CITY OF THE DALLES, OREGON

CONTRACT NO. 2022-001

BIDDING REQUIREMENTS AND CONTRACT DOCUMENTS

for the construction of the

DOG RIVER PIPELINE REPLACEMENT

VOLUME 1: SPECIFICATIONS

Work under this contract is funded by the federal Safe Drinking Water Revolving Loan Fund through Business Oregon and a partnership of Local and/or Private Funds.

JACOBS

Corvallis, Oregon

March 2022

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Project No. D3504800

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March 23, 2022

Robert Brady Fuller

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CITY OF THE DALLES

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

SPECIFICATIONS DIVISION 03—CONCRETE



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Lori A. Elkins

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Marcelo Azevedo

CITY OF THE DALLES

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Matthew John Baldwin

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PART 1

PROCUREMENT REQUIREMENTS

ADVERTISEMENT FOR BIDS

The City of The Dalles (Buyer) is accepting Bids for the construction of the Dog River Pipeline Replacement. Because of the ongoing COVID-19 pandemic, procedures for Bid submissions and public Bid openings have been amended¹. Bids must be submitted no later than <u>May 5, at 2:00 p.m. Pacific Standard Time via e-mail to: thedallesbids@ci.the-</u> <u>dalles.or.us</u>, at which time the e-mail account designated for Bid receipt will be accessed. Bids shall not be sent to any other e-mail addresses. Bid responses will be read aloud via a Zoom meeting. Zoom Meeting ID is 872 0390 4519; Passcode 389877. Note: Immediately following the electronic submission of a Bid, Bidders will receive confirmation that Bidder's e-mail has been received. <u>DUTY IS ON BIDDER TO ENSURE THE REQUIRED BID</u> <u>DOCUMENTS ARE ATTACHED TO ANY E-MAIL BEING SENT TO THE CITY IN</u> <u>RESPONSE TO THIS ADVERTISEMENT FOR BIDS.</u>

The Project purpose is to replace an existing aging wood-stave pipeline. The Project contemplated consists of approximately 20,300 feet of new 30-inch Ductile Iron Pipe Size (DIPS) high density polyethylene pipe, air release and vent locations, new culvert at Brooks Meadow Creek, pipeline stream crossing at Brooks Meadow Creek, removal of existing fill where existing pipeline crosses through a depression, and new outfall energy dissipation facilities. Screening and fish passage facilities will be constructed as part of a separate contract and bid separately. Certain pipe materials are Owner-furnished. Work includes resurfacing certain existing dirt and gravel roads and construction of stormwater and erosion control facilities. All construction is located on lands owned by the United States Forest Service (USFS), and the City operates under a Special Use Permit. Work will be constrained to comply with conditions of multiple permits including those issued by USFS, US Army Corps of Engineers, Oregon Division of State Lands, Oregon Department of Fish and Wildlife, and Oregon Department of Environmental Quality.

The Work will be completed in all respects on or before November 30, 2023.

Bidding Documents may be examined and obtained at no cost from the City's website at <u>http://www.ci.the-dalles.or.us/current_job_openings.htm</u>.

The following plan room services have received sets of Bidding Documents for the Work contemplated herein:

- Daily Journal of Commerce Plan Center;
- Oregon Contractor Plan Center;
- Southwest Washington Contractors;
- Central Oregon Builders Association;

¹Receipt of electronic bids is permissible under ORS 279.055B(a) and remote public meeting are permissible under House Bill 4212, adopted in the 80th Oregon Legislative Assembly 2020 Special Session.

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

- Tri-City Construction Council;
- Salem Contractors Exchange;
- Hermiston Plan Center;
- Premier Builder's Exchange;
- iSqFt;
- Builders Exchange of Washington; and
- Oregon Association of Minority Entrepreneurs.

Each Bid must be submitted on the prescribed Bid Form and accompanied by Bid security as prescribed in the Instructions to Bidders.

The Successful Bidder will be required to furnish the additional bond(s) and insurance prescribed in the Bidding Documents.

Prior to submission of its Bid, Bidder shall be registered with the Oregon Construction Contractors Board.

Bidders shall have attended a mandatory pre-bid meeting on October 14, 2021, with recording of such attendance made by the City and published following the October 14, 2021 meeting. Bidders are further required to be prequalified by Owner specifically for this project. Qualified certified Disadvantaged Business Enterprises (DBEs) are encouraged to bid.

In order to submit a Bid, Bidders shall comply with the requirements listed in the Instructions to Bidders.

It is not anticipated that no asbestos will be encountered during the Project.

Each bid must contain a statement as to whether the proposer is a resident bidder as defined by ORS 279A.120. The project will be funded using a combination of federal Safe Drinking Water Revolving Loan Funds, Oregon Water Project Grants as administered by the Oregon Water Resources Department (OWRD), and City water utility revenues and System Development Charges (SDCs). Accordingly, the contract documents will incorporate requirements of these funding programs including, but not limited to, the higher of Oregon state or federal prevailing wages to be paid, certified payroll requirements, good-faith efforts to engage disadvantaged businesses, methods of procurement, and American Iron and Steel requirements. All contractors entering into prime contract with City will be required to have a valid DUNS number and System of Award Management (SAM) registration.

No Bid will be received or considered by Owner unless the Bid contains, or is accompanied by, a statement by Bidder that Bidder accepts prevailing wage rate provisions required by ORS279C.800-ORS279C.870 and 40 USC 276a.

For information concerning the proposed Work, contact Dave Anderson, Public Works Director, (541) 506-2008 (office), (541) 980-1446 (cell).

The construction site is expected to be inaccessible for wheeled motor vehicles during the bid period due to snowpack. For an appointment to visit the pipe staging Site, contact Dave Anderson, Public Works Director.

Attendance at the October 14, 2021 prebid conference will be a mandatory requirement of submitting a Bid for this Project. Bids will be accepted only from contractors who have been prequalified by the City for this project. Attendance at an additional pre-bid conference on April 6, 2022, 10:00 a.m., is a mandatory requirement of submitting a Bid for this Project. Refer to Instructions to Bidders for additional information. Note that video of the pipeline corridor was obtained in Fall 2021 and has been made available via a link on the City's webpage http://www.ci.the-dalles.or.us/current_job_openings.htm by clicking through the project title CONTRACT NO. 2022-001 DOG RIVER PIPELINE CONSTRUCTION PROJECT DOCUMENTS.

Owner's right is reserved to reject all Bids or any Bid not conforming to the intent and purpose of the Bidding Documents.

Dated this 25th day of March, 2022.

Izetta Grossman, CMC, City Clerk

END OF SECTION

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

1.1. 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:

1.1.1. *Issuing Office*—The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

2. COPIES OF BIDDING DOCUMENTS

2.1. Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Advertisement for Bids may be obtained as described in the Advertisement for Bids.

2.2. Complete sets of Bidding Documents shall be used in preparing Bids. Neither Owner nor Engineer assumes responsibility for errors or misinterpretations resulting from use of incomplete sets of Bidding Documents.

2.3. Drawings bound in the Bidding Documents are photographic reductions of original tracings. Amount of reduction is indicated by a note or scale bar on Drawing. Full-size Drawings are not intended to be provided by Owner.

2.4. Owner and Engineer, in making copies of Bidding Documents made 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 or grant for any other use.

3. QUALIFICATIONS OF BIDDERS

3.1. In order to perform public work, Bidder and its Subcontractors, prior to award of Contract or as otherwise required by the jurisdiction, shall hold or obtain such licenses as required by State Statutes, and federal and local Laws and Regulations.

3.2. Owner has executed a prequalification process to prequalify bidders. Bidders must have attended the October 14, 2021 mandatory prebid meeting, and successfully completed the prequalification process completed in March 2022. Bids from firms not prequalified, are not responsible and will not be opened or considered.

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

3.4. Bidder shall not be listed on the Bureau of Labor and Industries list of persons having violated prevailing wage rate laws as required in ORS 701.227.

3.5. Bidder shall not be in violation of any tax laws as required in ORS 305.385.

3.6. Bidder shall have a drug-testing program as required in ORS 279C.505.

4. **REGISTRATION REQUIREMENTS**

4.1. In order to submit a Bid, a person, partnership, corporation, or joint venture shall have a current, valid license issued by the Oregon Construction Contractors Board, as required by ORS 701.055.

5. EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

- 5.1. Subsurface and Physical Conditions:
 - 5.1.1. The Supplementary Conditions identify:

5.1.1.1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site.

5.1.1.2. Those drawings known to Owner of physical conditions relating to existing surface and subsurface structures at the Site (except Underground Facilities).

5.1.2. Copies of reports and drawings referenced will be made available by Owner to any Bidder on request. The "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 5.03 of the General Conditions has been identified and established in Paragraph 5.03 of 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. Costs associated with making available copies of reports and drawings shall be borne by Bidder.

5.2. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner or others.

5.3. Hazardous Environmental Condition:

5.3.1. The Supplementary Conditions identify reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.

5.3.2. Copies of reports and drawings referenced will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 5.06 of the General Conditions has been identified and established in Paragraph 5.06 of 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. Costs associated with making available copies of reports and drawings shall be borne by Bidder.

5.4. 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 Paragraph 5.03 through Paragraph 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 as a result of 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.

5.5. Access to the site during bid period is expected to be limited or impossible with wheeled motor vehicles, due to snowpack. Access via snow machine or snowcat may be possible, but would require permission from USFS. On request, Owner will coordinate with USFS to determine if access can be made by Bidders, to access the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. 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. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

5.6. Related Work at Site: Reference is made to the General Requirements for identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request Owner will provide to each Bidder for examination, access to or copies of contract documents (other than portions thereof related to price) for such other work.

5.7. Safety: Paragraph 7.12.C of the General Conditions indicates that if an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.8. It is responsibility of each Bidder before submitting a Bid to:

5.8.1. Examine and carefully study the Bidding Documents, other related data identified in the Bidding Documents, and any Addenda.

5.8.2. Visit the Site to become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work. It is understood by Owner and all Bidders that this opportunity was provided in the Mandatory Pre-Bid meeting on October 14, 2021. Other visits by Bidders prior to bidding shall be made by request to Owner.

5.8.3. Become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

5.8.4. Carefully study all:

5.8.4.1. Reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 5.03 of the Supplementary Conditions as containing reliable "technical data".

5.8.4.2. Reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph 5.06 of the Supplementary Conditions as containing reliable "technical data".

5.8.5. Consider the information known to Bidder; 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:

5.8.5.1. Cost, progress, and performance of the Work.

5.8.5.2. Means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents.

5.8.5.3. Bidder's safety precautions and programs.

INSTRUCTIONS TO BIDDERS 00 21 13 - 4 5.8.6. Agree at the time of submitting its Bid that 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(s) Bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

5.8.7. 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.

5.8.8. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in Bidding Documents and confirm that written resolution thereof by Engineer is acceptable to Bidder.

5.8.9. Determine Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance of the Work.

5.9. 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 is premised upon performing and furnishing the Work required by Bidding Documents and applying specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by Bidding Documents; that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder; and that Bidding Documents are generally sufficient to indicate and convey understanding of terms and conditions for performing and furnishing the Work.

6. PREBID CONFERENCE

6.1. A prebid conference will be held at 10:00 a.m. local time on April 6, 2022 via an online meeting.

6.1.1. Dial In Number +1 469-214-8538, 250279470#, Phone Conference ID: 250 279 470#.

6.2. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are required to attend and participate in the conference. Bids will not be accepted from Bidders that do not have a representative at the prebid conference. Engineer will transmit to prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

7. SITE AND OTHER AREAS

7.1. The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner, unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

7.2. All new facilities to be constructed, and all identified staging areas will occur on lands owned by United States Forest Service.

8. ENVIRONMENTAL AND NATURAL RESOURCES LAWS AND REGULATIONS

8.1. Bidder's attention is directed to the Supplementary Conditions for ordinances and regulations dealing with the prevention of pollution and preservation of natural resources which may affect the performance of the Work. Bidder shall take such ordinances and regulations into consideration in preparation and submission of its Bid.

9. INTERPRETATIONS AND ADDENDA

9.1. 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. Any change to the solicitation documents will be done by written Addenda. Proposers will be responsible for checking the City's website regularly for addenda and additional information for the project. Questions received less than 7 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.

9.2. Addenda may also be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

10. BID SECURITY

10.1. Bid shall be accompanied by Bid security made payable to Owner in an amount of 10 percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a penal Bid bond (on the attached form), issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Acceptable Surety companies are limited to those authorized to do business in the State of Oregon.

10.1.1. In addition to types of Bid security listed above, the following will also be acceptable: Irrevocable letter of credit by an insured institution as defined in ORS 706.008, or cashier's check or Bank Money Order. Letter of credit or cashier's check or Bank Money Order shall be made payable to City of The Dalles.

10.2. The Bid security of the Successful Bidder will be retained until 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 returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within the time period specified in Article Signing of Agreement, 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. Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the 7th day after the Effective Date of the Agreement or the number of days specified for all Bids to remain subject to acceptance in Article Bids to Remain Subject to Acceptance, whereupon Bid security furnished by such Bidders will be returned.

10.3. Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within 7 days after Bid opening.

