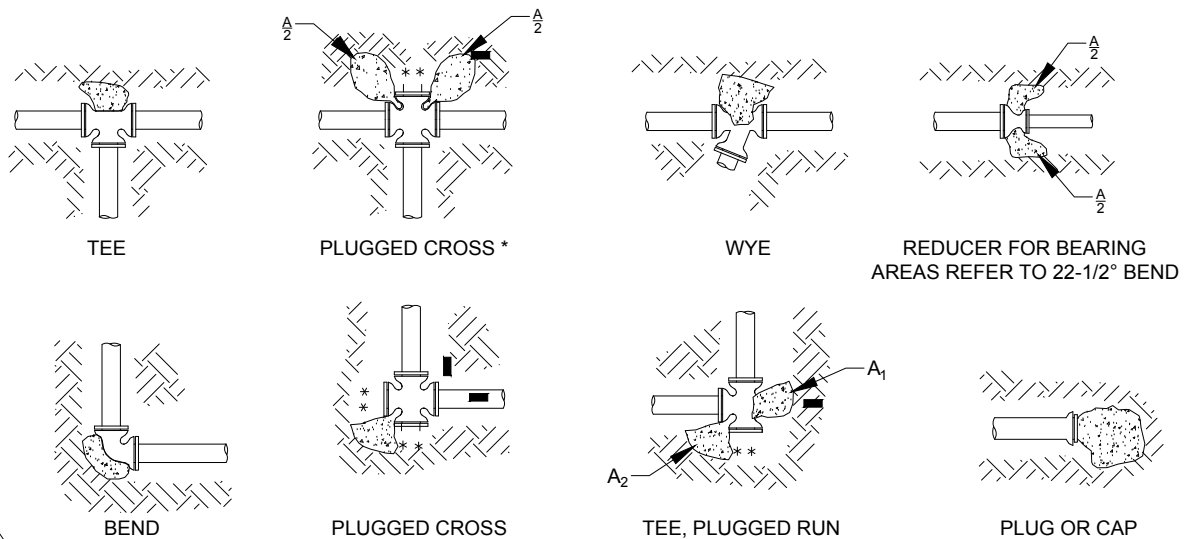


**Thrust Block** 1  
NO SCALE



- NOTE:
- ALL VALVES AND FITTINGS SHALL BE POLYWRAPPED AND SEALED WITH 3M POLYTAPPE OR APPROVED EQUAL.
  - NO PAYMENT SHALL BE MADE FOR ADJUSTMENT OF VALVE BOXES TO FINAL GRADE.
  - COMPACT ALL BACKFILL AROUND THE VALVE BOX UPPER SECTION BY MEANS OF HAND TAMPING.
  - CONTRACTOR SHALL PROVIDE OWNER WITH 1 VALVE WRENCH.
  - ALL CONCRETE AND CONCRETE THRUST BLOCKING SHALL BE ENCASED IN 3/4" MINUS GRAVEL OR STRUCTURAL FILL.

**Valve Setting** 2  
NO SCALE



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Checked By  
A. Eckhart, P.E.  
Designed By  
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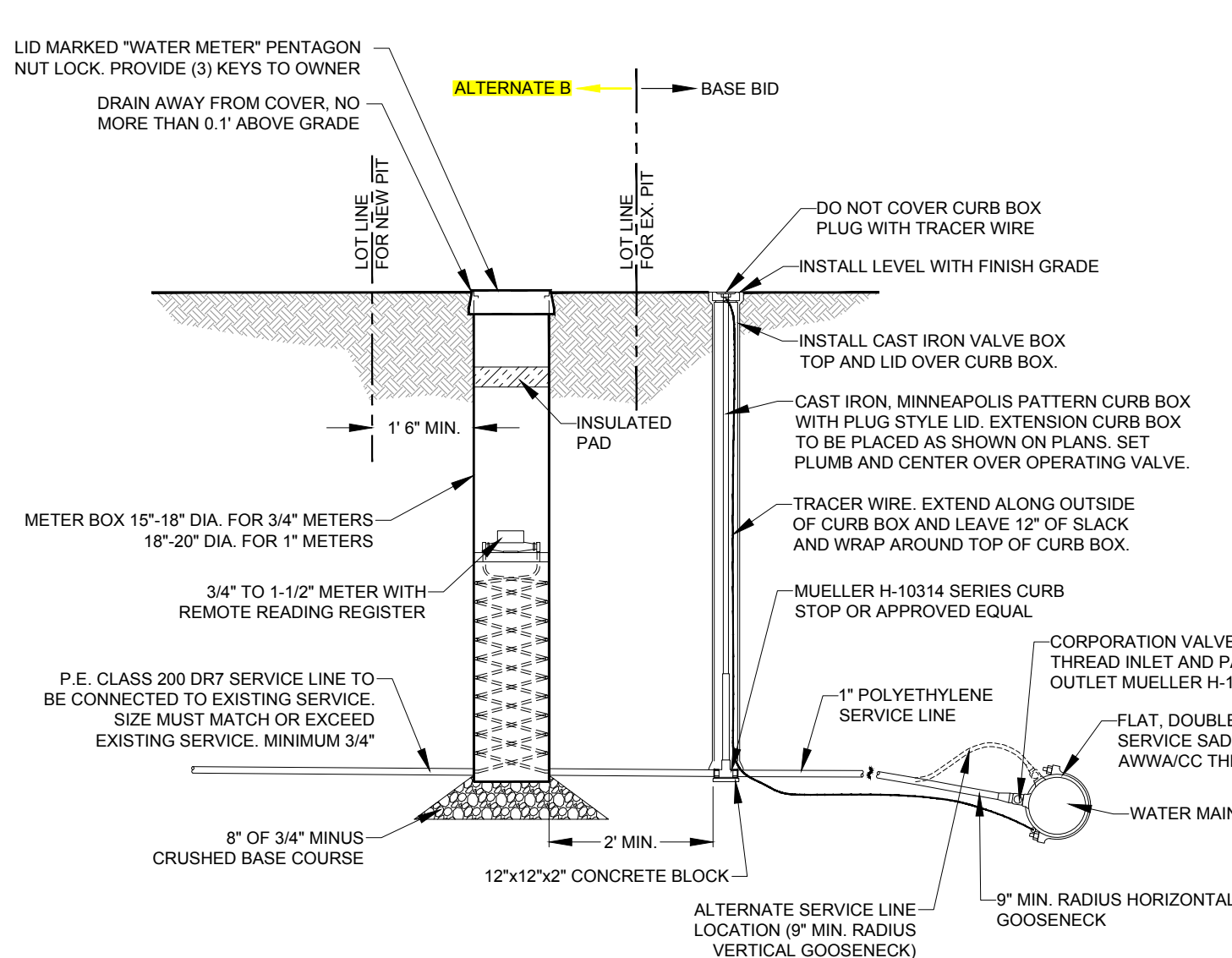
Owner  
**Town of Alberton**

Project Title  
**Alberton Water System Improvements Project**

Sheet Title  
**General Civil Details**

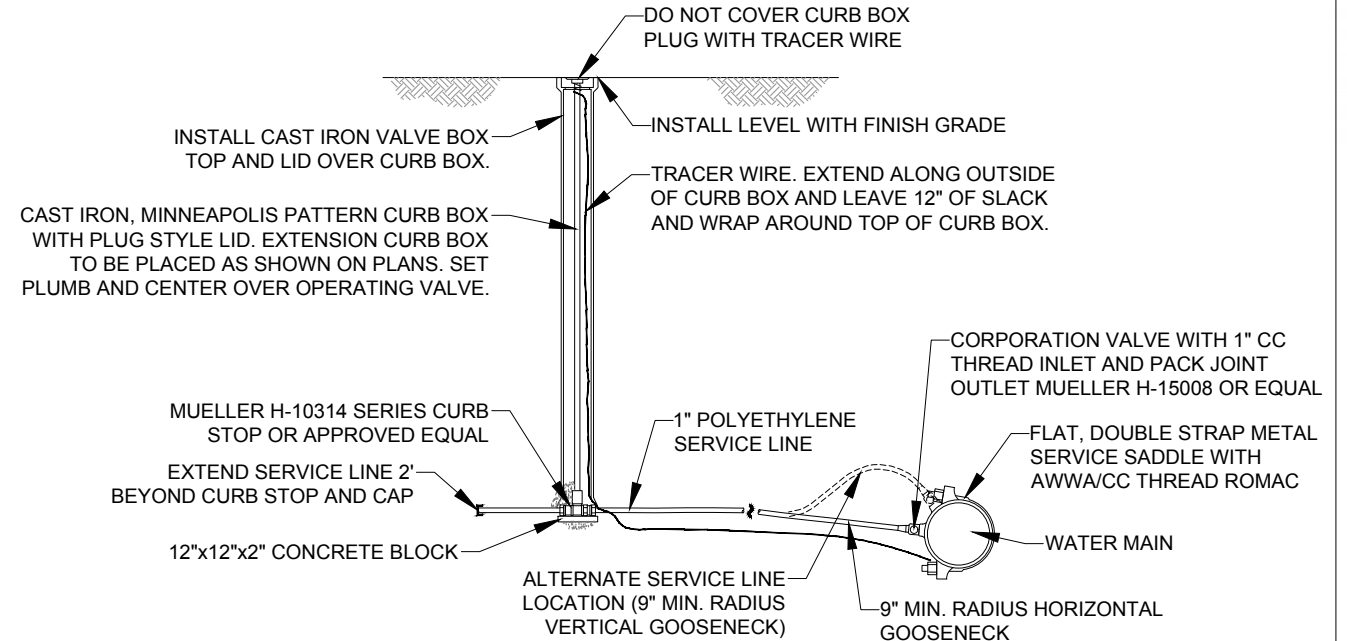
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**GC-3**

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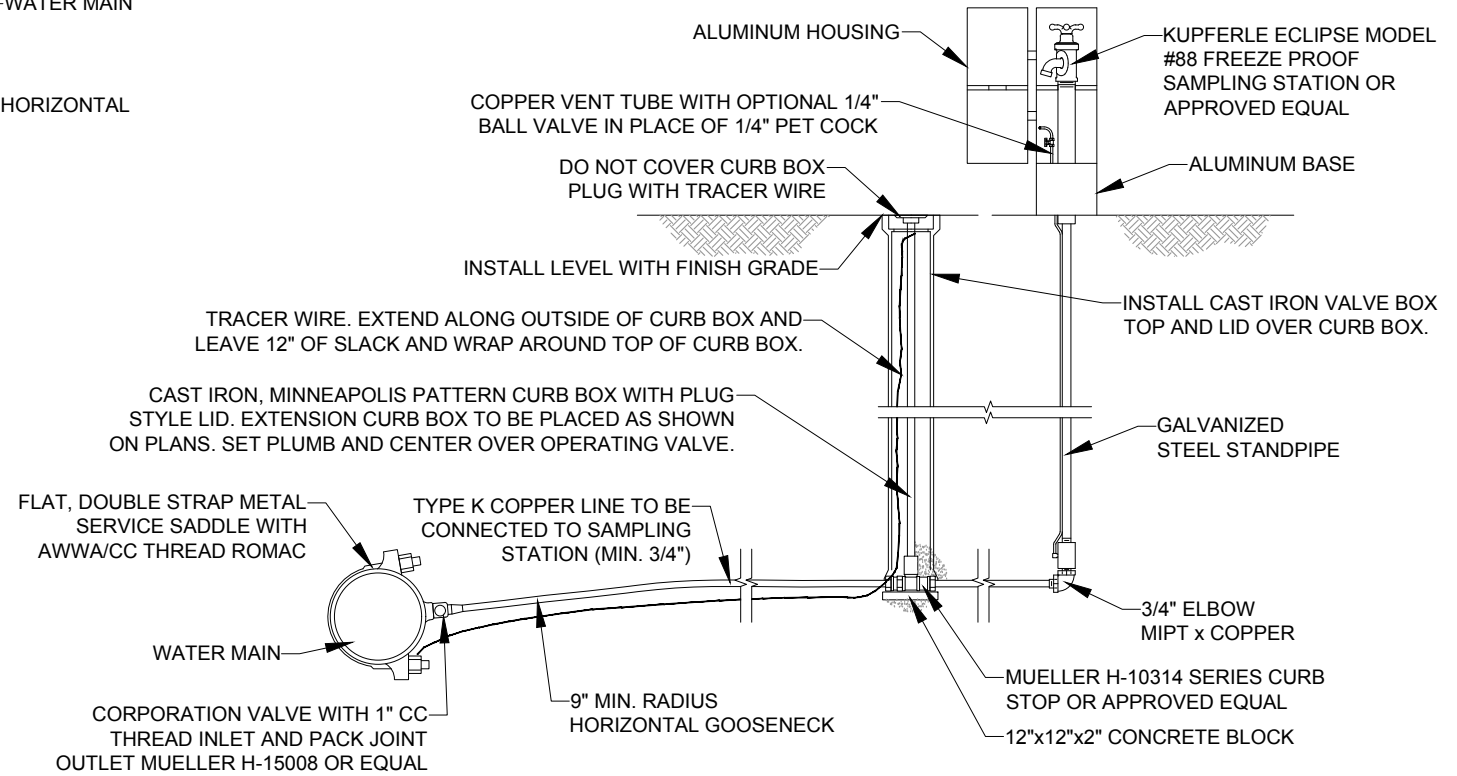
**Typical Active Water Service and Meter Pit Detail** (1)  
NO SCALE

- NOTES:**
- METER PITS INSTALLED IN AREAS SUBJECT TO VEHICLES TRAFFIC SHALL HAVE DUCTILE IRON LIDS RATED FOR VEHICULAR LOADING.
  - TRANSMITTERS FOR METERS INSTALLED IN METER PITS IN GROUNDWATER SHALL BE MOUNTED BETWEEN THE LOWER AND UPPER LIDS IN THE LID OR AS RECOMMENDED BY THE MANUFACTURER & ENGINEER.
  - METER BOX SHALL BE INSTALLED PLUMB & LEVEL
  - BEDDING SHALL BE 1" MINUS WITHIN 6" ALL AROUND SERVICE PIPE UNLESS SPECIFIED OTHERWISE.
  - CONTRACTOR SHALL PROVIDE TWO (2) 8 FOOT SHUT OFF RODS TO THE OWNER



**Typical Water Service Stub-Out Detail** (2)  
NO SCALE

- NOTES:**
- BEDDING SHALL BE 1" MINUS WITHIN 6" ALL AROUND SERVICE PIPE UNLESS SPECIFIED OTHERWISE.



**Typical Water Sampling Station Detail** (3)  
NO SCALE

- NOTES:**
- INSTALL PIPE BOLLARD BETWEEN SAMPLE STATION CONNECTED TO INLET PIPING AND THE PARKING AREA
  - BEDDING SHALL BE 1" MINUS WITHIN 6" ALL AROUND SERVICE PIPE UNLESS SPECIFIED OTHERWISE.



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

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Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

Sheet Title

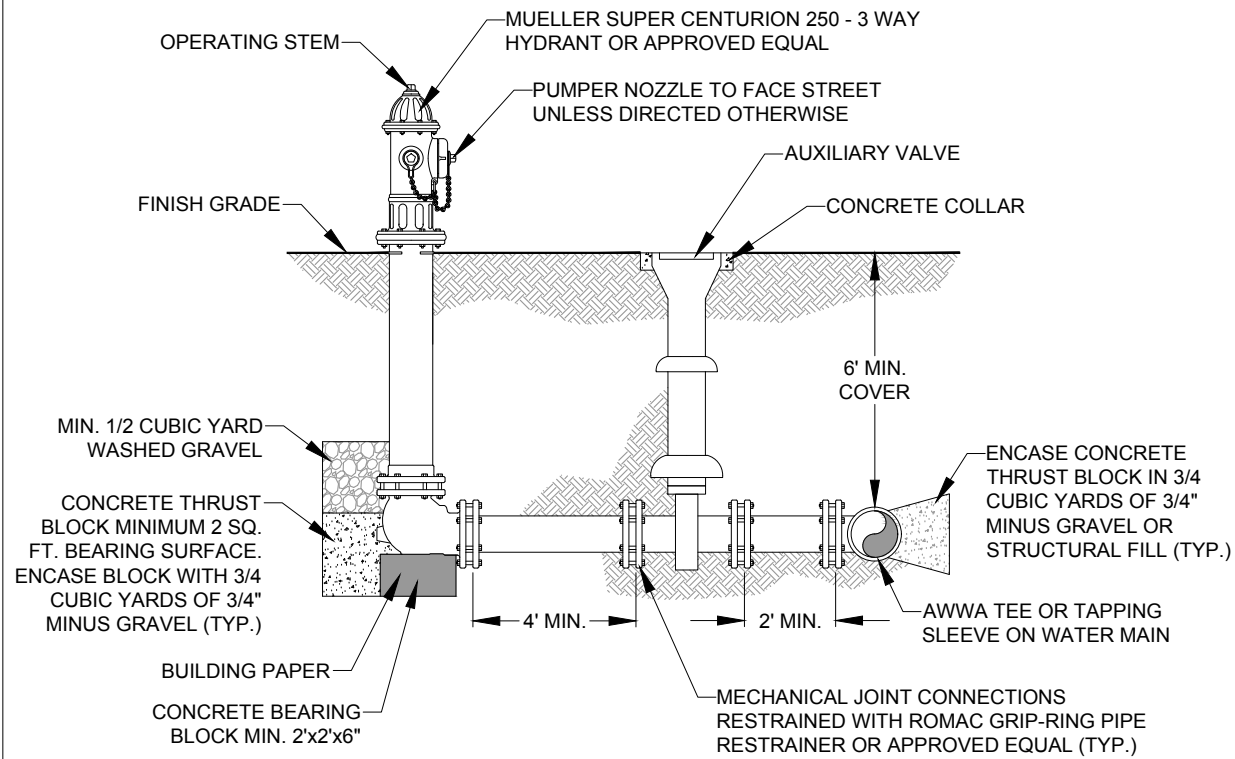
General Civil Details

Sheet

GC-4



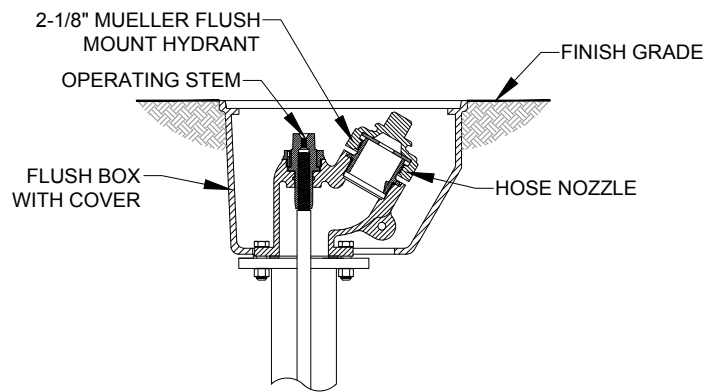
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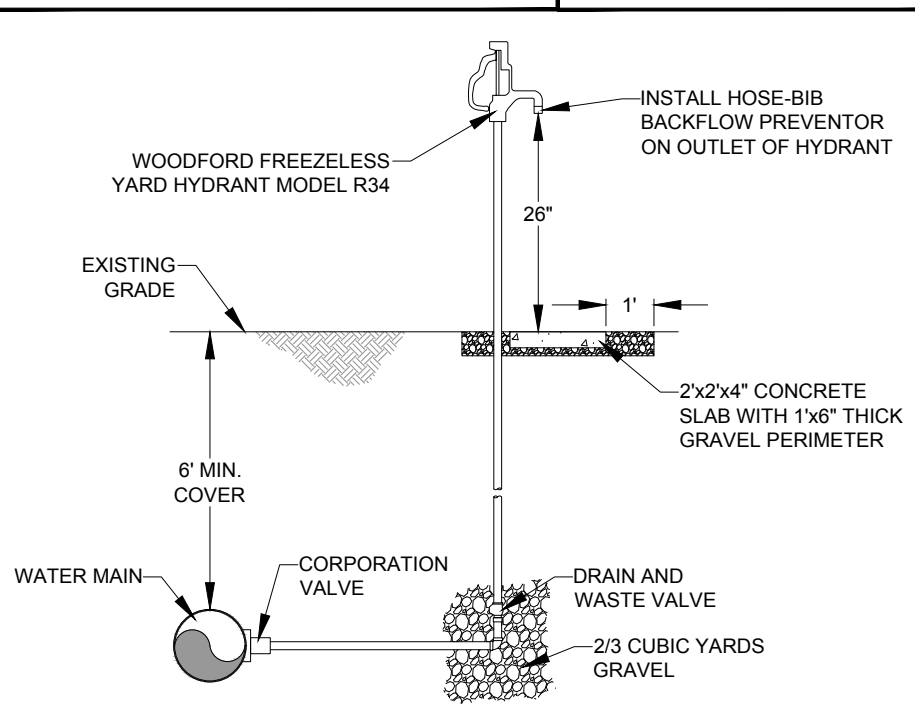
**Typical Hydrant Assembly Detail 1**  
NO SCALE

**NOTES:**

- THRUST BLOCKING TO BE IN CONFORMANCE WITH MPW STANDARD DRAWING 2713-1.
- FOR BOLTED FITTINGS, BLOCKING SHALL NOT OBSTRUCT BOLTS.
- HYDRANT WEEP HOLES TO REMAIN UNOBSTRUCTED.
- THRUST BLOCK SHALL BEAR HORIZONTALLY AGAINST UNDISTURBED SOIL.
- HYDRANT ROTATED IN DRAWING FOR CLARITY.
- FLUSHING HYDRANT ASSEMBLY SHALL BE A 2-1/8" MUELLER FLUSH MOUNT HYDRANT AS SHOWN BELOW.



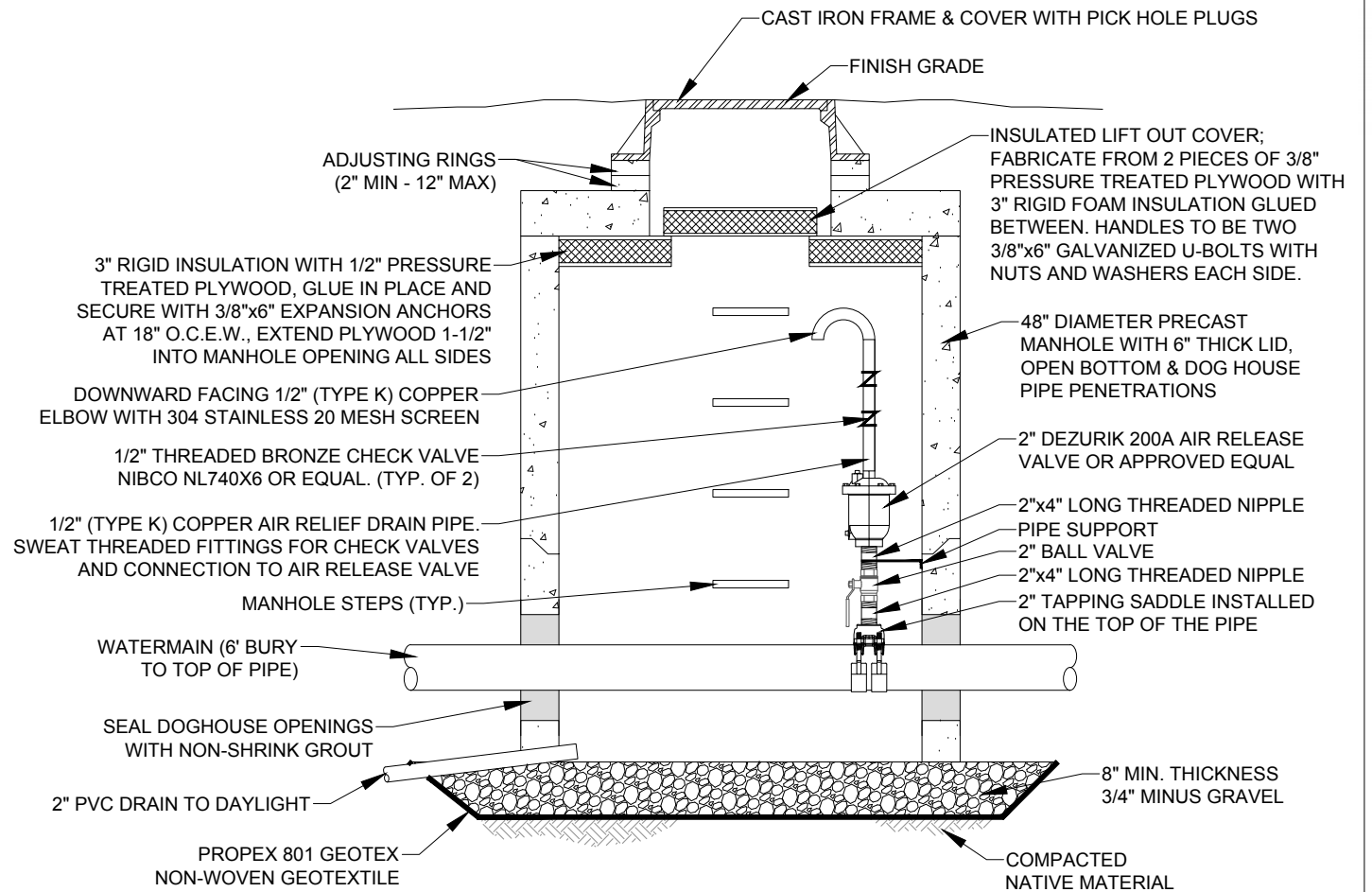
**Flushing Hydrant Detail**  
NO SCALE



**Typical Yard Hydrant Assembly Detail 3**  
NO SCALE

**NOTE:**

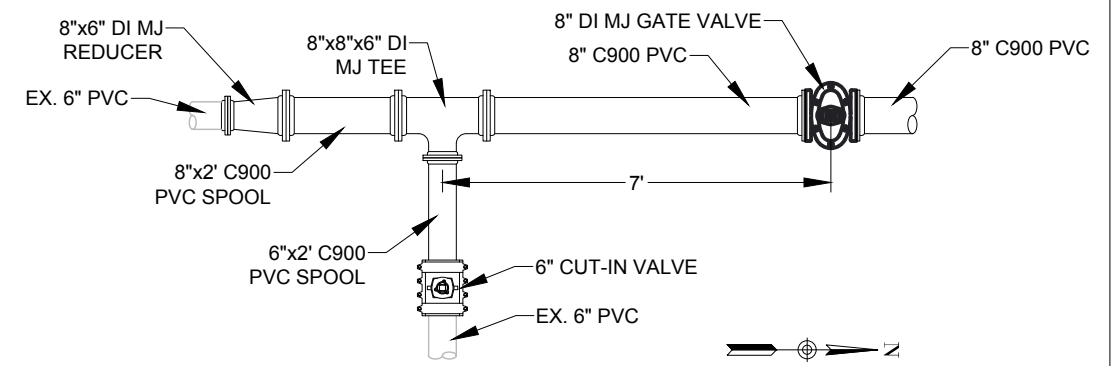
- INSTALL A PIPE BOLLARD ON EACH SIDE (DRIVING DIRECTION) OF THE YARD HYDRANT.



**Air Relief Valve Structure Detail 2**  
SCALE 1 0.5 0 1 2 Feet

**NOTES:**

- PRECAST CONCRETE MANHOLES SHALL COMFORM TO ASTM C478
- FINISHED MANHOLES SHALL BE IN ACCORDANCE WITH LATEST EDITION OF MPWSS STANDARD SPECIFICATIONS
- ALL JOINTS SHALL BE WATERTIGHT. MATERIAL SHALL BE RUBBER-NEK OR APPROVED EQUAL
- STRUCTURE SHALL BE COATED WITH AN EXTERIOR DAMPPROOFING; BITUMINOUS COAT OR COAL TAR EPOXY
- PROVIDE ALL SHORING NECESSARY TO PROTECT EXISTING STRUCTURES AND INFRASTRUCTURE



**Railroad Ave. Watermain Connection 4**  
SCALE 2 1 0 2 4 Feet

**NOTE:**

- \*ALL C900 PVC PIPE WILL BE DR25 OR DR18



Revision	Date	By
Draft	8-11-23	PWM
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Plot Scale	1:2
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Owner

Town of  
Alberton

Project Title

Alberton  
Water System  
Improvements  
Project

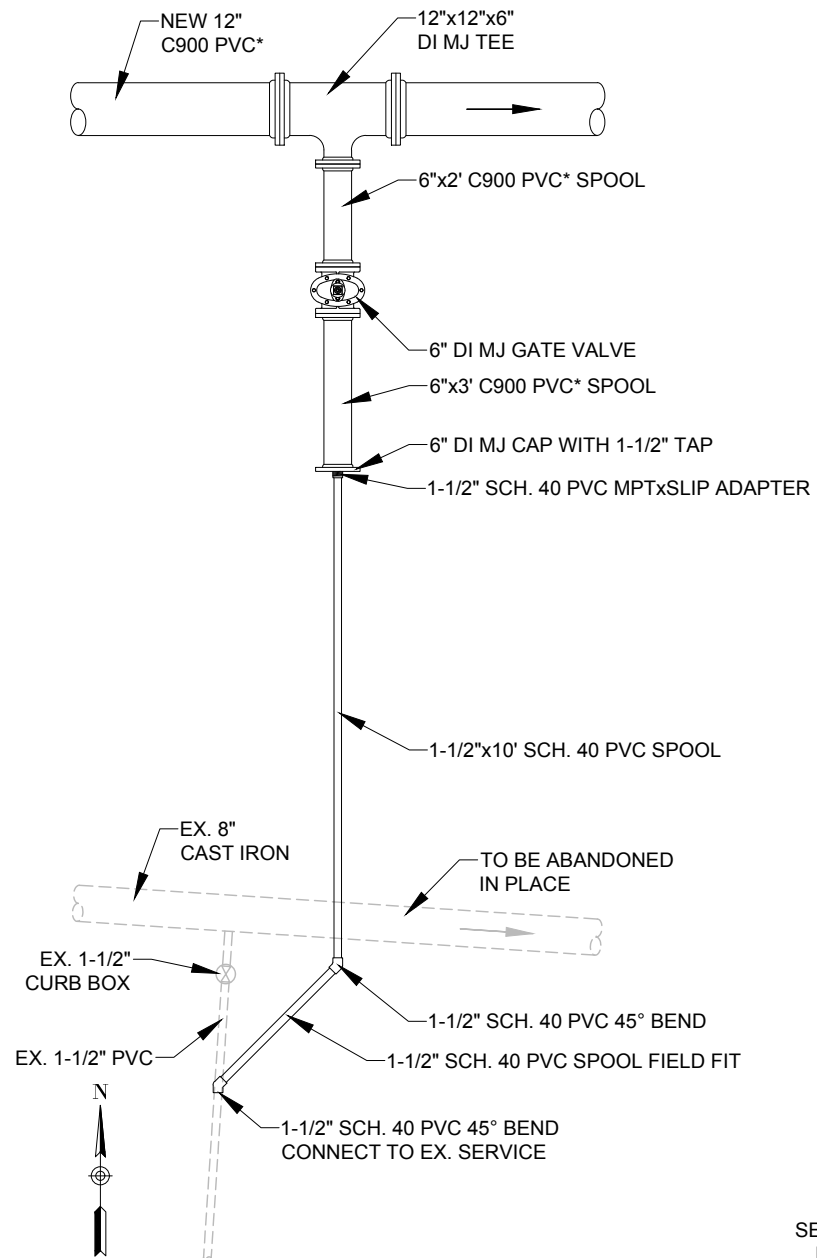
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General  
Civil Details

Sheet

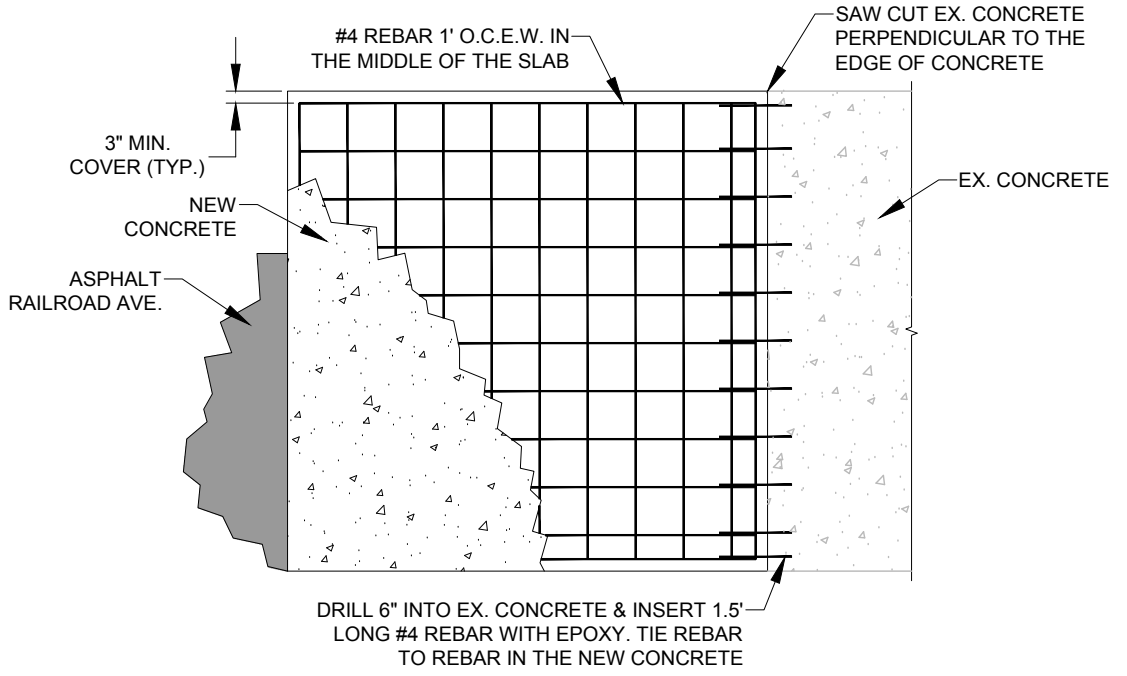
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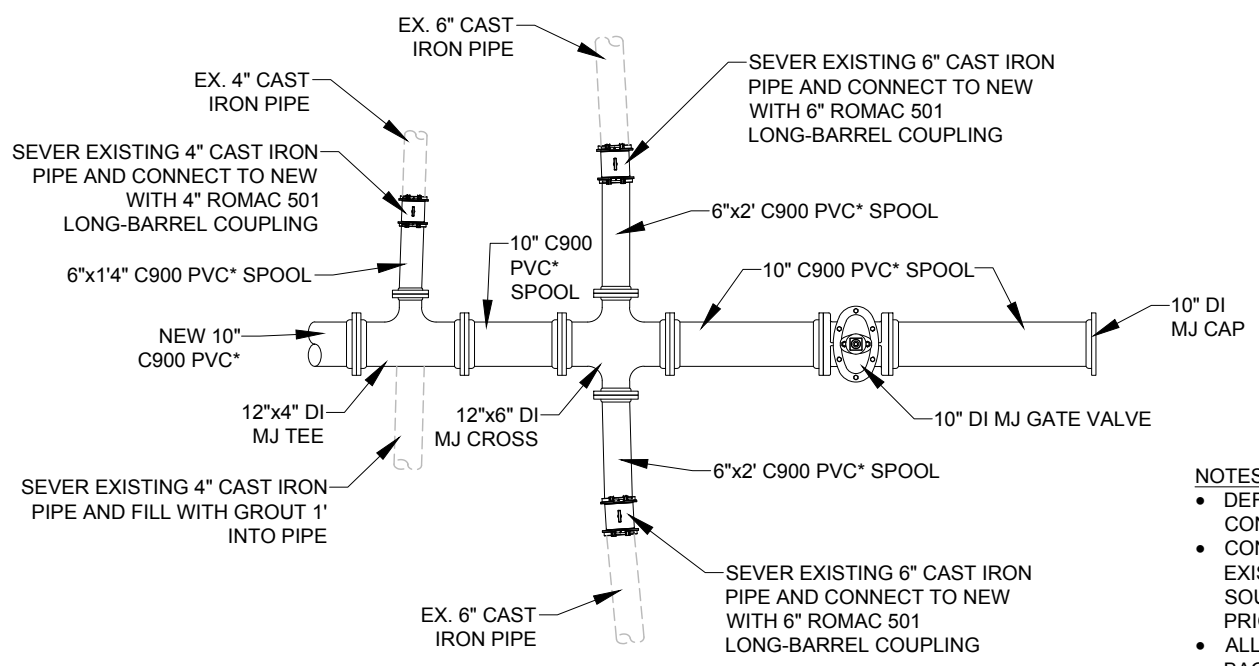
**1-1/2" Service Connection Detail** (1)  
SCALE 2 1 0 2 4 Feet  
D-1,D-2

- NOTES:
- \*ALL C900 PVC PIPE WILL BE DR25 OR DR18
  - ALL 1-1/2" PVC FITTINGS SHALL BE SOLVENT WELD



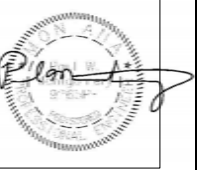
**Concrete Sidewalk/Drive Repair** (2)  
SCALE 2 1 0 2 4 Feet

- NOTES:
- SIDEWALK REPAIRS SHALL BE 4" THICK
  - DRIVEWAY REPAIRS SHALL BE 6" THICK
  - FOR BACKFILL/SUBGRADE DETAILS SEE THE PAVED SECTION IN DETAIL (3) GC-2
  - REBAR SHALL BE VERTICALLY CENTERED IN THE SLAB
  - REBAR SHALL BE TIED TOGETHER AT ALL CROSSINGS
  - EX. CONCRETE SHALL BE SAWCUT TO PROVIDE A CLEAN EDGE FOR THE NEW CONCRETE INTERFACE WITH THE EX. CONCRETE AND ASPHALT
  - THE NEW CONCRETE FOOTPRINT SHALL MATCH THE EXISTING CONCRETE FOOTPRINT THAT WAS REMOVED/DAMAGED.