11. CONTRACT TIMES

11.1. The times for Substantial Completion, and readiness for final payment are to be set forth by Bidder in the Bid and will be entered into the Agreement (or incorporated therein by reference to the specific language of the Bid). Substantial Completion is desired on or before October 31, 2023. The times will be taken into consideration by Owner during the evaluation of Bids, and it will be necessary for the apparent Successful Bidder to satisfy Owner it will be able to achieve Substantial Completion and be ready for final payment within the times designated in the Bid.

12. LIQUIDATED DAMAGES

12.1. Provisions for liquidated damages, if any, are set forth in the Agreement.

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13. SUBSTITUTE AND "OR-EQUAL" ITEMS

13.1. The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

14. SUBCONTRACTORS, SUPPLIERS, AND OTHERS

14.1. Oregon Revised Statutes (ORS) 279C.370 requires Bidders for public improvement projects exceeding \$100,000 in Contract Price to submit First-Tier Subcontractor Disclosure Form with Bid, or within 2 working hours of Bid closing. Disclosure form identifies first-tier Subcontractors that will furnish labor or labor and materials equal to 5 percent of Contract Price or \$15,000 whichever is greater, or \$350,000, regardless of percentage of Contract Price. Disclosure form not submitted with Bid or within 2 working hours of Bid closing will cause Bid to be considered nonresponsive.

14.2. 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 a substitute in which case apparent Successful Bidder shall submit an acceptable 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.

14.3. If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in General Conditions Paragraph 7.06.E.

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

15. WAGE RATES

15.1. The Work under these Bidding Documents is to be paid for by public funds. This is a public works project subject to the state prevailing wage under ORS 279C.800 to ORS 279C.870 and the federal Davis Bacon and Related Acts (40 USC Section 3141 et seq.). Unless otherwise exempt, Contractor and any Subcontractors must pay workers in each trade or occupation that Contractor or its Subcontractors or other person who is a party to the Contractor uses in performing all or a part of the Contract not less than the higher of the applicable minimum Oregon prevailing wage rates in accordance with ORS 279C.838 and ORS 279C.840, or the applicable federal Davis Bacon Wage Decision. The work being performed for this project will include Davis Bacon Wage Decision Number OR20220068 Modification February 24, 2022The applicable Oregon minimum prevailing wage rates for such workers are contained in the Bureau of Labor and Industries (BOLI) booklet (and any listed amendment to that booklet), which are incorporated herein by reference, apply to the Work authorized under this Agreement, and entitled, PREVAILING WAGE RATES for Public Works Contracts, in Oregon as amended on January 1, 2022, which can be downloaded from the following address: https://www.oregon.gov/boli/employers/Pages/prevailing-wage-rates.aspx. Refer to

Paragraph 7.10 of the Supplementary Conditions for more information.

15.2. Oregon Statutes require that Bids for public work, including those public work projects financed by federal funds and subject to the Davis Bacon Act, shall include a statement by Bidder that it will include in its Agreement the provisions of ORS279C.800-ORS279C.870 or 40 USC 276a. When the Bid Form in the Bidding Documents contains a statement of Bidder's declaration of compliance with ORS 279C.840 or 40 USC 276a, the Bidder's signing of the Bid constitutes compliance with this Oregon Statute. If the Bid Form does not contain such statement, each Bidder shall submit with its Bid for the Work, a separately signed statement that it will include the provisions of ORS 279C.840 or 40 USC 276a in the Agreement.

15.3. Oregon Statute 279C.836 requires that, before starting work on a contract or subcontract for a public works project, Contractor or Subcontractor shall file with the Construction Contractors Board a public works bond with the corporate surety authorized to do business in the State of Oregon in the amount of \$30,000.

16. PREPARATION OF BID

16.1. With each copy of the Bidding Documents, Bidder will be furnished one separate unbound copy of the Bid Form, and, if applicable, the Bid Bond Form. No substitution of the Bid Form will be allowed.

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS 16.2. All blanks on the Bid Form shall be completed by typing or printing with 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 Bid item listed therein or the words "No Bid," "No Change," or "Not Applicable" entered.

16.3. A Bid by a corporation shall be executed in the corporate name by the president or a vice president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

16.4. 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.

16.5. A Bid by a limited liability company shall be executed in the name of the firm by a member 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.

16.6. A Bid by an individual shall show the Bidder's name and official address.

16.7. A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

16.8. All names shall be typed or printed in ink below the signatures.

16.9. The Bid shall contain an acknowledgement of receipt of all Addenda; the numbers of which shall be filled in on the Bid Form.

16.10. Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

16.11. 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 and class, if applicable, shall also be shown on the Bid Form.

17. BASIS OF BID; COMPARISON OF BIDS

17.1. Lump Sum:

17.1.1. Bidders shall submit a Bid on a lump sum basis as set forth in the Bid Form.

INSTRUCTIONS TO BIDDERS 00 21 13 - 10

17.2. Unit Price:

17.2.1. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.

17.2.2. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

17.2.3. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

18. SUBMISSION OF BID

18.1. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the following data:

18.1.1. List of Proposed Subcontractors and Suppliers.

18.1.2. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids.

18.1.3. Contractor's License No.:

18.1.4. First-Tier Subcontractor Disclosure Form.

18.1.5. Affidavit of Noncollusion.

18.2. A Bid shall be submitted no later than the date and time prescribed, and at the place indicated in the Advertisement for Bids.

19. MODIFICATION AND WITHDRAWAL OF BID

19.1. A Bid may be modified or 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.

19.2. 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.

INSTRUCTIONS TO BIDDERS 00 21 13 - 11

20. OPENING OF BIDS

20.1. Bids will be opened at the time and place indicated in the Advertisement for Bids and unless obviously nonresponsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

21. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

21.1. 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.

22. EVALUATION OF BIDS AND AWARD OF CONTRACT

22.1. Nonresident Bidders: In determining the lowest responsible Bidder, Owner will for the purpose of awarding the Contract, add a percent increase on the Bid of a nonresident Bidder equal to the percent, if any, of the preference given to that Bidder in the state in which the Bidder resides.

22.2. Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

22.3. More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

22.4. 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.

22.5. In evaluating Bidders, Owner may consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted either with the Bid, or otherwise prior to issuance of the Notice of Award.

INSTRUCTIONS TO BIDDERS 00 21 13 - 12

22.6. Owner may conduct such investigations as Owner deems necessary to establish responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.

22.7. If the Contract is to be awarded, Owner will award the Contract to Bidder whose Bid is in the best interests of the Project.

23. CONTRACT SECURITY AND INSURANCE

23.1. Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to bonds and insurance. When Successful Bidder delivers executed Agreement to Owner, it shall be accompanied by such bonds.

24. SIGNING OF AGREEMENT

24.1. When Owner issues a Notice of Award to Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents that are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within 10 days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of Drawings with appropriate identification.

25. RETAINAGE

25.1. Provisions concerning retainage and Contractor's rights to deposit securities in lieu of retainage, if applicable, are set forth in the Agreement.

END OF SECTION

NOTE TO BIDDER: Use typewriter or ink for completing this Bid Form.

BID FORM (STIPULATED PRICE BASIS)

1. BID RECIPIENT

1.1. This Bid is submitted to:

Owner:	City of The Dalles, Oregon
Address:	via email to thedallesbids@ci.the-dalles.or.us
Project Identific	ation: Dog River Pipeline Replacement
Contract No.:	2022-001

1.2. 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.

2. BIDDER'S ACKNOWLEDGEMENTS

2.1. 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 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

3. BIDDER'S REPRESENTATIONS

3.1. In submitting this Bid, Bidder represents that:

3.1.1. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

Addendum No.	Addendum Date		

(Bidder shall insert number of each Addendum received.)

3.1.2. Bidder has visited the Site 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.

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

3.1.4. Bidder has carefully studied: i) reports of explorations and tests of subsurface conditions at or contiguous to the Site and drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) which have been identified in Paragraph 5.03 of the Supplementary Conditions as containing reliable "technical data,"; and ii) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph 5.06 of the Supplementary Conditions as containing reliable "technical data."

3.1.5. Bidder has considered the information known to Bidder; 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, including applying the specific means, methods, techniques, sequences of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.

3.1.6. Based on information and observations referred to in paragraph above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) Bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

3.1.7. 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.

3.1.8. Bidder has given Engineer written notice of conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

3.1.9. The Bidding Documents are generally sufficient to indicate and convey understanding of terms and conditions for the performance of the Work for which this Bid is submitted.

4. BIDDER'S CERTIFICATION

4.1. Bidder certifies:

4.1.1. 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;

4.1.2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

4.1.3. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

4.1.4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this paragraph:

4.1.4.1. "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;

4.1.4.2. "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 noncompetitive levels, or (c) to deprive Owner of the benefits of free and open competition;

4.1.4.3. "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, noncompetitive levels; and

4.1.4.4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

4.1.5. Required sales and use taxes are included in the stated Bid prices for the Work unless provision is made herein for the Bidder to separately itemize the estimated amount of sales tax or if Instructions to Bidders state Owner is tax exempt. 4.1.6. Bidder accepts the provisions required by ORS 279C.840 and the Davis Bacon Act (40 USC 276a) relating to prevailing wage rates and that Bidder shall make applicable restitution to the Oregon Bureau of Labor and Industries Commissioner in accordance with ORS 279C.825.

4.1.7. Neither Bidder nor their Subcontractors are on the Bureau of Labor and Industries list of persons having violated prevailing wage rate laws.

4.1.8. Bidder has not discriminated against minority, women, or emerging small business enterprises in obtaining required subcontracts.

4.1.9. Bidder is not in violation of any tax laws described in ORS 305.385.

4.1.10. Bidder has established a drug-testing program for employees per ORS 279C.505.

4.1.11. In accordance with OAR 137-049-0200, Subcontractors performing work will be registered with the Construction Contractors Board before Subcontractor commences work.

5. BASIS OF BIDS

5.1. Bidder shall complete the Work in accordance with the Contract Documents for the following price(s):

5.2. Lump Sum Bid Price: \$_____

5.3. Unit Price Bid Schedule:

5.3.1. Unit prices have been computed in accordance with Paragraph 13.03.C of the General Conditions.

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

	Unit Price Bid Schedule					
Item No.	Description	Estimated Quantity	Unit	Bid Unit Price	Extended Bid Unit Price	
1.	Foundation Stabilization Material (Section 31 23 23.15, Trench Backfill)	100	CY	\$	\$	

	Unit Price Bid Schedule				
Item No.	Description	Estimated Quantity	Unit	Bid Unit Price	Extended Bid Unit Price
2.	Hazard Tree Removal (Section 31 10 00, Site Clearing)	20	EA	\$	\$
3.	Rock Excavation (Section 31 23 16, Excavation)	4,075	CY	\$	\$
Total of Extended Bid Unit Prices				\$	

5.4. Base Bid Summary:

5.4.1. Lump Sum Bid Price: \$_____

5.4.2. Total Extended Unit Bid Prices: \$_____

5.4.3. Base Bid (Total of lines 5.4.1 and 5.4.2):

6. TIME OF COMPLETION

6.1. Bidder agrees the Work, and any Milestones specified in Section 01 31 13, Project Coordination, will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates, or within the number of calendar days, indicated in the Agreement.

\$_____

6.2. Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work, and any specified Milestones, within the Contract Times.

7. ATTACHMENTS TO THIS BID

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

7.1.1. Required Bid security in the form of Bid bond.

7.1.2. Certificate of Bidder Regarding Equal Opportunity.

7.1.3. Forms from Drinking Water SRF-Funded Construction Project Contract:

7.1.3.1. Attachment D – Fair Share Objectives, Six Good Faith Efforts, Contract Administration and Language.

7.1.4. Contractor's License No.: ______.

7.1.5. Subcontractor Disclosure Form (required within 2 hours of Bid closing).

7.1.6. Noncollusion Affidavit.

8. DEFINED TERMS

8.1. 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.

9. BID SUBMITTAL

9.1. We Certify that we _____ ARE ____ARE NOT (mark one) a "Resident Bidder" as defined by ORS 279A.120. As defined in ORS 279A.120, "Resident Bidder" means a bidder that has paid unemployment taxes or income taxes in this state in the twelve calendar months immediately preceding submission of the bid, has a business address in this state, and has stated in the bid whether the bidder is a "Resident Bidder". If not a Resident Bidder as defined in ORS 279A.120, please indicate state of residence:_____.

9.2. This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By (signature):

Doing business as:

A Partnership

Partnership Name:		(SEAL)
-------------------	--	--------

By: _____

(Signature of general partner – attach evidence of authority to sign) Name (typed or printed):
	<u>A Corporation</u>
	Corporation Name:(SEAL)
	State of Incorporation:
	Type (General Business, Professional, Service, Limited Liability):
	By:
	Name (typed or printed):
	Name (typed of printed).
	Title: (CORPORATE SEAL)
	Attest: (Signature of Corporate Secretary)
	Date of Qualification to do business in Oregon is:
	A Joint Venture
	Joint Venturer Name:(SEAL)
	By:
	Name (typed or printed):
	Title:
	(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)
Bidder's Busi	ness Address:
Phone No.:	FAX No.:
E maile	

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

SUBMITTED on	_, 20
Oregon Contractor's License No.:	
Contractor's License Class (where applicable):	
DUNS Number:	
System for Award Management (SAM) number:	

Bidder is an Oregon company as defined in ORS 279A.120.