**3rd Street & Railroad Ave. Connection to Existing Watermain Detail** (3)  
SCALE 2 1 0 2 4 Feet  
D-6

- NOTES:
- DEFLECT PIPE WITHIN MANUFACTURER'S TOLERANCE AT FITTINGS TO CONNECT TO THE EXISTING CAST IRON PIPE.
  - CONNECTIONS TO THE EXISTING CAST IRON PIPE SHALL BE MADE WHERE THE EXISTING PIPE IS SOUND. IF ADDITIONAL EXCAVATION IS REQUIRED TO FIND A SOUND SECTION OF PIPE THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING.
  - ALL EXCAVATION WITHIN THE STATE HIGHWAY 507 (RAILROAD AVE.) SHALL BE BACKFILLED WITH FLOWABLE FILL FROM THE TOP OF PIPE BEDDING TO THE BOTTOM OF ASPHALT BASE COURSE.
  - FOR BACKFILL/SUBGRADE DETAILS UNDER THE FOOTPRINT OF THE ASPHALT SEE THE PAVED SECTION IN DETAIL (3) GC-2



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Final Re-Bid  
Plot Scale  
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Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

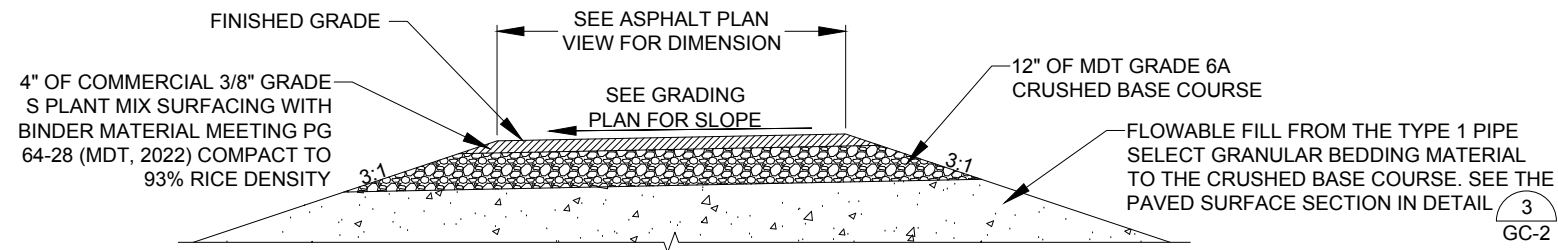
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General Civil Details

Sheet

GC-6

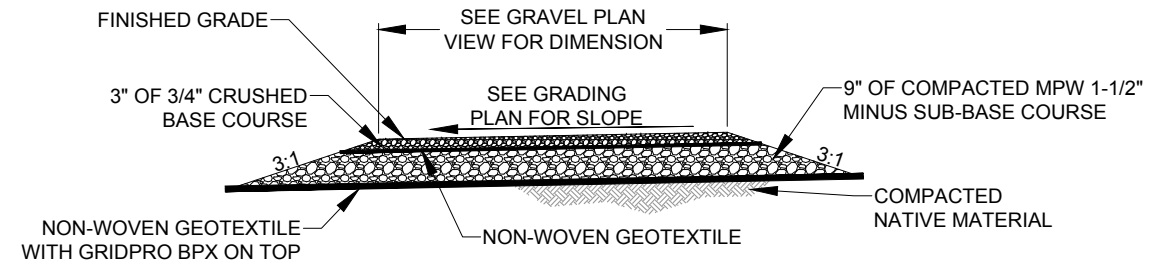
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**Railroad Ave. Asphalt Section** 1  
NO SCALE

**NOTES:**

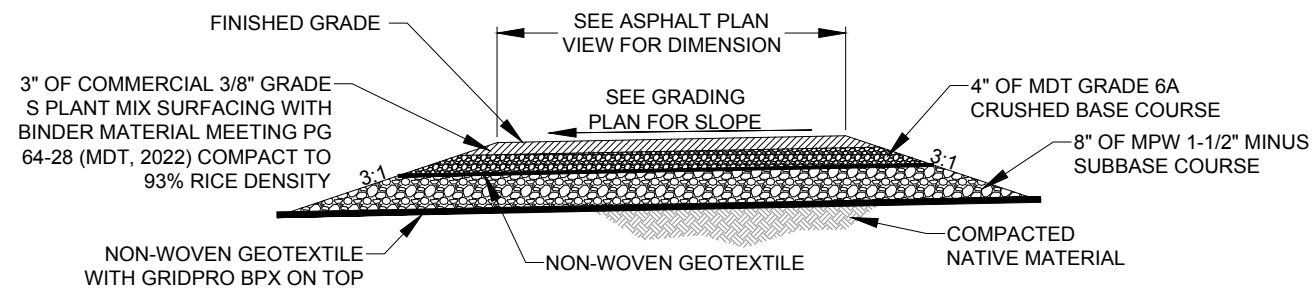
- EXCAVATE TO DESIGN GRADE
- PROVIDE ENGINEER AN OPPORTUNITY TO INSPECT THE BOTTOM OF THE EXCAVATIONS.
- USE A LOADED DUMP TRUCK OR LOADER TO PROOF ROLL SUBGRADE. SUB-EXCAVATE SOFT SPOTS OR UNSATISFACTORY MATERIALS THAT ARE OBSERVED. MOISTURE CONDITION NATIVE SUBGRADE TO WITHIN ±2% OF OPTIMUM MOISTURE AND COMPACT SUBGRADE TO STANDARD RELATIVE COMPACTION (ASTM D698) OF AT LEAST 95%
- BASE COURSE: PROVIDE AND PLACE NEW CRUSHED BASE COURSE MEETING THE CURRENT EDITION MDT STANDARD SPECIFICATIONS FOR GRADE 6A CRUSHED BASE COURSE (MDT, 2022). BASE COURSE SHALL BE MOISTURE CONDITIONED (±2% OF OPTIMUM MOISTURE) PLACED IN 8-INCH MAXIMUM LOOSE LIFTS, AND COMPACTED TO A STANDARD RELATIVE COMPACTION OF AT LEAST 95% (ASTM D698)
- ASPHALT: PROVIDE AND PLACE COMMERCIAL 3/8-INCH GRADE S PLANT MIX SURFACING (PMS) WITH BINDER MATERIAL MEETING PG 64-28 CONFORMING TO CURRENT EDITION MDT STANDARD SPECIFICATIONS (MDT, 2022). PLACE ASPHALT AND COMPACT TO AT LEAST 93% OF ITS RICE DENSITY. MAXIMUM LIFT THICKNESS IS 3 INCHES.



**Gravel Road & Approaches Typical Section** 3  
NO SCALE

**NOTES:**

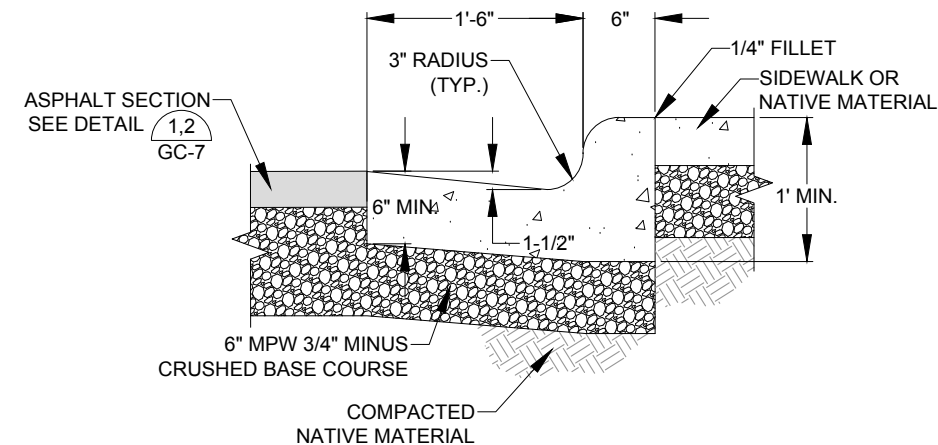
- EXCAVATE TO DESIGN GRADE
- PROVIDE ENGINEER AN OPPORTUNITY TO INSPECT THE BOTTOM OF THE EXCAVATIONS.
- USE A LOADED DUMP TRUCK OR LOADER TO PROOF ROLL SUBGRADE. SUB-EXCAVATE SOFT SPOTS OR UNSATISFACTORY MATERIALS THAT ARE OBSERVED. MOISTURE CONDITION NATIVE SUBGRADE TO WITHIN ±2% OF OPTIMUM MOISTURE AND COMPACT SUBGRADE TO STANDARD RELATIVE COMPACTION (ASTM D698) OF AT LEAST 95%
- BASE COURSE: PROVIDE AND PLACE NEW CRUSHED BASE COURSE MEETING THE CURRENT EDITION MDT STANDARD SPECIFICATIONS FOR GRADE 6A CRUSHED BASE COURSE (MDT, 2022). BASE COURSE SHALL BE MOISTURE CONDITIONED (±2% OF OPTIMUM MOISTURE) PLACED IN 8-INCH MAXIMUM LOOSE LIFTS, AND COMPACTED TO A STANDARD RELATIVE COMPACTION OF AT LEAST 95% (ASTM D698)



**Asphalt Typical Section** 2  
NO SCALE

**NOTES:**

- EXCAVATE TO DESIGN GRADE
- PROVIDE ENGINEER AN OPPORTUNITY TO INSPECT THE BOTTOM OF THE EXCAVATIONS.
- USE A LOADED DUMP TRUCK OR LOADER TO PROOF ROLL SUBGRADE. SUB-EXCAVATE SOFT SPOTS OR UNSATISFACTORY MATERIALS THAT ARE OBSERVED. MOISTURE CONDITION NATIVE SUBGRADE TO WITHIN ±2% OF OPTIMUM MOISTURE AND COMPACT SUBGRADE TO STANDARD RELATIVE COMPACTION (ASTM D698) OF AT LEAST 95%
- SUBBASE COURSE: SUBBASE SHALL MEET MPW STANDARD SPECIFICATIONS. SUBBASE COURSE SHALL BE MOISTURE CONDITIONED (±2% OF OPTIMUM MOISTURE), PLACED IN 8-INCH MAXIMUM LOOSE LIFTS, AND COMPACTED TO A STANDARD RELATIVE COMPACTION OF AT LEAST 95% (ASTM D698)
- BASE COURSE: PROVIDE AND PLACE NEW CRUSHED BASE COURSE MEETING THE CURRENT EDITION MDT STANDARD SPECIFICATIONS FOR GRADE 6A CRUSHED BASE COURSE (MDT, 2022). BASE COURSE SHALL BE MOISTURE CONDITIONED (±2% OF OPTIMUM MOISTURE) PLACED IN 8-INCH MAXIMUM LOOSE LIFTS, AND COMPACTED TO A STANDARD RELATIVE COMPACTION OF AT LEAST 95% (ASTM D698)
- ASPHALT: PROVIDE AND PLACE COMMERCIAL 3/8-INCH GRADE S PLANT MIX SURFACING (PMS) WITH BINDER MATERIAL MEETING PG 64-28 CONFORMING TO CURRENT EDITION MDT STANDARD SPECIFICATIONS (MDT, 2022). PLACE ASPHALT AND COMPACT TO AT LEAST 93% OF ITS RICE DENSITY. MAXIMUM LIFT THICKNESS IS 3 INCHES.



**Concrete Spill Curb Section** 4  
NO SCALE

**NOTES:**

- ASPHALT FINISHED STREET SURFACE SHALL BE 1/8" TO 1/4" ABOVE GUTTER LIP



Revision	Date	By
Draft	8-11-23	PWM
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Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

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Owner

Town of Alberton

Project Title

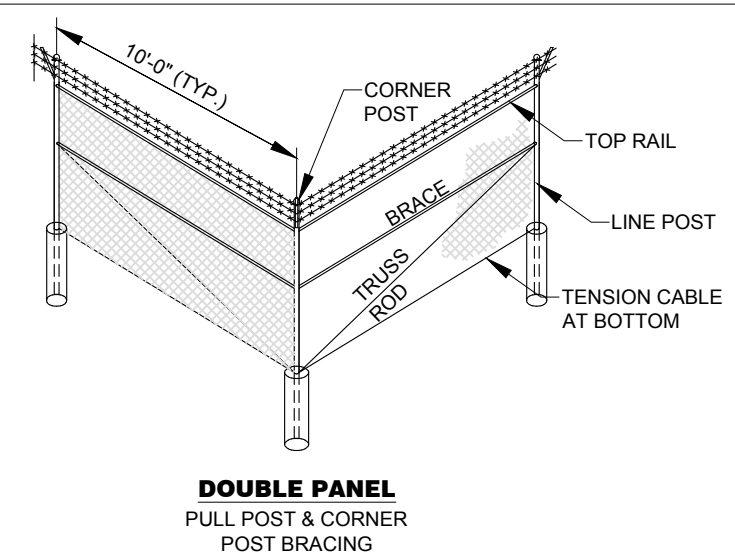
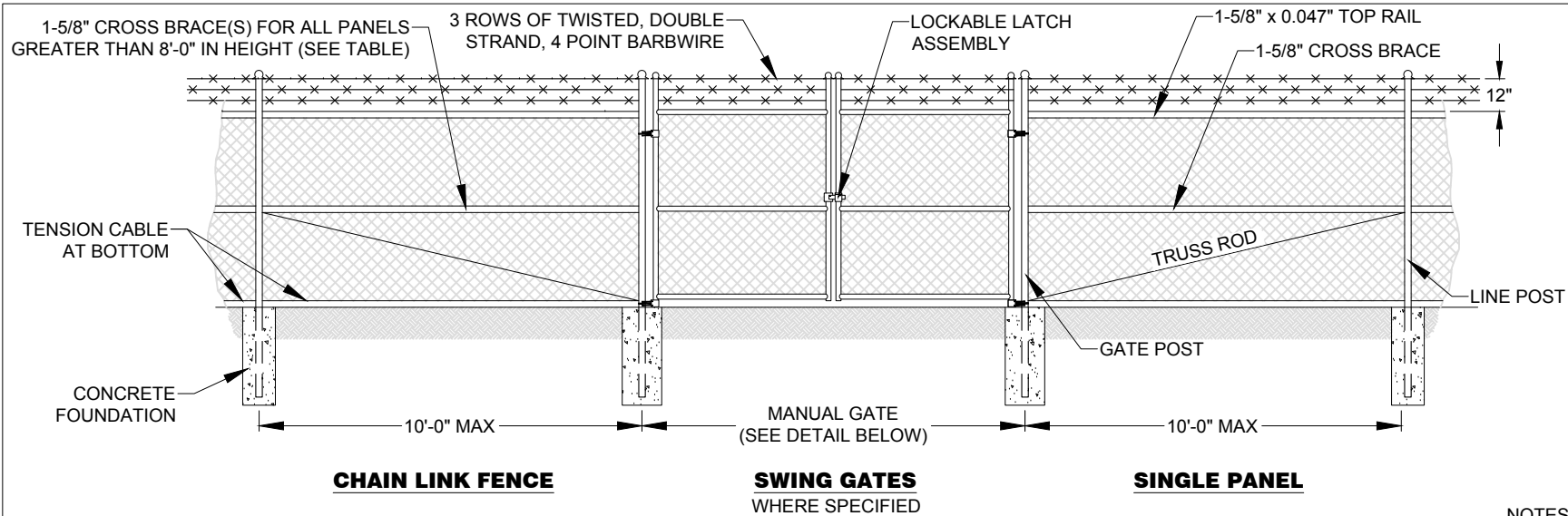
Alberton Water System Improvements Project

Sheet Title

General Civil Details

Sheet

**GC-7**

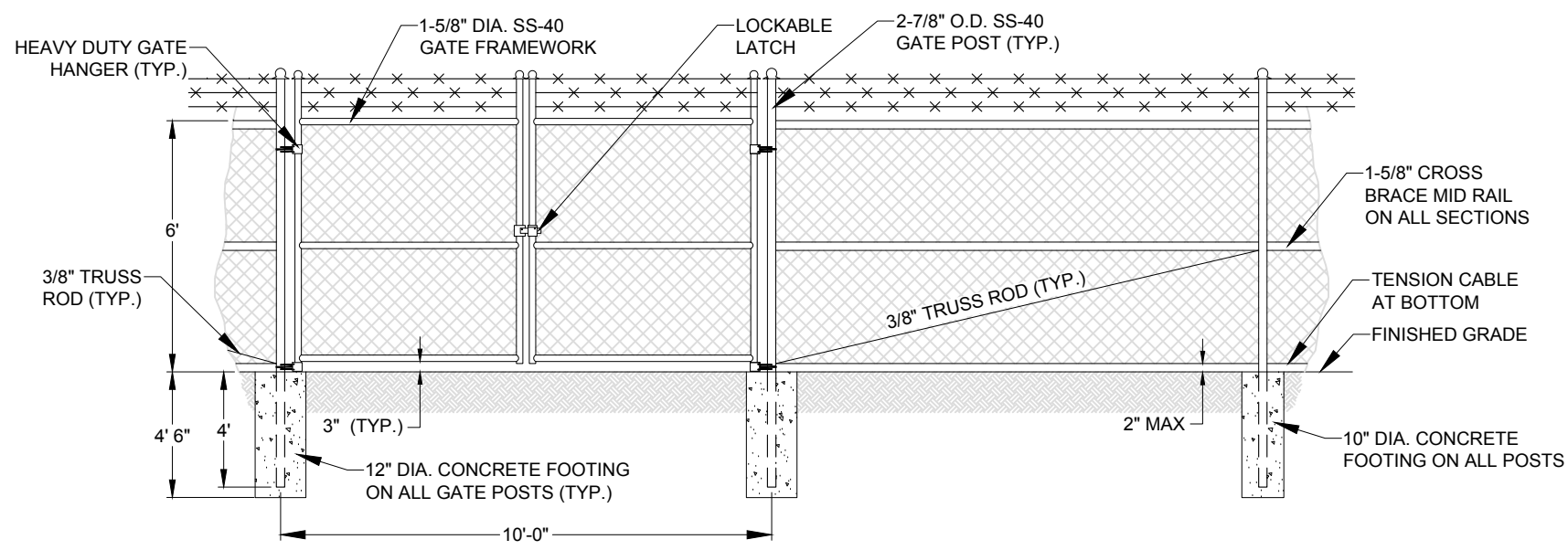


CHAIN LINK FENCE MINIMUM REQUIREMENTS					
FENCE HEIGHT (FEET)	TERMINAL POST DIM. (IN INCHES) (O.D. x WALL THICKNESS)	LINE POST DIM. (IN INCHES) (O.D. x WALL THICKNESS)	TERMINAL POST CONCRETE FOUNDATION SIZE (IN INCHES) (DIA. x DEPTH)	LINE POST CONCRETE FOUNDATION SIZE (IN INCHES) (DIA. x DEPTH)	NO. OF CROSS BRACES REQ'D FOR ALL PANELS. BRACES TO BE EQUALLY SPACED, VERTICALLY
UP TO 4	2-3/8 x 0.042	1-5/8 x 0.047	10 x 24	8 x 24	NA
OVER 4 TO 5	2-3/8 x 0.042	1-7/8 x 0.055	10 x 24	8 x 24	NA
OVER 5 TO 6	2-3/8 x 0.042	1-7/8 x 0.065	10 x 24	8 x 24	NA
OVER 6 TO 8	2-3/8 x 0.110	2-3/8 x 0.095	10 x 36	10 x 36	NA
OVER 8 TO 10	2-7/8 x 0.160	2-3/8 x 0.130	12 x 40	10 x 40	1
OVER 10 TO 12	2-7/8 x 0.160	2-7/8 x 0.120	12 x 42	12 x 42	1
OVER 12 TO 16	4 x 0.230	4 x 0.230	18 x 60	18 x 60	2

- NOTES:**
- SEE TECHNICAL SPECIFICATIONS FOR MATERIALS.
  - A SINGLE PANEL SHALL BE PLACED AT EVERY END OF CHAIN LINK FENCE.
  - TENSION BANDS ON TERMINAL POSTS TO BE INSTALLED AT 12" SPACING ON CENTER.
  - ALL CONCRETE SHALL BE MADE USING 3/4" AGGREGATE AND 602 POUNDS OF CEMENT PER CUBIC YARD OF CONCRETE AND SHALL HAVE A SLUMP OF 5" WITH COMPRESSIVE STRENGTH OF 3,000 PSI.
  - DOUBLE PANELS SHALL BE INSTALLED NO MORE THAN 300'-0" APART ON TANGENT AND USED FOR PULLING. SUCH PANELS SHALL BE PLACED AT EACH CORNER SHAPER THAN 5 DEGREES AND BE EVENLY SPACED BETWEEN 20'-0" OF CENTRAL ANGLE (10'-0" DEFLECTION) APART, BUT NO MORE THAN 250'-0" APART ON ANY CURVE.
  - THE HEIGHT OF THE FABRIC SHALL BE NO GREATER THAN 2" FROM THE GROUND UNLESS OTHERWISE APPROVED BY THE ENGINEER.
  - CONTRACTOR SHALL ATTACH FABRIC TO POSTS USING WIRE TIES.
  - CONCRETE GATE POST ENCASMENTS SHALL MEET MANUFACTURER'S REQUIREMENTS.
  - INSTALL COPPER CLAD GROUNDING RODS EVERY 500'-0" AT A MINIMUM.
  - GAPS NO GREATER THAN 2" WILL BE PERMITTED IN ALL LOCATIONS.
  - SPRING SOURCE FENCES: A MID RAIL CROSS BRACE WILL BE REQUIRED FOR ALL FENCE SECTIONS.
  - A LATCH ASSEMBLY LOCKING DEVICE IS REQUIRED FOR ALL GATE INSTALLATIONS.

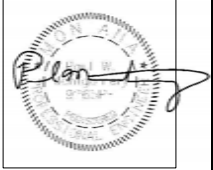
**• THESE SPECIFICATIONS APPLY TO RESIDENTIAL CHAIN LINK FENCE THAT IS DAMAGED OR REMOVED DUE TO BASE BID CONSTRUCTION ACTIVITIES. REPLACE FENCE TO ORIGINAL OR BETTER CONDITION. RESIDENTIAL FENCE SHALL NOT INCLUDE 3 STRAND BARBWIRE.**

**Chain Link Fence Details** 1  
NO SCALE



- NOTES:**
- INSTALL LOCKABLE SLIDING GATE LATCH PER MANUFACTURER'S RECOMMENDATIONS.
  - GATE SHALL NOT SAG WHEN IN THE OPEN OR CLOSED POSITION.
  - TERMINAL POSTS BRACED AND TRUSSED TO THE NEAREST LINE POST WITH 1-5/8" O.D. SS-40 PIPE AND 3/8" THREADED TRUSS ROD & PRESSED STEEL INDUSTRIAL TRUSS ROD TIGHTENER
  - GATE FRAMEWORK SHALL BE 1-5/8" SS-40 PIPE (1.83 LBS/FT). GATES SHALL BE BRACED AND TRUSSED AS NECESSARY.
  - GATE POSTS SHALL BE 2-7/8" O.D. SS-40 PIPE (4.64 LBS/FT) ENCASED IN 10" DIAMETER CONCRETE (SEE DETAIL FOR DIMENSIONS)
  - BARBED WIRE SHALL BE 3 STRANDS OF 12-1/2 GAUGE 4 POINT CLASS III BARB WIRE ON 3 WIRE 45° DOMESTIC BARB ARMS
  - FITTINGS: 1/8"x1" HEAVY BRACE BAND & CARRIAGE BOLT, PRESSED STEEL RAIL END, PRESSED STEEL DOME CAP, 3/16"x3/4" STEEL TENSION BAR, 1/8"x1" HEAVY TENSION BAND & CARRIAGE BOLT.
  - GATE HARDWARE SHALL BE BULLDOG HINGES WITH STRONG ARM COMMERCIAL DOUBLE GATE LOCKABLE LATCH
  - TIE WIRE: 8-1/4" STEEL 9 GAUGE TIE WIRE AND 6-1/2" STEEL 9 GAUGE TIE WIRE SPACED 15" ON CENTER FOR LINE POSTS AND 12" ON CENTER FOR RAILS

**10 Foot Double Leaf Gate** 2  
NO SCALE



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
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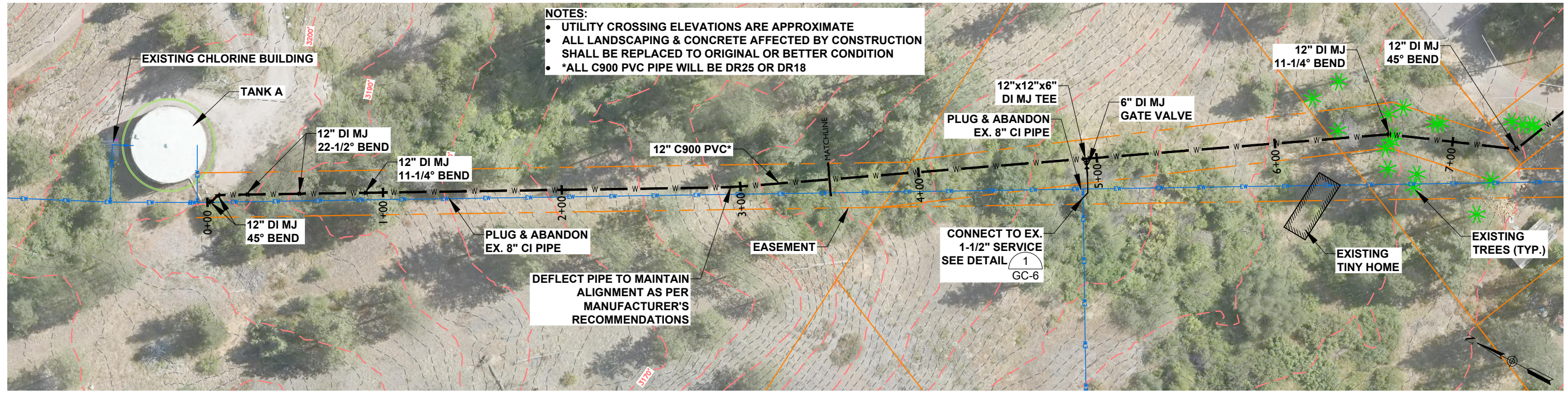
Fence Details

Sheet

GC-8

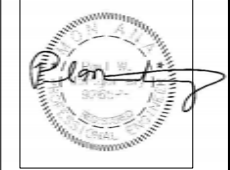
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**NOTES:**

- UTILITY CROSSING ELEVATIONS ARE APPROXIMATE
- ALL LANDSCAPING & CONCRETE AFFECTED BY CONSTRUCTION SHALL BE REPLACED TO ORIGINAL OR BETTER CONDITION
- \*ALL C900 PVC PIPE WILL BE DR25 OR DR18



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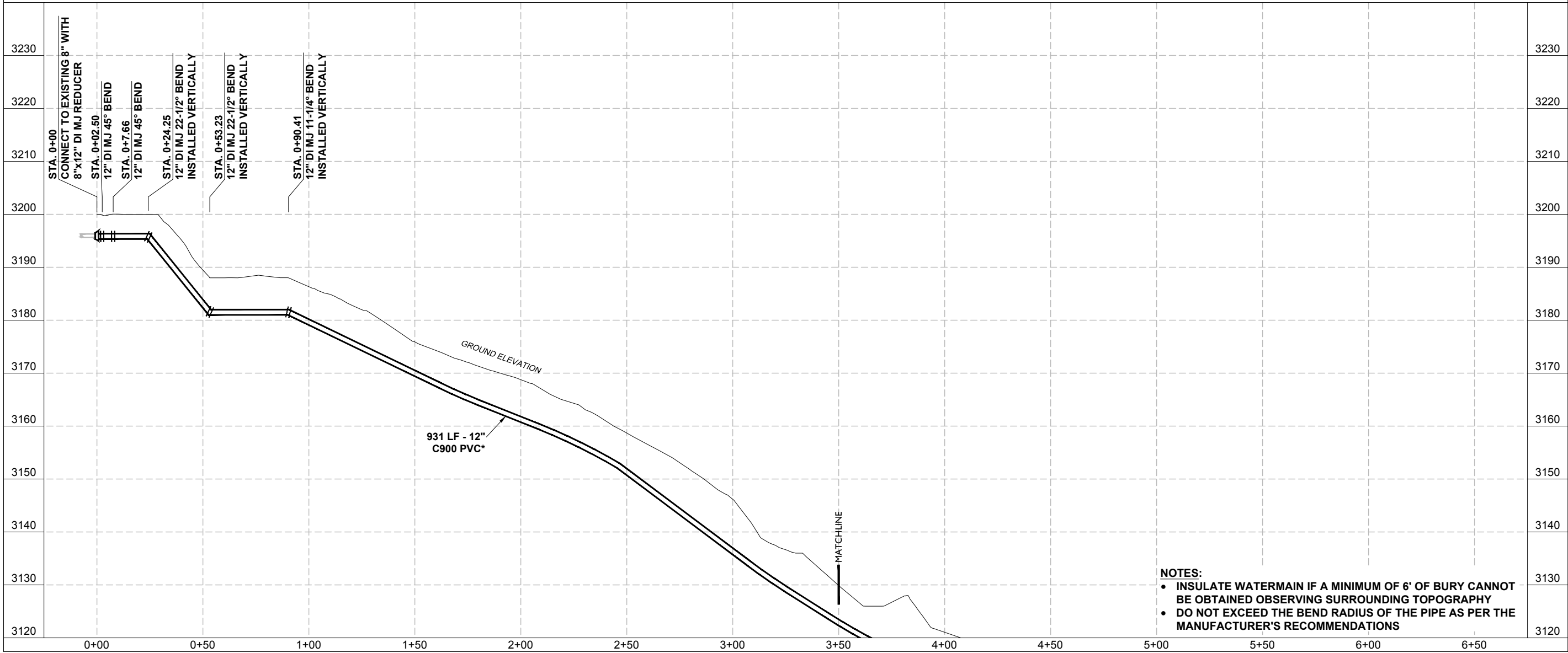
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 Town of Alberton

Project Title  
 Alberton Water System Improvements Project

Sheet Title  
 New Potable Water Plan & Profile  
 Storage Tank to Distribution

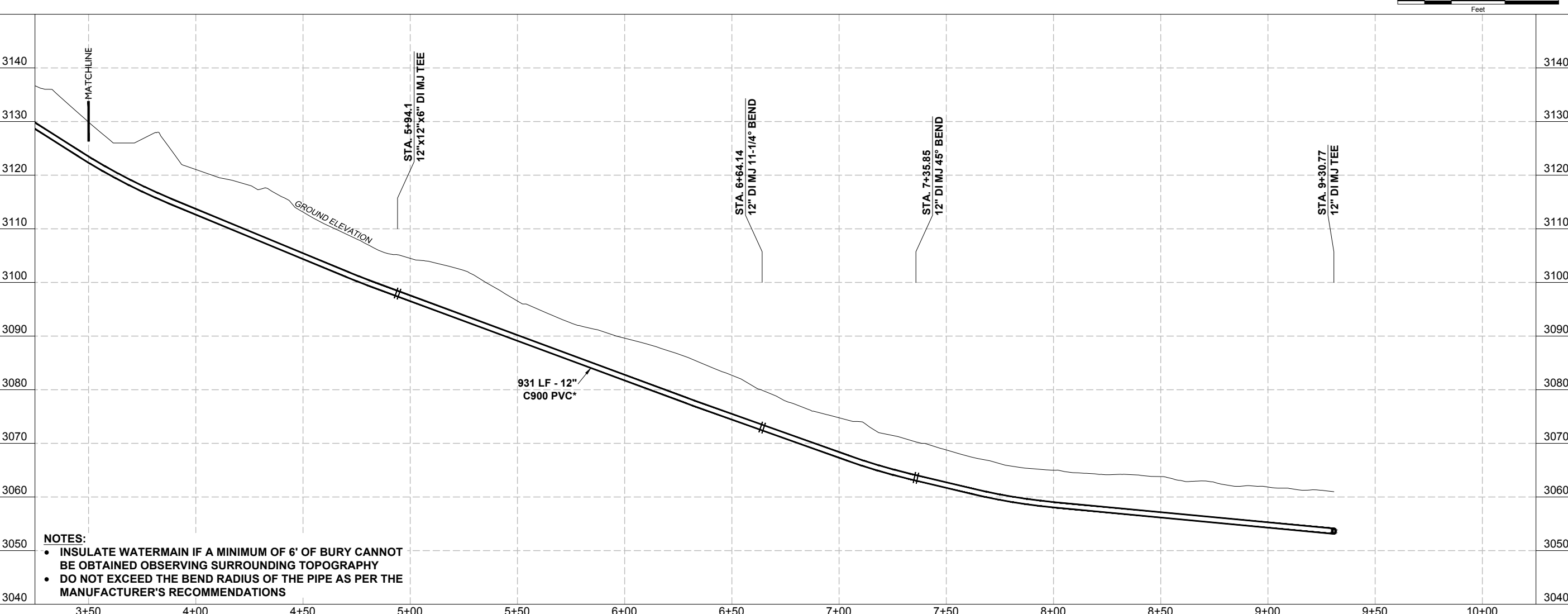
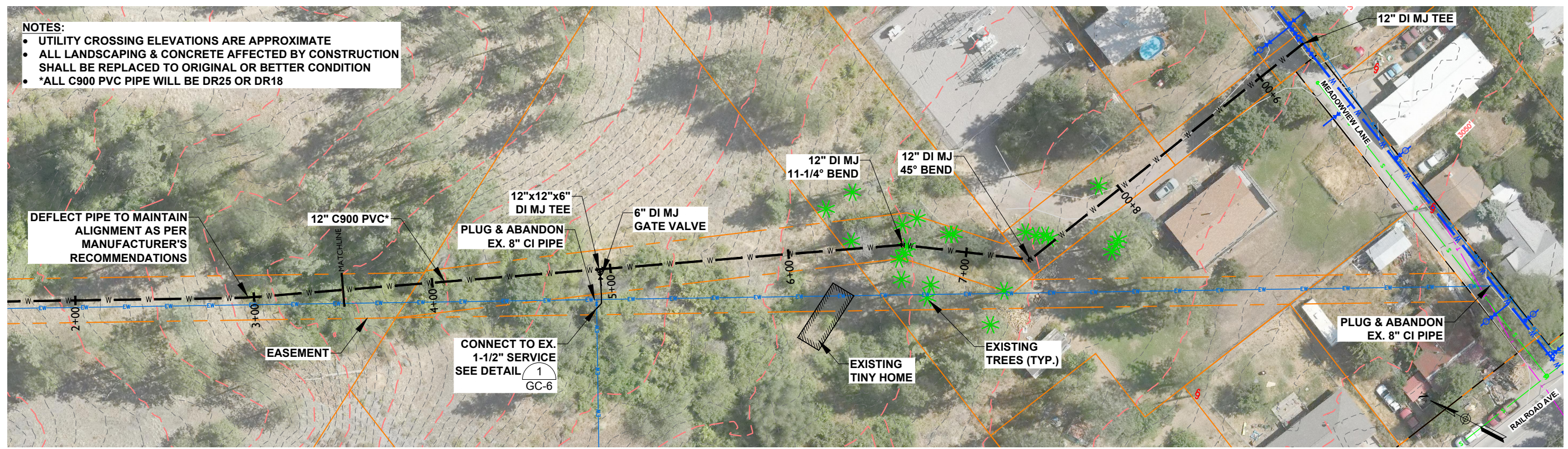
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**D-1**



**NOTES:**

- INSULATE WATERMAIN IF A MINIMUM OF 6' OF BURY CANNOT BE OBTAINED OBSERVING SURROUNDING TOPOGRAPHY
- DO NOT EXCEED THE BEND RADIUS OF THE PIPE AS PER THE MANUFACTURER'S RECOMMENDATIONS

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**NOTES:**

- UTILITY CROSSING ELEVATIONS ARE APPROXIMATE
- ALL LANDSCAPING & CONCRETE AFFECTED BY CONSTRUCTION SHALL BE REPLACED TO ORIGINAL OR BETTER CONDITION
- \*ALL C900 PVC PIPE WILL BE DR25 OR DR18

DEFLECT PIPE TO MAINTAIN ALIGNMENT AS PER MANUFACTURER'S RECOMMENDATIONS

EASEMENT

12" C900 PVC\*

12"x12"x6" DI MJ TEE  
PLUG & ABANDON EX. 8" CI PIPE

6" DI MJ GATE VALVE

CONNECT TO EX. 1-1/2" SERVICE SEE DETAIL GC-6

12" DI MJ 11-1/4° BEND

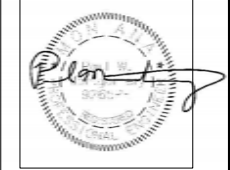
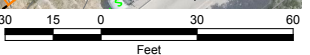
12" DI MJ 45° BEND

EXISTING TINY HOME

EXISTING TREES (TYP.)

PLUG & ABANDON EX. 8" CI PIPE

12" DI MJ TEE



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision: Final Re-Bid  
 Plot Scale: 1:2  
 Drawn By: A. Eckhart, P.E.  
 Approved By: P. Montgomery, P.E.  
 Checked By: A. Eckhart, P.E.  
 Designed By: P. Montgomery, P.E.

Engineer  
  
 Anderson-Montgomery  
 CONSULTING ENGINEERS  
 1064 N. Warren  
 Helena, Mt 59601  
 Phone (406) 449-3303  
 Fax (406) 449-3304

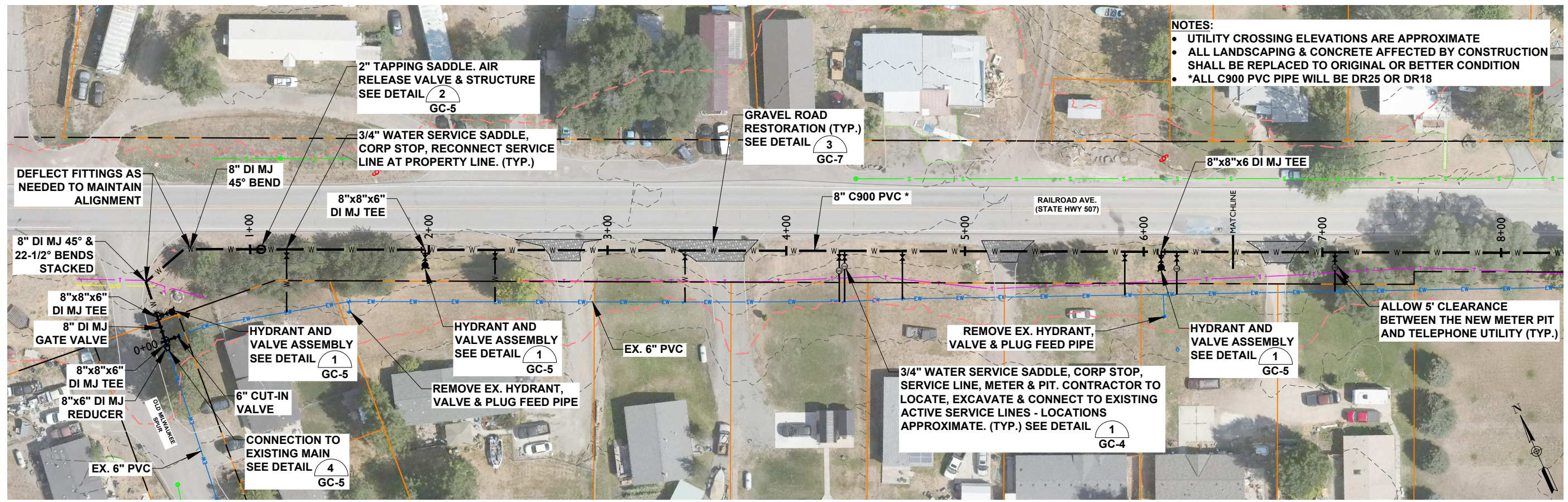
Owner  
 Town of Alberton

Project Title  
 Alberton Water System Improvements Project

Sheet Title  
 New Potable Water Plan & Profile  
 Storage Tank to Distribution Continued

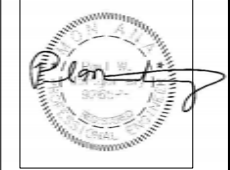
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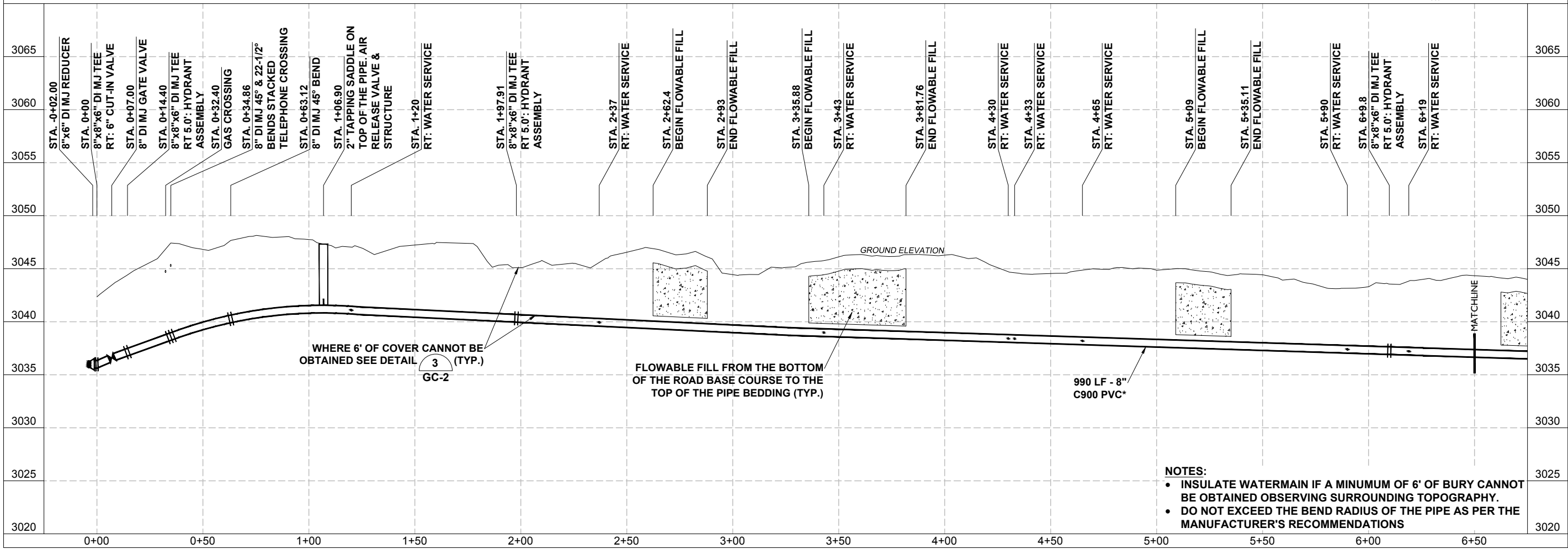
Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

Engineer

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CONSULTING ENGINEERS

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Fax (406) 449-3304



**NOTES:**

- INSULATE WATERMAIN IF A MINIMUM OF 6' OF BURY CANNOT BE OBTAINED OBSERVING SURROUNDING TOPOGRAPHY.
- DO NOT EXCEED THE BEND RADIUS OF THE PIPE AS PER THE MANUFACTURER'S RECOMMENDATIONS

Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

Sheet Title

New Potable Water Plan & Profile  
Railroad Avenue

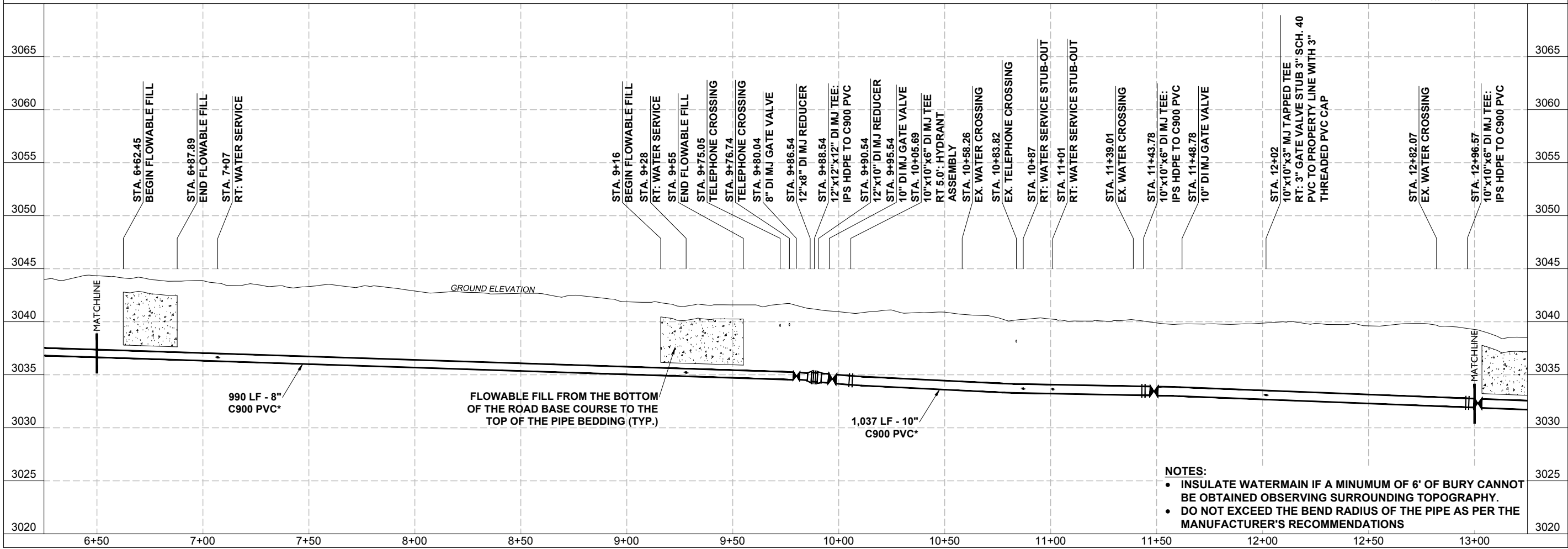
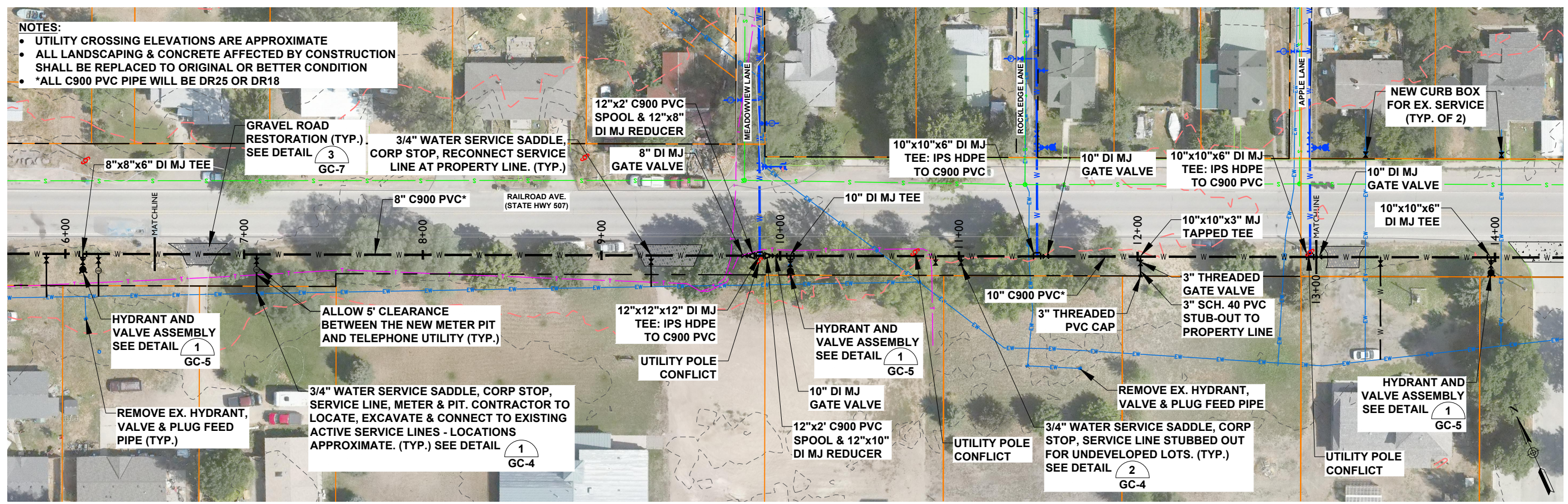
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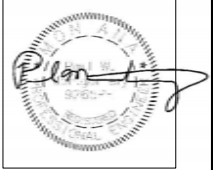
**NOTES:**

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Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision: Final Re-Bid  
 Plot Scale: 1:2  
 Drawn By: A. Eckhart, P.E.  
 Approved By: P. Montgomery, P.E.  
 Checked By: A. Eckhart, P.E.  
 Designed By: P. Montgomery, P.E.

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Owner  
 Town of Alberton

Project Title  
 Alberton Water System Improvements Project

Sheet Title  
 New Potable Water Plan & Profile  
 Railroad Avenue Continued

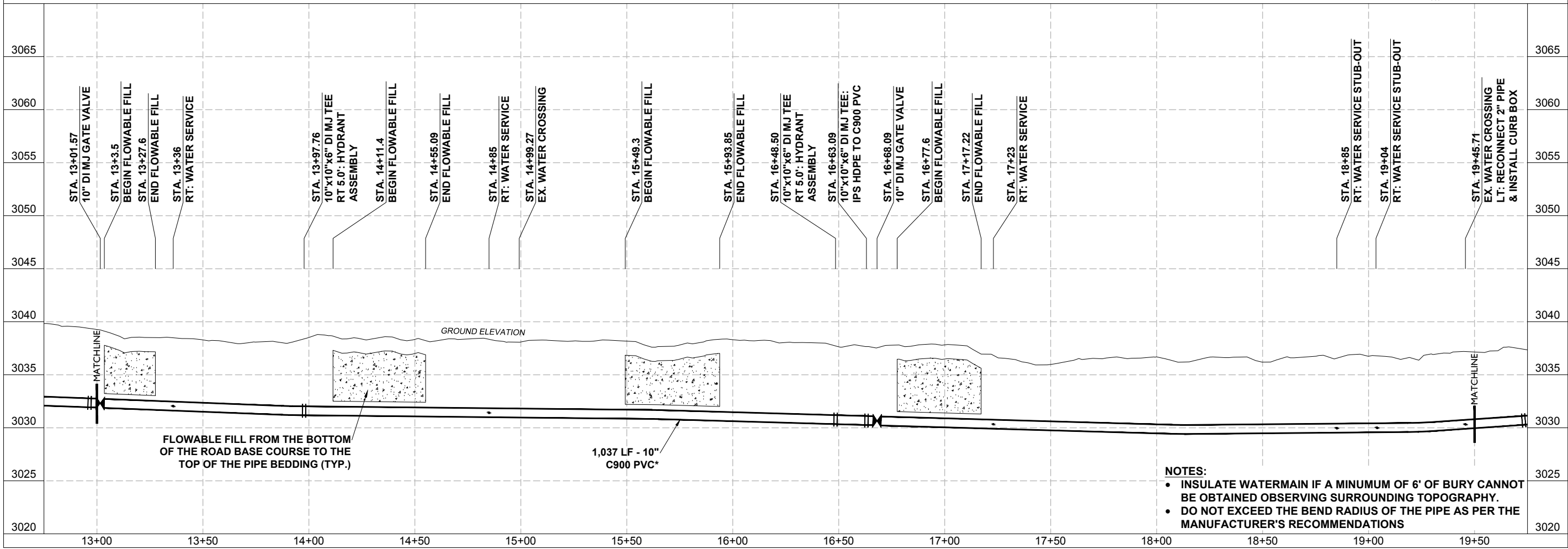
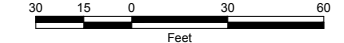
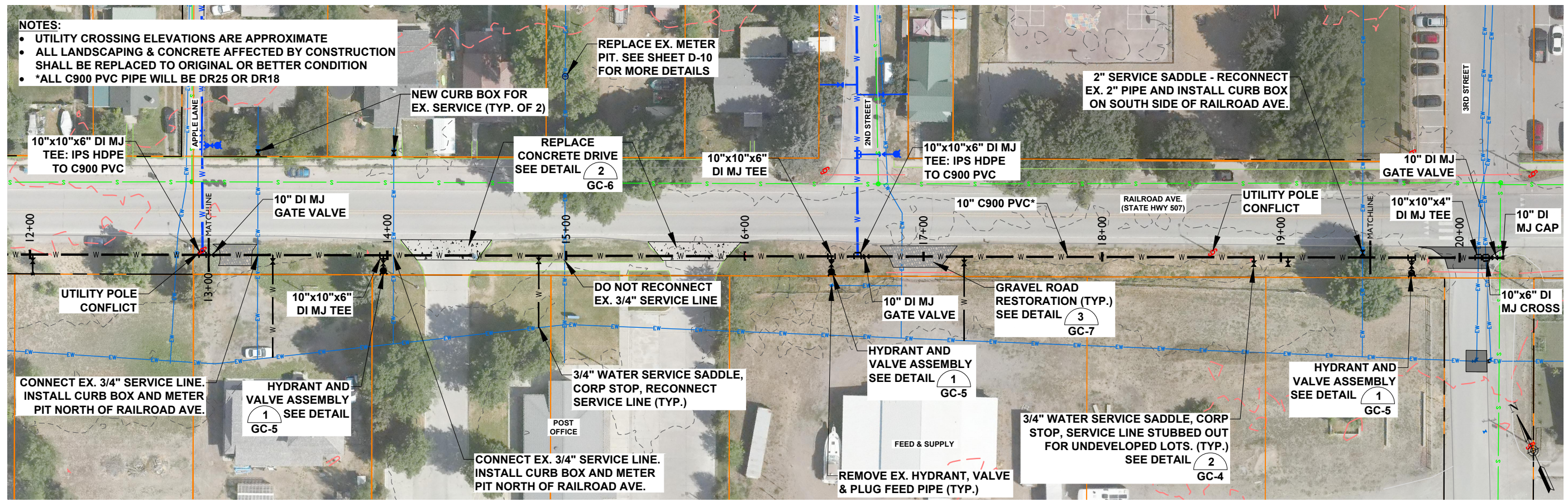
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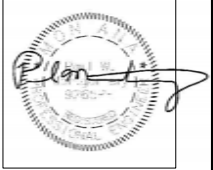
**NOTES:**

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Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

Engineer

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CONSULTING ENGINEERS

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Helena, Mt 59601  
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Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

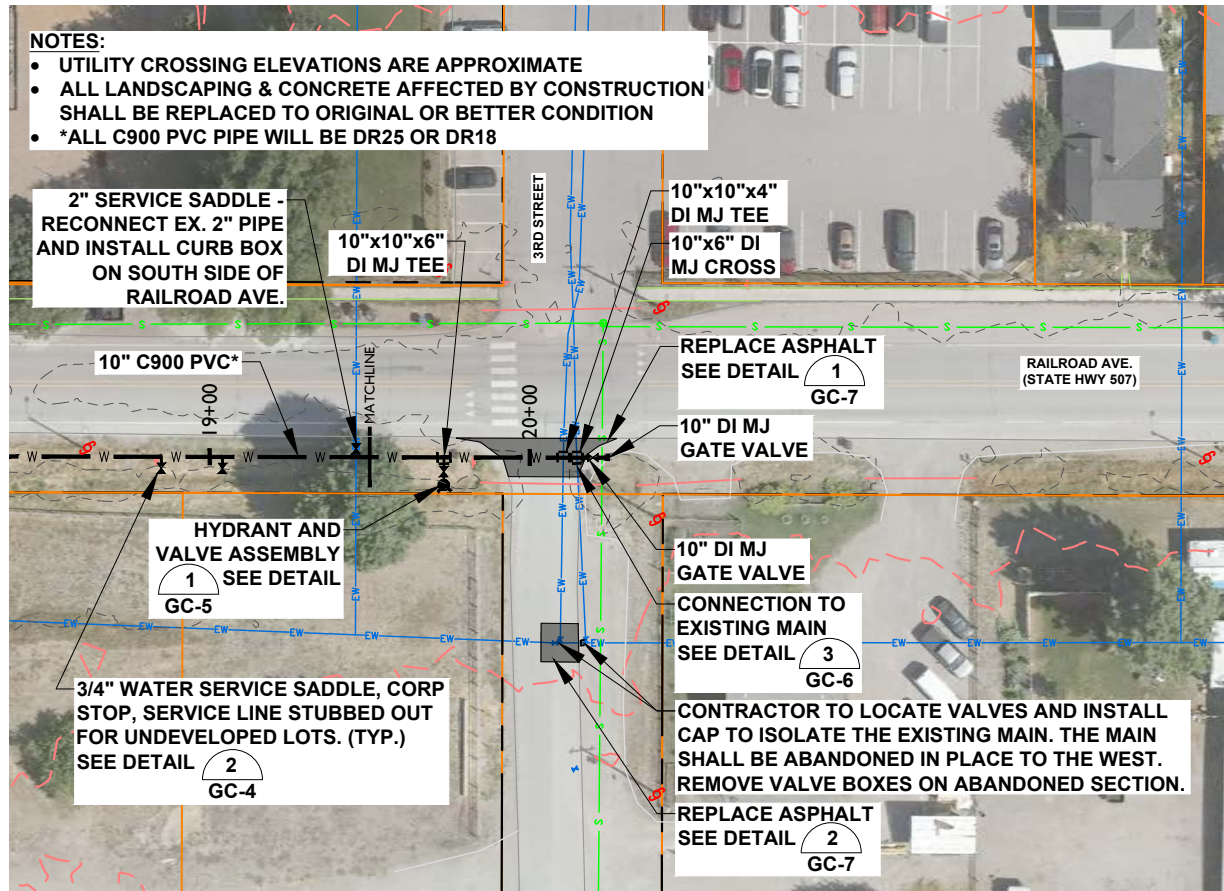
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New Potable Water Plan & Profile

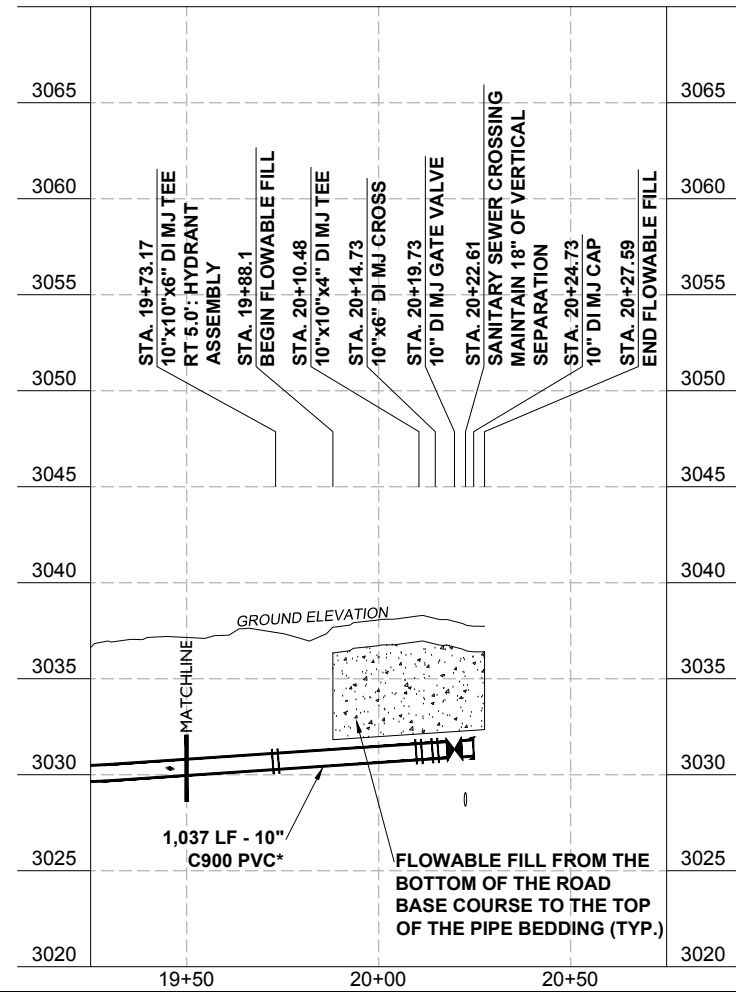
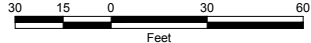
Railroad Avenue Continued

Sheet

**D-5**



- NOTES:**
- UTILITY CROSSING ELEVATIONS ARE APPROXIMATE
  - ALL LANDSCAPING & CONCRETE AFFECTED BY CONSTRUCTION SHALL BE REPLACED TO ORIGINAL OR BETTER CONDITION
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Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision  
Final Re-Bid  
Plot Scale  
1:2  
Drawn By  
A. Eckhart, P.E.  
Approved By  
P. Montgomery, P.E.  
Checked By  
A. Eckhart, P.E.  
Designed By  
P. Montgomery, P.E.

Engineer  
**Anderson-Montgomery**  
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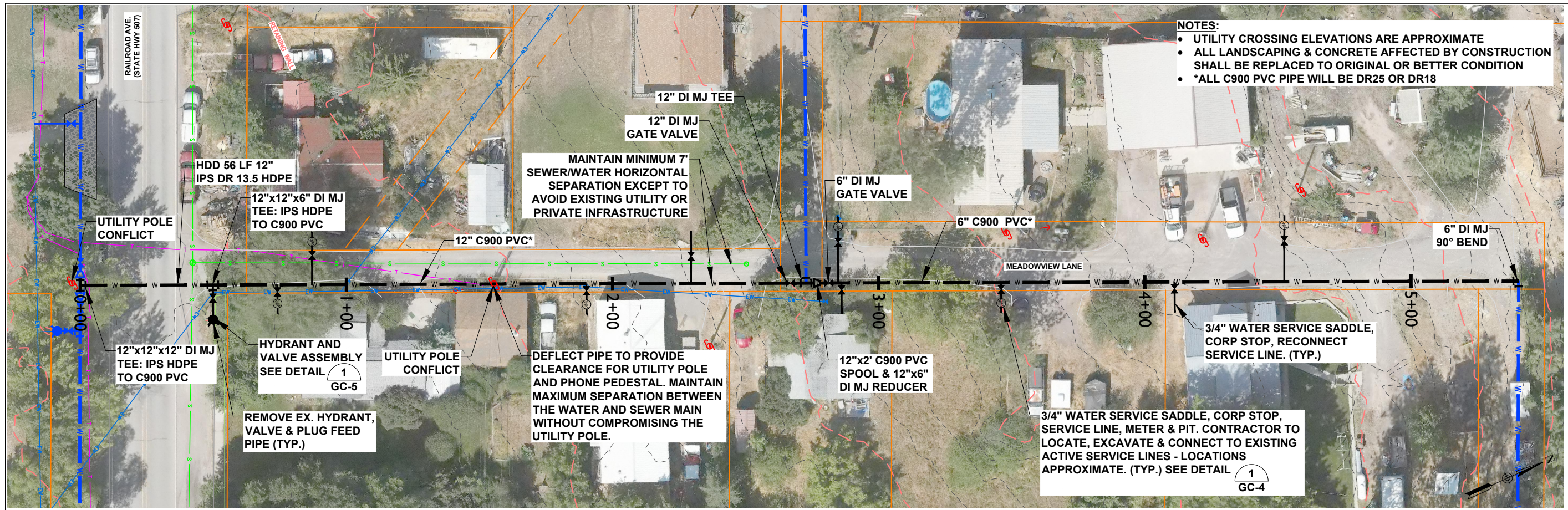
Owner  
**Town of Alberton**

Project Title  
**Alberton Water System Improvements Project**

Sheet Title  
**New Potable Water Plan & Profile**  
**Railroad Avenue Continued**

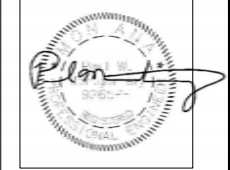
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**NOTES:**

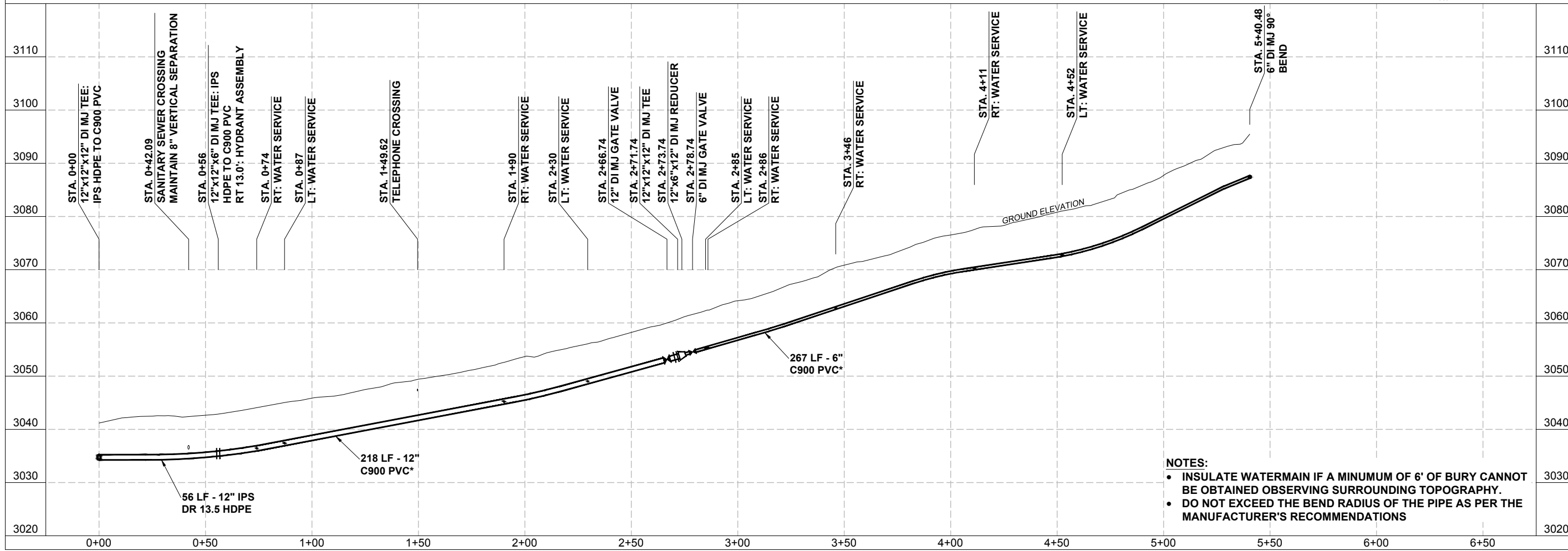
- UTILITY CROSSING ELEVATIONS ARE APPROXIMATE
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- \*ALL C900 PVC PIPE WILL BE DR25 OR DR18



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision: Final Re-Bid  
 Plot Scale: 1:2  
 Drawn By: A. Eckhart, P.E.  
 Approved By: P. Montgomery, P.E.  
 Checked By: A. Eckhart, P.E.  
 Designed By: P. Montgomery, P.E.