____Yes ____No

END OF SECTION

BID BOND

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

BIDDER (Name and Address):

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

OWNER (Name and Address):

BID

Bid Due Date: Project (Brief Description Including Location): Dog River Pipeline Replacement; Hood River County, Oregon.

BOND

Bond Number: Date (Not later than Bid due date):

Penal sum

(Words)

(Figures)

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.

(Seal)

BIDDER

SURETY

By:

(Seal)

Bidder's Name and Corporate Seal

By:

Signature and Title

Attest: Signature and Title Attest: Signature and Title

Signature and Title

(Attach Power of Attorney)

Surety's Name and Corporate Seal

Note: Above addresses are to be used for giving required notice.

PW\DEN003\D3504800\01 **MARCH 2022** ©COPYRIGHT 2022 JACOBS **BID BOND**

00 43 13 - 1

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.

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 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 of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

END OF SECTION

FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

PROJECT NAME:	Dog River Pipeline Replacement	
BID #:	BID CLOSING: Date:	Time:

This form shall be submitted at the location specified in the Advertisement/Invitation to Bid within 2 working hours after the advertised Bid closing time on advertised Bid closing date.

List below the name of each Subcontractor that will be furnishing labor or labor and materials and that is required to be disclosed, the category of work that Subcontractor will be performing, and dollar value of subcontract. Enter "NONE" if there are no Subcontractors that need to be disclosed. (Attach additional sheets if needed.)

	NAME	DOLLAR VALUE	CATEGORY OF WORK
1)		\$	
2)		\$	
3)		\$	
4)		\$	
5)		\$	
6)		\$	
7)		\$	
8)		\$	

Failure to submit this form by the disclosure deadline will result in a nonresponsive Bid. A nonresponsive Bid will not be considered for award.

FORM SUBMITTED BY (BIDDER NAME):

CONTACT NAME: PHONE NO.:

END OF SECTION

AFFIDAVIT OF NONCOLLUSION

Each Bidder shall complete the following statement

STATE OF_____} } ss

That (s)he is the agent authorized by the Bidder to submit the attached Bid. Affiant further states that the Bidder has not been a party to any collusion among Bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or with any State, County, or City official or employee as to quantity, quality, or price in the prospective Contract, or any other terms of said prospective contract; or in any discussions between Bidders and any State, County, or City official concerning exchange of money or other thing of value for special consideration in the letting of a contract.

Affiant further warrants that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business.

	Name of Contractor	
	Bidder (Affiant)	
Subscribed and sworn to before me this	day of	, 20
My commission expires:		
	Notary Public	

END OF SECTION

PART 2

CONTRACTING REQUIREMENTS

AGREEMENT

THIS AGREEMENT is by and between	
(Owner) and	
	(Contractor).

Owner and Contractor, in consideration of the mutual covenants set forth herein, agree as follows:

1. WORK

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

1.1.1. The completed Work will provide Owner with a replacement of an existing pipeline and includes: 20,300 feet of new 30-inch Ductile Iron Pipe Size high density polyethylene pipe, air releases and vents, new culvert at Brooks Meadow Creek, pipeline stream crossing at Brooks Meadow Creek, removal of existing fill where existing pipeline crosses through a depression, and new outfall energy dissipation facilities. Certain piping materials are Owner-furnished. Work includes resurfacing certain existing dirt and gravel roads and construction of stormwater and erosion control facilities. All construction is located on lands owned by the United States Forest Service (USFS), and the City operates under a Special Use Permit. Work will be constrained to comply with conditions of multiple permits including those issued by USFS, US Army Corps of Engineers, Oregon Division of State Lands, Oregon Department of Fish and Wildlife, and Oregon Department of Environmental Quality.

2. THE PROJECT

2.1. The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

2.1.1. Dog River Pipeline Replacement.

3. ENGINEER

3.1. The Project has been designed by Jacobs Engineering Group Inc. (Engineer), who is to act as Owner's representative, assume 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.

4. CONTRACT TIMES

4.1. Time of the Essence: Time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.2. Dates for Substantial Completion and Final Payment:

4.2.1. The Work shall be substantially completed on or before October 31, 2023, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before November 30, 2023.

4.3. Liquidated Damages:

4.3.1. Contractor and Owner recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph Contract Times above, plus any extensions thereof allowed in accordance with Article 11 of the General Conditions. 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) Contractor shall pay Owner \$3,300 for each day that expires after the time specified herein for Substantial Completion until the Work is substantially complete.

4.3.2. After Substantial Completion, if Contractor neglects, refuses, or fails to complete remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$3,300 for each day that expires after the time specified herein for completion and readiness for final payment until the Work is completed and ready for final payment. Substantial completion and final completion liquidated damages shall not be additive, and therefore shall not exceed total of \$3,300 per day.

5. CONTRACT PRICE

5.1. Owner will pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to the following:

5.1.1. Lump Sum: For Work other than Unit Price Work, a lump sum of \$_____

plus:

5.1.2. Unit Prices:

5.1.2.1. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 10.06 of the General Conditions. Unit prices have been computed as provided in Paragraph 13.03 of the General Conditions.

5.1.2.2. For Unit Price Work, an amount equal to the sum of established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item as indicated in this paragraph:

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Price
1.	Foundation Stabilization Material (Section 31 23 23.15, Trench Backfill)	100	СҮ	\$	\$
2.	Hazard Tree Removal (Section 31 10 00, Site Clearing)	20	EA	\$	\$
3.	Rock Excavation (Section 31 23 16, Excavation)	4,075	СҮ	\$	\$

TOTAL OF ESTIMATED UNIT PRICES: \$_____

6. PAYMENT PROCEDURES

6.1. Submittal and Processing of Payments: 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 and Retainage: Owner will make progress payments on account of the Contract Price on the basis of Contractor's Application for Payment on or about the 25th day of each month during performance of the Work as provided herein. All such payments will be measured by the Schedule of Values established as provided in Paragraph 2.05 of 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 in the General Requirements.

6.2.1. 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 Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 15.01 of the General Conditions:

6.2.1.1. Ninety five percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, Owner, on recommendation of Engineer, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage; and

6.2.1.2. Ninety five percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

6.2.2. In lieu of retainage, and at the Contractor's option, provisions may be made as provided in ORS 279C.560 for either depositing with Owner or in a bank or trust company, bonds or securities for all or any portion of the retainage in a form acceptable to Owner. Interest on such bonds or securities shall accrue to Contractor. Costs incurred by Owner as a result of this option will be deducted from Contractor's final payment.

6.2.3. Upon Substantial Completion, Owner will pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts as Engineer will determine in accordance with Paragraph 15.01.C.6 of the General Conditions and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.3. Final Payment:

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

7. INTEREST

7.1. Monies not paid when due as provided in Article 15 of the General Conditions shall bear interest at the rate of 1 percent per month.

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8. CONTRACTOR'S REPRESENTATIONS

8.1. In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

8.1.1. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

8.1.2. Contractor has visited the Site 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.

8.1.3. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

8.1.4. Contractor has carefully studied: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) if any, which have been identified in Paragraph 5.03 of the Supplementary Conditions as containing reliable "technical data", and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site which have been identified in Paragraph 5.06 of the Supplementary Conditions as containing reliable "technical data."

8.1.5. Contractor has considered the information known to Contractor; 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 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, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and 3) Contractor's safety precautions and programs.

8.1.6. Based on the information and observations referred to above, Contractor does not consider that any 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 Documents. 8.1.7. 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.

8.1.8. Contractor has given Engineer written notice of conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

8.1.9. The Contract Documents are generally sufficient to indicate and convey understanding of terms and conditions for performance and furnishing of the Work.

9. CONTRACT DOCUMENTS

9.1. Contents:

9.1.1. The Contract Documents that are attached to this Agreement (except as expressly noted otherwise) consist of the following:

- 9.1.1.1. This Agreement (pages 1 to _____, inclusive).
- 9.1.1.2. Performance bond (pages _____ to ____, inclusive).
- 9.1.1.3. Payment bond (pages _____ to ____, inclusive).
- 9.1.1.4. General Conditions (pages _____ to ____, inclusive).
- 9.1.1.5. Supplementary Conditions (pages _____ to ____, inclusive).

9.1.1.6. Specifications as listed in the table of contents of the Project Manual.

9.1.1.7. Drawings consisting of ______ sheets with each sheet bearing the following general title: Dog River Pipeline Replacement.

9.1.1.8. Addenda (numbers _____ to ____, inclusive).

- 9.1.1.9. Safe Drinking Water Requirements.
- 9.1.1.10. Prevailing Wage Rate Determination.
- 9.1.2. Exhibits to this Agreement (enumerated as follows):
 - 9.1.2.1. None.

9.1.3. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

9.1.3.1. Notice to Proceed (pages _____ to ____, inclusive).

9.1.3.2. Work Change Directives.

9.1.3.3. Change Order(s).

9.2. There are no Contract Documents other than those listed above in this article.

9.3. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 11.01 of the General Conditions.

10. MISCELLANEOUS

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

10.2. Successors and Assigns: Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.3. Severability: Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree 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.

10.4. Assignment of Contract:

10.4.1. No assignment by a party hereto of any rights under or interests in the Contract shall be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, monies that may become due and monies that are 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 shall release or discharge the assignor from any duty or responsibility under the Contract Documents.

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10.5. Contractor's Certifications:

10.5.1. 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:

10.5.1.1. "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 Contract execution;

10.5.1.2. "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 Price at artificial noncompetitive levels, or (c) to deprive Owner of the benefits of free and open competition;

10.5.1.3. "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, noncompetitive levels; and

10.5.1.4. "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:

10.6.1. Federally Funded Project: Oregon Revised Statute 279A.030 states that if federal rules or regulations conflict with certain ORS provisions, the applicable federal laws, rules, and regulations shall govern.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in triplicate. One counterpart each has been delivered to Owner, Contractor, and Engineer. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

This Agreement will be effective on	, 20	_ (which is the Effective Date of the
Agreement).		

OWNER:

Title:

By: _____

[CORPORATE SEAL]

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CITY OF THE DALLES

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

Attest:	CONTRACTOR:
Title:	
Address for giving notices:	By:
	Title:
	[CORPORATE SEAL]
(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public	Attest:
body, attach evidence of authority to sign and resolution or other documents	Title:
authorizing execution of this Agreement.)	Address for giving notices:
	License No
	(Where applicable)
	Agent for service or process:
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
	DUNS number:
	System for Award Management (SAM) Number:
END OF	SECTION

CONSTRUCTION CONTRACT CLAUSES AND REQUIREMENTS

Construction Contract Requirements for Recipients of Safe Drinking Water Financing

SAM Registration and DUNS number are required for all entities that enter into direct contracts with the recipients of Safe Drinking Water Revolving Loan funds

SAM Registration: <u>https://www.sam.gov/SAM/</u>	DUNS Number <u>http://www.dnb.com/get-a-</u>
	duns-number.html
NOTE: The SAM registration expires annually and must be kept	
active until the SDWRLF project is closed	

Language to be included verbatim in construction contracts according to any accompanying instructions

Clauses required in all Contracts

Termination for Cause and for Convenience & Breach of Contract (language to be included in all construction contracts and subcontracts in excess of \$10,000:)

"Contractor shall address termination for cause and for convenience, including the manner by which it will be effected and the basis for settlement. In addition, contractor shall address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate."

Equal Employment Opportunity (language to be included in all construction contracts and subcontracts in excess of \$10,000:)

"Contractor shall comply with Executive Order 11246 of September 24, 1965, entitled 'Equal Employment Opportunity,'' as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR chapter 60)."

Procurement of Recovered Materials (language to be included in all construction contracts and subcontracts in excess of \$10,000:)

"Contractor must comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, including procurement of recovered materials in a manner designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247."

Whistleblower (language to be included in all construction contracts and subcontracts)

"Contractor receiving SDWRLF funds shall under or through this contract to, post notice of the rights and remedies provided to whistleblowers under No Fear Act Pub. L. 107-174. 29 CFR § 1614.703(d)."

	Source of Funds (language to be included in all construction contracts and subcontracts)
	"Work under this contract is funded by the federal Safe Drinking Water Revolving Loan Fund through Business Oregon and a partnership of Local and/or Private Funds."
	Suspension and Debarment (language to be included in all construction contracts and subcontracts)
	"Contractor certifies that it is not debarred or suspended or is otherwise excluded from or ineligible for participation in federal assistance programs under Executive Order 12549, "Debarment and Suspension", and shall not contract or permit any subcontract at any level with any party similarly excluded or ineligible. A list of excluded parties is available in the System for Award Management (SAM) at <u>www.sam.gov</u> , under "search records"."
	Copeland "Anti-Kickback" Act (language to be included in all construction contracts and subcontracts:)
	"Contractor shall comply with the Copeland "Anti-Kickback" Act (18 U.S.C. 847) as supplemented in Department of Labor regulations (29 CFR part 3)."
	Intellectual Property (language to be included in all construction contracts and subcontracts:)
	"Contractor hereby grants to the U.S. E.P.A. a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for federal government purposes, any intellectual property developed under this contract. Contractor shall secure from third parties the same license in the name of the U.S. E.P.A. regarding any intellectual property developed by third parties as subcontractors under this contract, or developed under contract with the Contractor specifically to fulfill Contractor's obligations related to this contract."
	Inspections; Information (language to be included in all construction contracts and subcontracts:)
	"Contractor shall permit, and cause its subcontractors to allow <i>[insert name of water system Owner]</i> , the State of Oregon, the federal government and any party designated by them to:
	• Examine, visit and inspect, at any and all reasonable times, the property, if any, constituting the Project.
	• Inspect and make copies of any accounts, books and records, including, without limitation, its records regarding receipts, disbursement, contracts, and any other matters relating to the Project, and to its financial standing, and shall supply such reports and information as reasonably requested.
	• Interview any officer or employee of the Contractor, or its subcontractors, regarding the Project.
	Contractor shall retain all records related to the Project for three years after final payments are made and any pending matters are closed.

Disadvantaged Business Enterprises (language to be included in all construction contracts and subcontracts:)

Recipient will implement the good faith efforts for solicitation and contracting with Disadvantaged Business Enterprises ("DBE") described in Section 4.1 of the Safe Drinking Water Handbook. This applies to all solicitation and contracting for construction, equipment, supplies, engineering or other services that constitute the Project financed by this Contract. Recipient will maintain documentation in a Project file on Disadvantaged Business Enterprises. Recipient will maintain documentation in a Project file and submit required forms, as described in Section 4.1 of the Safe Drinking Water Handbook. Recipient will ensure that all prime contractors and subcontractors implement the good faith efforts for solicitation and contracting, and comply with all DBE procurement forms, statements, and reporting requirements. Recipient will ensure that each procurement contract (prime plus all subcontractor contracts) includes the following term and condition:

"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."

Recipient will ensure that all prime contractors and subcontractors implement the good faith efforts for solicitation and contracting, and comply with all DBE procurement forms, statements, and reporting requirements.

(Include the following forms, found in the Business Oregon Preconstruction Packet:)

• DBE Six Good Faith Efforts and Form

Prohibition on Certain Telecommunication and Video Surveillance Services or Equipment (language to be included in all construction contracts and subcontracts:)

"As required by <u>2 CFR 200.216</u>, federal grant or loan recipients and subrecipients are prohibited from obligating or expending loan or grant funds to procure or obtain; extend or renew a contract 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, video surveillance services or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in <u>Public Law 115-232</u>, Section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

Prohibitions extend to the use of Federal funds by recipients and subrecipients to enter into a contract with an entity that "uses any equipment, system, or service that uses covered telecommunications equipment or services" as a substantial or essential component of any system, or as critical technology as part of any system. Certain equipment, systems, or services, including

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS CONSTRUCTION CONTRACT CLAUSES AND REQUIREMENTS 00 54 25 - 3 equipment, systems, or services produced or provided by entities subject to the prohibition are recorded in the <u>System for Award Management</u> exclusion list."

American Iron Steel (language to be included in all construction contracts and subcontracts:)

The Contractor acknowledges to and for the benefit of the [insert name of water system Owner] ("Purchaser") and the State of Oregon (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Drinking Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Federal Labor Standards (language to be included in all construction contracts and subcontracts.)

NOTE: Oregon Bureau of Labor and Industries (BOLI) prevailing wage requirements apply to public entities for projects over \$50,000 and private entities for projects that utilize more than \$750,000 of public funds.

Prevailing Wage Requirements.

"Construction projects assisted in whole or in part with the Safe Drinking Water Revolving Loan Fund Program (SDWRLF) must be carried out in compliance with Federal Davis Bacon and Related Acts and the Oregon Bureau of Labor and Industries (BOLI) requirements. Contractor shall pay each worker employed in the performance of this contract not less than the higher of the wage rate for the type of work being performed as set forth in either the Oregon Prevailing Wage "Prevailing Wage Rate for Public Works Contracts in Oregon" (if applicable) or the applicable federal Davis-Bacon Wage Decision. Contractor shall download a U.S. Department of Labor Employee Fair Compensation Notice and post it at the work site along with a list of locally prevailing wage rates.

CONSTRUCTION CONTRACT CLAUSES AND REQUIREMENTS 00 54 25 - 4

Contractor shall prepare and submit weekly Certified Payroll Reports on forms to be supplied by Business Oregon. Contractor shall permit access to construction site in order to conduct on-site interviews with workers during working hours."

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work 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 § 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.

Sub recipients may obtain wage determinations from the U.S. Department of Labor's web site, www.dol.gov.

(ii)(A) The sub recipient(s), on behalf of EPA, 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 State award official shall approve a request for 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 sub recipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the sub recipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official 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 sub recipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request 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 sub recipient(s), shall upon written request of the EPA Award Official or 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

CONSTRUCTION CONTRACT CLAUSES AND REQUIREMENTS 00 54 25 - 6

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, all or part of the wages required by the contract, the (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 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. 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 sub recipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the sub recipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls 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 the weekly payrolls. 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 sub recipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS CONSTRUCTION CONTRACT CLAUSES AND REQUIREMENTS 00 54 25 - 7 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 sub recipient(s).

(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 § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 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 State, EPA 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 or State 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

CONSTRUCTION CONTRACT CLAUSES AND REQUIREMENTS 00 54 25 - 8

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,

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS CONSTRUCTION CONTRACT CLAUSES AND REQUIREMENTS 00 54 25 - 9 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 EPA determines may by appropriate, 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 sub recipient(s), State, EPA, 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.

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Additional Clauses for Contracts greater than 100,000

Construction contracts and subcontracts greater than 100,000 must include all clauses listed above in addition to the clauses listed below

Federal Labor Standards

4. Contract Provision for Contracts in Excess of \$100,000.

(a) Contract Work Hours and Safety Standards Act. The sub recipient shall insert the following clauses set forth in paragraphs (a)(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 Item 3, above or 29 CFR 4.6. 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 (a)(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 (a)(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 (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The sub recipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall 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.

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS CONSTRUCTION CONTRACT CLAUSES AND REQUIREMENTS 00 54 25 - 11 (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(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 (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Sub recipient shall 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 Sub recipient shall insert in any such contract a clause providing hat 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 (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

5. Compliance Verification.

(a) The sub recipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The sub recipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.

(b) The sub recipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. Sub recipients must conduct more frequent interviews if the initial interviews or other information indicated that there is a risk that the contractor or subcontractor is not complying with DB.

Sub recipients shall immediately conduct interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence."

(c) The sub recipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The sub recipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or

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subcontract. At a minimum, if practicable, the sub recipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Sub recipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the sub recipient shall verify evidence of fringe benefit plans and payments there under by contractors and subcontractors who claim credit for fringe benefit contributions.

(d) The sub recipient shall periodically review contractors and subcontractor's use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

(e) Sub recipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at http://www.dol.gov/whd/america2.htm.

Environmental and Natural Resource Laws (include the following language in all construction contracts and subcontracts in excess of \$100,000:)

"Contractor shall comply with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act (42 U.S.C. 1857(h)), Section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR part 15).

Prohibition on the Use of Federal Funds for Lobbying (Certification Regarding Lobbying form follows, for any contracts in excess of \$100,000:)

Certification Regarding Lobbying

(Awards to Contractors and Subcontractors in Excess of \$100,000)

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

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

Signed

Title

Date

Six Good-Faith Efforts

Any public water system receiving an award from the Safe Drinking Water Revolving Loan Fund and the Drinking Water Source Protection Fund must ensure implementation of the six good-faith efforts comprising the federal "Fair Share Program," for the solicitation of all contractors providing construction, equipment, supplies, engineering or other services that constitute the project financed by the award.

Documentation demonstrating that these six good-faith efforts have been taken must be included and maintained in the water system's project files. Likewise, once a **contractor** has been selected by the water system, that contractor must adhere to the following six good-faith efforts in soliciting its subcontractor:

- 1. Ensure Disadvantaged Business Enterprises (DBEs) are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, state and local government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources. (Note: The acronym DBE used throughout this document is a global term for Minority Business Enterprises (MBEs) and Women's Business Enterprises (WBEs).
- 2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
- 3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, state and local government recipients, this will include dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
- 4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
- 5. Utilize the services of the Small Business Administration (SBA) and the Minority Business Development Agency of the Department of Commerce.
- 6. If the prime contractor awards subcontracts, require the prime contractor to take these six goodfaith efforts in subcontracting with Disadvantaged Business Enterprises for any subcontract that they let.

Locating Disadvantaged Business Enterprises for Outreach

Applicable MBE/WBEs are certified by the Oregon Certification Office of Business Inclusion and Diversity, Small Business Administration, or by another federal agency.

The following sites may be of assistance for locating Minority or Women Owned business firms and others may exist too:

- Oregon directory of certified firms at Certification Office of Business Inclusion and Diversity
 <u>http://www.oregon4biz.com/How-We-Can-Help/OMWESB/</u>
- Federal System for Award Management at <u>www.sam.gov/</u>
- Minority Business Development Agency, US Dept. of Commerce at http://www.mbda.gov/
- EPA's Office of Small Business Programs at <u>www.epa.gov/osbp/</u>
- U.S. Department of Transportation at https://www.transportation.gov/civil-rights/disadvantaged-business-enterprise

Prevention of Unfair Practices

Finally, there are a number of provisions designed to prevent unfair practices that may adversely affect DBEs that are now required of the prime contractor for every SDWRLF funded project:

- A SWRLF loan recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment.
- A SWRLF loan recipient must be notified in writing by its prime contractor prior to any termination of a DBE subcontractor for convenience by the prime contractor.
- If a DBE subcontractor fails to complete work under the subcontract for any reason, the SDWRLF loan recipient must require the prime contractor to employ the Six Good-Faith Efforts if soliciting a replacement subcontractor.
- A SDWRLF loan recipient must require its prime contractor to employ the Six Good-Faith Efforts even if the prime contractor has achieved its fair share objectives.

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Project File Documentation of Good-Faith Efforts

In addition to narrative summaries of actions and decisions taken to fulfill each of the above affirmative steps, project file documentation must include any relevant information. The following are some examples, with the above step numbers in parentheses (#):

- Copies of solicitation lists including identified certified MBE/WBEs and small businesses (1 & 2)
- Printed lists of certified MBE/WBE businesses that may be qualified contractors, as obtained from web sites or other official sources (1 & 5)
- Options for dividing up or adjusting the pace of contracts in excess of \$500,000 (3 & 4)
- Copies of advertisements, web postings, etc., for bid calls in relevant media (1 & 2)
- Correspondences with/information from relevant federal/state agencies, contractor clearinghouses and the like (2 & 5)
- Correspondences/bids from any disadvantaged business enterprise (2)
- Copies of any bid documentation and instructions to any general/prime contractor for purposes of that contractor's fulfillment of the six good faith efforts (6).

State or federal officials overseeing the SDWRLF may ascertain the existence of such project file documentation at any time, including but not limited to audits.

Each procurement contract (prime plus all subcontractor contracts) must include the following term and condition:

"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."

Data Reporting

FORM: Procurement of Disadvantaged Business Enterprises by Quarter The form on the next page must be submitted at the end of any quarter, in which the water system receiving an SDWRLF award, a prime contractor for the system or a subcontractor to the prime procures/contracts for construction, equipment, supplies or services from an applicable business in conjunction with the award. The system must submit this form to Business Oregon, Regional Project Manager. Without these reports Business Oregon may not be able to process subsequent requests for cash to pay for procurements.

FORM: Disbursements Attributable to Certified Disadvantaged Business Enterprises Included here is a second form, which is **required each time** that the water system requests cash draw down of its award. The draw-down request must include this sheet in order for the request to be processed.

Safe Drinking Water Revolving Loan Fund Procurement of Disadvantaged Business Enterprises by Quarter Submit to Business Oregon Regional Project Manager within 30 days following any quarter in which applicable procurements have been made or modified									
Letter of Interest Year Project Number			Qu		Quarter				
Loan Ro	ecipient	:							
Procurement Made by (check one)		Busi Enter (check or	ness p rise ne or both)	Value of Procurement (\$)	Date of	Type of Product or Service	Name & Address and Certification Number of MBE/WBE		
Loan Recipient	Prime Contractor	Sub- Contractor	Minority Owned	Woman Owned	· (Ψ)	Contract (MM/DD/YY)	Code No.)*	Contractor or Vendor	

* 1. Actual building of structures, installations; 2. Intangible/soft costs, such as consultants, engineers, design, surveyors; 3. Direct purchases of materials needed for project, will often comprise subcontractors; 4. Purchases (and installation if by vendor) of devices, machines; 5. Trucking and other activities.

Safe Drinking Water Revolving Loan Fund Disbursements Attributable to Disadvantaged Business Enterprises Must be included with every cash draw request to the department					
Project Number Cash Request # Disadvantaged Business Enterpr			Cash Request #		
	Total Draw Amount	Minority-Owned	Women-Owned		
1. Construction	\$	\$	\$		
2. Services	\$	\$	\$		
3. Supplies	\$	\$	\$		
4. Equipment	\$	\$	\$		
5. Other	\$	\$	\$		
Totals	\$0	\$0	\$0		

1. Actual building of structures, installations; 2. Intangible/soft costs, such as consultants, engineers, design, surveyors; 3. Direct purchases of materials needed for project, will often comprise subcontractors; 4. Purchases (and installation if by vendor) of devices, machines; 5. Trucking and other activities.