Engineer:  
  
 Anderson-Montgomery  
 CONSULTING ENGINEERS  
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 Fax (406) 449-3304



**NOTES:**

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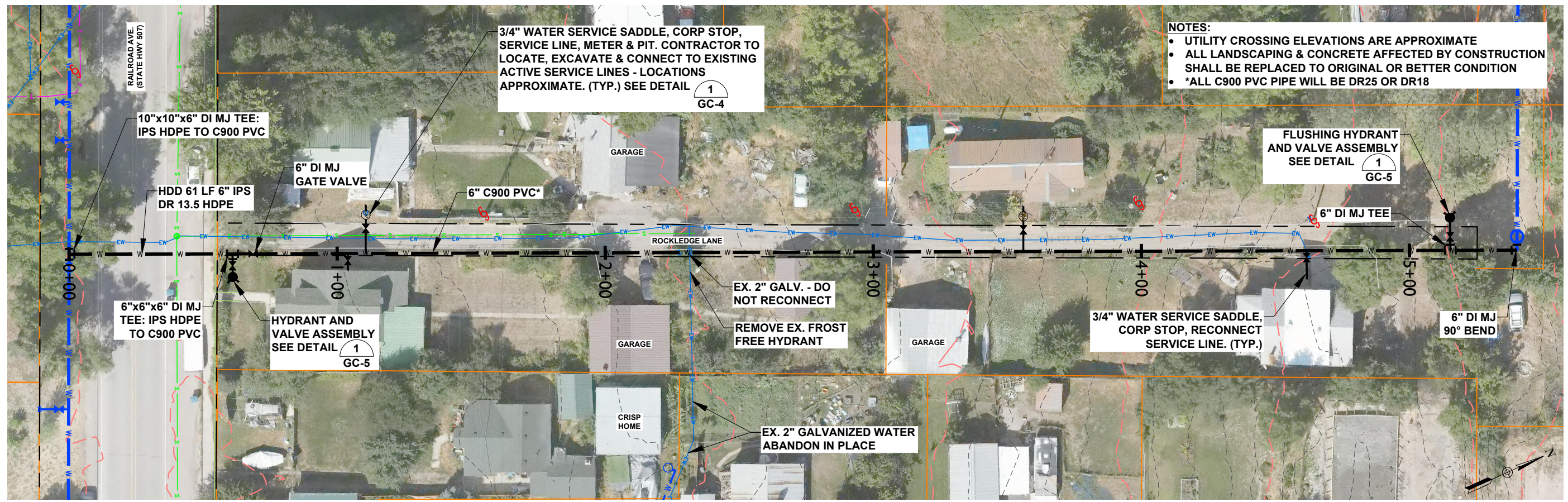
Owner:  
 Town of Alberton

Project Title:  
 Alberton Water System Improvements Project

Sheet Title:  
 New Potable Water Plan & Profile  
 Meadowview Lane

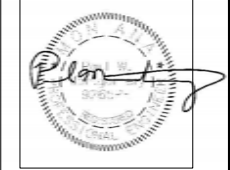
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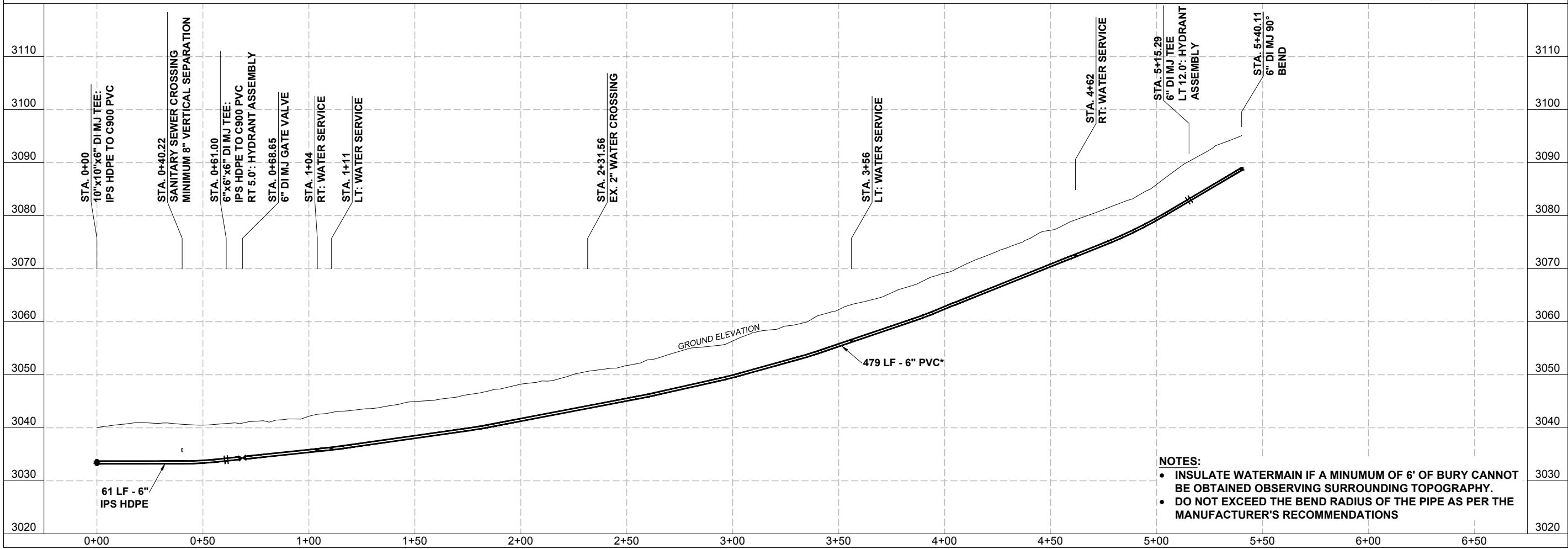


Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

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Fax (406) 449-3304



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Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

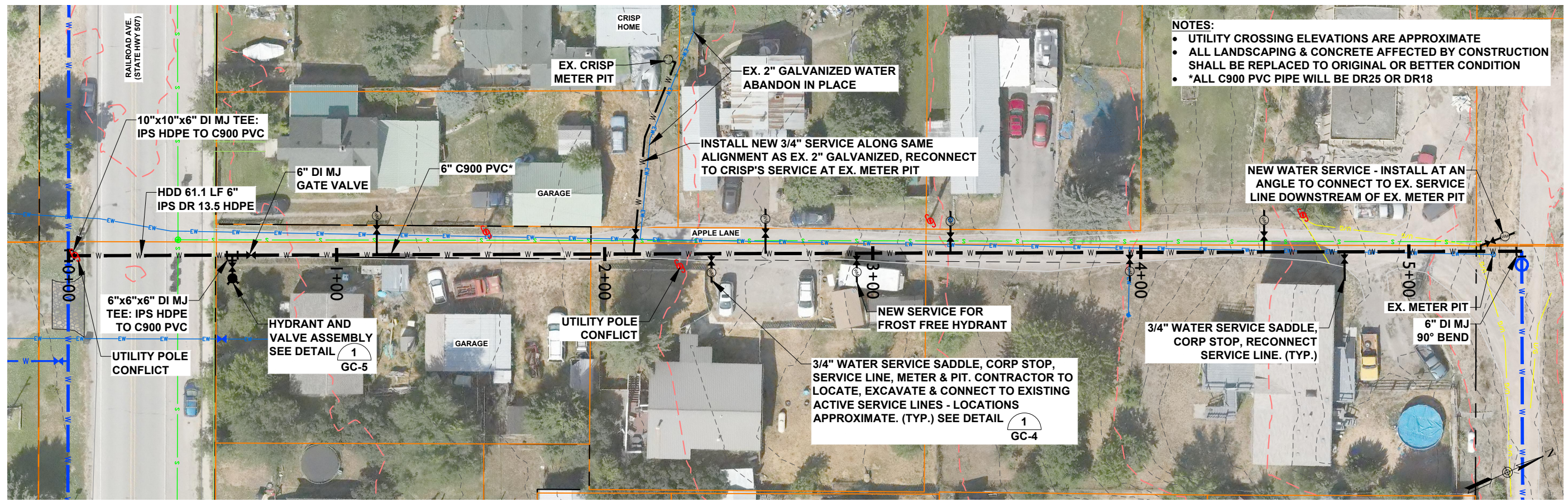
Sheet Title

New Potable Water Plan & Profile  
Rockledge Lane

Sheet

**D-8**

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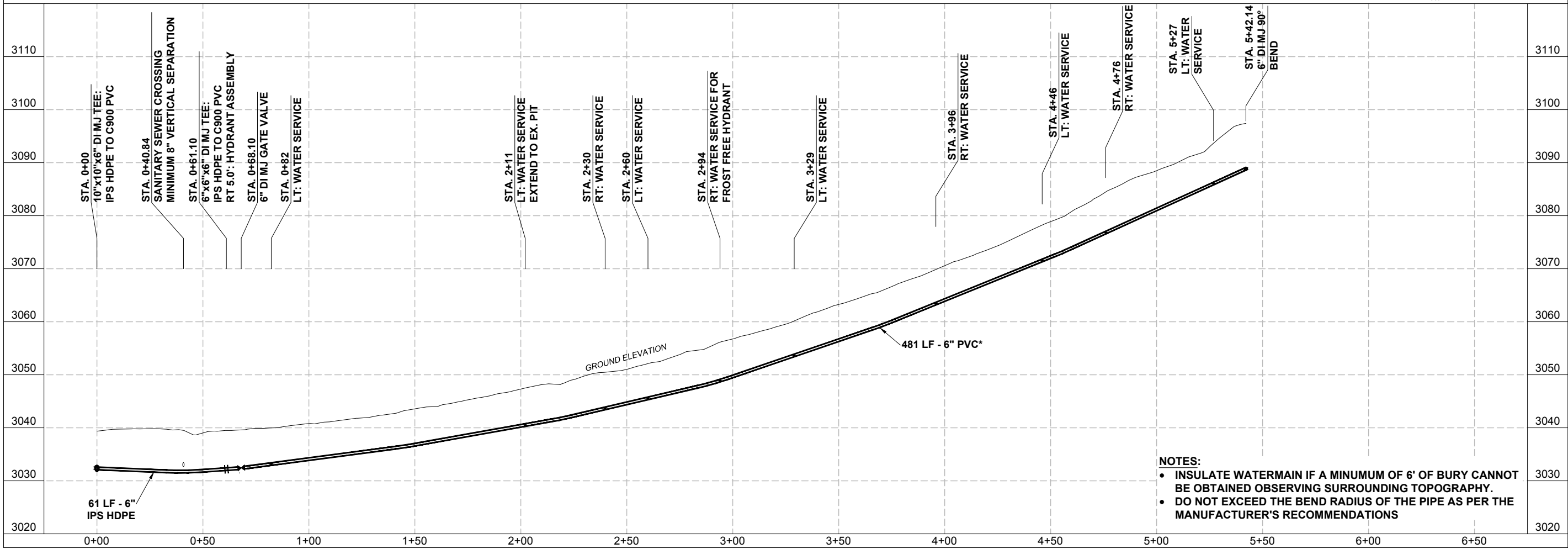


Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

Engineer

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Fax (406) 449-3304



Owner  
Town of Alberton

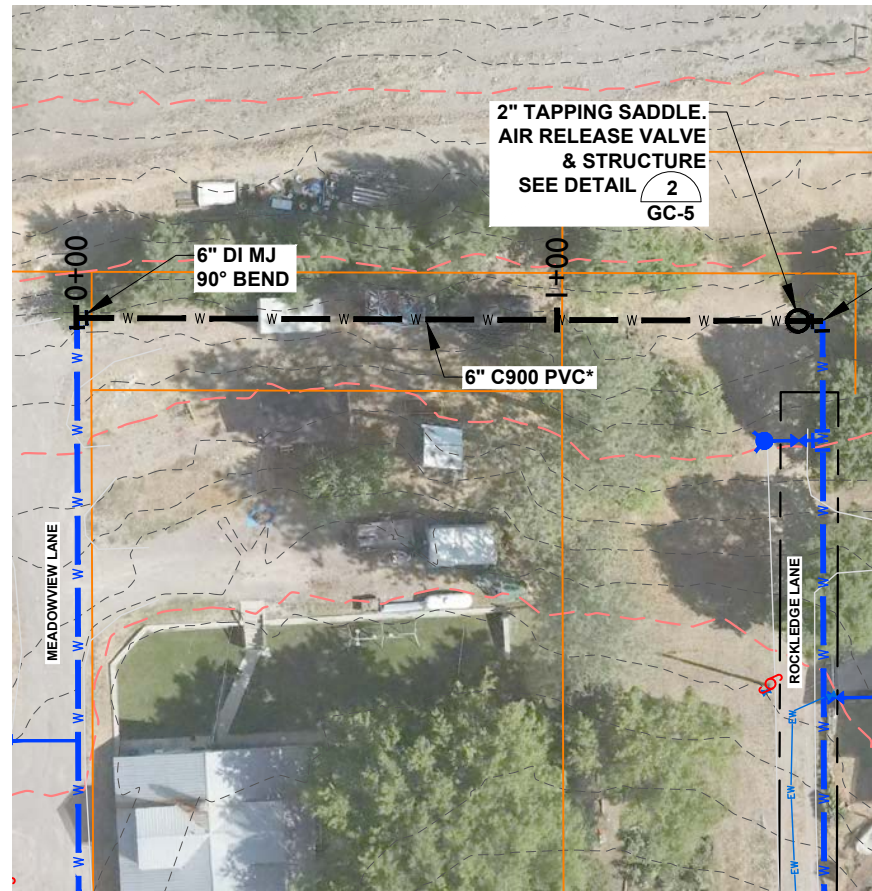
Project Title  
Alberton Water System Improvements Project

Sheet Title  
New Potable Water Plan & Profile  
Apple Lane

Sheet  
D-9







- NOTES:**
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Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision  
Final Re-Bid  
Plot Scale  
1:2  
Drawn By  
A. Eckhart, P.E.  
Approved By  
P. Montgomery, P.E.  
Checked By  
A. Eckhart, P.E.  
Designed By  
P. Montgomery, P.E.

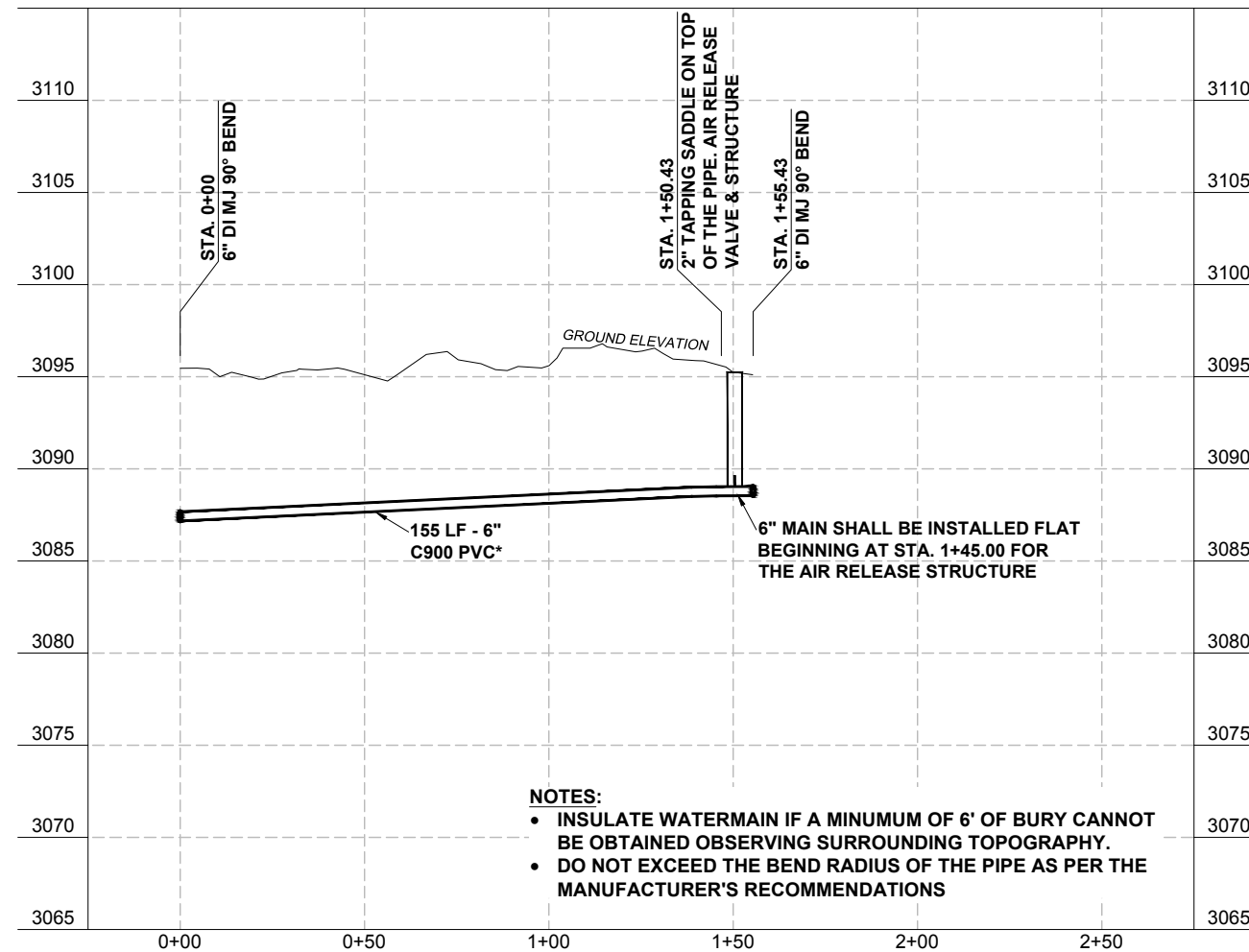
Engineer  
**Anderson-Montgomery**  
CONSULTING ENGINEERS  
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Helena, Mt 59601  
Phone (406) 449-3303  
Fax (406) 449-3304

Owner  
**Town of Alberton**

Project Title  
**Alberton Water System Improvements Project**

Sheet Title  
**New Potable Water Plan & Profile**  
**Meadowview Lane to Rockledge Lane**

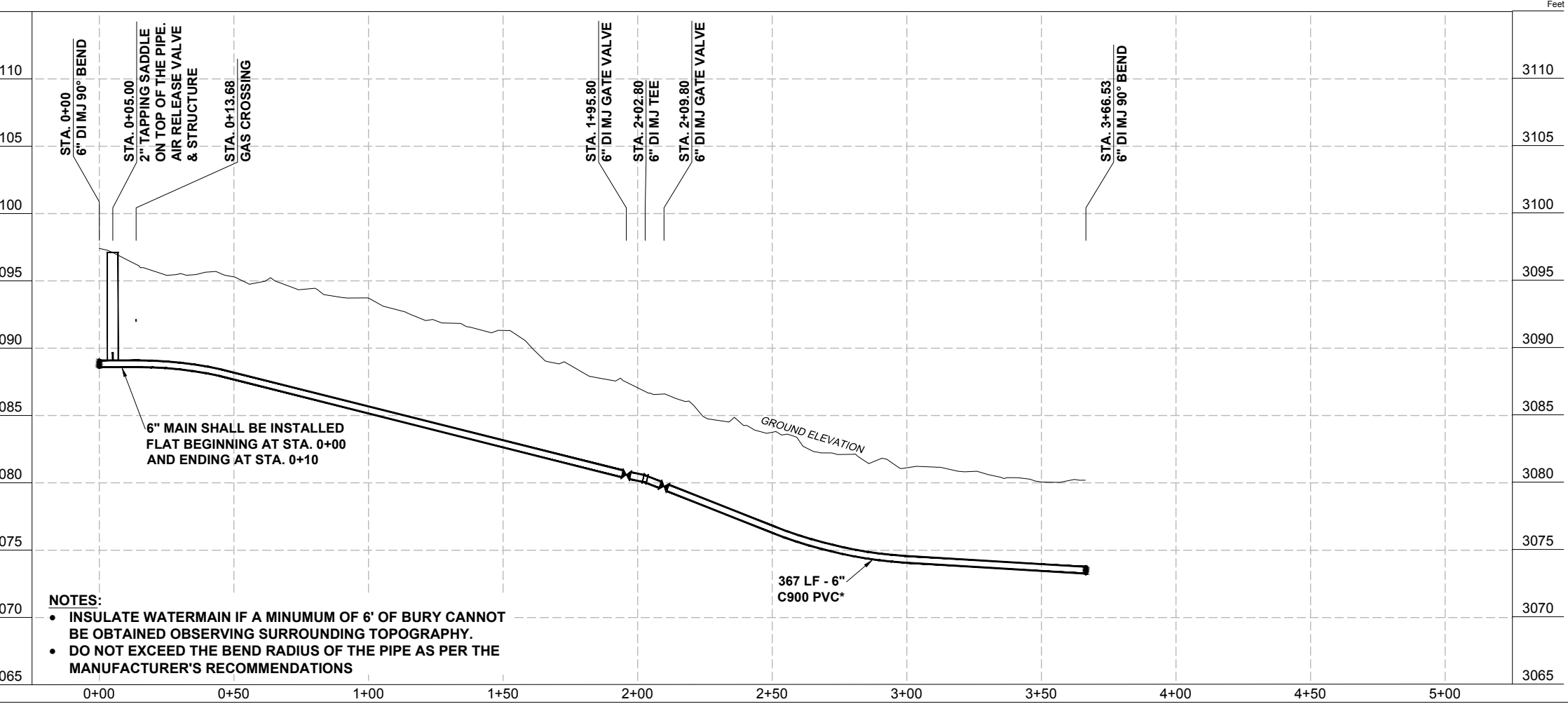
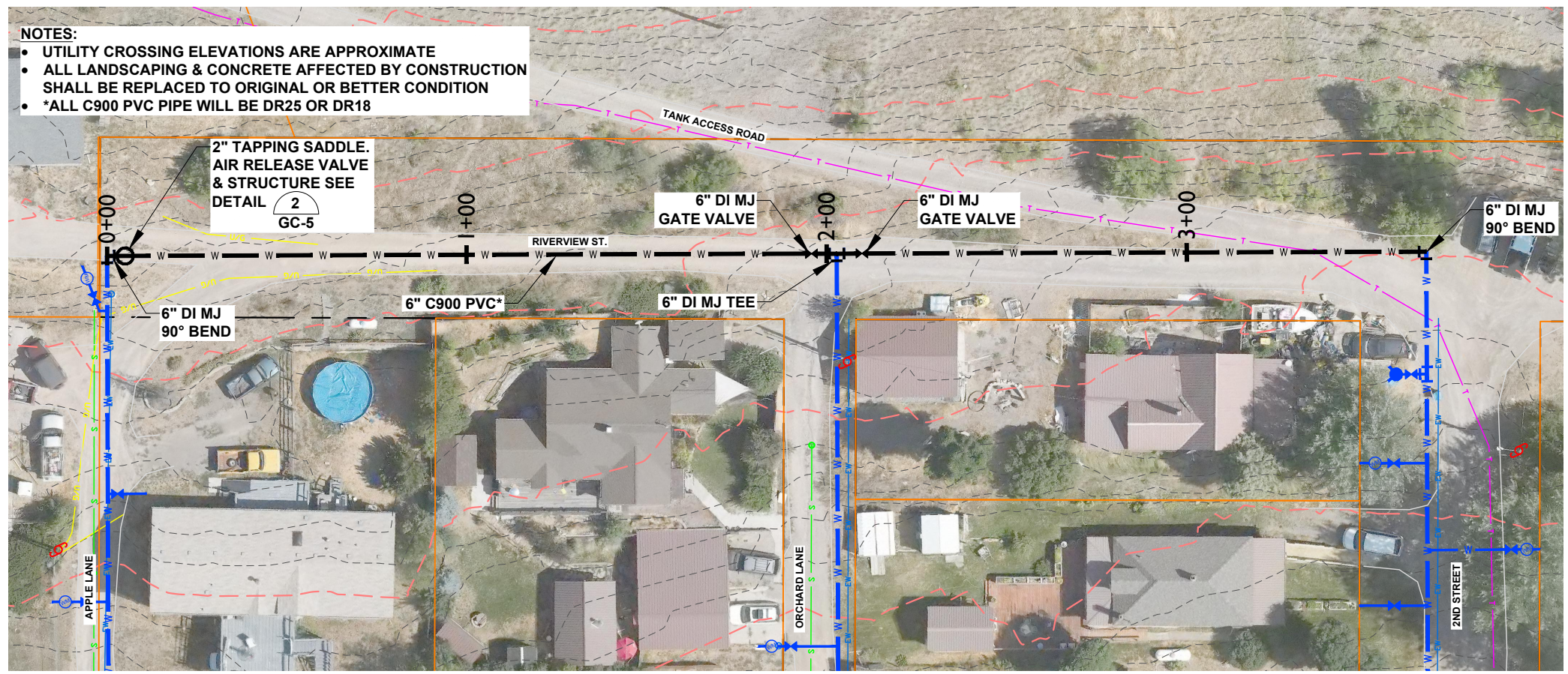
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**D-12**



- NOTES:**
- INSULATE WATERMAIN IF A MINIMUM OF 6' OF BURY CANNOT BE OBTAINED OBSERVING SURROUNDING TOPOGRAPHY.
  - DO NOT EXCEED THE BEND RADIUS OF THE PIPE AS PER THE MANUFACTURER'S RECOMMENDATIONS

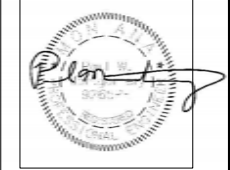


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Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision	Final Re-Bid
Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
Designed By	P. Montgomery, P.E.

Engineer

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Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

Sheet Title

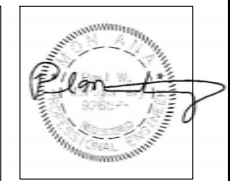
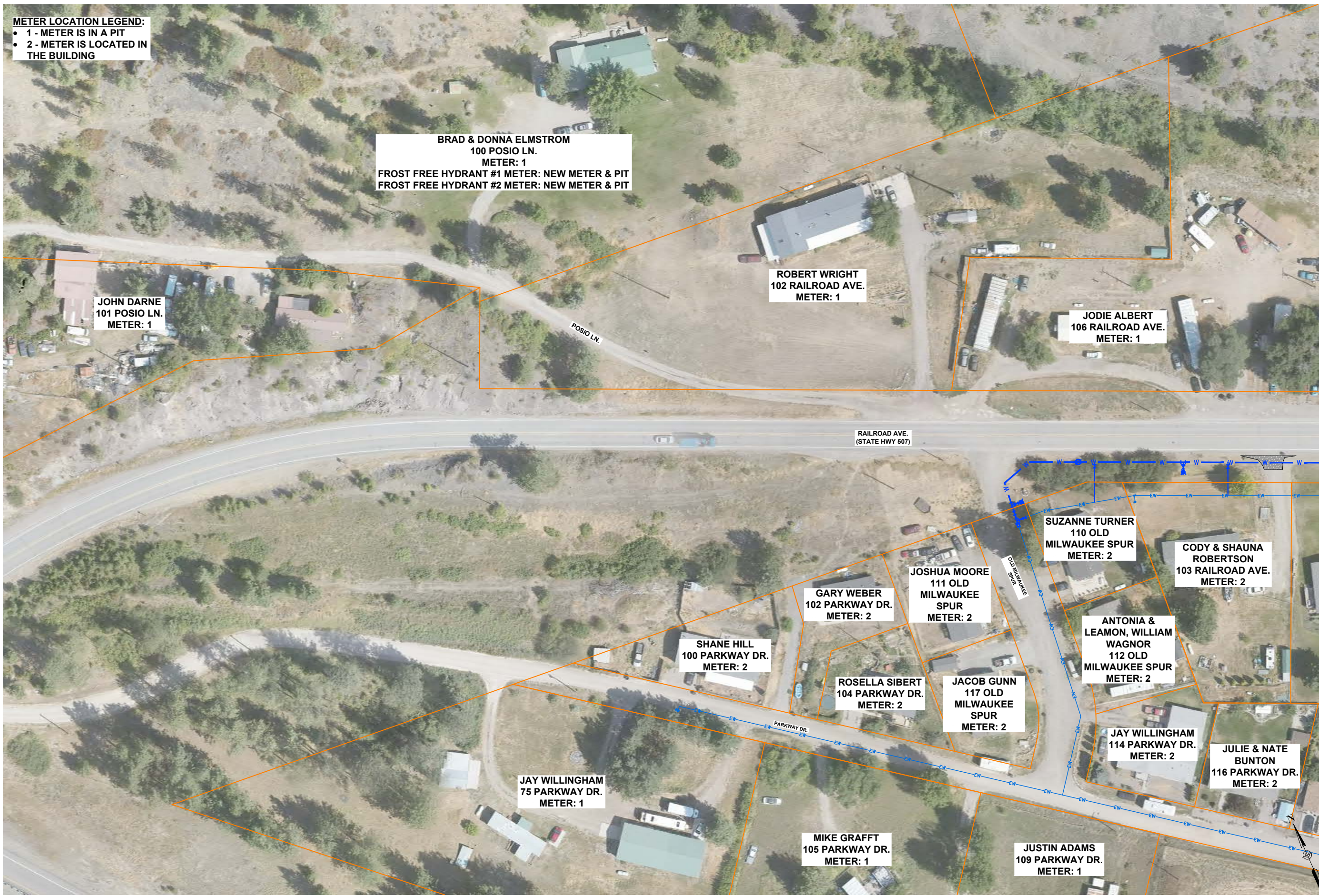
New Potable Water Plan & Profile  
Riverview Street

Sheet

**D-13**

**METER LOCATION LEGEND:**

- 1 - METER IS IN A PIT
- 2 - METER IS LOCATED IN THE BUILDING



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision  
Final Re-Bid  
Plot Scale  
1:2  
Drawn By  
A. Eckhart, P.E.  
Approved By  
P. Montgomery, P.E.  
Checked By  
A. Eckhart, P.E.  
Designed By  
P. Montgomery, P.E.

Engineer

Anderson-Montgomery  
CONSULTING ENGINEERS  
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Helena, Mt 59601  
Phone (406) 449-3303  
Fax (406) 449-3304

Owner  
  
Town of Alberton

Project Title  
  
Alberton  
Water System  
Improvements  
Project

Sheet Title  
  
Water  
Meter  
Location  
Map

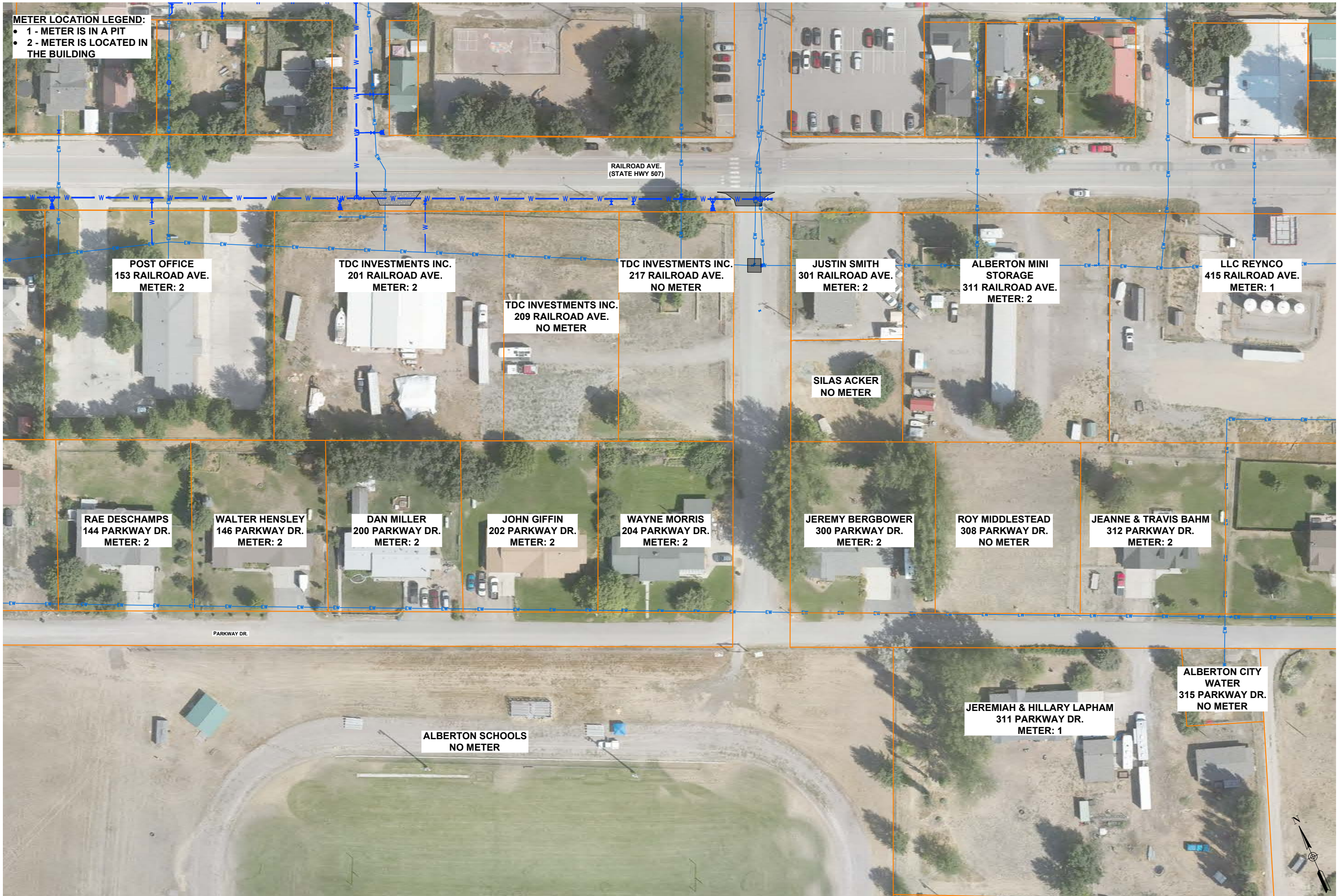
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**METER LOCATION LEGEND:**  
• 1 - METER IS IN A PIT  
• 2 - METER IS LOCATED IN THE BUILDING



Revision	Date	By
Draft	8-11-23	PWM
Final Draft	12-14-23	PWM
Final	2-5-24	PWM
Final Re-Bid	4-1-24	PWM

Revision: Final Re-Bid  
 Plot Scale: 1:2  
 Drawn By: A. Eckhart, P.E.  
 Approved By: P. Montgomery, P.E.  
 Checked By: A. Eckhart, P.E.  
 Designed By: P. Montgomery, P.E.

Engineer



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Owner  
**Town of Alberton**

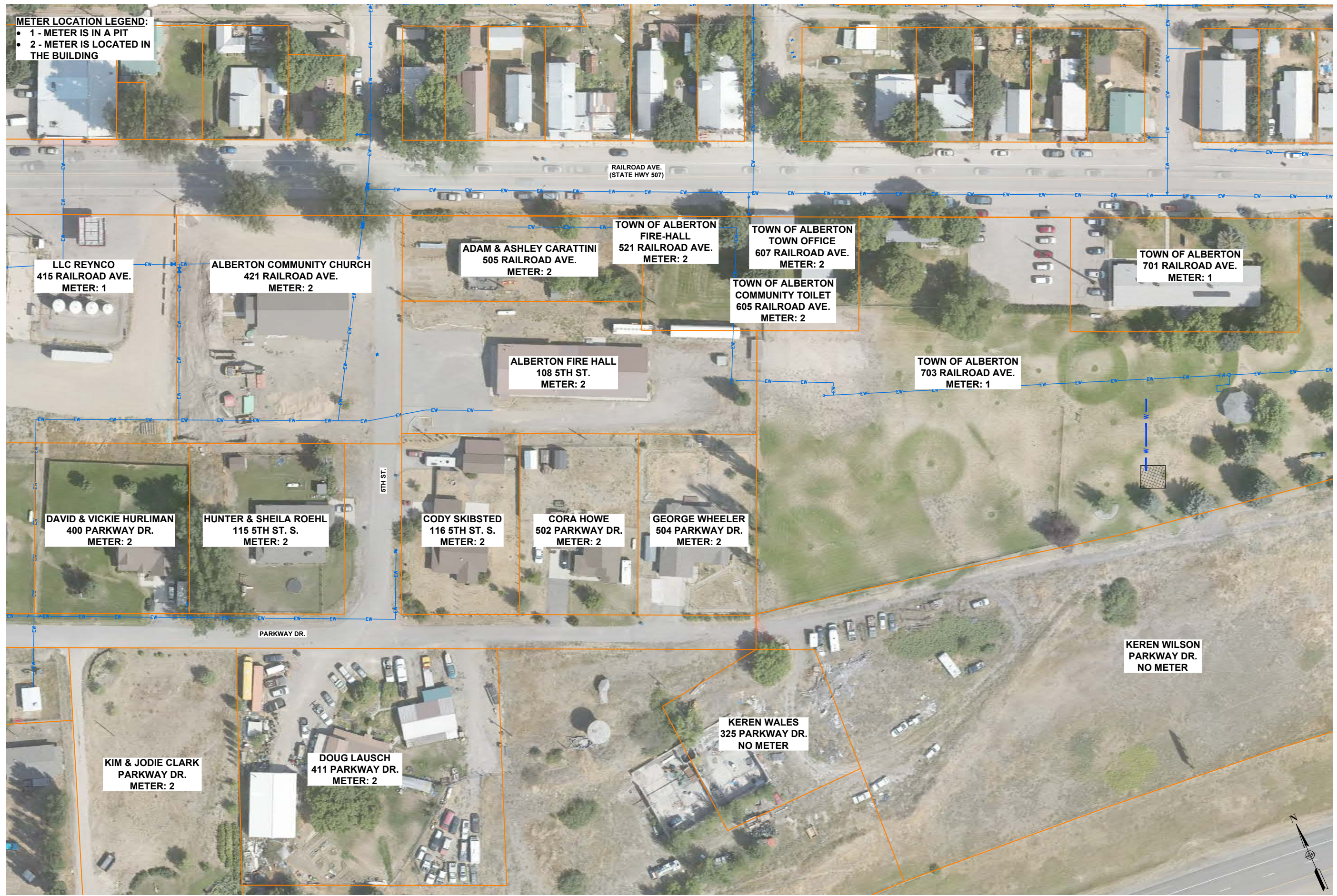
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Plot Scale	1:2
Drawn By	A. Eckhart, P.E.
Approved By	P. Montgomery, P.E.
Checked By	A. Eckhart, P.E.
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Project Title

Alberton Water System Improvements Project

Sheet Title

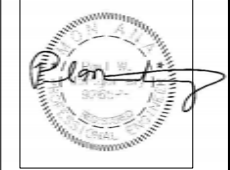
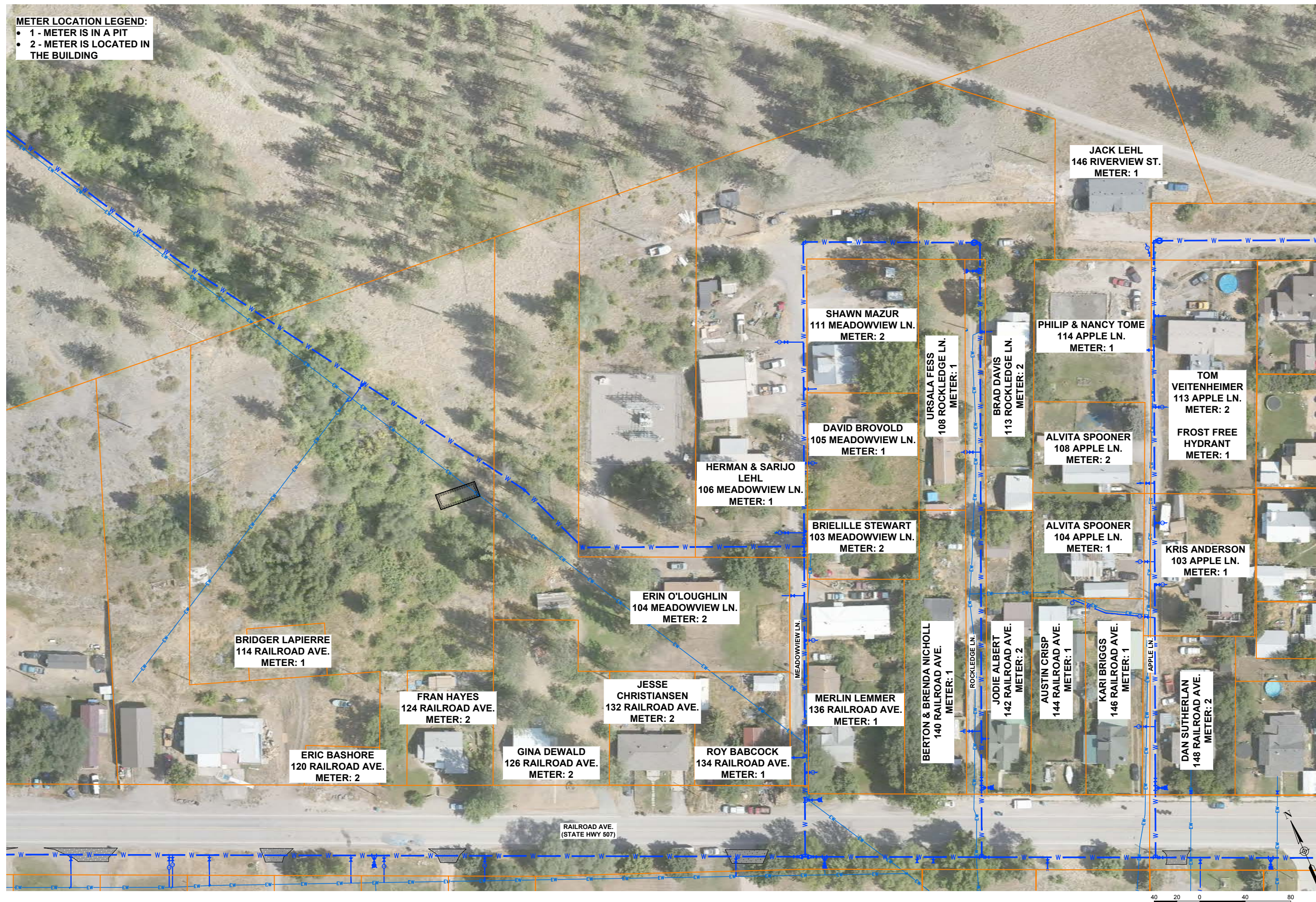
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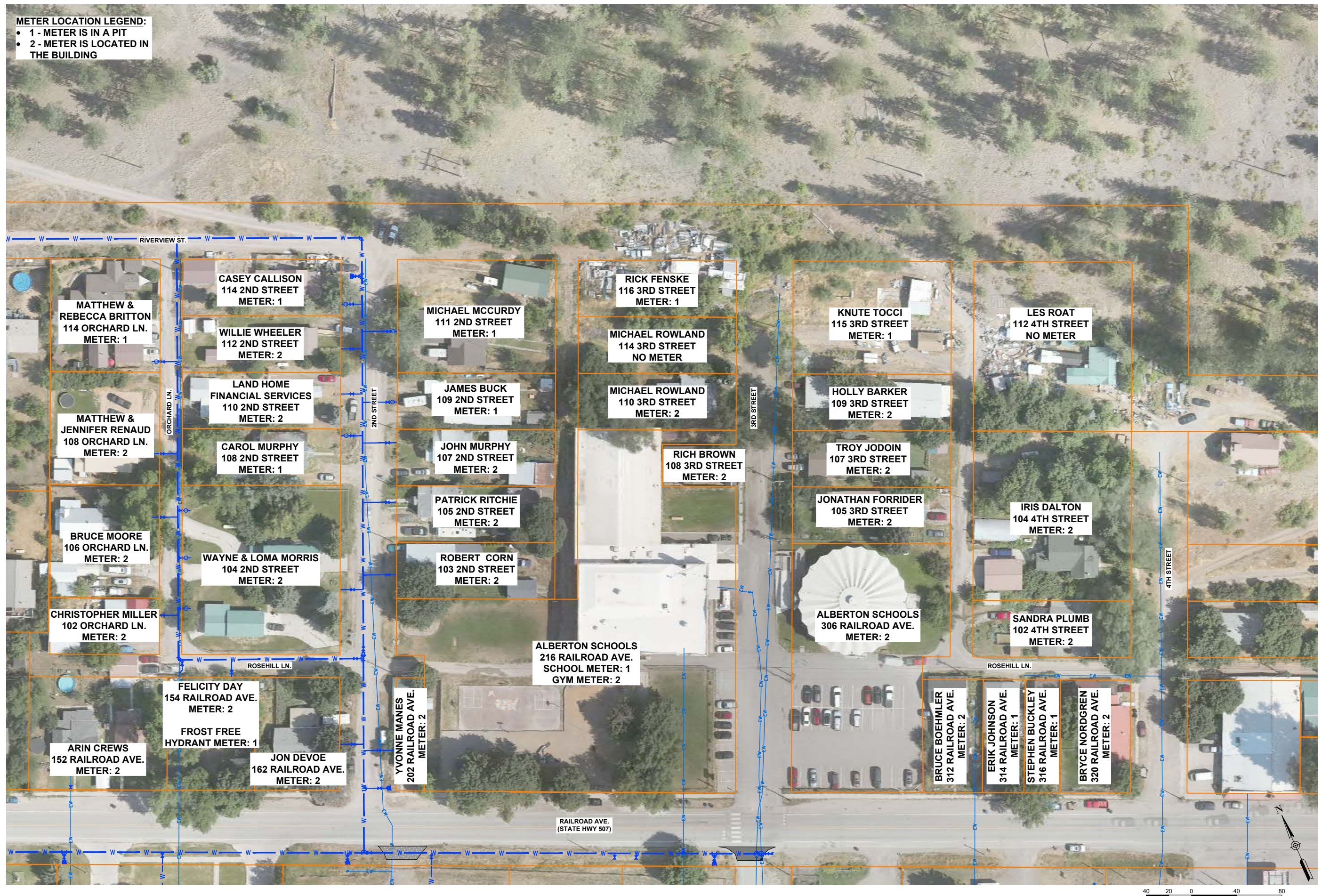
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Plot Scale  
1:2  
Drawn By  
A. Eckhart, P.E.  
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P. Montgomery, P.E.  
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Project Title  
  
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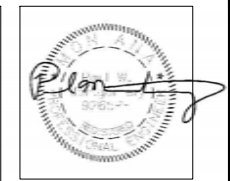
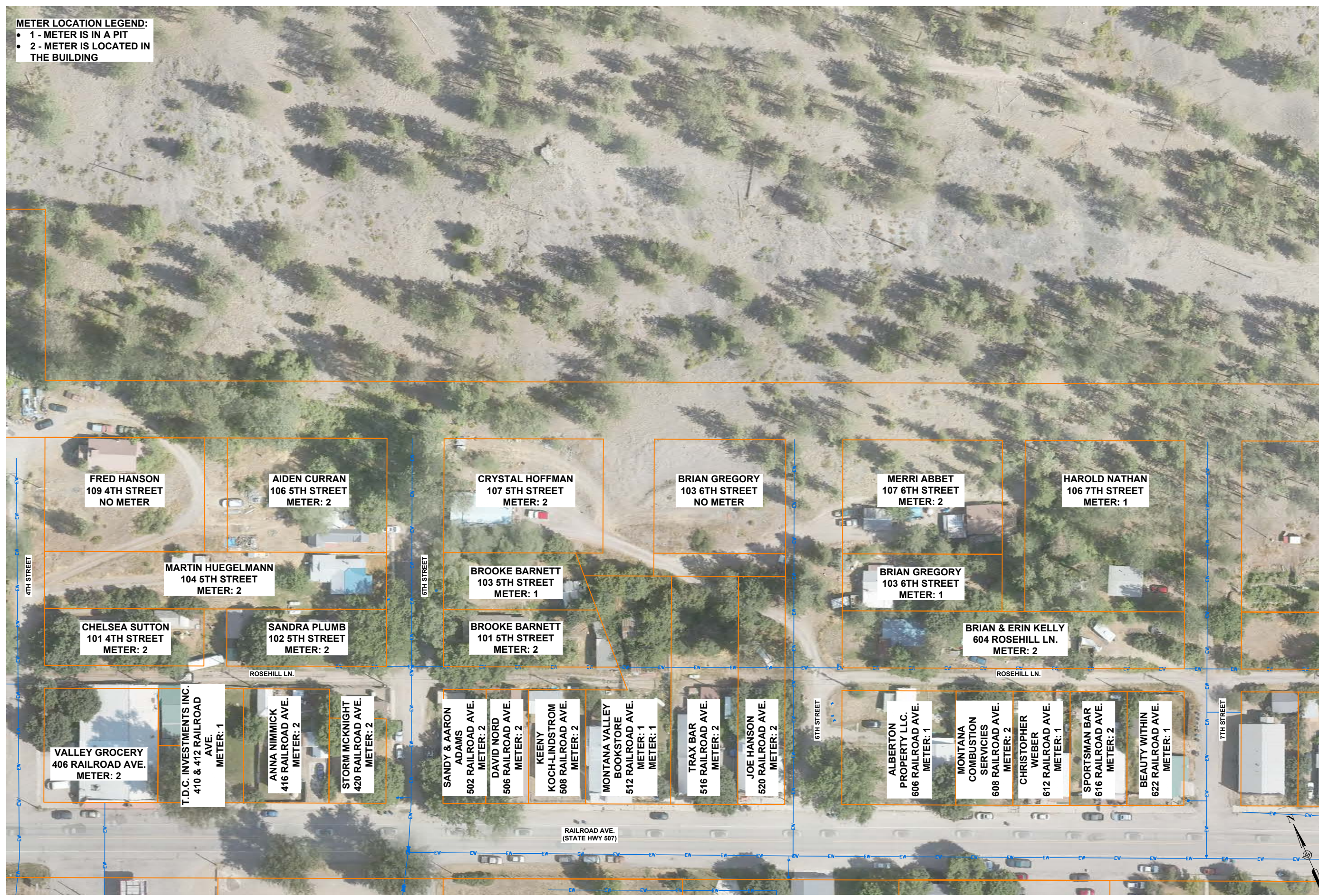
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Final Re-Bid  
Plot Scale  
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A. Eckhart, P.E.  
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P. Montgomery, P.E.  
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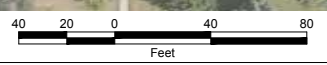
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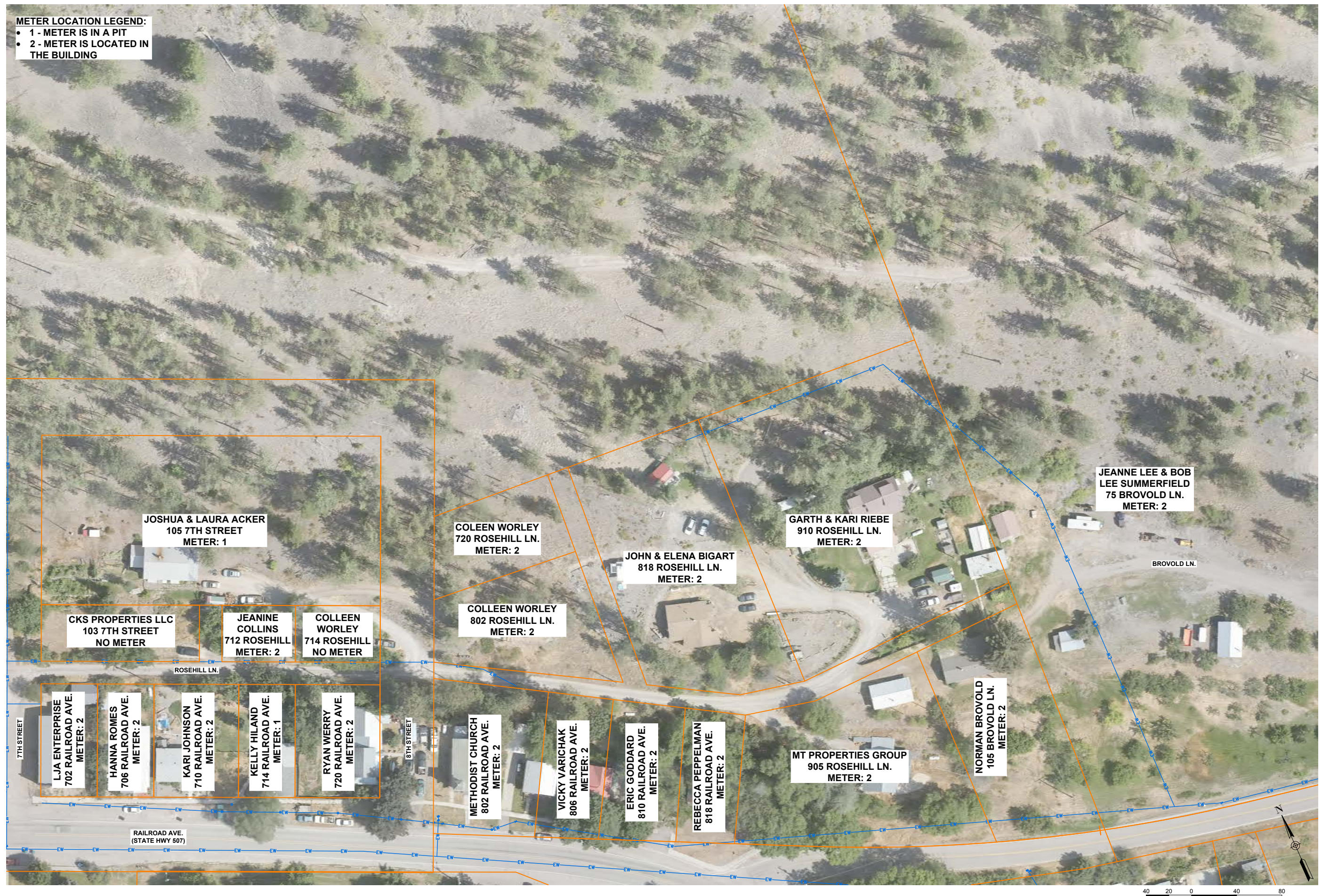




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Plot Scale  
1:2  
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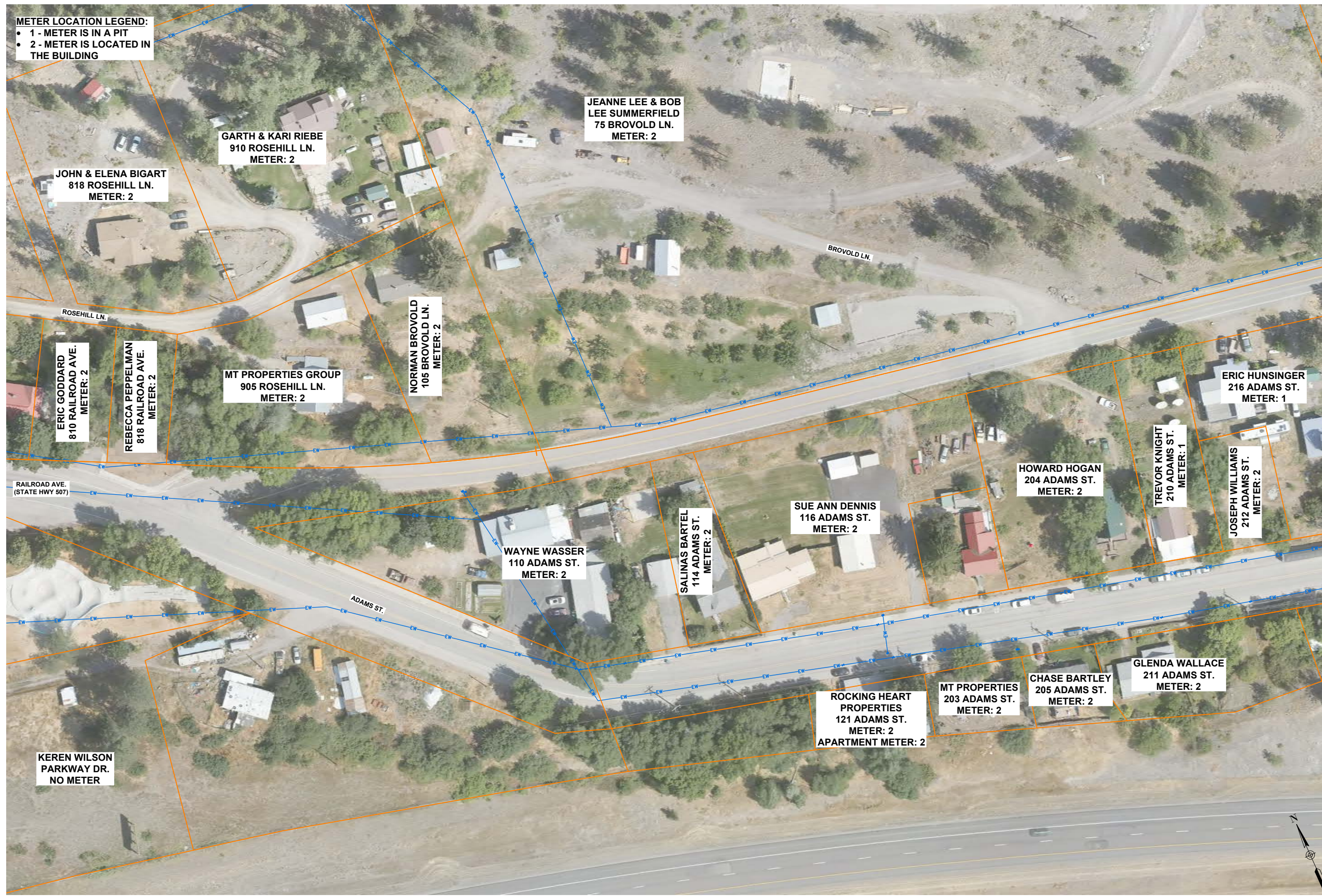
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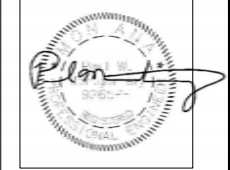
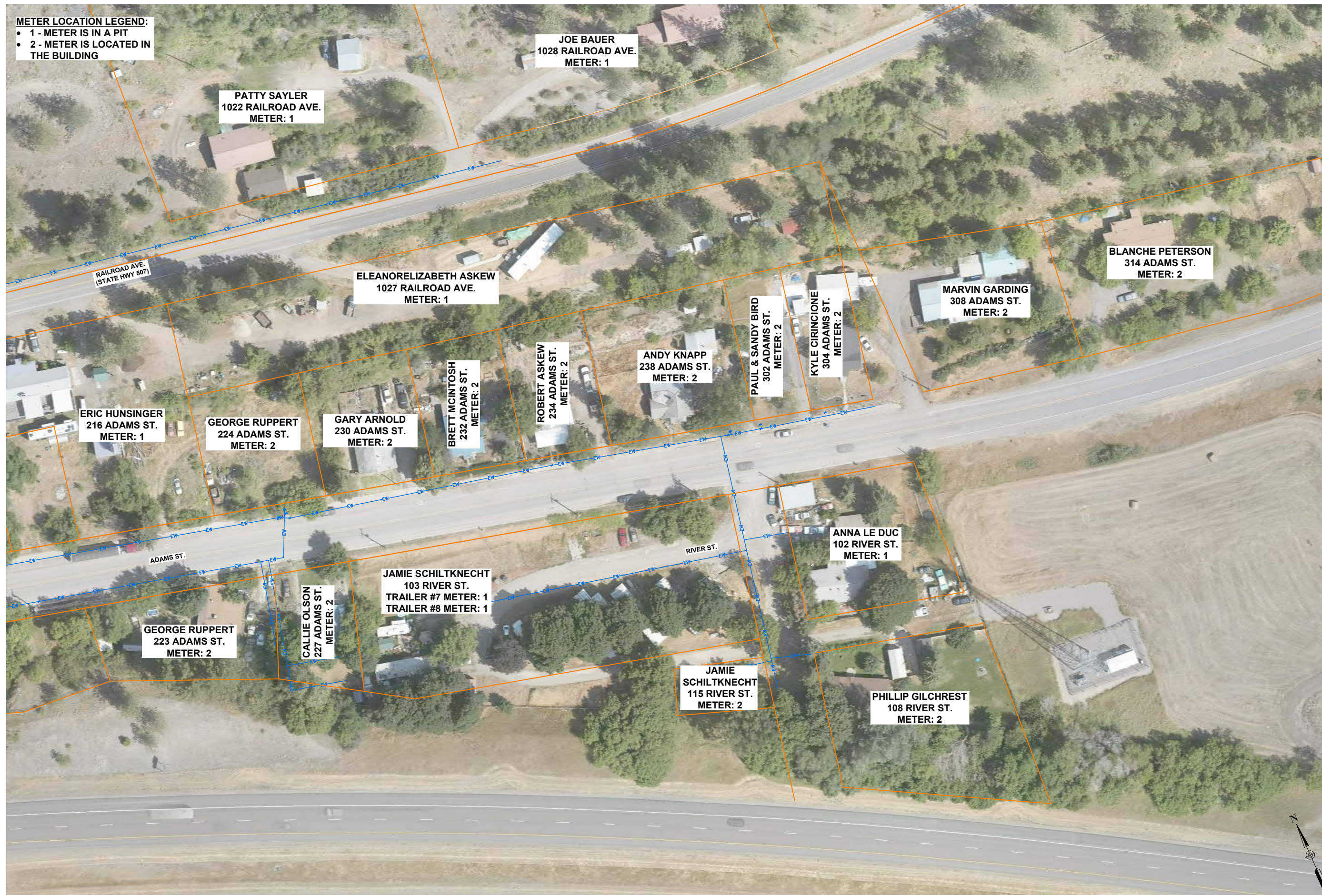
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Plot Scale  
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Drawn By  
A. Eckhart, P.E.  
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P. Montgomery, P.E.  
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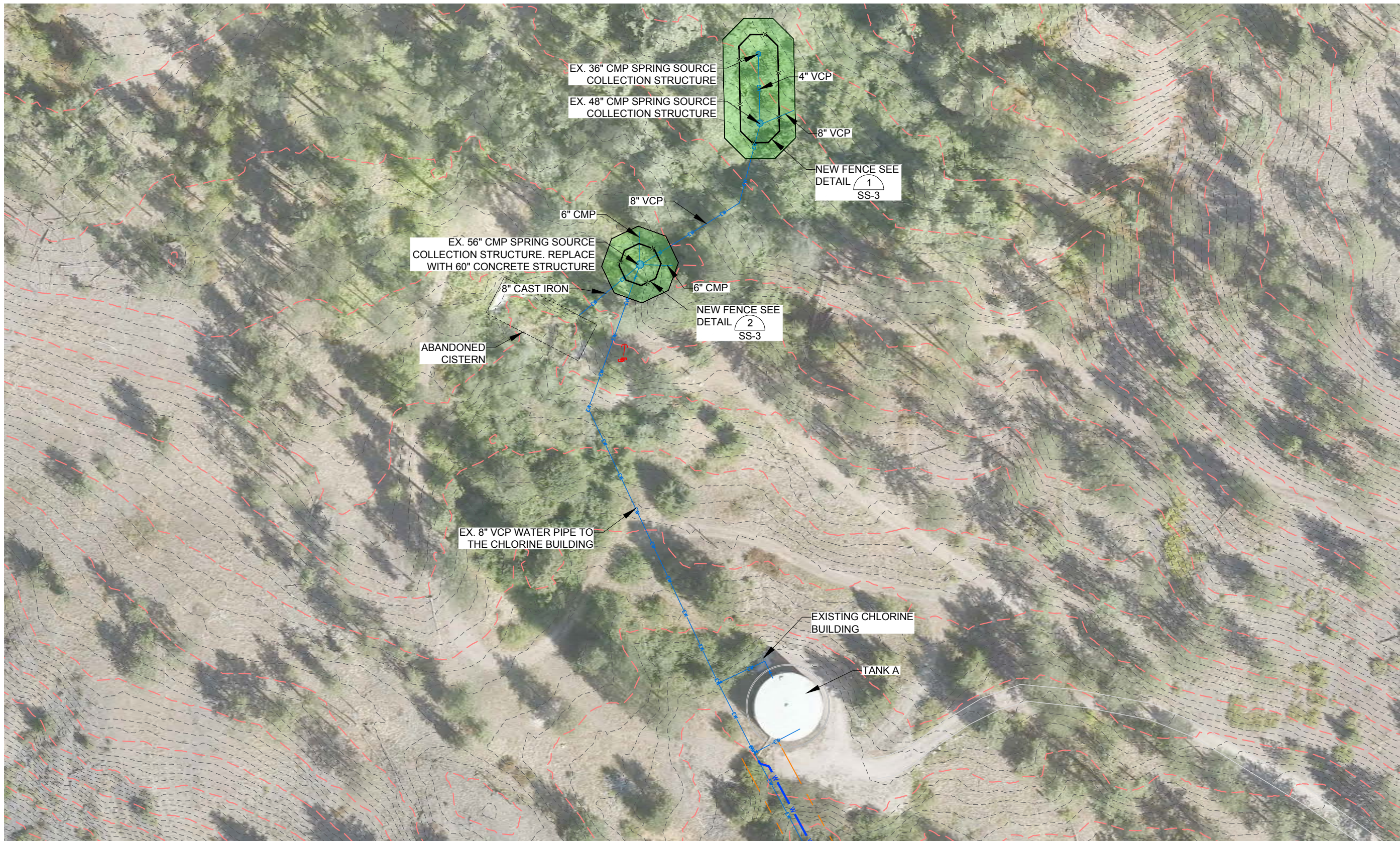
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Alberton  
Water System  
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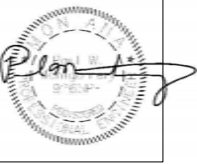
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**Spring Source Site Plan**



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Plot Scale  
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Drawn By  
A. Eckhart, P.E.  
Approved By  
P. Montgomery, P.E.  
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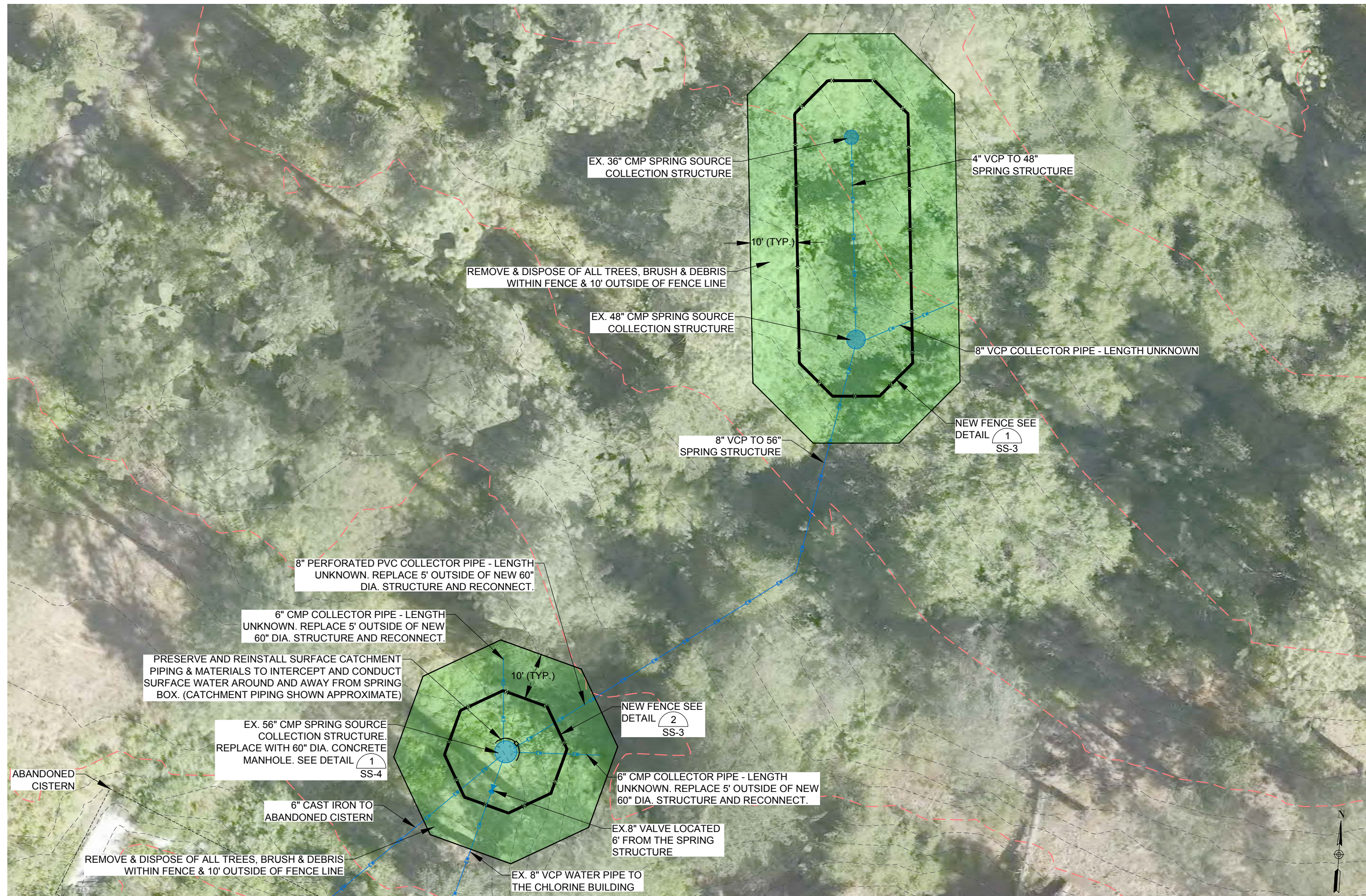
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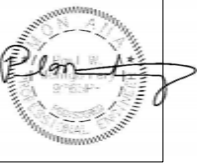
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**Spring Source Site Plan**  
SCALE 10 5 0 10 20  
Feet