6 Good Faith Efforts Checklist

Proj	ject Name:	Project No:			
Тур	e of Service Solicited: Engine	ering	Construction Contractor		
	Construction Sub-contractor Equipr	nent/Supp	pliesOther		
Nan	ne of Solicitor: Nan	me of Co	mpany Selected:		
#	Six Good-Faith Efforts	Did you pursue this effort?	If ves, please explain what you did and attach the supporting document. If no, please explain why this effort is not being pursued.		
1	Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, state and local government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.	Yes No			
2	Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.	Yes No			
3	Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, state and local government recipients, this will include dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.	Yes No			
4	Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.	Yes No			
5	Utilize the services of the Small Business Administration (SBA) and the Minority Business Development Agency of the Department of Commerce.	Yes No			
6	If the prime contractor awards subcontracts, require the prime contractor to take these six good-faith efforts in subcontracting with Disadvantaged Business Enterprises for any subcontract that they let.	Yes No			

	Contract	Part A
Date:	Contractor:	
Project Number:	Address:	
Project Name:		

1. The parties, having executed a contract for:

in the amount of \$	in the construction of the above-identified project acknowledge and agree that:

- a. The Labor Standards provision and Lobbying Certification are included in the aforesaid contract;
- b. The applicable Davis-Bacon wage rates and BOLI wage rates are included in aforesaid contract;
- c. The addendum to the Contract between Contractor and Subcontractor is part of the Contract;
- d. The attached Fringe Benefit Summary form describes how the required fringe benefit amounts, if any, will be paid by the subcontractor; and,
- e. Correction of any infractions of the aforesaid conditions, including infractions by the subcontractor and any lower tier subcontractors, is a mutual responsibility.
- 2. The parties certify that:
 - a. As required by 24 Code of Federal Regulations Part 24, neither they nor their principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this covered transaction; and,
 - b. No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any of its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this or a lower tier covered transaction.
- 3. The subcontractor agrees to obtain and forward to the contractor within ten days after the execution of any subcontract, including those executed by the subcontractors and any lower tier subcontractors copy of said contract containing fully executed items 1.(a), (b), (c) and (d) listed above.
- 4. The Subcontractor certifies that:
 - a. The legal name and the business address is:

Employer I.D.

- b. The subcontractor is an independent contractor in compliance with Oregon Revised Statutes Chapter 701.
- c. The subcontractor is currently registered with the Oregon Construction Contractors Board in a class appropriate for the work to be performed under this subcontract.

d.	Construction Contractors Board Number:	
	Contractor Signature:	Subcontractor Signature:
	(Title/Date)	(Title/Date)

Payroll Signature Authorization Part B

Since the owner, partner or corporate officer is not signing the certified payrolls, I, as an owner, partner or corporate officer certify that I have appointed

whose signature appears below to supervise the payment of the company's employees beginning (date)

and that this person is in a position to have full knowledge of the facts set forth in the payroll documents and in the statement of compliance required by the so-called Kick-Back Statute which said person is to execute with my full authority and approval until such time as I submit to the local agency administering the contract a new certificate appointing some other person for the purposes stated above.

Signature of Appointee	Date
Signature of (prime)(sub) Contractor	Date

Fringe Benefit Summary Form

Part C

Project Name:	Project Number:
Name of Recipient:	
Name of Contractor:	

The contractor named above will pay employees on this project fringe benefits required by the applicable Davis-Bacon wage determination or BOLI wage determination as follows:

- 1. Required fringe benefit amounts will be paid in cash.
- 2. **<u>FUNDED PLAN(S)</u>** (Deductions for fringe benefits will be paid into a fund, plan, or program administered by a third party "e.g., union plan, Blue Cross")

Name of plan(s)

I certify that the deductions made for the above plan(s) are:

a. Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and consent is not a condition either for the obtaining of or the continuation of employment,

or

They are provided for in a bona fide collective bargaining agreement between the contractor and representatives of the employees:

- b. No profit or other benefit is otherwise obtained, directly or indirectly, by the contractor or any affiliated person in the form of commission, dividend, or otherwise;
- c. The deductions shall serve the convenience and interest of the employee;
- d. Contributions to the plans are made at least quarterly;
- e. When the cash paid and per hour contribution for benefits do not equal the total rate set forth in the wage determination, the difference will be paid in cash; and
- f. Employees who are excluded from the plans for any reason will be paid in cash.
- 3. <u>UNFUNDED PLAN(S)</u> (Deductions for fringe benefits will be administered by the contractor "e.g. vacation plan")

Name of plan(s)

I certify that no deductions will be made for unfunded plans until approval is obtained from the U.S. Department of Labor. I understand that to obtain approval, I must provide the representative of the Safe Drinking Water Revolving Loan Fund recipient with the following for submission to the U.S. Department of Labor:

- a. Description of the coverage that will be provided to employees including conditions for receiving the benefits; and
- b. Signed authorization from those employees to accept those specific employer-paid contribution amounts.

Until approval is obtained, I will pay the employees the fringe benefit amounts in cash.

Contractor/Subcontractor Signature	Date

Certification Regarding Lobbying

Part D

The undersigned certifies, to the best of his or her knowledge and belief, that:

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

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

Signed (Contractor)		
Title / Firm		
Date		

SECTION 00 54 27 PREVAILING WAGE RATES

This Contract is for a project that is subject to ORS 279C.800 to 279C.870. CONTRACTOR shall pay each worker employed in the performance of this contract not less than the higher of the wage rate for the type of work being performed as set forth in either the Oregon Prevailing Wage set forth in the "Prevailing Wage Rates for Public Works Contracts in Oregon" or the applicable federal Davis-Bacon Wage Decision. The applicable federal Davis-Bacon Wage Rates are included in Appendix A. "Prevailing Wage Rates for Public Works Contracts in Oregon" (effective January 1, 2022) are the appropriate Oregon prevailing wage rate publications for this contract, and are incorporated herein as though fully set forth as of the date the Bidding Documents are first advertised. These documents are published by the Oregon Bureau of Labor and Industries (BOLI) and are available on-line at: https://www.oregon.gov/boli/employers/Pages/prevailing-wage-rates.aspx

Eugene	1400 Executive Pkwy., Suite 200 Eugene, OR 97401	(541) 686-7623
Medford	119 N Oakdale Ave.	(541) 776-6270
	Medford, OR 97501	
Portland	800 NE Oregon St., Suite 1045	(971) 673-0761
	Portland, OR 97232	
Salem	3865 Wolverine St. NE, Building E-1	(503) 378-3292
	Salem, OR 97305	

BOLI Office Locations:

The successful Bidder and all subsequent subcontracts shall comply with ORS 279C.845 wage rate requirements and produce appropriate certificates that they have compiled.

If CONTRACTOR fails to pay for labor and services, the AGENCY can pay for them and withhold these amounts from payments to the CONTRACTOR. CONTRACTOR must pay daily, weekly, weekend and holiday overtime as required.

BOLl Prevailing Wage:

Applicable Oregon prevailing wages and further related information is available by contacting BOLI at 971/673-0839 or on-line at the BOLI web site: https://www.oregon.gov/boli/employers/Pages/prevailing-wage-rates.aspx

END OF SECTION

ATTACHMENT:

1) DAVIS-BACON WAGE DETERMINATION OR20220068

PREVAILING WAGE RATES 00 54 27 - 2

"General Decision Number: OR20220068 02/25/2022

Superseded General Decision Number: OR20210068

State: Oregon

Construction Type: Heavy

County: Hood River County in Oregon.

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)(2)-(60).

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:	 Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least \$15.00 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 2022.
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:	 Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least \$11.25 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 2022.

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 https://www.dol.gov/agencies/whd/government-contracts.

Modification Number O 1 2	Publication Date 01/07/2022 02/18/2022 02/25/2022	
CARP0001-038 06/01/202	0	
	Rates	Fringes
CARPENTER (Excluding Fo Work) MILLWRIGHT	rm \$ 41.75 \$ 43.26	18. 30 18. 75
ELEC0048-018 01/01/202	1	
	Rates	Fringes
ELECTRI CI AN	\$ 50.35	25.48
ENGI 0701-038 01/01/202	0	
	Rates	Fringes
POWER EQUI PMENT OPERATO GROUP 1 GROUP 1A GROUP 1B GROUP 2 GROUP 3 GROUP 4	R \$ 45.90 \$ 48.06 \$ 50.22 \$ 43.99 \$ 42.84 \$ 41.01	15.35 15.35 15.35 15.35 15.35 15.35

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: CRANE: Helicopter Operator, when used in erecting work; Whirley Operator, 90 ton and over; LATTICE BOOM CRANE: Operator 200 tons through 299 tons, and/or over 200 feet boom; HYDRAULIC CRANE: Hydraulic Crane Operator 90 tons through 199 tons with Luffing or tower attachments;

GROUP 1A: HYDRAULIC CRANE: Hydraulic Operator, 200 tons and

over (with luffing or tower attachment); LATTICE BOOM CRANE: Operator, 200 tons through 299 tons, with over 200 feet boom;

GROUP 1B: LATTICE BOOM CRANE: Operator, 300 tons through 399 tons with over 200 feet boom; Operator 400 tons and over

GROUP 2: CRANE: Cableway Operator, 25 tons and over; HYDRAULIC CRANE: Hydraulic crane operator 90 tons through 199 tons (without luffing or tower attachment); TOWER/WHIRLEY OPERATOR: Tower Crane Operator; Whirley Operator, under 90 tons; LATTICE BOOM CRANE: 90 through 199 tons and/or 150 to 200 feet boom; HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (with luffing or tower attachment); Rubber tired scraper with tandom scrapers; BLADE: Auto Grader; Blade Operator-Robotic; Bulldozer over 120,000 lbs and above;

GROUP 3: HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (without luffing or tower attachment); LATTICE BOOM CRANES: Lattice Boom Crane-50 through 89 tons (and less than 150 feet boom); Rubber Tired Scraper: with tandom scrapers; self loading, paddle wheel, auger type, finish and/or 2 or more units; Bulldozer over 70,000 lbs up to and including 120,000 lbs;

GROUP 4: CRANE: Hydraulic Crane Operator, under 50 tons; LATTICE BOOM CRANE OPERATOR: Lattice Boom Crane Operator, under 50 tons; TRACKHOE-ROBOTIC: track and wheel type, up to and including 20,0000 lbs. with any or all attachments; BLADE: Blade Operator; Tractor operator with boom attachment; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator over 20,000 lbs pullback; CRANE: Chicago boom and similar types; Boom type lifting device, 5 ton capacity or less; Rubber-Tired Scraper, single engine, single scraper; Compactor-Self Propelled; Bulldozer over 20,000 lbs and more than 100 horse up to 70,000 lbs; Screed; Compactor with blade; Mechanic Hoist Operator two or more drums, Stiff leg, guy derricl or similar type 50 ton and over

GROUP 5: TRACKHOE-HYDRAULIC: Track type up to and including 20,000 lbs, Wheel type (Ford, John Deer, Case Type); Boom truck operator; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator less than 20,000 lbs pullback; Forklift over 5 ton, Bulldozer 20,000 lbs or 100 horses or less; Roller; Compactor without blade; Hoist Operator single drum.

GROUP 6: Oiler; Grade Checker; Crane oiler; Forklift; Roller (non-asphalt) Zone Differential (add to Zone 1 rates): Zone 2 - \$3.00 Zone 3 - \$6.00

For the following metropolitan counties: MULTNOMAH; CLACKAMAS; MARION; WASHINGTON; YAMHILL; AND COLUMBIA; CLARK; AND COWLITZ COUNTY, WASHINGTON WITH MODIFICATIONS AS INDICATED:

All jobs or projects located in Multnomah, Clackamas and Marion Counties, West of the western boundary of Mt. Hood National Forest and West of Mile Post 30 on Interstate 84 and West of Mile Post 30 on State Highway 26 and West of Mile Post 30 on Highway 22 and all jobs or projects located in Yamhill County, Washington County and Columbia County and all jobs or porjects located in Clark & Cowlitz County, Washington except that portion of Cowlitz County in the Mt. St. Helens ""Blast Zone"" shall receive Zone I pay for all classifications.

All jobs or projects located in the area outside the identified boundary above, but less than 50 miles from the Portland City Hall shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the Portland City Hall, but outside the identified border above, shall receive Zone III pay for all classifications.

For the following cities: ALBANY; BEND; COOS BAY; EUGENE; GRANTS PASS; KLAMATH FALLS; MEDFORD; ROSEBURG

All jobs or projects located within 30 miles of the respective city hall of the above mentioned cities shall receive Zone I pay for all classifications.

All jobs or projects located more than 30 miles and less than 50 miles from the respective city hall of the above mentioned cities shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the respective city hall of the above mentioned cities shall receive Zone III pay for all classifications.