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Plot Scale  
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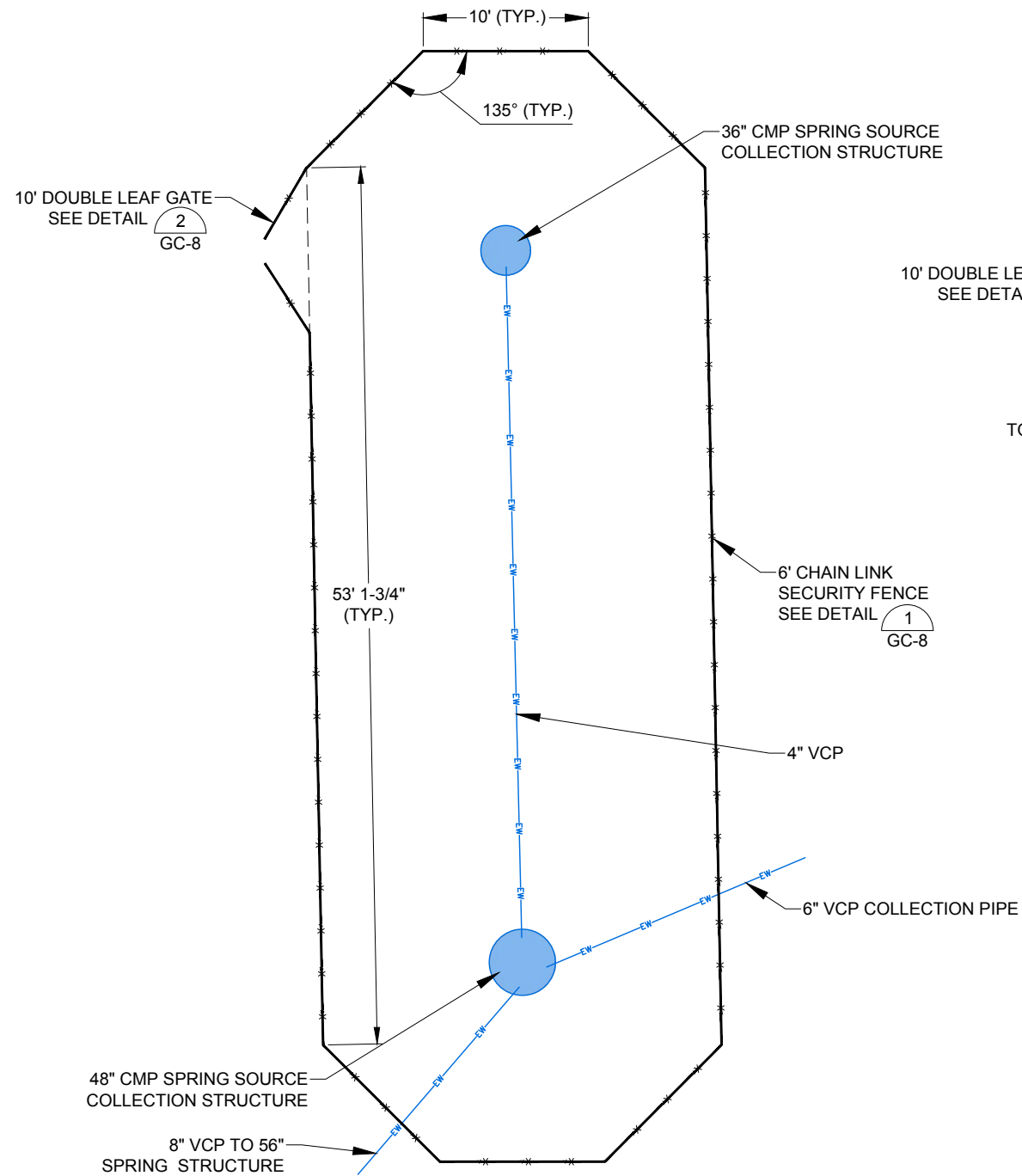
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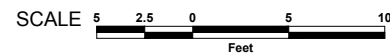
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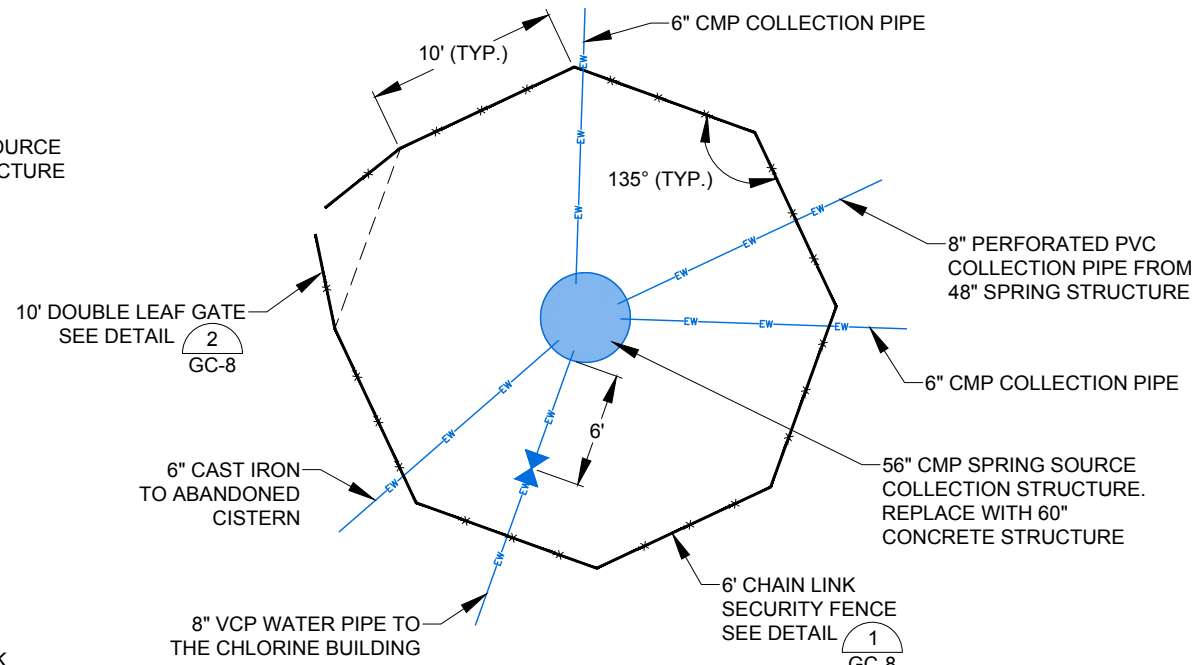


**36" & 48" Spring Source Fence** (1) SS-1,SS-2



**NOTES:**

- ENSURE THE LOCATION OF POSTS DO NOT VERTICALLY LINE UP DIRECTLY ABOVE ANY UTILITIES. FENCING SHALL BE ADJUSTED TO AVOID POST CONFLICTS WITH ALL BURIED UTILITIES.
- REMOVE & DISPOSE OF ALL TREES, BRUSH, & DEBRIS WITHIN FENCE & 10' OUTSIDE OF FENCE LINE.
- SPRING STRUCTURES SHALL BE LOCATED IN THE CENTER OF THE OCTAGON FENCE ENDS.
- SPRING STRUCTURE AND PIPING SHOWN FOR REFERENCE.



**56" Spring Source Fence** (2) SS-1,SS-2



**NOTES:**

- ENSURE THE LOCATION OF POSTS DO NOT VERTICALLY LINE UP DIRECTLY ABOVE ANY UTILITIES. FENCING SHALL BE ADJUSTED TO AVOID POST CONFLICTS WITH ALL BURIED UTILITIES.
- REMOVE & DISPOSE OF ALL TREES, BRUSH, & DEBRIS WITHIN FENCE & 10' OUTSIDE OF FENCE LINE.
- SPRING STRUCTURE SHALL BE LOCATED IN THE CENTER OF THE OCTAGON FENCE.
- SPRING STRUCTURE AND PIPING SHOWN FOR REFERENCE.



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Owner

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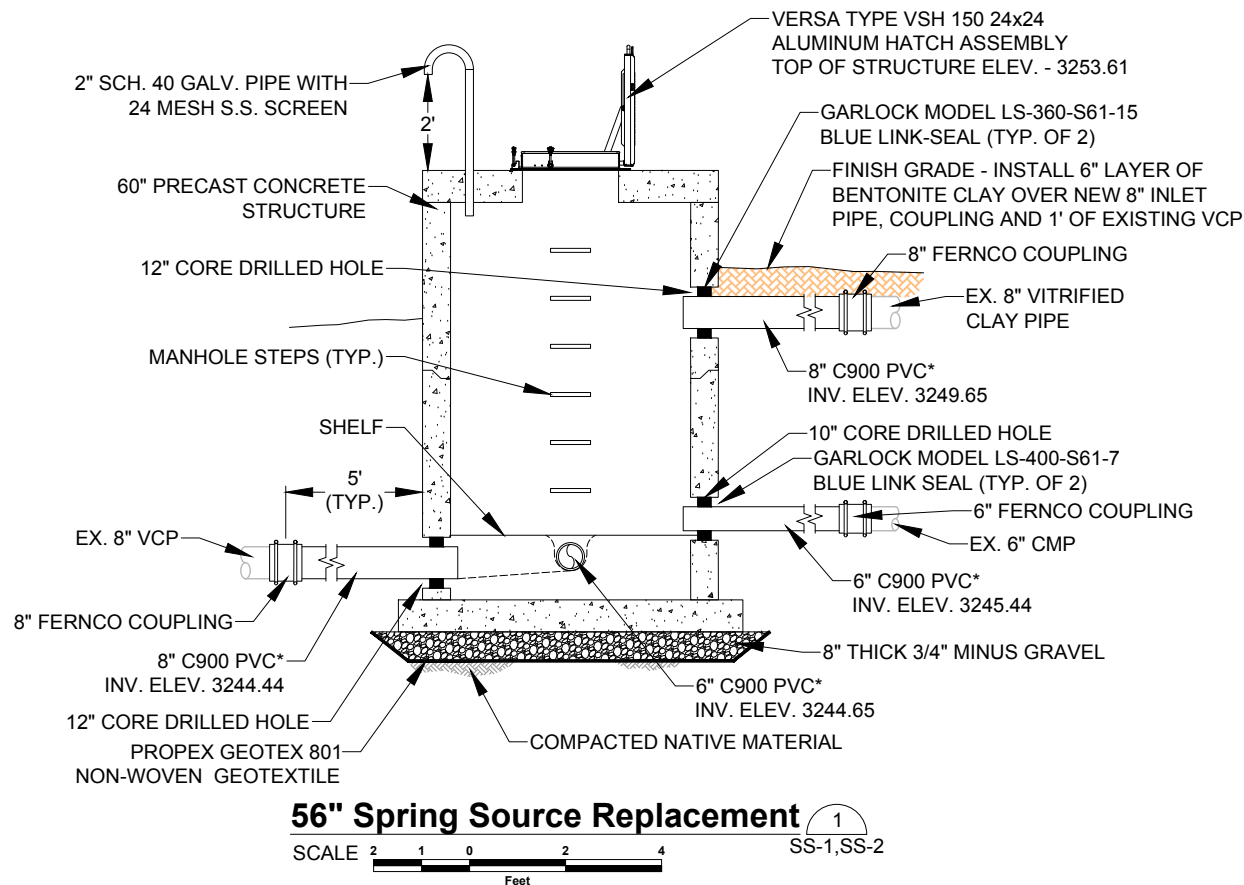
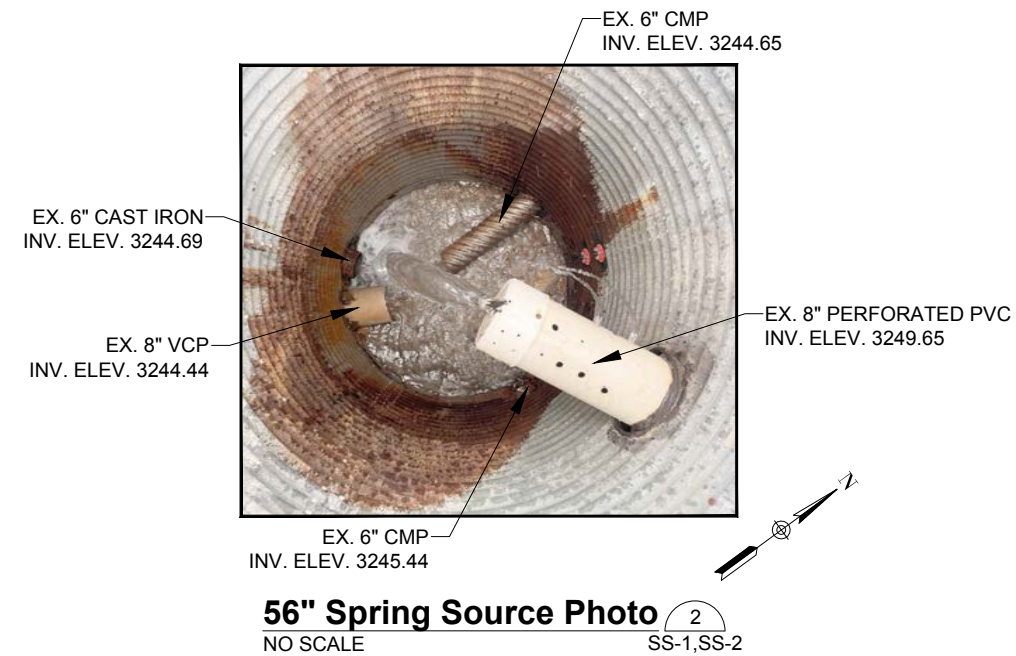
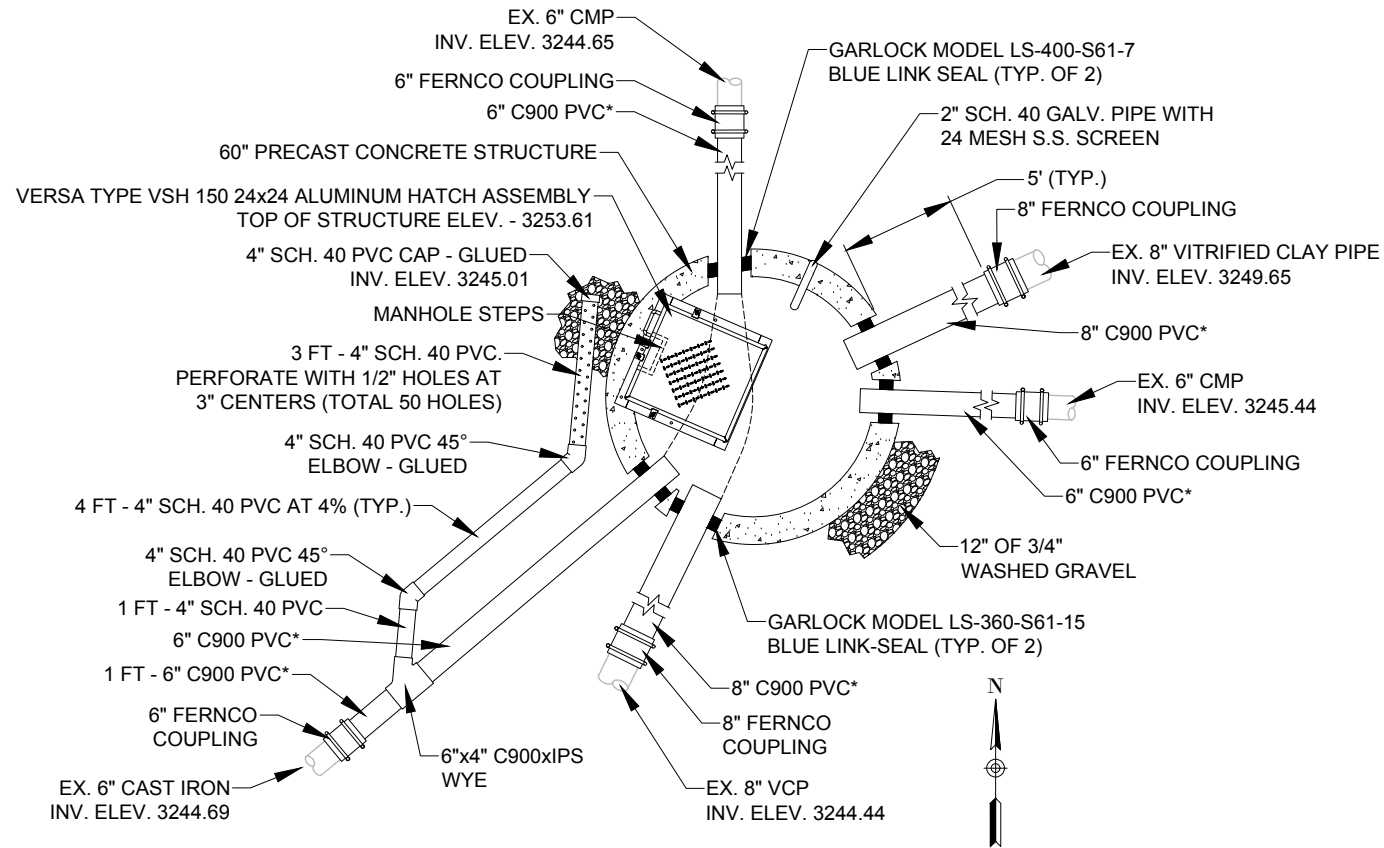
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**NOTES:**

- PRECAST CONCRETE MANHOLE SHALL CONFORM TO ASTM C478.
- ALL JOINTS SHALL BE WATERTIGHT. MATERIAL SHALL BE RUBBER-NEK OR APPROVED EQUAL.
- VERSA TYPE VSH 150 24x24 ALUMINUM HATCH ASSEMBLY. HATCH ROTATED IN SECTION VIEW FOR CLARITY.
- CHANNEL DEPTH SHALL GENERALLY BE HALF THE DIAMETER OF THE INLET OR OUTLET PIPE.
- CONCRETE SHELVES SHALL SLOPE TOWARD THE CHANNEL(S) AT 1" PER FOOT AND SHALL BE CONSTRUCTED AS PER THE LATEST EDITION OF MPW.
- PROVIDE WATER-TIGHT, NSF-61 COMPLIANT LINK SEAL FOR ALL PIPE PENETRATIONS.
- NEW MANHOLE SHALL BE COATED WITH AN EXTERIOR NSF COMPLIANT DAMPPROOFING: S-W SHERPLATE 600 OR APPROVED EQUAL.
- FINISHED MANHOLES SHALL BE IN ACCORDANCE WITH LATEST EDITION OF MPWS STANDARD SPECIFICATIONS.
- STEPS & PIPES IN SECTION VIEW HAVE BEEN ROTATED FOR DRAWING CLARITY.
- THE EXISTING 6" CAST IRON PIPE IS NOT SHOWN IN THE SECTION VIEW FOR DRAWING CLARITY.
- PROVIDE ALL SHORING NECESSARY TO PROTECT EXISTING STRUCTURES AND INFRASTRUCTURE.
- MANHOLE BARREL SHALL BE ENTIRELY ENCASED IN 12" OF 3/4" WASHED GRAVEL (NOT SHOWN FOR DRAWING CLARITY).
- PERFORATED DRAIN SHALL BE ENTIRELY ENCASED IN 3/4" WASHED GRAVEL (PARTIALLY SHOWN FOR DRAWING CLARITY).
- WRAP ALL NEW PIPE, COUPLING AND 1' OF EXISTING PIPE IN NON-WOVEN GEOTEXTILE FABRIC (TYP. OF 5) (NOT SHOWN FOR DRAWING CLARITY)
- \*ALL C900 PVC PIPE WILL BE DR25 OR DR18
- **ALL MATERIALS THAT COME IN CONTACT WITH THE SPRING WATER SHALL MEET ANSI/AWWA OR ANSI/NSF REQUIREMENTS FOR DRINKING WATER CONTACT. THIS INCLUDES: CONCRETE; ADMIXTURES; SEALING MATERIALS; GROUT; PIPE PENETRATION SEALS. CONTRACTOR TO PROVIDE VERIFICATION THAT THIS REQUIREMENT IS SATISFIED.**



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Owner

Town of Alberton

Project Title

Alberton Water System Improvements Project

Sheet Title

Spring Source Replacement Details

Sheet

SS-4

**APPENDIX C**

**DEQ PERMIT FORMS**



**GENERAL PERMIT  
FOR  
STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY**

**PERMIT NUMBER MTR100000**

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY**

**AUTHORIZATION TO DISCHARGE UNDER  
THE MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES)**

In compliance with Section 75-5-101 *et seq.*, Montana Code Annotated (MCA); Administrative Rules of Montana (ARM) 17.30.1101; 17.30.1301 *et seq.*; and ARM 17.30.601 *et seq.*, owners and operators (permittees) with authorization under this *General Permit for Storm Water Discharges Associated with Construction Activity* are permitted to discharge storm water resulting from construction activities as described in Part 1.1 of this permit and subject to effluent limitations, monitoring requirements, and other conditions set forth herein.

This permit shall become effective January 1, 2023.

This permit and the authorization to discharge shall expire at midnight, December 31, 2027.

FOR THE MONTANA DEPARTMENT  
OF ENVIRONMENTAL QUALITY

|S| Jon Kenning

---

Jon Kenning, Chief  
Water Protection Bureau

Issuance Date: October 31, 2022

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# 1. Coverage Under this Permit

## 1.1 Eligibility

### 1.1.1 Construction Activities Covered

The MPDES Storm Water Discharges Associated with Construction Activity General Permit (SWC or the General Permit) applies to all areas of the State of Montana, except for areas within the boundary of “Indian country,” as defined in Part [5](#). This permit applies to “storm water discharge associated with construction activity,” as defined in Part [5](#) and in ARM 17.30.1102. In this permit, the “owner or operator” (owner/operator), as defined in Part [5](#), is also identified as the permittee.

Owner/operators with construction activities that meet the following criteria are required to obtain authorization under the General Permit:

- There are areas of ground disturbance or other potential pollutant sources related to construction activity where a storm water discharge to state surface waters can occur; and
- Construction activity disturbs a total area of greater than or equal to one acre. Construction activities include clearing, grading, excavation, stockpiling earth materials, and other placement or removal of earth material performed during construction projects.
  - Permit coverage is required for construction activities that disturb less than one acre but are part of a “larger common plan of development or sale (larger common plan)” whose “total area” is greater than or equal to one acre, as defined in Part [5](#). See Part [1.1.5](#), below.

For construction activities that result in disturbance of less than five acres of total land area, determination of the acreage of disturbance does not include disturbance for routine maintenance activities on existing roads. The exclusion for routine maintenance is not available if the maintenance or repaving operation will alter the line and grade or hydrologic capacity of the road or involves clear, grading, or excavating of underlying and/or surrounding soil.

In determining the occurrence or potential occurrence of a storm water discharge associated with construction activity based on the acreage of ground disturbance and discharge potential to state surface waters, the permittee must consider the following additional factors:

- All potential drainage/discharge conditions and flow patterns, and their variation during the different phases of the construction activity;
- All potential rainfall or snowmelt events and their unpredictability over time (such as experiencing a relatively higher amount of rainfall or snowmelt in a relatively shorter time period);
- Support activities for the construction project which may be on or off the conventional construction project “site” (as defined in Part [5](#));
- Storm water discharges must typically be regulated beyond the conventional construction earthwork and building phases, lasting from the initiation of construction-related ground disturbance to “final stabilization” (per Parts [3.8](#) and [5](#)) of that disturbance, which can sometimes take significant extra time to achieve; and
- Storm water which discharges into a drain inlet and/or storm sewer system from the site is regulated as a discharge to state surface waters if the inlet or system ultimately discharges into a state surface water.

### 1.1.1.1 Support Activities

A support activity is a construction-related activity that occurs alongside construction and specifically supports construction activity. Support activities may include, but are not limited to:

- Areas used for access-related work,
- Earth material borrow areas,
- Equipment staging areas,
- Materials storage areas,
- Temporary concrete or asphalt batch plants, and
- Any areas used for fill placement.

For storm water discharges from support activities to be covered under a particular authorization under the General Permit, such support activities must:

- Be related to a specific construction activity with authorization under the General Permit;
- Not be part of a larger commercial operation serving multiple unrelated construction activities;
- Not be part of a larger commercial operation serving multiple unrelated construction activities, and not continue operation beyond the completion of the particular construction activity; and
- Not continue beyond the completion date of the associated construction activity authorized under the General Permit;
- Have appropriate controls and pollution prevention measures implemented and documented in the SWPPP, per Part [3](#).

### 1.1.2 Allowable Storm Water Discharges

Unless otherwise made ineligible through the provisions in Part [1.1.4](#), the following discharges are eligible for coverage under this permit:

- “Storm water discharges associated with construction activity” as defined in Part [5](#); and
- Storm water discharges to impaired waterbodies that are consistent with approved “TMDLs” (as defined in Part [5](#)) and assigned WLAs, and the additional requirements within the General Permit.

### 1.1.3 Allowable Non-Storm Water Discharges

The following are non-storm water discharges allowed under this permit:

- Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
- Irrigation drainage;
- Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
- Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed);
- Routine external building wash down that does not use detergents;
- Uncontaminated ground water or spring water;
- Water used to control dust;
- Discharges from emergency fire-fighting activities;
- Foundation or footing drains where flows are not contaminated with process materials; and
- Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., “piped” cooling tower blowdown or drains).

### 1.1.4 Limitations on Coverage

The following discharges are not eligible for coverage under this permit:

- Storm water discharges that are mixed with non-storm water, other than those non-storm water discharges listed in Part [1.1.3](#);
- Prohibited discharges as listed in Part [2.1.7](#);
- Discharges of construction dewatering effluent to state surface waters requiring authorization under the MPDES General Permit for Construction Dewatering;
- Storm water discharges to impaired waterbodies that are inconsistent with approved TMDLs and assigned WLAs, and the additional requirements with the General Permit;
- Storm water discharges to waterbodies that are inconsistent with additional Montana Department of Environmental Quality (DEQ) requirements, on a case-by-case basis; or
- Discharges which DEQ determines have a reasonable potential to cause, or contribute to, an exceedance of any applicable water quality standard, and/or DEQ has determined coverage under a MPDES Individual Permit is required.

Coverage does not relieve the permittee from any other statute, regulation, permits, or other regulatory requirements for activities occurring within the project area

DEQ may deny coverage for storm water discharges citing that the permittee appears unable to comply with one or more of the following requirements:

- Effluent standards, effluent limitations, standards of performance for new sources of pollutants, toxic effluent standards and prohibitions, and pretreatment standards;
- Water quality standards established pursuant to 75-5-301, MCA;
- Prohibition of discharge of any radiological, chemical, or biological warfare agent or high-level radioactive waste;
- Prohibition of any discharges to which the regional administrator has objected in writing;
- Prohibition of any discharge which is in conflict with a plan or amendment thereto approved pursuant to section 208(b) of the Clean Water Act;
- Any additional requirements that DEQ determines are necessary to carry out the provisions of 75-5-101, et seq., MCA; and
- A point source is a new source or a new discharge and the discharge from its construction or operation will cause or contribute to a violation of water quality standards per ARM 17.30.1311(7).

In addition, DEQ may deny coverage for the following reasons:

- The storm water discharge is different in degree or nature from discharges reasonably expected from sources or activities within the category described in this MPDES General Permit (including pollutants from process wastewater streams).
- The MPDES permit authorization for the same operation has previously been denied or revoked.
- The discharge sought to be authorized under the 2023 General Permit is also included within an application or is subject to review under the Major Facility Siting Act, 75-20-101, et seq., MCA.

The point source is, or will be, located in an area of unique ecological or recreational significance. Such determination must be based upon considerations of Montana stream classifications adopted under 75-5-301, MCA, impacts on fishery resources, local conditions at proposed discharge sites, and designations of wilderness areas under 16 USC 1132 or of wild and scenic rivers under 16 USC 1274.

### 1.1.5 Larger Common Plan of Development or Sale

A “larger common plan of development or sale (larger common plan)” is defined in Part [5](#) and referenced at ARM 17.30.1102. A larger common plan often involves dividing a parcel of land into smaller parts for individual sale, such as in residential communities, large commercial developments, or transportation projects.

See Parts [1.2.4.1](#); [1.3](#); and [1.4.1](#).

## 1.2 Authorization under this Permit

An “owner/operator” of a “storm water discharge associated with construction activity” (as defined in Part [5](#)) is required to obtain authorization under an MPDES permit. An owner/operator is a person who owns, leases, operates, controls, or supervises a point source. All construction activities that include ground disturbance and are part of a larger common plan that disturbs at least an acre are subject to coverage under the General Permit.

To obtain coverage under the General Permit, the owner/operator must submit a complete Notice of Intent application package to DEQ prior to discharge storm water associated with construction activity under this General Permit. By signing and submitting a complete NOI-SWC package the owner/operator confirms eligibility for coverage and agrees to comply with all conditions of this General Permit including effluent limits, monitoring requirements and special conditions.

### 1.2.1 Submission of Notice of Intention application packages, Modification Requests or Notice of Termination Forms

Documents related to requests for authorization (Part [1.1.5](#)), modification (Part [1.2.4](#)), transfer (Part [1.3](#)), or termination (Part [1.4](#)) of coverage under the General Permit must be completed and submitted via a DEQ-approved electronic method or mailed to:

Montana Department of Environmental Quality  
Water Protection Bureau  
P.O. Box 200901  
Helena, MT 59620-0901

### 1.2.2 New Authorizations (Not Previously Authorized)

Owners or operators can obtain first-time coverage under this permit by submitting a complete a Notice of Intent to Discharge under the Storm Water Discharges Associated with Construction Activity General Permit (NOI-SWC) Package to DEQ.

The NOI-SWC Package must consist of:

- A complete NOI-SWC form (signed by an authorized signatory per Part [4.18.1](#)) and topographic map(s);
- A separate SWPPP (signed by an authorized signatory or duly authorized representative per Part [4.18](#)), including all associated SWPPP site maps, diagrams, details, and plans, which has been completed in accordance with the requirements identified in Part [3](#);
- A copy of the consultation letter from the Montana Sage Grouse Habitat Conservation Program (if applicable); and
- The appropriate application fee.

### 1.2.3 Continuing Authorizations Issued Under the 2018 General Permit

Permittees requiring continued authorization beyond the December 31, 2022, expiration date, must submit a complete a SWC Renewal Package to DEQ for coverage under this reissued General Permit.

The SWC Renewal Package must consist of:

- A complete renewal NOI-SWC form (signed by an authorized signatory per Part [4.18.1](#)) with “Renewal” selected in Section A and updated topographic map(s);
- A separate SWPPP (signed by an authorized signatory or duly authorized representative per Part [4.18](#)), including all associated SWPPP site maps, diagrams, details, and plans, updated which has been completed in accordance with the requirements identified in Part [3](#);
- A copy of the consultation letter from the Montana Sage Grouse Habitat Conservation Program (if applicable); and

- The appropriate fee.

#### **1.2.4 Modification Requests to Authorizations under this General Permit**

Permittees can request a modification to their authorization under the General Permit by submitting a SWC Modification Package to DEQ.

Timing of the modification request relative to initial authorization determines how the request is processed.

- Modification requests to current authorizations (including decreased or increased disturbance area) submitted within six months of the date of initial coverage under the General Permit are processed as minor modifications with the corresponding fee.
- Modification requests (other than transfers) submitted more than six months after the first date of coverage under the General Permit will be processed with an application fee for a new authorization.

A permittee may request to add additional area(s) if the new additional construction-related disturbance is directly contiguous to and directly associated with the original site, except for support activities.

A permittee may request to reduce the area of a project, only when these areas requested to be removed from coverage have achieved final stabilization as defined in this General Permit.

The SWC Modification Package must consist of:

- A complete NOI-SWC application form (signed by an authorized signatory per Part [4.18.1](#)) with “Modification” selected in Section A and updated topographic map(s);
- An updated SWPPP (signed by an authorized signatory or duly authorized representative per Part [4.18](#)), including all associated maps, diagrams, details, plans, and records, updated in accordance with the requirements identified in Part [3](#);
- A copy of the consultation letter from the Montana Sage Grouse Habitat Conservation Program (see below for applicability); and
- The appropriate fee.

##### **1.2.4.1 Modifications to Projects Part of a Larger Common Plan**

For projects part of a larger common plan per Parts [1.1.5](#) and [5](#), and referenced at ARM 17.30.1102, the permittee may request a modification to reduce the area covered under the General Permit if:

- The areas requested to be removed from coverage under the General Permit have achieved final stabilization, or
- There is a new owner/operator of a specific parcel(s) and the new owner/operator has obtained coverage under the General Permit.
  - As part of the SWC Modification Package, the owner/operator of record (i.e. the current permittee) must include the authorization number for the parcel(s) with a new owner/operator and provide a map showing the parcel(s) with coverage under a new authorization.

Until DEQ grants the modification, the owner/operator of record remains responsible for compliance with the terms of the authorization under the General Permit, including fees and/or violations.

##### **1.2.4.2 Sage Grouse Consultation Requirements for Modifications**

If the project is within designated sage grouse habitat, any modification due to a change in disturbed acreage requires verification from the Montana Sage Grouse Habitat Conservation Program that may require a consultation letter and/or updates to a consultation letter. If the modification request is outside of sage grouse habitat, no consultation is required.

#### **1.2.5 Resubmittal and Administrative Processing**

DEQ may request a resubmittal of a NOI-SWC form, SWPPP, any required records, and any associated fees. Administrative processing fees may be assessed for DEQ reviews.



### 1.3 Transfer of Coverage

Permittees may request a transfer ownership or change the name of the entity that holds an authorization under the General Permit by submitting a Storm Water Construction Permit Transfer Notification form (PTN-SWC) and the corresponding fee. The PTN-SWC must be submitted at least 30 days before the effective date of the proposed transfer. Submittal constitutes written notice to DEQ under the Montana Water Quality Act that the new owner/operator assumes responsibility and liability for all the terms and conditions, including permit fees. The PTN-SWC form may not be used to transfer coverage to a new or different construction site, activity, or location.

The PTN-SWC form may only be used to transfer an entire project authorized under the General Permit to a new single owner/operator. For projects that are part of a larger common plan, it is more appropriate to modify (see Part [1.2.4](#)) or terminate (see Part [1.4](#)) an authorization if there will be several new owner/operators.

Until DEQ determines the submitted PTN-SWC form and the transfer to the new owner/operator a complete, the owner/operator of record remains responsible for compliance with the terms of the authorization under the General Permit, including fees and/or violations.

### 1.4 Termination of Coverage

Permittees may request termination of coverage under the General Permit after achieving “final stabilization” per Parts [3.8](#) and [5](#). In addition to achieving final stabilization, permittees must also complete the following prior to termination:

- Removal of all temporary storm water conveyances/channels and other temporary BMPs;
- Removal of all construction equipment and vehicles from the site; and
- Cessation of all potential pollutant-generating activities due to the construction activity.

To request that permit coverage be terminated, the permittee must submit a Notice of Termination for Storm Water Discharges Associated with Construction Activity General Permit (NOT-SWC) to DEQ. A complete NOT-SWC form must be signed by an authorized signatory meeting the requirements in [4.18.1](#). See Part [1.4.1](#) for additional termination requirements for projects part of a larger common plan.

Coverage under the General Permit remains in effect until DEQ reviews and processes the NOT-SWC. The permittee is responsible for payment of annual fees for each calendar year covered under the General Permit. Failure to submit a NOT-SWC will result in accrual of annual permit fees. The permittee is responsible for complying with the terms of the General Permit until notified by DEQ that the authorization is terminated.

#### 1.4.1 Terminations for Projects Part of a Larger Common Plan

Projects part of a larger common plan may request to terminate coverage under the General Permit in the following instances:

- The entire site meets the requirements in Part [1.4](#), above; or
- Each parcel has met the requirements in Part [1.4](#) or has a new owner/operator who has obtained coverage under the General Permit.

For projects part of a larger common plan, the NOT-SWC form must include:

- The authorization number for the parcel(s) with a new owner/operator, and
- A map showing:
  - The parcel(s) with coverage under a new authorization,
  - The parcel(s) that have achieved final stabilization, and
  - The owner/operator for each parcel.

If a one or more parcels part of the larger common plan have not reached final stabilization and do not have coverage under a General Permit authorization for a new owner/operator, then the authorization may not be terminated. The permittee may request a modification to permit authorization, per Part [1.2.4](#)

Coverage under the permit remains in effect until the Department processes a NOT-SWC form. The permittee is responsible for payment of annual fees for each calendar year covered under the permit. Failure to submit a NOT-SWC will result in accrual of annual permit fees. The permittee is responsible for complying with the terms of this permit until notified by the Department that the authorization is terminated.

## 1.5 Public Sign

The permittee must post a sign to publicly display confirmation of coverage under the General Permit. The sign must be posted starting on the authorization date and remain posted until permit authorization is terminated.

At a minimum the sign must:

- Use a large, readable font (at least 1” lettering);
- Be visible from the nearest road;
- Include the MPDES SWC authorization number for the project;
- Include the statement “Request project information from Montana DEQ Water Protection Bureau at (406) 444-3080”; and
- Include the statement “File a complaint at [deq.mt.gov/reporting](http://deq.mt.gov/reporting).”

Sign location:

- The public sign must be posted at the construction site’s entrance/exit, or most visible entrance/exit if there are multiple access points.
- For linear projects, the sign must be posted at the entrance to the equipment laydown, material storage, or job trailer location or at the entrance/exit(s) of the most active portion of the project.

## 1.6 Storm Water Rainfall Erosivity Waiver

The Storm Water Rainfall Erosivity Waiver (Erosivity Waiver) is an optional alternative to obtaining coverage under the General Permit for discharges associated with construction activity.

Construction activities must meet the following requirements to be eligible for coverage under the Erosivity Waiver:

- Total area of “disturbance related to construction activity” (disturbance), as defined in Part [5](#), is less than five acres;
- Disturbance related to construction activity starts after March 1 and reaches “final stabilization” (per Parts [3.8](#) and [5](#)) before November 30<sup>th</sup> of a given calendar year;
- The project’s Rainfall Erosivity (R) Factor is less than five during the period of construction activity; and
- The Erosivity Waiver request includes the entire construction project.
  - The Erosivity Waiver is not available for individual filings, phases, or portions of a construction project or site. A project that is part of a larger common plan is only eligible for an Erosivity Waiver if the entire development meets the conditions listed above.

To request a Waiver, the “owner/operator” (as defined in Part [5](#)) must submit an Erosivity Waiver Request form, applicable attachments, and the associated fee to DEQ. A project is not waived from coverage under the General Permit until DEQ receives a complete application and issues an Erosivity Waiver Confirmation Letter.

Those covered by an Erosivity Waiver are not required to submit a Notice of Termination (NOT) to end coverage, however construction activities and associated discharge are only authorized for the date range listed in the Erosivity Waiver Confirmation Letter. If the project changes, and any of the above criteria are not met, the project no longer qualifies for an Erosivity Waiver and the owner/operator must apply for and obtain coverage under the General Permit.

Any discharge of storm water associated with small construction activity not covered by either the General Permit or an Erosivity Waiver may be considered an unpermitted discharge under the Montana Water Quality Act. DEQ may notify any owner/operator covered by an Erosivity Waiver that they must obtain General Permit coverage.

## 2. Effluent Limitations, Monitoring, and Reporting Requirements

### 2.1 Technology-Based Effluent Limitations

Technology based effluent limits must be achieved through the good engineering practices and appropriate selection, design, implementation, installation, and maintenance of best management practices (BMPs) for all authorized storm water discharges associated with construction activities. To meet this requirement, the permittee must comply with all conditions in Part [2.1](#) and Part [3](#), and any other state or local requirements, regardless of stringency.

#### 2.1.1 Universal Requirements for Best Management Practices

- a. The permittee must select, design, install and maintain BMPs that address:
  1. The amount, frequency, intensity, and total duration of precipitation;
  2. Quantity and quality of storm water runoff including peak flow rates and total storm water volume;
  3. Characteristics of soils (including soil type and particle size) that are present at the construction project area(s); and
  4. Select BMPs appropriate to the timeframe and seasons in which the construction project will be completed.
- b. The permittee must complete the following for all BMPs:
  1. Document all BMPs in the SWPPP, SWPPP site map(s), and/or inspection records.
  2. Select, implement, and install all BMPs in accordance with good engineering practices and design specifications;
  3. Complete implementation and installation of BMPs appropriate to each phase of construction before or at the start of each major construction activity;
  4. Maintain BMPs in effective operating condition;
  5. Before terminating permit coverage, remove temporary BMPs or transition temporary BMPs to permanent BMPs.

#### 2.1.2 Erosion and Sediment Controls

- a. To minimize soil erosion, the permittee must:
  1. Stabilize ditches, swales, channels, and outlets;
  2. Minimize erosion within the perimeter and interior of construction project area; and
  3. Divert storm water runoff from disturbed areas to sediment removal BMPs.
- b. To minimize sediment discharges, the permittee must:
  1. Construct storm water retention and detention facilities during initial site grading activities;
  2. Minimize erosion at outlets and conveyance channels;
  3. Protect downstream properties and waterways by controlling volume and velocity within the construction project area;
  4. Protect all storm drain inlets;
    - i. If the permittee has the authority to access offsite the storm drain inlets, he must protect offsite inlets which convey storm water flow from the construction site to a state surface water;
  5. Protect infrastructure, including infiltration facilities from sedimentation during active construction; and
  6. Stabilize and remove accumulated sediment from areas of disturbance, including storm water retention and detention facilities.
- c. To minimize offsite sediment transport, the permittee must:
  1. Minimize vehicle/equipment entrances and exits to the construction project area; and
  2. Manage vehicle/equipment entrances and exits, equipment laydown, and material storage areas with stabilization techniques.

- d. To minimize soil disturbance and maintain natural buffers, the permittee must:
  - 1. Limit areas of disturbance and soil exposure;
  - 2. Mark and maintain clearing limits before disturbing soils and during construction activities;
  - 3. Maintain topsoil;
  - 4. Provide a natural (such as vegetated) buffer within the construction project area;
  - 5. Maintain natural buffers around “state waters” as defined in Part 5; and
  - 6. Direct storm water runoff to vegetated areas.
- e. To minimize the disturbance of steep slopes of 15% or greater, the permittee must:
  - 1. Design and construct cut-and-fill slopes to minimize erosion;
  - 2. Divert off site storm water or ground water away from slopes and disturbed areas; and
  - 3. Prevent storm water run on from impacting sediment removal BMPs.

### **2.1.3 Soil Stabilization**

- a. Temporary soil stabilization measures must include:
  - 1. Stabilization of disturbed areas immediately for any portion of the construction project that will remain inactive for 14 or more calendar days with erosion control BMPs.
- b. Final stabilization measures must include:
  - 1. Use erosion control BMPs (including post construction BMPs) to stabilize disturbed areas within any portion of the project that have completed clearing, grading, excavation, or other earth disturbing activities.

### **2.1.4 Dewatering**

- a. For “construction dewatering” activities the permittee must:
  - 1. Control ground water, surface water, and/or accumulated storm water dewatering activities to prevent discharges to state waters; and
  - 2. Obtain authorization under the Construction Dewatering General Permit or an individual permit prior to discharge of dewatering effluent to state surface waters. See Part [3.6](#).

### **2.1.5 Pollution Prevention Measures**

- a. To implement pollution prevention measures that effectively manage and dispose of all pollutants in a way that does not cause contamination of storm water, the permittee must:
  - 1. Provide cover, containment, and protection for all chemicals, liquids, petroleum products, and construction materials, products, and wastes;
  - 2. Use spill prevention and control measures for vehicle maintenance and fueling;
  - 3. Maintain appropriate spill kits; clean up spills and leaks immediately; and report appropriate quantities in accordance with Part [4](#);
  - 4. Prevent discharge of equipment wash water and clean-out wastes, and designate these activities away from and state waters and their conveyances;
  - 5. Apply fertilizers and herbicides per manufacturers’ requirements; and
  - 6. Prevent discharges of concrete products.

### **2.1.6 Surface Outlets**

- a. The permittee must ensure discharge of the highest quality water using structures that withdraw water from the surface from basins and impoundments as follows:
  - 1. Retention facilities must have a surface outlet installed for active construction.
  - 2. Detention facilities must be designed to prevent discharges from bottom outlets during active construction.
  - 3. When discharging from impoundments such as sediment basins and traps, outlet structures must be utilized that withdraw water from the surface.

### **2.1.7 Prohibited Discharges**

- a. The following discharges are prohibited:
  1. Wastewater from washout of concrete;
  2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
  3. Fuels, oils, or other potential pollutants used in vehicle and equipment operation and maintenance;
  4. Soaps or solvents used in vehicle and equipment washing or external building wash down;
  5. Storm water discharges of disturbed, contaminated soils; and
  6. Toxic or hazardous substances from a spill or other release including the disturbance and/or removal of contaminated soils.

## **2.2 Water Quality-Based Effluent Limitations**

### **2.2.1 Water Quality Standards**

Storm water discharges regulated under this permit must be controlled as necessary to meet applicable numeric and narrative water quality standards. A storm water discharge associated with construction activity may not cause or contribute to an exceedance of applicable water quality standards.

If at any time the permittee becomes aware, or DEQ determines, that a storm water discharge causes or contributes to an exceedance of applicable water quality standards, the permittee must take corrective action as required in Part [2.4](#). Additionally, DEQ may require the permittee to obtain coverage under an individual permit, if information indicates the discharges are not controlled as necessary to meet applicable water quality standards.

### **2.2.2 Storm Water Discharges to Impaired Waterbodies**

The permittee must identify if storm water discharges from their construction activity will discharge to impaired waterbodies. Information on impaired waterbodies may be obtained from DEQ. The permittee must consider all impairments and the presence of the corresponding pollutants of concern in their proposed discharges. Storm water-related pollutants contributing to impairments generally include sediment, suspended solids and turbidity, and any secondary sources of pollutants based on construction materials and support activities.

Permittees will be informed if any additional controls are necessary for discharges to protect beneficial uses or to be consistent that the assumptions of any available TMDL wasteload allocation. Such additional controls must be identified within the permittees SWPPP. In certain cases, DEQ may require a facility to obtain coverage under a MPDES individual permit.

Discharges of pollutants of concern to impaired waterbodies are eligible for coverage under this General Permit if consistent with approved TMDLs and assigned WLAs, and the requirements outlined below.

#### **2.2.2.1 Discharges to an Impaired Waterbodies with No Approved TMDL**

For regulated storm water discharges associated with construction activity under this permit, the SWPPP must include a section that describes BMPs that target and reduce any discharges of the identified pollutants of concern to the corresponding impaired waterbodies. Under this subsection of the General Permit, the permittee need only to include the identified pollutants of concern in its SWPPP if the waterbodies are listed as impaired for such pollutants.

#### **2.2.2.2 Discharges to an Impaired Waterbodies with an Approved TMDL**

For regulated storm water discharges associated with construction activity, the SWPPP must include a section that describes BMPs that target and reduce any discharges of the identified pollutants of concern to the corresponding impaired waterbodies. Under this subsection of the General Permit, the permittee need only include the identified pollutants of concern in its SWPPP if the waterbodies are listed as impaired for such pollutants. The section submitted by the permittee must ensure that all discharges are

consistent with the assumptions of any applicable TMDL wasteload allocation. All EPA approved TMDL wasteload allocations applicable to MPDES-regulated storm water construction activities are incorporated by reference into this permit.

## 2.3 Inspections

### 2.3.1 Person(s) Responsible for Conducting and Documenting Inspections

Inspections must be performed by a SWPPP Administrator as defined in Part [3.2](#).

### 2.3.2 Frequency of Inspections

Inspections must be performed in accordance with the inspection schedule in Part [2.3.3](#) or the inspection schedule in [2.3.4](#), unless the construction site or areas of the construction site meet the conditions for a reduction in inspection frequency as defined in Part [2.3.5](#). Inspections must be conducted during the construction project's normal business hours. The inspection schedule must be documented in the SWPPP. Any changes to the inspection schedule must be documented in the SWPPP or corresponding inspection report.

### 2.3.3 Weekly Routine Inspections

If the weekly inspection schedule is chosen, a SWPPP Administrator must do all of the following:

- Conduct a routine inspection at least once every 7 calendar days;
- Document any changes to the inspection schedule, even during periods of noncompliance, in the SWPPP or corresponding inspection report.

### 2.3.4 Biweekly Routine and Post-Storm Event Inspections

If a biweekly and post-storm event inspection schedule is chosen, a SWPPP Administrator must do all of the following:

- Conduct a routine inspection at least once every 14 calendar days;
- Conduct and a post-storm event inspection within 24-hours of the end of a rainfall event of 0.25 inches or greater and within 24-hours of runoff from snowmelt (i.e., any snowmelt event resulting in a discharge); and
- Use one of the following methods to determine the amount of rainfall resulting from a storm event:
  - (1) Maintain a rain gage on site, or
  - (2) Obtain storm event information from a weather service representative of the site's location.
- For any day of rainfall 0.25 inches or greater, record the method of rainfall determination and the total rainfall measured in a calendar day.
- A post-storm event inspection may be used as a biweekly routine inspection, but the biweekly routine inspections must commence again no later than 14 calendar days after the last post-storm event inspection.
- Document any changes to the inspection schedule, even during periods of noncompliance, in the SWPPP or corresponding inspection report.

### 2.3.5 Reductions in Inspection Frequency

The inspection schedules in Parts [2.3.3](#) and [2.3.4](#) may be temporarily reduced to a routine inspection once every 30 calendar days for either the entire construction site or a portion of it. For any reduction in inspection frequency, the requirements in [a](#) (below) must be followed and the conditions of [b](#) or [c](#) must be met.

- a. For any reduction to inspection frequency:
  1. The change to the inspection schedule must be documented in the SWPPP or corresponding inspection report;
  2. BMPs must remain in place as identified in the SWPPP and/or inspection report, and SWPPP site map(s); and
  3. For a reduction in inspection frequency for a portion of the site, the portion of the construction site with reduced inspection frequency must be identified on updated SWPPP site map(s).
- b. The entire site is eligible for a reduction in inspection frequency if:
  1. All construction activities at the site are temporarily inactive or shutdown and all areas of disturbance have achieved “temporary stabilization” as defined in Part [5](#); or
  2. Earthwork and construction activities are completed at the site, and erosion and sediment controls are implemented or installed to establish “final stabilization” per Parts [3.8](#) and [5](#).
- c. A portion of the site is eligible for a reduction in inspection frequency if one of the following conditions is met and the portions of the construction site with reduced inspection frequency are identified on updated SWPPP site map(s):
  1. A portion of the site is temporarily inactive or shutdown and that portion has achieved “temporary stabilization” as defined in Part [5](#); or
  2. A portion of the site is completed and erosion and sediment controls are implemented or installed to establish “final stabilization” per Parts [3.8](#) and [5](#).

### 2.3.6 Severe Winter Conditions Delay

- a. A delayed inspection may be allowed if an inspection is not possible due to:
  1. Remote site access;
  2. Severe winter condition; and
  3. Temporary work shutdown at the site due to severe winter weather.
- b. In the event of a delayed inspection, the following are required:
  1. Documentation of the cause of the delayed inspection must be included in the corresponding inspection report and SWPPP, accordingly.
  2. A substitute inspection must be performed to compensate for the delayed inspection and follow requirements in accordance with Part [2.3.7](#).
  3. Inspections must resume as soon as the site is accessible. Delays are self-determined on a case-by-case basis with appropriate documentation, and determination is subject to review during a DEQ compliance evaluation inspection.

### 2.3.7 Inspection Requirements

Inspections conducted under Parts [2.3.3](#), [2.3.4](#), and [2.3.5](#) must comply with the inspection requirements in Part [2.3.7](#), below.

- a. At a minimum, the following areas must be inspected:
  1. All areas disturbed by the construction activity;
  2. All pollutant sources generated by the construction activity;
  3. Material and waste storage areas exposed to rainfall or snowmelt;
  4. Support activities exposed to rainfall or snowmelt;
  5. Entrance and exit locations to the construction activity;
  6. Site perimeter;
  7. All areas where storm water flows onto and within the construction project area; and
  8. Discharge locations and if impaired waterbodies were impacted.

- b. At a minimum, the inspection report must include:
  1. The MPDES permit authorization number;
  2. The inspection date and time;
  3. Name(s) of the SWPPP Administrator(s) completing the inspection;
  4. Weather conditions at the time of the inspection;
  5. The type of inspection based on Parts [2.3.3](#), [2.3.4](#), [2.3.5](#), and [2.3.6](#);
  6. Changes in the inspection schedule;
  7. Major construction activities at the time of the inspection;
  8. Pollutant sources present at the time of the inspection;
  9. BMPs implemented or installed at the time of the inspection;
  10. Description of all BMPs requiring maintenance;
  11. Corrective actions per Part [2.4](#) including a description of implementation including dates that the corrective action(s) were completed;
  12. Discharges of sediment or other pollutants;
  13. Instances of noncompliance; and
  14. Certification and signature.
- c. Inspection reports must be signed and certified by a SWPPP Administrator based on the requirements in Part [4.15](#).
- d. Inspection records must be maintained as required by Part [2.5](#).
- e. Maintenance, repair, replacement, or installation of new BMPs determined necessary during site inspections to address ineffective or inadequate BMPs must be conducted in accordance with Part [2.3.8](#).

### **2.3.8 BMP Maintenance, Replacement, and Failures**

- a. All BMPs must be maintained in effective operating condition.
- b. If inspections identify BMPs that are not in effective operating condition:
  1. Maintenance must be documented and performed by the close of the next business day.
    - i. If this timeframe is “infeasible” (as defined in Part [5](#)), document rationale and provide a schedule of events with a maintenance timeframe making BMPs operational within seven (7) calendar days.
  2. If new or replacement BMPs are required to be implemented or installed or if additional BMPs are necessary, these additional measures must be implemented or installed by no later than seven (7) calendar days from the time of discovery.
    - i. If this timeframe is infeasible (as defined in Part [5](#)), document rationale and provide a schedule of events with a timeframe making BMPs operational as soon as feasible after the 7-day timeframe.
- c. All changes in the design, implementation, or installation of erosion and sediment controls or other BMPs must be documented according to Part [3.12.2](#).

## **2.4 Corrective Actions**

Corrective actions are actions a SWPPP Administrator takes to:

- Repair, modify, or replace any BMP used at the site;
- Install new or additional BMPs;
- Immediately clean up, dispose of, and, under Part [4](#), report spills, releases, and other deposits; and
- Remedy a permit violation or noncompliance.

If any of the following conditions occur, a SWPPP Administrator must review and revise the selection, design, installation, implementation, and maintenance of BMPs to ensure the condition is eliminated and will not be repeated in the future:

- An unauthorized release or discharge (e.g., spill, leak, or discharge of non-storm water not authorized by this or another MPDES permit) occurs at the site;



- A SWPPP Administrator or DEQ determines that the BMPs are not adequate enough for the discharge as it causes or contributes to an exceedance of applicable water quality standards;
- A SWPPP Administrator or DEQ determines that modifications to the BMPs are necessary to meet the requirements in Part [2](#);
- A SWPPP Administrator or DEQ determines that the BMPs are not properly selected, designed, installed, operated, and/or maintained; or
- A failure of erosion or sediment controls resulting in sediment, solids, or other wastes being discharged from the site. Upon identification of sediment, solids, or other wastes lost or discharged from the site, the material must be cleaned up and placed back on site, or otherwise disposed of in an acceptable manner.
- A SWPPP Administrator must document the completed corrective actions in the corresponding inspection report, and complete any updates to the SWPPP site map(s). In addition, these changes can be updated in the SWPPP for the permittee to maintain consistency with their internal records.

## 2.5 Recordkeeping

At the identified site, the primary SWPPP Administrator must retain:

- A copy of the General Permit;
- A copy of the completed and signed NOI-SWC form including modification submittals;
- A copy of DEQ's confirmation letter;
- A copy of the signed SWPPP, including revisions and updates, and attachments;
- BMP installation, design, and maintenance specifications/standards for all BMPs installed and detailed in the SWPPP and/or inspection records;
- SWPPP site map(s) reflecting up-to-date site conditions
- SWPPP Administrator and Preparer documentation under Part [3.2](#);
- All inspection records required under Part [2.3](#), [2.4](#), [3.11](#), and [3.12](#);
- All reports of noncompliance under Part [4](#); and
- Sage Grouse consultation letter, as applicable.

These documents are to be made available at the site immediately upon request from a DEQ representative, EPA official, or local official. These records are to be maintained by the permittee for a period of three years from the date of termination.

## 2.6 Reporting

### 2.6.1 Notification of SWPPP Administrator Changes

The permittee must notify DEQ in writing of any change to the SWPPP Administrator's name, mailing address, and/or telephone number within 15 calendar days of the change. Notification can be submitted using Attachment A or other written correspondence sent to DEQ.

### 2.6.2 Noncompliance Reporting

Any instance of noncompliance must be reported to DEQ as required by Part [4.23](#).

## 3. Storm Water Pollution Prevention Plan (SWPPP)

### 3.1 SWPPP General Requirements

#### 3.1.1 SWPPP Definition

The SWPPP is a document that must be developed, implemented, and maintained in accordance with good engineering selection and design, hydrologic principles, and pollution control practices to minimize and control potential pollutants in storm water associated with construction activity.

#### 3.1.2 SWPPP Minimum Requirements

At a minimum, the SWPPP must have the following components:

- Include the information specified in Part [2](#) and Part [3](#) of the General Permit;
- Provide a site description of the nature of the construction activity that includes identification and details of the major construction activities and project area characteristics;
- Identify and describe all potential pollutant sources which may affect the quality of storm water discharges associated with the construction activity;
- Identify and describe the BMPs to be used to reduce potential pollutants in storm water discharges associated with the construction activity and to ensure compliance with the effluent limitations in the General Permit;
- Identify and describe the measures which will be used to achieve final stabilization; and
- Identify and clearly describe the inspection and maintenance procedures implemented at the site to maintain BMPs identified in the SWPPP in good and effective operating condition.

#### 3.1.3 SWPPP Implementation

The SWPPP must be implemented as follows:

- The SWPPP must be implemented in accordance with the primary SWPPP Administrator's up-to-date field copy;
- SWPPP implementation must initiate at the start of ground disturbance associated with the construction activity;
- The SWPPP must be maintained to reflect up-to-date site conditions through documented revisions and updates in accordance with Part [3.12.2](#). Inspection reports, logs, and the SWPPP site map may supplement the SWPPP to reflect the most up-to-date site conditions; and
- SWPPP implementation must continue until final stabilization of all construction activity-related ground disturbance is achieved and permit coverage has been terminated.

### 3.2 SWPPP Preparer and Administrator

SWPPP Preparers and Administrators must obtain certification from a course approved by DEQ and maintain a valid certification by meeting the requirements in Parts [3.2.1](#), [3.2.2](#), and [3.2.3](#), as applicable to their role.

Consistent with standard industry practice, a SWPPP Preparer or Administrator certification is valid no more than 3 years after date of certification. Training providers issue certifications complete with expiration dates.

Validation of SWPPP Preparer and Administrator certification will be determined at the time a NOI-SWC Package is submitted or during a regulatory inspection. Valid certification demonstrating the minimum requirements for the SWPPP Preparer and Administrator(s) must be maintained with the SWPPP, and must include the following:

- Name(s), title(s), phone number(s), and email address(es) of SWPPP Preparer and Administrator(s); and
- Date and name of provider of course(s).

### 3.2.1 SWPPP Preparer and Administrator Minimum Requirements

DEQ identified minimum requirements for SWPPP Preparers and Administrators so that the quality of storm water discharges is controlled and the effluent limitations in Part [2](#) are complied with.

To adequately serve their assigned roles and maintain valid certification, SWPPP Preparers and Administrators must understand and be able to apply the following concepts:

- General Permit requirements including, but not limited to: applicability, application procedures, SWPPP elements, standard conditions, and termination conditions;
- Local permitting requirements;
- Sage Grouse requirements based on location of the project;
- Principles and practices of erosion and sediment controls and pollution prevention, including the minimum criteria for BMPs defined in Part [2.1](#);
- Construction site assessment and planning skills including knowledge and identification of major construction activities, phases of construction activities and all support activities, and the potential pollutants generated based on the scope of the project;
- Development, selection, and implementation skills for all BMPs on the site, including final stabilization measures, required by this permit based on appropriate design, installation, function, and location; and how they are to be maintained and/or repaired according to developed and/or manufacturers plans and specifications;
- Development, selection, and implementation skills for pollution prevention controls and BMPs required by the General Permit;
- Development and implementation skills for procedures and associated documentation for all inspections, maintenance, and required recordkeeping to include when and how to conduct inspections, record applicable findings, take corrective actions, and, when appropriate, report violations and/or noncompliance; and
- Ability to develop and update the SWPPP site map(s) required by the General Permit.

### 3.2.2 SWPPP Preparer

A SWPPP Preparer is a designated individual who is responsible for planning and development of the SWPPP prior to submission of the NOI-SWC Package. The permittee must specify a SWPPP Preparer in the NOI-SWC form and the SWPPP.

The SWPPP Preparer(s) must:

- Develop and document all aspects of the SWPPP, starting with the initiation of construction activities, and lasting until final stabilization is achieved and the permit authorization is terminated;
- Meet minimum requirements in Part [3.2.1](#) and obtain valid certification before the submittal of the NOI-SWC Package to DEQ.

### 3.2.3 SWPPP Administrator

A SWPPP Administrator is a designated individual who is responsible for developing, implementing, maintaining, revising, and updating the SWPPP. The permittee must specify at least one SWPPP Administrator in the NOI-SWC form and the SWPPP. For new employees hired after the submission of the NOI-SWC Package, the minimum requirements and valid certification must be completed before assuming SWPPP Administrator responsibilities. Validation of certification will be determined during an inspection. Valid certification demonstrating the minimum requirements for the SWPPP Administrator(s) must be maintained with the SWPPP.

The SWPPP Administrator(s) must:

- Address all aspects of the SWPPP, initiating with the start of construction activities, and lasting until final stabilization is achieved and the permit authorization is terminated;

- Apply knowledge of erosion and sediment controls and pollution prevention to assess site conditions and determine the effectiveness of selected BMPs;
- Meet minimum requirements in Part [3.2.1](#) and obtain valid certification before the submittal of the NOI-SWC Package to DEQ;
- Individuals seeking to assume the SWPPP Administrator responsibilities after the start of a project must first meet the minimum requirements Part [3.2.1](#) and obtain valid certification;
- Meet the duly authorized representative requirements as defined in Part 4.18 to sign inspection documents and other reports.

### 3.3 Site Description

- a. The SWPPP must include all of the following:
  1. A description of the nature of the construction activity and what is being constructed;
  2. A description of all support activities and associated storm water discharges dedicated to the construction activity including but not limited to: material borrow areas, material fill areas, concrete or asphalt batch plants, equipment staging areas, access roads/corridors, material storage areas, and material crushing/recycling/processing areas;
  3. The total area of the site (in acres), and the area of the site (in acres) expected to undergo construction-related disturbance (including all construction-related support activities);
  4. A description of the character and erodibility of soil(s) and other earth material to be disturbed at the site, including cut/fill material to be used;
  5. For construction-related disturbance of five acres or more of total land area:
    - i. An estimate of the runoff coefficient of the site, both before and after construction, including a source for the estimate; and
    - ii. An estimate of the increase in impervious area after the construction activity is completed;
  6. The names and impairment status of receiving state surface waters and a description of the size (drainage area), type, and location of each point source discharge or outfall with connectivity.
    - i. If there is no distinguishable point source discharge or outfall to the receiving state surface waters, a description of storm water runoff flow and drainage patterns into the receiving state surface waters.
    - ii. If the discharge is to unnamed drainage, the name of the first named waterbody downstream of the site that will receive the discharge.
    - iii. If the discharge is to a municipal separate storm sewer system (MS4), the location of the MS4 outlet where the storm sewer discharges into receiving state surface waters.
    - iv. If there is no distinguishable point source discharge or outfall to the receiving state surface waters, a description of storm water runoff flow and drainage patterns into the receiving state surface waters.
  7. A brief description of the existing natural cover and vegetation at the site and an estimate of the percent density of vegetative ground cover.

### 3.4 Identification of Potential Pollutant Sources

All potential pollutant sources, including soils, materials, and activities, within the scope of the entire construction project must be evaluated for the potential to contribute pollutants to storm water discharges. The SWPPP must identify those sources determined to have the potential to contribute pollutants to storm water discharges, and these sources must be controlled through BMP selection and implementation, as required in Part [3.5](#), below.

The permittee must identify all potential pollutant sources within lists provided for soils, materials, and activities within the SWPPP. In addition, the permittee must identify and list the following:

- Other potential pollutant sources from soils, activities, and materials not already identified the SWPPP;
- Other non-storm water discharges if present; and
- Any additional potential pollutant sources.

### 3.5 Selection of Best Management Practices (BMPs)

The SWPPP must document the selection of BMPs based on the potential pollutant sources identified in Part [3.4](#) above that have been installed and implemented at the site to achieve the effluent limits in Parts [2.1](#) and [2.2](#). All BMPs must be designed, installed, and implemented, and maintained according to published specifications. A copy of specifications must be maintained on-site and be accessible upon request. Specification sources must be identified in the SWPPP and kept up-to-date. Any departures from the specifications must reflect good engineering practices and must be documented in the SWPPP or corresponding inspection reports.

The permittee must identify all selected BMPs within the SWPPP including:

- Erosion control BMPs;
- Sediment control BMPs;
- Run on/runoff control BMPs;
- Administrative controls; and
- Post construction controls.

In addition, the permittee must select and list the following:

- Additional BMPs not already identified in the SWPPP and likely to be used at the construction project;
- Local sediment and erosion controls including a description of requirements;
- BMPs that target and reduce discharges of the identified pollutants of impairment to impaired waterbodies as required under Part [2.2](#); and
- Sage Grouse controls (The consultation letter attached to the SWPPP will meet the requirements for this section in Part [2.5](#)).

### 3.6 Dewatering

All dewatering practices and BMPs associated with dewatering must be identified in the SWPPP and SWPPP site map(s) as required under Part [3.10](#).

- Ground water, surface water, and/or accumulated storm water due to dewatering practices which *will* discharge (or have the potential to discharge) to state surface waters are not authorized under the SWC General Permit and must obtain authorization under the MPDES General Permit for Construction Dewatering (CDGP) or an individual MPDES permit, as applicable. The CDGP applies to discharges that include in-stream dewatering, surface area dewatering, and ground water dewatering (See “Construction Dewatering” definition in Part [5](#)).

### 3.7 Major Construction Activity and BMP Phasing

A major construction activity is defined as any distinct construction related disturbance or pollutant generating activity that occurs within the schedule of activities associated with the project. Major construction activities are often referred to as construction phases.

For each major construction activity, the SWPPP must:

- Identify the activity;
- Document the activity and associated BMP phasing using a table or narrative description;
- Include a list of all the construction related tasks (i.e. the series of steps) necessary to complete the activity;
- Provide an estimated timeframe (from initiation to completion) of the activity;
- Document the selected BMPs throughout the succession of each major construction activity until the site reaches final stabilization;
- Identify BMP phasing of major construction activities the SWPPP site map(s) as required under Part [3.10](#).

### 3.8 Final Stabilization

The SWPPP must clearly describe all procedures and BMPs used to ensure that “final stabilization” (as defined in Part 5) is achieved.

To achieve final stabilization a permittee must:

- Uniformly establish vegetative cover or equivalent permanent physical erosion reduction methods over the entire disturbed area, without any relatively bare areas based on the pre-disturbance conditions;
- Establish vegetative cover to density of at least 70% of pre-disturbance levels, or implement equivalent permanent physical erosion reduction methods;
- For vegetative cover, use perennial plants adapted to site conditions; and
- Utilize final stabilization measures that can provide erosion control equivalent to pre-existing site conditions.

In addition to achieving final stabilization, the permittee must have completed the items listed in Part 1.4 to be eligible to terminate coverage under the General Permit.

### 3.9 Post-Construction Storm Water Management

The SWPPP must clearly describe any BMPs which will be used to control storm water and potential pollutants in storm water discharges that will occur after construction operations have been completed at the site, including any applicable local requirements. If a temporary BMP will be transitioned to a post-construction BMP, the SWPPP must clearly describe the transition process and how the BMP will be maintained. Where practicable, DEQ supports the use of low impact development (LID) and green infrastructure BMPs that allow for infiltration, evapotranspiration, or capture for reuse storm water runoff generated from the majority of expected storm events post-construction.

### 3.10 Site Map

The SWPPP must include at least one legible site map/plan of sufficient scale and size which clearly display site conditions. Multiple SWPPP site maps/plans are encouraged for clarity.

- a. At a minimum, the SWPPP site maps/plans must include the following:
  1. Site boundaries to include the perimeter of common plans of development;
  2. Locations and types of all dedicated construction activity support areas (including off-site) such as access-related work, earth material borrow areas, equipment staging areas, materials storage areas, temporary concrete or asphalt batch plants, and any areas used for fill placement;
  3. Locations where ground-disturbing activities will occur, noting any BMP phasing of major construction activities;
  4. Preconstruction topography of the site including showing state surface waters which will receive storm water runoff from the site.
  5. Any receiving state surface waters listed as impaired;
  6. Labeled outfalls with drainage pattern(s) and flow directions (use arrows) of storm water and authorized non-storm water flow onto, over, and from the site property before and after major grading activities, including lines showing boundaries between different drainage areas;
  7. Storm water, and allowable non-storm water discharge locations and types, including the locations of any storm drain inlets and where storm water or allowable non-storm water will be discharged to state surface waters;
  8. MS4s including the identification of applicable outlets, where the construction activity’s storm water discharges flow into them;
  9. Locations and sources of run-on to the site from adjacent property that may contain potential pollutants (including sediment);
  10. Locations of areas of cut and fill;
  11. Locations of areas which are to remain undisturbed including vegetative buffer areas;
  12. Locations of existing natural cover and vegetation or other pre-existing ground stabilization measures before construction (such as forest, pasture, lawn, pavement, structures);

13. Approximate slopes before and after major grading activities. Note areas of steep slopes both before and after grading;
14. Locations where sediment, soil, or other construction and building materials will be stockpiled;
15. Locations of fueling, vehicle and equipment maintenance, and/or vehicle cleaning and washing areas;
16. Locations of concrete washout and other waste management areas;
17. Locations of ground water or other construction dewatering activities and discharges (see Part [3.6](#));
18. Designated points on the site where vehicles will exit onto paved roads;
19. Locations of other potential pollutant-generating activities not specified elsewhere;
20. Locations of all structural and non-structural BMPs for potential pollutants other than sediment;
21. Locations and specific types of all temporary or permanent erosion and sediment control BMPs;
22. Locations and specific types of all BMPs, including impoundments or conveyances such as retention and detention ponds, ditches, pipes, and swales;
23. Locations of structures and other impervious surfaces upon completion of construction;
24. Location(s) of the public sign(s);
25. Map scale;
26. North arrow; and
27. Map legend.

### **3.11 Inspection and BMP Maintenance Procedures**

In the SWPPP, the permittee must identify which self-inspection schedule Part [2.3.2](#) they are following. The SWPPP must identify and clearly describe the inspection and maintenance procedures implemented to maintain BMPs identified in the SWPPP, in good and effective operating condition. These documented procedures must comply with the inspection requirements in Part [2.3](#) and correspond with BMP maintenance specifications. Refer to Parts [2.3.8](#), [2.4](#), [3.5](#), and [0](#) for related BMP maintenance requirements.

### **3.12 SWPPP Revisions and Updates**

The permittee must maintain the SWPPP and SWPPP site map(s) to reflect inspections (per Part [2.3](#)) and corrective actions (per Part [2.4](#)).

#### **3.12.1 Conditions Triggering Revisions and Updates**

- a. The following conditions trigger required revisions and updates to the SWPPP:
  1. When there is a change in design, construction, operation, or maintenance of the site, which would require the implementation of new, additional, or revised BMPs; or
  2. If the SWPPP proves to be ineffective in achieving the general objectives of controlling potential pollutants in storm water discharges associated with construction activity; or
  3. DEQ determines that the BMPs are not properly selected, designed, installed, operated, and/or maintained; or
  4. When BMPs are no longer necessary and are removed.
- b. If a permittee is applying for a renewal or modification of their authorization, as described in Part [1.2.3](#) and [1.2.4](#), respectively, an updated SWPPP including all associated maps, diagrams, details, plans, and records must be submitted.