IRON0029-013 01/03/2022

Rates

Fringes

IRONWORKER (Reinforcing and Structural)	\$ 41.13	30. 72
LAB00737-005 06/01/2020		
	Rates	Fringes
Laborers: (Mason Tender-Cement/Concrete)	\$ 32.71	15.40
LAB00737-031 06/01/2021		
	Rates	Fringes
Laborers: GROUP 1 GROUP 2	\$ 33.48 \$ 34.71	16. 23 16. 23
LABORER CLASSIFICATIONS		
GROUP 1: Asphalt Spreader		
GROUP 2: Grade Checker		
PAI N0055-022 07/01/2020		
	Rates	Fringes
PAINTER BRUSH, ROLLER AND SPRAY.	\$ 25.94	13.34
PLUM0290-008 04/01/2021		
	Rates	Fringes
Plumbers and Pipefitters	\$ 48.93	30.10
SUOR2009-066 11/23/2009		
	Rates	Fringes
CARPENTER (Form Work Only)	\$ 23.50	9.27
CEMENT MASON/CONCRETE FINISHE	ER\$ 21.13	8.90
LABORER: Common or General	\$ 18.57	6.24
LABORER: Fence Erection	\$ 23.88	7.45
LABORER: Flagger	\$ 19. 31	5.31

LABORER: F	Pipelayer\$ 20.52	4.51
LINE CONSTR	RUCTION: Groundman\$ 31.36	7.27
OPERATOR:	Backhoe\$ 29.80	7.13
OPERATOR: Steer/Skid	Bobcat/Skid Loader\$ 22.77	7.90
OPERATOR:	Broom/Sweeper\$ 32.31	6.43
OPERATOR:	Excavator\$ 30.12	6.23
OPERATOR:	Loader\$ 32.31	6.43
OPERATOR: Aggregate,	Paver (Asphalt, and Concrete)\$ 27.59	2.96
TRUCK DRIVE	ER: Dump Truck\$ 23.79	5.95
TRUCK DRIVE	ER: Off the Road	6.33
TRUCK DRIVE	R: Water Truck\$ 26.12	6.53

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

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. lf 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) (ii)).

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.

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 DECISIO"

PERFORMANCE BOND FORM

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

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

OWNER (Name and Address):

CONTRACT

Date: Amount: Description (Name and Location):

BOND

Bond Number: Date (Not earlier than Contract Date): Amount: Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL	SURETY
Company:	
Signature:(Seal) Name and Title	(Seal) Surety's Name and Corporate Seal
	By: Signature and Title
	(Attach Power of Attorney)
(Space is provided below for signatures of additional parties, if required.)	

Attest: ______ Signature and Title

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:			
Signature: Name and Title	(Seal)	Surety's Name and Corporate Seal	(Seal)
		By: Signature and Title	
		(Attach Power of Attorney)	
		Attest:	

CITY OF THE DALLES

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

2. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.

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

3.1. Owner has notified Contractor and Surety, at the addresses described in Paragraph 10 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and

3.2. Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 3.1; and

3.3. Owner has agreed to pay the Balance of the Contract Price to:

1. Surety in accordance with the terms of the Contract;

2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.

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

4.1. Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or

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

4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or

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

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

2. Deny liability in whole or in part and notify Owner citing reasons therefor.

5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 4.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

6. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To a limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

6.1. The responsibilities of Contractor for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions or failure to act of Surety under Paragraph 4; and

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

7. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the 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 Owner or its heirs, executors, administrators, or successors.

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

9. 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 Contractor Default or within two years after Contractor ceased working or within two years after 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 period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable. 10. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

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

12. Definitions.

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

12.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3. Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone Surety Agency or Broker Owner's Representative (engineer or other party)

END OF SECTION

PAYMENT BOND FORM

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

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

OWNER (Name and Address):

CONTRACT

Date: Amount: Description (Name and Location):

BOND

Bond Number: Date (Not earlier than Contract Date): Amount: Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL	SURETY
Company:	
Signature:(Seal)	(Seal)
Name and Litle	Surety's Name and Corporate Seal
	By:
	Signature and Title
	(Attach Power of Attorney)
(Space is provided below for signatures of additional	

parties, if required.)

Attest: Signature and Title

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:			
Signature: Name and Title	(Seal)	Surety's Name and Corporate Seal	(Seal)
		By: Signature and Title	
		(Attach Power of Attorney)	
		Attest:	

CITY OF THE DALLES

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.

2. With respect to Owner, this obligation shall be null and void if Contractor:

2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2. Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

4. Surety shall have no obligation to Claimants under this Bond until:

4.1. Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2. Claimants who do not have a direct contract with Contractor:

1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and

2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and

3. Not having been paid within the above 30 days, have sent a written notice to Surety and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

6. Reserved.

7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS PAYMENT BOND FORM 00 61 13.16 - 3 10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, 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.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond. 14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions:

15.1. Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and 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.

15.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone Surety Agency or Broker: Owner's Representative (engineer or other party):

END OF SECTION

PAYMENT BOND FORM 00 61 13.16 - 4

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



American Council of Engineering Companies





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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
 - 1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 - 2. Agreement—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 - 3. Application for Payment—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 - 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 - 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 - 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 - 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 - 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued

on or after the Effective Date of the Contract.

- 9. *Change Proposal*—A written request by duly submitted Contractor, 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 setoff 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" "substantially and 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, steam, gases, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
- 46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
- 47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
- 48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.
- 1.02 Terminology
 - A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
 - B. Intent of Certain Terms or Adjectives:
 - 1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect

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

- C. Day:
 - 1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.
- D. Defective:
 - 1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. Furnish, Install, Perform, Provide:
 - 1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

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

ARTICLE 2 – PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

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

insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

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

2.03 Before Starting Construction

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.
- 2.04 Preconstruction Conference; Designation of Authorized Representatives
 - A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph

2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

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

2.05 Initial Acceptance of Schedules

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

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

- 3.01 Intent
 - A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
 - B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
 - C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
 - D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
 - E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- 3.02 Reference Standards
 - A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference

standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

- No provision of any such standard 2. specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.
- 3.03 *Reporting and Resolving Discrepancies*
 - A. Reporting Discrepancies:
 - Contractor's Verification of Figures and 1. 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 field measurements. applicable 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 Regulation, (b) actual field or conditions. any standard (c) 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 bv 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
 - the provisions of any Laws or b. Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).
- 3.04 *Requirements of the Contract Documents*
 - A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under

the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.
- 3.05 *Reuse of Documents*
 - A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
 - B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude

Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

- 4.01 Commencement of Contract Times; Notice to Proceed
 - A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.
- 4.02 *Starting the Work*
 - A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.
- 4.03 Reference Points
 - A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.
- 4.04 *Progress Schedule*
 - A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

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

4.05 Delays in Contractor's Progress

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. abnormal weather conditions;

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

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

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

- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.
- 5.02 Use of Site and Other Areas
 - A. Limitation on Use of Site and Other Areas:
 - Contractor shall confine construction 1. 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.
 - If a damage or injury claim is made by 2. 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 Contractor is responsible, which 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 officers. directors. the members. partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all

court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.
- 5.03 Subsurface and Physical Conditions
 - A. *Reports and Drawings*: The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 - 3. Technical Data contained in such reports and drawings.
 - B. Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions

with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

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

5.04 Differing Subsurface or Physical Conditions

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

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

- Β. 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
 - the existence of such condition b. 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 bv the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
- 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
- 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 Underground Facilities

A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing

Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

- 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
- 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. Notice by Contractor: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
- C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to

which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

- D. Owner's Statement to Contractor Regarding Underground Facility: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. Possible Price and Times Adjustments:
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.

- 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
- 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
- 5.06 Hazardous Environmental Conditions at Site
 - A. *Reports and Drawings*: The Supplementary Conditions identify:
 - 1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 - 2. Technical Data contained in such reports and drawings.
 - Reliance by Contractor on Technical Data R 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 Hazardous Environmental а 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

6.01 *Performance, Payment, and Other Bonds*

- Contractor shall furnish a performance bond A. 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 vear 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.
- All bonds shall be in the form prescribed by B. 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-infact signed the accompanying bond.

- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 Insurance—General Provisions

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

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

- Owner shall deliver to Contractor, with copies D. 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 and endorsements. policies and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other

party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
 - 4. Foreign voluntary worker compensation (if applicable).
- B. Commercial General Liability—Claims Covered: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
 - 1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 - 2. claims for damages insured by reasonably available personal injury liability coverage.
 - 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.
- 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.
- Contractor's professional liability insurance: H. If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.

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

6.04 Owner's Liability Insurance

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

policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 Property Insurance

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - include the Owner and Contractor as 1 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 mischief; malicious 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.

- cover, as insured property, at least the 3. 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.
- Partial Occupancy or Use by Owner: If D. Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 Waiver of Rights

- All policies purchased in accordance with A. 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.
- Contractor shall be responsible for assuring D. agreement under which a that the Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees. agents. consultants. and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.
- 6.07 Receipt and Application of Property Insurance Proceeds
 - A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
 - B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 Supervision and Superintendence

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.
- 7.02 Labor; Working Hours
 - A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
 - B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.
- 7.03 Services, Materials, and Equipment
 - A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or

not such items are specifically called for in the Contract Documents.

- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.
- 7.04 *"Or Equals"*
 - Whenever an item of material or equipment is A. 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;

- 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;
- it has a proven record of performance and availability of responsive service; and
- it is not objectionable to Owner.
- b. Contractor certifies that, if approved and incorporated into the Work:
 - there will be no increase in cost to the Owner or increase in Contract Times; and
 - 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 "orequal", which will be evidenced by an approved Shop Drawing or other written advise communication. Engineer will Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may

request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

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

- 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
- 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
 - 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.
- Engineer's Evaluation and Determination: B. 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.
- E. Effect of Engineer's Determination: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 Concerning Subcontractors, Suppliers, and Others

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

acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- Owner may require the replacement of any E. Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor. Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of

Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.
- O. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- 7.07 Patent Fees and Royalties
 - A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual

knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the directors, members, officers. partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.
- 7.08 Permits
 - Unless otherwise provided in the Contract A. Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of

utility owners for connections for providing permanent service to the Work.

- 7.09 *Taxes*
 - A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.
- 7.10 Laws and Regulations
 - A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
 - If Contractor performs any Work or takes any R 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 partners. officers. directors. members, 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.
 - shall furnish required 2. Contractor 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;
 - 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
 - To the fullest extent permitted by Laws and A. 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 anv 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. professional design If services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
 - C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
 - D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract

Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

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

work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 Coordination

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.
- 8.03 Legal Relationships
 - A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner 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.
- If Contractor damages, delays, disrupts, or D. interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors,

members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

- 9.01 Communications to Contractor
 - A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.
- 9.02 Replacement of Engineer
 - A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.
- 9.03 Furnish Data
 - A. Owner shall promptly furnish the data required of Owner under the Contract Documents.
- 9.04 Pay When Due
 - A. Owner shall make payments to Contractor when they are due as provided in the Agreement.
- 9.05 Lands and Easements; Reports, Tests, and Drawings
 - A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
 - B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
 - C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 9.06 Insurance
 - A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

- 9.07 Change Orders
 - A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 Inspections, Tests, and Approvals
 - A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 Limitations on Owner's Responsibilities
 - A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- 9.10 Undisclosed Hazardous Environmental Condition
 - A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 Evidence of Financial Arrangements
 - A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).
- 9.12 Safety Programs
 - A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
 - B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

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

10.02 Visits to Site

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

- 10.04 *Rejecting Defective Work*
 - A. Engineer has the authority to reject Work in accordance with Article 14.
- 10.05 Shop Drawings, Change Orders and Payments
 - A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
 - B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
 - C. Engineer's authority as to Change Orders is set forth in Article 11.
 - D. Engineer's authority as to Applications for Payment is set forth in Article 15.
- 10.06 Determinations for Unit Price Work
 - A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.
- 10.07 Decisions on Requirements of Contract Documents and Acceptability of Work
 - A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.
- 10.08 Limitations on Engineer's Authority and Responsibilities
 - A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

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

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

11.01 Amending and Supplementing Contract Documents

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. Change Orders:
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order

also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

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

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

11.02 Owner-Authorized Changes in the Work

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

11.03 Unauthorized Changes in the Work

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.
- 11.04 Change of Contract Price
 - A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
 - B. An adjustment in the Contract Price will be determined as follows:

- 1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
- 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
- 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or
 - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - where one or more tiers of c. 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.

11.05 Change of Contract Times

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

11.06 Change Proposals

Contractor shall submit a Change Proposal to Α. Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

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

- 11.07 Execution of Change Orders
 - A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 - 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.
 - B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.
- 11.08 Notification to Surety
 - A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

- 12.01 Claims
 - A. *Claims Process*: The following disputes between Owner and Contractor shall be

submitted to the Claims process set forth in this Article:

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

agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

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

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

- 13.01 Cost of the Work
 - A. Purposes for Determination of Cost of the Work: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

- 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
- 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
 - Payroll costs for employees in the direct 1. 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.

- Payments made by Contractor to 3. 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 established insurance 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:
 - Pavroll costs and other compensation of 1. Contractor's officers, executives. principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, 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 schedule agreed upon of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of

Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

- E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.
- 13.02 Allowances
 - A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
 - B. *Cash Allowances*: Contractor agrees that:
 - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
 - C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
 - D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.
- 13.03 Unit Price Work
 - A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

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

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

- 14.01 Access to Work
 - A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable

times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 Tests, Inspections, and Approvals

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

prior to Contractor's purchase thereof for incorporation in the Work.