#### **3.12.2 Revision and Update Options**

The permittee must document how revisions and updates to the SWPPP will be maintained to reflect current site conditions. SWPPP site map(s) must reflect any revisions or updates to the SWPPP or from corresponding inspection reports. Inspection reports may be used to supplement the SWPPP to reflect revisions and updates.

Revisions and updates must be made before changes in the site conditions except for BMP changes addressing installation/implementation. BMP changes addressing installation/implementation must be made as soon as practicable, but in no case more than 72 hours after the changes occur at the site.

The permittee may use any of the three options below to document revisions and updates to the SWPPP:

- (1) Revisions and updates directly to the SWPPP and the SWPPP site map(s). Updates to the SWPPP must include additional pages attached the SWPPP which include the time, date, and SWPPP Administrator authorizing the change; or
- (2) Revisions and updates reflected through inspection records, and the SWPPP site map(s); or
- (3) Revisions and updates reflected through a log, and the SWPPP site map(s). Log entries must include the time and date of the change(s) in the field; an identification of the BMP(s) removed or added; the location(s) of those BMP(s); and the name of the SWPPP Administrator authorizing the change.



## **4. Standard Conditions**

### **4.1 Duty to Comply**

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Montana Water Quality Act and is grounds for enforcement action; for termination under the General Permit; for revocation and reissuance of a confirmation letter; for a modification requirement; or for denial of coverage under the General Permit (new or renewed). The permittee shall give the department advance notice of any planned changes at the permitted facility or of an activity which may result in permit noncompliance.

### **4.2 Penalties for Violations of Permit Conditions**

The Montana Water Quality Act at MCA 75-5-631 provides that in an action initiated by the department to collect civil penalties against a person who is found to have violated a permit condition of this Act is subject to a civil penalty not to exceed \$25,000. Each day of violation constitutes a separate violation.

The Montana Water Quality Act at MCA 75-5-632 provides that any person who willingly or negligently violates a prohibition or permit condition of the Act is guilty of an offense, and upon conviction, is subject to a fine not to exceed \$25,000 per day of violation or imprisonment for not more than one year, or both, for the first conviction. Following an initial conviction, any subsequent convictions subject a person to a fine of up to \$50,000 per day of violation or by imprisonment for not more than two years, or both.

The Montana Water Quality Act at MCA 75-5-611 provides for administrative penalties not to exceed \$10,000 for each day of violation and up to a maximum not to exceed \$100,000 for any related series of violations. Except as provided in permit conditions "Bypass of Treatment Facilities" and "Upset Conditions", nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

### **4.3 Duty to Reapply**

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The reapplication must be submitted at least 30 days before the expiration date of this permit.

### **4.4 Need to Halt or Reduce Activity not a Defense**

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

### **4.5 Duty to Mitigate**

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

### **4.6 Proper Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

### **4.7 Permit Actions**

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

#### **4.8 Property Rights**

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.

#### **4.9 Duty to Provide Information**

The permittee shall furnish to the department, within a reasonable time, any information which the department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the department, upon request, copies of records required to be kept by this permit.

#### **4.10 Inspection and Entry**

The permittee shall allow the head of the department, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

- Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and as otherwise authorized by the Montana Water Quality Act, any substances or parameters at any location; and
- Sample, or monitor at reasonable times for the purpose of assuring permit compliance, any substances or parameters at any location.

#### **4.11 Availability of Reports**

Except for data determined to be confidential under 40 CFR Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the department. As required by the Clean Water Act, applications, permits and effluent data shall not be considered confidential.

#### **4.12 Reporting Requirements- Monitoring and Monitoring Reports**

The department may require a permittee to monitor in addition to any conditions in this permit, on a case-by-case basis. If monitoring is required, the department will specify monitoring requirements to include, and not limited to, storm water sampling, analytical testing, and an evaluation of monitoring results, recording, and reporting. Monitoring results must be reported on a discharge monitoring report (DMR) or as required by the department. Monitoring results must be reported at the intervals specified.

If the permittee monitors any pollutant more frequently than required, using approved test procedures, the results of this monitoring must be included in the calculation and reporting of data submitted in the DMR. Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified by the department.

#### **4.13 Monitoring and Records- Representative Sampling**

Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.

#### **4.14 Monitoring and Records- Retention of Records**

The permittee shall retain records of all monitoring information including all calibrations and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report, or application. This period may be extended by request of the department at any time.

#### **4.15 Monitoring and Records- Records Content**

Records of monitoring information must include:

- The date, exact place, and time of sampling or measurements;
- The individual(s) who performed the sampling or measurements;
- The date(s) analyses were performed;
- The individual(s) who performed the analyses;
- The analytical techniques or methods used; and
- The results of such analyses.

#### **4.16 Monitoring and Records- Test Procedures**

Monitoring must be conducted according to test procedures approved under Title 40 of the Code of Federal regulations (40 CFR) Part 136, unless other test procedures have been specified in this permit, confirmation letter, or by the department.

#### **4.17 Monitoring and Records-Penalties for Falsification of Reports and Tampering**

The Montana Water Quality Act at MCA 75-5-633 provides that any person who knowingly falsifies, tampers with, or renders inaccurate any monitoring device or method, or makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$25,000 per violation, or by imprisonment for not more than six months per violation, or by both.

#### **4.18 Signatory and Authorized Representative Requirements**

All applications, reports or information submitted to the department shall be signed and certified in accordance with ARM 17.30.1323.

##### **4.18.1 Signatory Authority**

All NOI-SWC application forms (including modifications and renewals), NOT, and PTN documents must be signed by an individual with signatory authority defined below:

- a. For a corporation, a responsible corporate officer. A responsible corporate officer means:
  1. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or
  2. The manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- b. For a partnership or sole proprietorship, a general partner or the proprietor, respectively; or
- c. For a municipality, state, federal, or other public agency, either a principal executive officer or ranking elected official. A principal executive officer of a federal agency includes:
  1. The chief executive officer of the agency; or
  2. A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

##### **4.18.2 Duly Authorized Representative**

The SWPPP, inspections reports, and other documents required by the General Permit that are not identified as needing the signature of a signatory authority in Part [4.18.1](#) may be signed by either an individual with signatory authority or a duly authorized representative of that person. A person is a duly authorized representative only if:

- a. Authorization is made in writing by an individual with signatory authority (Part 4.18.1);
- b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position.)
- c. The written authorization is submitted to the department.

#### **4.18.2.1 Changes to Duly Authorized Representative**

If an authorization, described above, is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the above requirements must be submitted to the department prior to or together with any reports, information, or applications to be signed by an authorized representative.

#### **4.18.3 Certification:**

Any person signing a document under Part [4.18.1](#) or [4.18.2](#) shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

#### **4.19 Reporting Requirements - Planned Changes**

The permittee shall give notice to the department as soon as possible of any planned physical alterations or additions to the permitted facility, activity, or operation.

Notice is required only when:

- The alteration or addition to the permitted facility, activity, or operation may meet one of the criteria for determining whether a facility is a new source; or
- The alteration or addition could significantly change the nature or increase the quantity of pollutant discharged. This notification applies to pollutants which are not subject to effluent limitations in the permit.

#### **4.20 Reporting Requirements- Anticipated Noncompliance**

The permittee shall give advance notice to the department of any planned changes in the permitted facility/activity/operation which may result in noncompliance with permit requirements. The permittee shall notify as soon as possible by phone and provide with the following information, in writing, within five (5) days of becoming aware of such condition:

- A description of the discharge and cause of noncompliance; and
- The period of noncompliance including exact dates and times, or if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the non-complying discharge.

#### **4.21 Reporting Requirements- Transfers**

Permit coverage is not transferable to any person except after notice is given to the department and a transfer fee is paid. The Permit Transfer Notification (PTN-SWC) form provided by the department must be completed and must be received by the department at least 30 days prior to the anticipated date of transfer. The form must be signed by both the existing owner/operator and the new owner/operator following the signatory requirements of Part [4.18](#).

#### **4.22 Reporting Requirements- Compliance Schedules**

Reports of compliance or noncompliance with, or any progress reports on, interim, and final requirements contained in any compliance schedule of this permit or required by the department shall be submitted no later than 14 days following each schedule date.

#### **4.23 Reporting Requirements- Twenty-four Hour Reporting**

The permittee shall report any serious incident of noncompliance affecting the environment. Any information must be provided orally within 24 hours from the time the permittee first becomes aware of the following circumstances:

- Any noncompliance which may seriously endanger health or the environment;
- Any unanticipated bypass which exceeds any effluent limitation in the permit;
- Any upset which exceeds any effluent limitation in the permit; or
- As applicable, violation of a maximum daily discharge limit of any pollutant listed by the department in the General Permit or confirmation letter.

A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

- A description of the noncompliance and its cause;
- The period of noncompliance, including exact dates and times;
- The estimated time noncompliance is expected to continue if it has not been corrected; and
- Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

##### **4.23.1 Oral Notification**

The report shall be made orally to the Water Protection Bureau at (406) 444-5546 or the Office of Disaster and Emergency Services at (406) 324-4777.

##### **4.23.2 Waiver of Written Notification Requirement**

The department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Water Protection Bureau, by phone, (406) 444-5546. Written reports shall be submitted to the following address:

Montana Department of Environmental Quality  
Water Protection Bureau  
PO Box 200901  
Helena, Montana 59620-0901

#### **4.24 Reporting Requirements- Other Noncompliance**

Instances of noncompliance not required to be reported within 24 hours shall be reported as soon as possible. The reports shall contain the information listed above for written submissions under Part [4.23](#).

#### **4.25 Reporting Requirements- Other Information**

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application package, or submitted incorrect information in a permit application package or any report to the department, it shall promptly submit such facts or information.

#### **4.26 Bypass**

Intentional diversions of untreated waste streams from any portion of a treatment facility are prohibited unless:

- The bypass does not cause effluent to exceed effluent limitations and is necessary for essential maintenance to ensure efficient operation; or

- The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage; or
- There are no feasible alternatives;
- And the proper notification is submitted.

Bypass is prohibited and the department may take enforcement action against a permittee for a bypass. If the permittee knows in advance of the need for anticipated bypass, it shall submit prior notice, if possible, at least ten days before the date of the bypass. The department may approve an anticipated bypass, after considering its adverse effects. The permittee shall submit notice of an unanticipated bypass as required under Part [4.23](#).

#### **4.27 Upset Conditions**

An upset may be used as an affirmative defense in actions brought to the permittee for noncompliance with a technology-based effluent limitation. The permittee (who has the burden of proof) must have operational logs or other evidence showing:

- When the upset occurred and its causes;
- That the facility was being operated properly;
- Proper notification was made; and
- Remedial measures were taken as required by the duty to mitigate standard condition.

#### **4.28 Fees**

The permittee is required to submit payment of an annual fee as set forth in ARM 17.30.201. If the permittee fails to pay the annual fee within 90 days after the due date for the payment, the department may:

- Impose an additional assessment computed at the rate established under ARM 17.30.201: and,
- Suspend the processing of the application for a permit or authorization or, if the nonpayment involves an annual permit fee, suspend the permit, certificate or authorization for which the fee is required. The department may lift suspension at any time up to one year after the suspension occurs if the holder has paid all outstanding fees, including all penalties, assessments and interest imposed under this sub-section. Suspensions are limited to one year, after which the permit will be terminated.

#### **4.29 Removed Substances**

Collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard.

#### **4.30 Oil and Hazardous Substance Liability**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

#### **4.31 Severability**

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

#### **4.32 Reopener Provisions**

This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations (and compliance schedule, if necessary), or other appropriate requirements if one or more of the following events occurs:

- Water Quality Standards: The water quality standards of the receiving water(s) to which the permittee discharges are modified in such a manner as to require different permit conditions than contained in this permit.
- Water Quality Standards are Exceeded: If it is found that water quality standards or trigger values in the receiving stream are exceeded either for parameters included in the permit or others, the department may modify the permit conditions or water management plan.
- TMDL or Wasteload Allocation: TMDL requirements or a wasteload allocation is developed and approved by the department and/or EPA for incorporation in this permit.
- Water Quality Management Plan: A revision to the current water quality management plan is approved and adopted which calls for different effluent limitations than contained in this permit.

### **4.33 Toxic Pollutants**

The permittee shall comply with effluent standards or prohibitions established for toxic pollutants which are present in the discharge, within any specified timeframe within rule or thereof, and even if the General Permit or confirmation letter has not yet been modified to incorporate such standard or prohibition for the toxic pollutant.

## 5. General Definitions and Abbreviations

“**Act**” means the Montana Water Quality Act, Title 75, Chapter 5, MCA.

“**Best management practices**” (“**BMPs**”) means a schedule of activities, prohibition of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of state surface waters. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

“**Board**” means the Montana Board of Environmental Review established by 2-15-3502, MCA.

“**CFR**” means the Code of Federal Regulations.

“**Clean Water Act**” means the federal legislation at 33 USC 1251, et seq.

“**Construction dewatering**” means the action of pumping or actively removing ground water, surface water, and/or accumulated storm water from a construction site or other related activities. MPDES General Permit for Construction Dewatering applies to the discharge of construction dewatering effluent to state surface water with increased sediment and turbidity as the primary pollutants of concern, including:

- *In-stream dewatering*: cofferdams, drill hole or pylon development;
- *Surface area dewatering*: water pumped from disturbed surface areas (foundations, trenches, excavation pits, vaults, sumps, or other similar points of accumulation associated with a construction site or related activities where sediment-laden ground water, surface water, and/or storm water inflow must be removed); and
- *Ground water dewatering*: water discharged from well development, well pump tests, or pumping of ground water from a construction site or other related activities.

“**Department**” means the Montana Department of Environmental Quality. Established by 2-15- 3501, MCA.

“**Disturbance related to construction activity**” means areas that are subject to clearing, excavating, grading, stockpiling earth materials, and placement/removal of earth material performed during construction projects.

“**Ephemeral stream**” means a stream or part of a stream that flows only in direct response to precipitation in the immediate watershed or in response to the melting of a cover of snow and ice and whose channel bottom is always above the local water table.

“**EPA**” or “**US EPA**” means the United States Environmental Protection Agency.

“**Facility or activity**” means any MPDES point source or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the MPDES program.

“**Final stabilization**” as defined at ARM 17.30.1102(5), means the time at which all soil-disturbing activities at the site have been completed, and a vegetative cover has been established with a density of at least 70% of the pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed. Final stabilization using vegetation must be accomplished using seeding mixtures or forbs, grasses, and shrubs that are adapted to the conditions of the site. Establishment of a vegetative cover capable of providing erosion control equivalent to pre-existing conditions at the site will be considered final stabilization.

“**General permit**” means a MPDES permit issued under ARM 17.30.1341 authorizing a category of discharges under the Act within a geographical area.

“**Indian country**” as defined at 40 CFR § 122.2, means (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the



limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

**“Infeasible”** means not economically possible or economically practicable in light of best industry practices.

**“Larger common plan of development or sale (larger common plan)”** means a project where multiple separate and distinct construction activities may be taking place at different times and/or schedules but remain related under one common plan. A “common plan” is defined as any announcement or piece of documentation (including, but not limited to a sign, public notice or hearing, sales pitch, advertisement, drawing, engineering plan, permit application, zoning request, or schematic) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activities may occur within a specific geographic area. Construction activities which form a larger common plan of development or sale may have areas of disturbance which are not physically connected.

**“Montana pollutant discharge elimination system (MPDES)”** means the system developed by the Board and DEQ for issuing permits for the discharge of pollutants from point sources into state surface waters. The MPDES is specifically designed to be compatible with the federal NPDES program established and administered by the EPA.

**“Owner or operator” (or owner/operator)** as defined at 75-5-103, MCA, means a person who owns, leases, operates, controls, or supervises a point source.

**“Point source”** as defined at ARM 17.30.1102, means a discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

**“Pollutant”** as defined at ARM 17.30.1102, means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural wastes discharged into water. The terms "sewage," "industrial waste," and "other wastes" as defined at 75-5-103, MCA, are interpreted as having the same meaning as pollutant.

**“Process wastewater”** as defined at ARM 17.30.1102, means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

**“Receiving state surface waters”** means the initial surface water body which receives the discharge from the site. See definitions of “state waters” and “surface waters” below.

**“Regional Administrator”** is the administrator of the EPA Region with jurisdiction over federal water pollution control activities in the State of Montana.

**“Runoff coefficient”** as defined at ARM 17.30.1102, means the fraction of total rainfall that will appear at the conveyance as runoff.

**“Severe property damage”** means substantial physical damage to property, damage to treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

**“Site”** as defined at ARM 17.30.1102, means the land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.

**“State waters”** as defined at 75-5-103, MCA, means a body of water, irrigation system, or drainage system, either surface or underground. The term does not apply to:

- Ponds or lagoons used solely for treating, transporting, or impounding pollutants; or
- Irrigation waters or land application disposal waters when the waters are used up within the irrigation or land application disposal system and the waters are not returned to state waters.

**“Storm water”** as defined at ARM 17.30.1102, means storm water runoff from precipitation, snowmelt runoff, and surface runoff and drainage.

**“Storm water discharge associated with construction activity”** as defined at ARM 17.30.1102, means a discharge of storm water from construction activities that result in the disturbance of equal to or greater than one acre of total land area. Construction activities include clearing, grading, excavation, stockpiling earth materials, and other placement or removal of earth material performed during construction projects. Construction activity includes the disturbance of less than one acre of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb one acre or more.

- Regardless of the acreage of disturbance resulting from a construction activity, this definition includes any other discharges from construction activity designated by the DEQ pursuant to ARM 17.30.1105(1)(f).
- For construction activities that result in disturbance of less than five acres of total land area, the acreage of disturbance does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility.
- For construction activities that result in disturbance of five acres or more of total land area, this definition includes those requirements and clarifications stated in ARM 17.30.1102(29)(a), (b), (d) and (e).

**“Storm Water Pollution Prevention Plan (SWPPP)”** as defined at ARM 17.30.1102, means a document developed to help identify sources of pollution potentially affecting the quality of storm water discharges associated with a facility or activity, and to ensure implementation of measures to minimize and control pollutants in storm water discharges associated with a facility or activity. DEQ determines specific requirements and information to be included in a SWPPP based on the type and characteristics of a facility or activity, and on the respective MPDES permit requirements.

**“Surface waters”** as defined at ARM 17.30.1102, means any waters on the earth's surface, including but not limited to streams, lakes, ponds, reservoirs, and irrigation and drainage systems. Water bodies used solely for treating, transporting, or impounding pollutants shall not be considered surface water.

**“Temporary stabilization”** means a condition where exposed soils or disturbed areas are provided a temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

**“Total maximum daily load”** or **“TMDL”** as defined at 75-5-103, MCA, means the sum of the individual waste load allocations for point sources and load allocations for both nonpoint sources and natural background sources established at a level necessary to achieve compliance with applicable surface water quality standards.

**“Upset”** means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

**“Waste load allocation”** as defined at ARM 17.30.1102, means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources.

**“Waste pile”** means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.



## **INSTRUCTIONS FOR Notice of Intent Form NOI-07 Construction Dewatering General Permit (MTG070000)**

Owners/operators seeking authorization under Montana's construction dewatering general permit (CDGP) have the option of completing an electronic Notice of Intent (NOI) submittal by FACTS or hardcopy. FACTS can be found here: <http://deq.mt.gov/Public/FACTS>. Owners/operators who wish to complete the NOI request by hardcopy can find the forms here: <http://deq.mt.gov/Water/permits/Discharges> or by calling the Montana Department of Environmental Quality (DEQ) at 444-5546.

An NOI package will not be considered complete unless you answer every question. If an item does not apply to you, enter "NA" (not applicable) to show that you considered the question. Responses must be self-explanatory and must not refer exclusively to attached maps, plans, or documents. You must maintain a copy of the CDGP and completed NOI-07 package (electronic or paper copy) and have them available on-site.

### **The complete NOI-07 Package must include:**

- NOI-07 form – completed, including all required attachments, using the standard NOI form (hardcopy or electronic) provided by the DEQ;
- Appropriate application fee (see ARM 17.30.201 or contact DEQ);
- Completion of the Dewatering Control Plan (*submittal is not required*); and
- A copy of the consultation letter from the Montana Sage Grouse Habitat Conservation Program (if applicable)

In addition, you must have access to a turbidity meter or testing laboratory to monitor your discharge turbidity.

The complete NOI-07 Package shall be submitted to:

Montana Department of Environmental Quality  
Water Protection Bureau  
P.O. Box 200901  
Helena, MT 59620-0901

DEQ will review the NOI Package for completeness. If the NOI-07 Package is incomplete, DEQ will notify you regarding the deficiencies, and you must address these deficiencies to continue the review process. When the package is complete, DEQ will issue an authorization letter specific to your activity. You must have this authorization letter prior to initiating discharge to any state surface waters.

Please type or print legibly; NOI Forms that are not legible, incomplete, or unsigned will be returned.

## **SPECIFIC ITEM INSTRUCTIONS**

### **Section A – Application Status**

Check the appropriate box. For resubmitted, renewed, and modified applications, provide the 9-digit authorization (beginning with MTG07) assigned to your construction dewatering operation.

- *New* – Use only if this is the first NOI submission for this operation. DEQ will assign the permit number.
- *Renewal* – Use only if renewing an authorization that was issued under the 2015-issued CDGP.
- *Modification* – Use only if you have an authorization but are planning changes to permitted outfalls or discharge categories. Do not use this form to transfer permit coverage to a new owner or operator. For a permit transfer you must use DEQ's Permit Transfer Notification form (PTN).
- *Resubmittal* – Use only if DEQ requests a resubmitted NOI.

*Fees* - Each of the options above requires a fee, per outfall. Refer to the Administrative Rules of Montana (ARM) 17.30.201 for fees.

## **Section B – Site or Activity Information**

Identify the name of the site or activity that is the source of construction dewatering discharge. The location of the site is the specific area where the activity is physically conducted. Give the address or location of this site or activity and the geographical coordinate information. DEQ prefers the latitude and longitude location be specified in decimal degrees, accurate to the fourth decimal place. Sources for geographical coordinate information include: DEQ’s CWAIC site at <http://deq.mt.gov/Water/Resources/CWAIC>, GoogleMaps, GIS, a “GPS” handheld navigation device, a USGS topographic map, or other locational sources. The location may be a physical address or description of how the site may be accessed (PO Boxes are not acceptable).

If the facility or site is located on or within the boundaries of a federally-recognized Tribal Lands DEQ is not the permitting authority. You must contact the Environmental Protection Agency (EPA) Montana’s Region 8 Operation Office in Helena at (406) 457-5000.

## **Nature of the Business or Activity and Standard Industrial Classification Code**

List the primary and (if applicable) secondary four-digit Standard Industrial Classification (SIC) Code(s) that best describe the business of the owner/operator related to the relevant project. Also, provide a brief description in the space provided. At least one SIC code must be provided. SIC Codes and conversions from the newer North American Industry Classification System (NAICS) can be found at: <http://www.osha.gov/pls/imis/sicsearch.html> or <https://www.census.gov/eos/www/naics/> or in paper form in the document entitled “Standard Industrial Classification Manual,” Office Management and Budget, 1987.

Some examples are SIC codes for Building Construction (1521 through 1542), Heavy Construction (1611 through 1629), Excavation (1794), and water well drilling (1781).

## **Section C – Applicant (Owner/Operator) Information**

Organizational Formal Name - give the name, as it is legally referred to, of the business, public organization, person, or other entity that owns, operates, controls or supervises the site or activity described in Section B of this form. The permit will be issued to the entity identified in this section (Section C). ***The owner or operator assumes all liability for discharges from the site and compliance with the terms and conditions of the permit and applicable regulations.***

Provide information for a contact that can provide further information to DEQ, including on-site visits.

## **Section D – Authorized Representative**

Permits must be certified by an appropriate signatory (“Responsible Official”) for the owner/operator (entity or organizational formal name) identified in Section C. However, all reports including electronic Discharge Monitoring Reports, or NetDMRs, may be signed by a duly authorized representative. A person is a duly authorized representative only if:

1. The authorization is made in writing by the signatory;
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and
3. The written authorization is submitted to DEQ.

Any signatory or authorized representative shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

The Responsible Official can duly authorize the person identified as a contact in Section C or another individual or position name. If the Responsible Official does not duly authorize anyone, all correspondence

must come from him/her until a written designation is submitted to DEQ. In the future, if the authorization made in this NOI is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new written delegation of authorization, including a written letter satisfying the requirements above, must be submitted to DEQ prior to or together with any reports, information, or applications to be signed by an authorized representative.

### **Section E – Outfalls and Receiving Waters**

Outfalls are defined as “a disposal system through which effluent or waste leaves the facility or site.” For the CDGP, **an outfall location is the flow path from which the dewatering discharge leaves the facility after all treatment, prior to discharge into state surface waters.** (Water bodies used solely for treating, transporting, or impounding pollutants shall not be considered surface water.)

For the CDGP, multiple discharge locations of the same discharge to the same stream segment or the same receiving waters can be considered one outfall. Provide the following information in the table on the NOI Form Section E for each outfall that you propose:

1. Assign a number to each outfall starting with 001. For existing permittees, ensure outfall numbers used are consistent with those identified in the past for the same outfall.
2. Provide the latitude/longitude of each outfall. DEQ prefers the latitude and longitude location be specified in decimal degrees, accurate to the fourth decimal place. Sources for geographical coordinate information include: DEQ’s CWAIC site at <http://deq.mt.gov/Water/Resources/CWAIC>, GoogleMaps, GIS, a “GPS” handheld navigation device, a USGS topographic map, or other locational sources. If the dewatering is part of a linear project and the dewatering effluent may be discharged at various points along a given stream segment, provide the mid-point for the receiving water segment on this table and indicate the maximum extent of the discharge as a range in Section K Supplemental Information.
3. Give the name of the initial receiving surface waters that receive the discharge. If the receiving water is unnamed, please also indicate the closest named drainage the receiving water flows into (*i.e. unnamed tributary to Clear Creek*).
4. Attach a USGS topographic quadrangle map or USGS-based topographic map or an aerial photo extending one mile beyond the property boundaries of the site or facility/activity identified in Section B depicting the facility or activity boundaries, any dewatering effluent treatment areas, the outfall location(s) and the receiving surface waters stated above.

If additional space is necessary for more outfall locations, attach additional sheets with the requested information.

**An application fee needs to be included for each identified outfall that is to a unique waterbody or has unique effluent limits or monitoring requirements.** Multiple outfalls from the same source that have similar effluent characteristics may not be required to pay individual application fees, unless the discharges are to different receiving waters or stream segments, or result in multiple effluent limits or monitoring requirements. If questions develop on identifying these outfalls, call DEQ prior to completing this NOI.

### **Section F – Proximity to Contaminated Sites**

As described in the CDGP, discharge of dewatering effluent that contains contamination from a previous release is not allowed under the CDGP. **For due diligence, the applicant must review readily available information to identify known or suspected release sites, including groundwater plumes in the vicinity of the dewatering.** Release sites are depicted here: <http://svc.mt.gov/deq/wmadst/#>.

Other specific information sources may include:

- Leaking Underground Storage Tank (LUST) list: <http://deq.mt.gov/Land/lust/lustsites>
- Abandoned Mine Lands list: <http://deq.mt.gov/Land/AbandonedMines/priority>
- Federal Superfund: <http://deq.mt.gov/Land/FedSuperfund>
- State Superfund: <http://deq.mt.gov/Land/StateSuperFund/cecralistformats>

If applicant has information that an area of known or suspected contamination is near the dewatering activity, the applicant must:

- Determine the distance between the planned dewatering activity (well or pump location) and the suspected area of contamination.
- Contact the regulatory program with authority on the release. The contact name and date must be provided in this section of the NOI hardcopy or in Section K. Additional Information.
- Take a pre-discharge ground water sample and supply DEQ with a copy of lab results for the pollutants in question. The analyses must be capable of detecting the suspected pollutants down to the Required Reporting Value (RRV) listed in Circular DEQ-7. If a sample cannot be obtained prior to authorization, available hydrologic information on the contamination plume must be submitted. DEQ may decide to authorize the dewatering contingent on a sample taken within the first four hours of dewatering with expedited analysis.

*If pollutants are found to be in concentrations over their RRV, then dewatering discharge cannot be authorized under the CDGP. If all parameters are “nondetect” at levels below the RRV, DEQ will continue to process the request, but may require periodic testing for suspected contaminants for the life of the dewatering project.*

**Section G – Description of Expected Discharge Duration and Mitigation Measures (Dewatering Control Plan)**

Please provide the following to the extent known:

- The projected beginning and end dates for the construction dewatering activities at your site. *Dewatering discharge is not allowed until after an authorization letter is obtained from DEQ.*
- *Please be reminded to submit a written request for termination of this authorization after all dewatering is completed, signed by the Responsible Official.* Authorizations that are not terminated are subject to annual fees accrued for every calendar year.
- Provide an estimate of the expected flow rate of the treated dewatering discharge into state surface waters, after initial purge has been completed, in gallons per minute (gpm). Use engineering assumptions to the extent available. For instance, Caltrans provides a rough estimate of pumping flow rates in their “Field Guide to Construction Site Dewatering.” CTSW-RT-010:

Typical Pump Flow Rates Pump Size (submersible)	Typical Flow Rates
1.5-inch	90 to 120 gpm
2-inch	90 to 300 gpm
3-inch	300 to 800 gpm
4-inch	400 to 1300 gpm
6-inch	400 to 1800 gpm

- **Dewatering Control Plans are mandatory.** Each applicant is required to certify that have completed and will implement a dewatering plan prior to initiating construction dewatering. Provide a summary of your Dewatering Control Plan by indicating all Best Management Practices (BMPs) that you will or might employ to reduce the turbidity/suspended sediment load. As your project progresses you may change selections to address site-specific issues; if so, the Dewatering Plan must be updated. The CDGP also requires the applicant to take corrective action for failure of any BMPs.

**Section H –Selection of Dewatering Category & Mixing Zones *(for each outfall):***

**Dewatering Category:** for each outfall, the applicant needs to review the ‘receiving water – discharge’ scenario in order to select the representative dewatering category as described in the CDGP and outlined below. *By selecting a category, the applicant acknowledges that they will comply with the applicable effluent limits and monitoring requirements for that category as described in the CDGP.*

**A. “Minimal Impact” category** – capped at 100 NTU. If Category A is selected, the applicant also needs to indicate which subcategory applies.

- **A.1. Discharge to a storm sewer or an ephemeral waterbody.** A storm sewer system is comprised only of storm water or snow melt. Ephemeral is defined as ‘a stream or part of a stream which flows only in direct response to precipitation in the immediate watershed or in response to the melting of a cover of snow and ice and whose channel bottom is always above the local water table.’ Ephemeral waterbodies are not considered high quality water; therefore, the applicant may discharge to them regardless whether they are wet or dry.
- **A.2 Discharge to a dry intermittent segment.** This subcategory includes dry intermittent streams or lakes. Intermittent stream is defined as ‘a stream or reach of a stream that is below the local water table for at least some part of the year, and obtains its flow from both surface run-off and ground water discharge.’ An applicant is allowed to discharge under this subcategory only if the upstream segment is dry. **If circumstances change and there is ambient water upstream, the owner/operator is required to comply with Category B requirements in accordance with the General Permit.**
- **A.3 Discharge to large rivers.** This subcategory includes only the eight rivers listed in Department Circular DEQ-12A, Table E-1 (Big Horn, Clark Fork, Flathead, Kootenai, Madison, Missouri, South Fork Flathead, or Yellowstone Rivers). A mixing zone is applicable for this category.

**B. “Discharge Turbidity Limited to Prevent Impact” category** – the turbidity in the discharge for authorizations under this category is limited to prevent impact on any high-quality water. This category has the most conservative turbidity effluent limits and therefore could apply to any state surface water, other than A-1 and A-closed. This includes perennial and flowing intermittent rivers, lakes, and reservoirs. Wetlands are also covered under this category due to the great variability in their sensitivity.

**C. “Real-time Turbidity Demonstration” category** – the maximum daily turbidity in the discharge cannot be greater than the upstream (ambient) turbidity in order to ensure ‘no increase above background;’ in addition, the discharge cannot exceed an average monthly turbidity of 100 NTU. **If circumstances change and there is no ambient flow, the owner/operator is required to comply with the Category A.2 requirements during periods when the receiving water is not flowing, in accordance with the General Permit.**

*Note:* Any discharge to waterbodies classified as A-1 or A-Closed (other than dry drainages) must comply with Category C. Discharges to A-1 and A-Closed waterbodies, which are the most protected, include the following water quality standards respectively: “No increase above naturally occurring turbidity is allowed except as permitted in 75-5-318, MCA” and “No increase above naturally occurring turbidity or suspended sediment is allowed except as permitted in 75-5-318, MCA.” Therefore, unless permitted otherwise under the 318 Authorization, authorization requests for these waterbodies are limited to either Category A.1 or A.2 (dry waterbodies) or Category C (no greater than background). If the discharge may be to a more protected waterbody and the classification is unknown, applicants can check the regulations under ARM 17.30 Subchapter 6 or the Clean Water Act Information Center (CWAIC) at <http://deq.mt.gov/Water/Resources/CWAIC>

**Mixing Zone:** For any discharge under subcategory A.3 (discharge to large rivers) or category B (discharge turbidity limited to prevent impact for variable receiving waters), the applicant needs to provide information to calculate the approved mixing zone at the driest time that will be encountered for the proposed project.

- For flowing water, a mixing zone length based on 10 times the receiving water width will be automatically applied for these dischargers.
- For standing water such as lakes or wetlands, the mixing zone area will be the smaller of 200 feet radius or 5% of the wetted area.
- Other discharges do not need and will not be authorized for mixing zones, and “NA” should be indicated.

### **Section I– Turbidity Monitoring Method**

The owner/operator is required to monitor the turbidity of dewatering activities when discharging to state surface waters. You are responsible for either contracting with a laboratory or obtaining access to a turbidity meter – identify which method you have selected, and provide the specific information required. You are allowed to change methods during your dewatering project.



## **Section J - Sage Grouse**

Visit <https://sagegrouse.mt.gov/> and review the Sage Grouse Core Areas and General Habitat Map to determine whether your project would occur in sage grouse habitats designated as a core area, general habitat, or a connectivity area. **Projects within sage grouse habitat must be submitted to the Montana Sage Grouse Habitat Conservation Program (the Program), through their website, for consultation.** Any recommendations and mitigations determined by the Program are provided in a consultation letter. If the project is outside of sage grouse habitat, no consultation is required.

## **Section K - Additional Information**

Use this space to provide additional information such as explaining the basis for a proposed permit modification being submitted, further description of linear projects, information on any flocculation agent proposed to be used, etc.

## **Section L – Certification**

The NOI Form certification must be completed by the applicant (owner/operator) responsible for the authorization and as described in ARM 17.30.1323. Examples of the correct signatory are owners or vice presidents of a construction firm. Project Managers are typically not eligible to certify the NOI.

Certification of this NOI is certification that the applicant will comply with the applicable terms of the CDGP.

If you have any questions concerning how to fill out this form, or other forms related to the Montana Pollutant Discharge Elimination System (MPDES) discharge permitting program, please contact DEQ at (406) 444-5546.