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

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.
- 14.03 Defective Work
 - A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.
 - B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.
 - C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
 - D. Correction, or Removal and Replacement: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
 - E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
 - F. Costs and Damages: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to

defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 Acceptance of Defective Work

- If, instead of requiring correction or removal A. and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.
- 14.05 Uncovering Work
 - A. Engineer has the authority to require 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, and testing, and inspection, of replacement satisfactory or reconstruction (including but not limited to all costs of repair or replacement of of others); and work pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
- 2. If the uncovered Work is not found to be defective. Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof. then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.
- 14.06 Owner May Stop the Work
 - A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.
- 14.07 Owner May Correct Defective Work
 - A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other

provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

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

- 15.01 Progress Payments
 - A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

- B. Applications for Payments:
 - At least 20 days before the date 1. 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:
 - Engineer will, within 10 days after 1. 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 indicating in Contractor 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:
 - claims have been made against a. Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or account damages on 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;
- 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;
- 1. there are other items entitling Owner to a set off against the amount recommended.
- If Owner imposes any set-off against 2. payment, whether based on its own knowledge the or on written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
- 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 Contractor's Warranty of Title

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

15.03 Substantial Completion

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

permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

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

15.04 Partial Use or Occupancy

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its purpose intended without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that

part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 Final Inspection

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

15.06 Final Payment

- A. Application for Payment:
 - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered. in accordance with the Contract all maintenance Documents. and instructions. operating 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.
- In lieu of the releases or waivers of Liens 3. 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:
 - If, on the basis of Engineer's observation 1. of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are

necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. Payment Becomes Due: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.
- 15.07 Waiver of Claims
 - A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
 - B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.
- 15.08 Correction Period
 - A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the

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

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

warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

- 16.01 Owner May Suspend Work
 - At any time and without cause, Owner may A. 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. Change Proposal seeking Anv such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.
- 16.02 Owner May Terminate for Cause
 - A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
 - B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and

- 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

- 16.03 Owner May Terminate For Convenience
 - A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
 - B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.
- 16.04 Contractor May Stop Work or Terminate
 - A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
 - B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such

amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 Methods and Procedures

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

ARTICLE 18 – MISCELLANEOUS

- 18.01 Giving Notice
 - A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 Computation of Times

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

18.03 *Cumulative Remedies*

- The duties and obligations imposed by these Α. General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.
- 18.04 *Limitation of Damages*
 - A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.
- 18.05 No Waiver
 - A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.
- 18.06 Survival of Obligations
 - A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or

termination or completion of the Contract or termination of the services of Contractor.

18.07 Controlling Law

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

18.08 Headings

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

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract as indicated below. 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-1.01. Renumber Paragraph 1.01.A.21 to 1.01.A.21.a. and add the following new paragraphs:

1.01.A.21.b. *Geotechnical Data Report (GDR)*—The factual report that collects and presents data regarding actual subsurface conditions at or adjacent to the Site, including Technical Data and other geotechnical data, prepared by or for Owner in support of the Geotechnical Baseline Report. The GDR's content may include logs of borings, trenches, and other site investigations, recorded measurements of subsurface water levels, the results of field and laboratory testing, and descriptions of the investigative and testing programs. The GDR does not include an interpretation of the data. If opinions, or interpretive or speculative non-factual comments or statements appear in a document that is labeled a GDR, such opinions, comments, or statements are not operative parts of the GDR and do not have contractual standing. Subject to that exception, the GDR is a Contract Document.

SC-1.01. Renumber Paragraph 1.01.A.38 to 1.01.A.38.a, and add the following new paragraphs:

1.01.A.38.b. *Specialist*—The term Specialist refers to a person, partnership, firm, or corporation of established reputation (or if newly organized, whose personnel have previously established a reputation in the same field), which is regularly engaged in, and which maintains a regular force of workers skilled in either (as applicable) manufacturing or fabricating items required by the Contract Documents, or otherwise performing Work required by the Contract Documents. Where the Specifications require the installation by a Specialist, that term shall also be deemed to mean either the manufacturer of the item, a person, partnership, firm, or corporation licensed by the manufacturer, or a person, partnership, firm, or corporation who will perform the Work under the manufacturer's direct supervision.

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS 1.01.A.38.c. *Standard Specifications*—Wherever in these Contract Documents reference is made to the Standard Specifications, said reference shall be understood as referring to the Oregon Standard Specifications for Construction 2021 published by the Oregon Department of Transportation (ODOT) which applicable parts are incorporated herein and made a part of these Documents by specific reference thereto. If requirements contained in the Standard Specifications are modified by or are in conflict with supplemental information in these Contract Documents, the requirements of these Contract Documents shall prevail.

SC-1.01. Add the following language at the end of Paragraph 1.01.A.40:

Substantial Completion is further defined as (i) that degree of completion of the Project's operating facilities or systems sufficient to provide Owner the full time, uninterrupted, and continuous beneficial operation of the Work; and (ii) required functional, performance and acceptance, or startup testing has been successfully demonstrated for components, devices, equipment, and instrumentation and control to the satisfaction of Engineer in accordance with the requirements of the Specifications.

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

2.01.B. Evidence of Contractor's Insurance: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies of insurance (including all endorsements, and identification of applicable self-insured retentions and deductibles) required to be provided by Contractor in Article 6. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.01.C. Evidence of Owner's Insurance: After receipt from Contractor of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner under Article 6 (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

SC-2.02. Delete Paragraph 2.02.A. in its entirety and insert the following new paragraph in its place:

2.02.A. Owner shall furnish to Contractor 5 copies of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully executed counterpart of the Agreement) and one copy in electronic portable document format (PDF). Additional printed copies of the conformed Contract Documents will be furnished upon request

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SC-3.01. Delete Paragraph 3.01.C in its entirety.

SC-3.01. Add the following new paragraph immediately after Paragraph 3.01.E:

3.01.F. Sections of Division 01, General Requirements, govern the execution of the Work of all sections of the Specifications.

SC-3.02.A Add the following new paragraph immediately after Paragraph 3.02.A.2:

3.02.A.3 American Iron and Steel Requirement. See Article 7.10.D.10. American Iron and Steel Requirement.

SC-4.01. Delete the third sentence of Paragraph 4.01.A in its entirety.

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

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

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

5.03.C. The following reports of explorations and tests of subsurface conditions at or adjacent to the Site are known to Owner:

5.03.C.1. Report dated September 2021 prepared by Jacobs Engineering Group Inc., 2020 S.W. Fourth Ave, #300, Portland, Oregon, 97201, entitled *Dog River Pipeline Geotechnical Data Report* consisting of 133 pages. The Technical Data contained in such report upon whose accuracy Contractor may rely are those indicated in the definition of Technical Data in the General Conditions. The *Dog River Pipeline Geotechnical Data Report* is provided in Volume 4–*Reference Information* of the *Bidding Requirements and Contract Documents* for the City of The Dalles Dog River Pipeline Replacement Project. SC-5.03 and SC-5.04. Delete Paragraph 5.03 and Paragraph 5.04 of the General Conditions in their entireties and replace with the following provisions:

SC-5.06. Delete Paragraph 5.06.A and Paragraph 5.06.B in their entirety and insert the following in their place:

5.06.A. No reports or drawings related to Hazardous Environmental Conditions are known to Owner.

SC-6.01. Add the following language after Paragraph 6.01.A:

Provide the following additional bond:

6.01.A.1. Contractor's Public Works Bond:

6.01.A.1.a. Public works bond in the amount of \$30,000 in accordance with the requirements of ORS 279C.836.

SC-6.02. Add the following new paragraph immediately after Paragraph 6.02.A:

6.02.A.1. Surety and insurance companies from which the bonds and insurance for this Project are purchased shall have an A.M. Best's rating of no less than A minus (A-) or higher in addition to other requirements specified herein.

SC-6.02. Add the following language at the end of Paragraph 6.02.B:

In accordance with ORS 279C.520, no person shall be employed for more than 10 hours in any 1 day, or 40 hours in any 1 week, except in cases of necessity, emergency, or where the public policy absolutely requires it. In such cases, the person so employed shall be paid at least time and a half the person's regular rate of pay for all time worked in excess of 40 hours in one week; when work week is 8 hours for 5 consecutive days or 10 hours for 4 consecutive days, and for time worked on Saturday and on any legal holiday specified in ORS 279C.540.

SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.A.4:

6.03.A.5. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

6.03.A.5.a. Workers' Compensation and related coverages under Paragraph 6.03.A.1 and Paragraph 6.03.A.3 of the General Conditions:

6.03.A.5.a.1. State: Statutory.

6.03.A.5.a.2. Applicable Federal (e.g., Longshoreman's): Statutory.

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6.03.A.5.a.4. Jones Act coverage, if applicable:

Bodily Injury by Accident, Each Accident: \$500,000 CSL; \$1,000,000 aggregate.

Bodily Injury by Disease, Aggregate: \$1,000,000.

6.03.A.5.a.5. Employer's Liability:

Bodily Injury, Each Accident: \$500,000 CSL; \$1,000,000 aggregate.

Bodily Injury by Disease, Each Employee: \$500,000 CSL; \$1,000,000 aggregate.

Bodily Injury/Disease Aggregate: \$1,000,000.

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

Foreign Voluntary Worker Compensation: Statutory.

SC-6.03.B. Add the following new paragraphs immediately after Paragraph 6.03.B:

6.03.C. Workers Compensation:

6.03.C.1. In accordance with ORS 279C.530, Contractor shall promptly, as due, make payment to any entity furnishing care incident to sickness or injury, to employees of Contractor, of all sums which Contractor agrees to pay for such care and all moneys which Contractor deducted from the wages of employees pursuant to any law, contract, or agreement for the purpose of providing or paying for such service.

6.03.C.2. Contractor and Subcontractors that employ workers who work under this Contract in the State of Oregon shall comply with ORS 656.017 and provide required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its Subcontractors complies with these requirements.

SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.C.8:

6.03.C.9. Contractor's General Liability under Paragraph 6.03.B. and Paragraph 6.03.C of the General Conditions which shall eliminate the

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS exclusion with respect to property under the care, custody and control of Contractor:

6.03.C.9.a. General Aggregate	\$5,000,000
6.03.C.9.b. Products - Completed Operations Aggregate	\$5,000,000
6.03.C.9.c. Personal Injury (per person/Organization)	\$500,000 Per occurrence
60.3.C.9.d. Each Occurrence (Bodily Injury and Property Damage)	\$2,000,000
6.03.C.9.e. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.	
SC-6.03. Add the following new paragraph immediately following Paragrap	h 6.03.D:

6.03.D.1. Contractor's Automobile Liability

6.03.D.1.a. Bodily Injury:

Each Person	\$500,000	
Each Accident	\$1,000,000	
6.03.D.1.b. Property Damage:		
Each Accident	\$500,000	
6.03.D.1.a. Combined Single Limit of	\$1,000,000	
SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.E:		
6.03.E.1. Excess or Umbrella Liability:		

a) General Aggregate	\$5,000,000
b) Each Occurrence	\$2,000,000

SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.F:

6.03.F.1. Pollution Liability:

a) Each Occurrence \$2,000,000

b) General Aggregate \$2,000,000

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

SC-6.03. Add the following language after Paragraph 6.03.G:

6.03.G.1. Include the following parties or entities as additional insured:

6.03.G.1.a. City of The Dalles, 1215 W. 1st Street, The Dalles, OR 97058.

6.03.G.1.b. Jacobs Engineering Group Inc., 2020 S.W. Fourth Avenue, #300, Portland, OR 97201.

6.03.G.1.c. Siemens and Associates, 19134 River Woods Drive, Bend, OR 97702.

6.03.G.1.d. AKS Engineering and Forestry, 2777 N.W. Lolo Dr, Suite 150, Bend, OR 97703.

6.03.G.1.e. Every Idea Marketing, 355 N.E. Lafayette Avenue, Bend, OR 97701.

6.03.G.1.f. Barney and Worth, Inc., 121 S.W. Morrison Street, Suite 820 Portland, OR 97204.

6.03.G.1.g. WyEast Timber Services, LLC, 3015 Lower Mill Road, Hood River, OR 97031.

6.03.G.1.h United States Government; Mt. Hood National Forest; 16400 Champion Way; Sandy, OR 97055.

SC-6.03. Add the following new paragraph immediately following Paragraph 6.03.H:

6.03.H.1 Contractor's Professional Liability:

- a) Each Claim \$2,000,000
- b) Annual Aggregate \$5,000,000

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS SUPPLEMENTARY CONDITIONS 00 73 00 - 7 SC-6.05. Insert the following paragraph after 6.05.A.1:

6.05.A.1.a. In addition to the individuals and entities specified in Paragraph 6.05.A.1, include as insureds, the following:

6.05.A.1.a.1) Jacobs Engineering Group Inc. shall be named insured under builder's risk policy.

6.05.A.1.a.2) United States Forest Service shall be named insured under builder's risk policy.

6.05.A.2.a. In addition to the above listed perils, the property insurance shall include flood; landslide; mudslide; wind; mechanical breakdown/failure.

6.05.A.2.b. 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 loss payee to whom a certificate of insurance has been issued; and

6.05.A.2.c. Comply with the requirements of Paragraph 6.05.A of the General Conditions.

SC-6.05. Add the following to the list of items in Paragraph 6.05.A, as numbered items:

6.05.A.18. Include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:

6.05.A.18.a. All Owner furnished pipe materials, fittings and appurtenances. \$1,050,000.

SC-7.02. Add the following language to the end of Paragraph 7.02.B:

7.02.B.1. Contractor and Subcontractor regular working hours consist of up to 10 working hours within an 11-hour period 24 hours per day on a regularly scheduled basis, excluding Sundays and holidays. Overtime work is work in excess of 40 hours per week. Note that Oregon BOLI has a daily overtime requirement that will take precedence for this project. Further, overtime is due for any work on holidays, Saturday, or Sunday. Multiple shifts are acceptable, to the extent allowed by Oregon law.

7.02.B.2. Project shall comply with 5USC613. Legal holidays are:

- New Year's Day
- MLK Jr. Day
- Washington's Birthday (President's Day)
- Memorial Day
- Independence Day
- Labor Day
- Columbus Day
- Veterans Day
- Thanksgiving Day
- Christmas Day

SC-7.02.B. Delete Paragraph 7.02.B. in its entirety and insert the following:

7.02.B. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion. All work performed on holidays shall be paid overtime.

SC-7.02. Add the following new paragraph immediately after Paragraph 7.02.B:

7.02.C. Owner shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-7.05. Add the following language at the end of Paragraph 7.05.D:

Reimbursement rates for Engineer or their officers, directors, members, partners, employees, agents, and other consultants and subcontractors for evaluation of proposed substitutes shall be on the basis established in Paragraph 15.01.E. of these Supplementary Conditions.

SC-7.06. Add the following new paragraphs immediately after Paragraph 7.06.D:

7.06.D.1. The identity and acceptance of Subcontractors and Suppliers for the following portions of the Work is required in accordance with the requirements of the Instructions to Bidders:

7.06.D.1.a. 5 percent and more than \$15,000, or \$350,000 or more regardless of percentage of project bid.

SC-7.08. Add the following new paragraphs immediately after Paragraph 7.08.A:

7.08.B. Owner has obtained and paid for the following construction permits and licenses:

7.08.B.1. No building permits are required. Owner will obtain Special Use Permits from US Forest Service, in-water work permits from Oregon DSL and US Army COE, fish screening/passage permits from ODFW.

7.08.B.2 Contractor shall obtain and pay for fish salvage permit(s) from ODFW as required for work in Dog River, Brooks Meadow Creek and at pipeline outfall to tributary to South Fork Mill Creek.

7.08.C. US Forest Service road closure permits for construction in Forest Service Road 44 and 17 shall be obtained by Contractor.

7.08.C. A copy of each permit is provided in Volume 3–*Permits and Approvals* of the *Bidding Requirements and Contract Documents* for the City of The Dalles Dog River Pipeline Replacement Project. Contractor shall examine the permits and conform to the requirements contained therein, including the purchase of additional bonds or insurance as specified therein, and such requirements are hereby made a part of these Contract Documents as fully and completely as though the same were set forth herein. Failure to examine the permit(s) will not relieve Contractor from compliance with the requirements stated therein.

SC-7.09. Add the following new paragraphs immediately after Paragraph 7.09.A:

7.09.B. Owner is exempt from payment of sales and compensating use taxes of the State of Oregon and of cities and counties thereof on materials to be incorporated into the Work.

7.09.B.1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of materials and equipment to be incorporated into the Work.

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7.09.B.2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to materials and equipment not incorporated into the Work.

SC-7.10. Add the following new paragraph(s) immediately after Paragraph 7.10.C:

7.10.D. While not intended to be inclusive of all Laws or Regulations for which Contractor may be responsible under Paragraph 7.10, the following Laws or Regulations are included as mandated by statute or for the convenience of Contractor:

7.10.D.1. Prevailing Wage Rates:

7.10.D.1.a. In accordance with ORS 279C.800 through 279C.870, concerning payment of not less than prevailing wage rates; each worker in each trade or occupation employed in the performance of the Work under these Contract Documents, either by Contractor, Subcontractor, or other person doing or contracting to do the whole or any part of the Work, shall be paid not less than the applicable prevailing wage rates included or referenced in the Contract Documents.

7.10.D.1.b. Owner will pay the Commissioner of the Bureau of Labor and Industries the fee required by ORS 279C.825.

7.10.D.2. Discrimination: In accordance with ORS 279A.110, Contractor will not discriminated against minority, women, or emerging small business in obtaining required subcontracts.

7.10.D.3. In accordance with ORS 279C.505, Contractor shall demonstrate that an employee drug testing program is in place.

7.10.D.4. ORS 654.150 applies at the Construction Site. All costs incurred in complying with state statutes requiring sanitation facilities shall be borne by Contractor.

7.10.D.5. Environmental Pollution:

7.10.D.5.a. In accordance with ORS 279C.525, as amended, specific reference is made all federal, state and local agencies that have enacted ordinances or regulations dealing with the prevention of environmental pollution and the preservation of natural resources that affect the performance of the Work.

7.10.D.6. In accordance with ORS 279C.510, Contractor shall salvage or recycle construction and demolition debris if feasible and cost effective.

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS 7.10.D.7. Workers employed by Contractor shall not be able to collect for unpaid overtime unless a claim is filed in accordance with ORS 279C.545 with Contractor.

7.10.D.8. Person claiming not being paid in full for supplied labor or materials for performance of the Work has right to file notice of such claim. Notice shall be filed in accordance with ORS 279C.605.

7.10.D.9. Industrial Fire Precaution Levels as established by US Forest Service.

7.10.D.10. American Iron and Steel Requirement. The Contractor acknowledges that it understands the goods and services provided in the performance of the Work are being funded with monies made available by the Safe Drinking Water State Revolving Fund that has statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to these Contract Documents. The Contractor hereby represents and warrants to and for the benefit of the Owner and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the Project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Owner or the State. Notwithstanding any other provision of these Contract Documents, any failure to comply with this paragraph by the Contractor shall permit the Owner or State to recover as damages against the Contractor any loss, expense, or cost incurred by the Owner or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Owner). While the Contractor has no direct contractual privity with the State, as a lender to the Owner for the funding of its Project, the Owner and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of the Contract Documents necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

7.10.D.11. Failure to comply with any or all of the requirements of Section 7.10.D shall be a material breach of the Contract and constitute grounds for Contract termination. Damages or costs resulting from such noncompliance shall be the responsibility of Contractor.

SC-9.13. Add the following new paragraph(s) immediately following Paragraph 9.12:

9.13. Owner As Resident Project Representative:

9.13.A. In addition to the Resident Project Representative furnished by Engineer, Owner will furnish an Owner's Site representative to assist Engineer. The responsibilities, authorities, and limitations of authority of Owner's Site representative will be as specified for Engineer's Resident Project Representative.

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

10.03.B. Resident Project Representative (RPR) will be furnished by Engineer. The responsibilities, authority, and limitations of the RPR are limited to those of Engineer in accordance with Paragraph 10.08 and as set forth elsewhere in the Contract Documents and are further limited and described below.

10.03.C. Responsibilities and Authority:

10.03.C.1. Schedules: Review and monitor Progress Schedule, Schedule of Submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

10.03.C.2. Conferences and Meetings: Conduct or attend meetings with Contractor, such as preconstruction conferences, progress meetings, Work conferences and other Project related meetings.

10.03.C.3. Liaison: (i) Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, and assist in understanding the intent of the Contract Documents; (ii) assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's onsite operations; (iii) assist in obtaining from Owner additional details or information when required for proper execution of the Work.

10.03.C.4. Interpretation of Contract Documents: Inform Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

10.03.C.5. Submittals: Receive submittals that are furnished at the Site by Contractor, and notify Engineer of availability for examination. Advise Engineer and Contractor of the commencement of any Work or arrival of materials and equipment at Site, when recognized, requiring a Shop Drawing or Sample if the submittal has not been approved by Engineer.

10.03.C.6. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and provide recommendations to Engineer; transmit to Contractor, in writing decisions as issued by Engineer.

10.03.C.7. Review of Work and Rejection of Defective Work: (i) Conduct onsite observations of the Work in progress to assist Engineer in determining if the Work is, in general, proceeding in accordance with the Contract Documents; (ii) inform Engineer and Contractor whenever RPR believes that any Work is defective; (iii) advise Engineer whenever RPR believes that any Work 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 the Work in progress that RPR believes should be corrected or rejected or uncovered for observation, or requires special testing, inspection, or approval.

10.03.C.8. Inspections, Tests, and System Startups: (i) Verify tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that Contractor maintains adequate records thereof; (ii) observe, record, and report to Engineer appropriate details relative to the test procedures and system startups; and (iii) accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections, and report to Engineer.

10.03.C.9. Records: (i) Maintain records for use in preparing Project documentation; (ii) keep a diary or log book recording pertinent Site conditions, activities, decisions and events; (iii) record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of Contractors, Subcontractors, and major Suppliers of materials and equipment.

10.03.C.10. Reports: (i) Furnish Engineer periodic reports of progress of the Work and of Contractor's compliance with the Progress Schedule and Schedule of Submittals; (ii) immediately notify Engineer of the occurrence of Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous

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Environmental Condition; and (iii) assist Engineer in drafting proposed Change Orders, Work Change Directives, and Field Orders; obtain backup material from Contractor as appropriate.

10.03.C.11. 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.

10.03.C.12. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify materials and equipment certificates and operation and maintenance manuals and other data required by Specifications 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 been delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

10.03.C.13. Completion: (i) Participate in a Substantial Completion inspection; assist in determination of Substantial Completion and the preparation of lists of items to be completed or corrected; (ii) Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied; and (iii) observe whether items on final list have been completed or corrected, and make recommendations to Engineer concerning acceptance.

10.03.D. Limitations of Authority: Resident Project Representative will not:

10.03.D.1. have authority to authorize a deviation from Contract Documents or substitution of materials or equipment, unless authorized by Engineer; or

10.03.D.2. exceed the limitations of Engineer's authority as set forth in Contract Documents; or

10.03.D.3. undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor's authorized representative; or

10.03.D.4. advise on, issue directions relative to, or assume control over an aspect of the means, methods, techniques, sequences, or procedures of Contractor's work unless such advice or directions are specifically required by the Contract Documents; or

10.03.D.5. advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor; or

10.03.D.6. participate in specialized field or laboratory tests or inspections conducted offsite by others, except as specifically authorized by Engineer; or

10.03.D.7. accept Shop Drawings or Samples from anyone other than Contractor; or

10.03.D.8. authorize Owner to occupy the Project in whole or in part.

SC-10.08. Add the following new paragraph immediately after Paragraph 10.08.E:

10.08.F. Contractors, Subcontractors, Suppliers, and others on the Project, or their sureties, shall maintain no direct action against Engineer, its officers, employees, affiliated corporations, and subcontractors, for any Claim arising out of, in connection with, or resulting from the engineering services performed. Only the Owner will be the beneficiary of any undertaking by Engineer.

SC-11.04. Add the following new paragraph immediately after Paragraph 11.04.C:

11.04.D. In the event Contractor submits request for additional compensation as a result of a change or differing Site conditions, or as a result of delays, acceleration, or loss of productivity, Owner reserves right, upon written request, to audit and inspect Contractor's books and records relating to the Project. Upon written request for an audit, Contractor shall make its books and records available within 14 days of request. Owner shall specifically designate identity of auditor. As part of audit, Contractor shall make available its books and records relating to the Project, including but not limited to Bidding Documents, cost reports, payroll records, material invoices, subcontracts, purchase orders, daily timesheets, and daily diaries. Audit shall be limited to those cost items which are sought by Contractor in a change order or claim submission to Owner.

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

13.01.B.5.c. Construction Equipment and Machinery:

13.01.B.5.c.(1) Rentals of construction equipment and machinery, and the parts thereof 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. Such costs shall be in accordance with the terms of said rental agreements. The rental

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of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

13.01.B.5.c.(2) Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the Rental Rate Blue Book published by Equipment Watch. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than \$1,000 will be considered small tools.

SC-13.03. Add the following language after Paragraph 13.03.E.3:

13.03.E.4. The unit price of an item of Unit Price Work shall be subject to re-evaluation and adjustment under the following conditions:

13.03.E.4.a. if the Bid price of a particular item of Unit Price Work amounts to 5 percent or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 15 percent from the estimated quantity of such item indicated in the Agreement; and

13.03.E.4.b. if there is no corresponding adjustment with respect to any other item of Work; and

13.03.E.4.c. if Contractor believes that Contractor has incurred additional expense as a result thereof or if Owner believes the quantity variation entitles Owner to an adjustment in the unit price, either Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Article 10 if the parties are unable to agree as to the effect of any such variation in the quantity of Unit Price Work performed.

SC-14.02. Delete Paragraph 14.02.B in its entirety and insert the following in its place:

14.02.B. Contractor shall retain an independent testing laboratory or testing agency and shall be responsible for arranging and shall pay for specified tests, inspections,

and approvals required for Owner's and Engineer's acceptance of the Work at the Site except:

14.02.B.1. costs incurred in connection with tests or inspections pursuant to Paragraph 14.02.C shall be paid for as provided in said paragraph; and

14.02.B.2. as otherwise specifically provided in the Contract Documents.

SC-14.02. Add the following language at the end of Paragraph 14.02.D:

Tests required by Contract Documents to be performed by Contractor that require test certificates be submitted to Owner or Engineer for acceptance shall be made by an independent testing laboratory or agency licensed or certified in accordance with Laws and Regulations and applicable state and local statutes. In the event state license or certification is not required, testing laboratories or agencies shall meet the following applicable requirements:

14.02.D.6. Basic requirements of ASTM E329, "Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection" as applicable.

14.02.D.7. Calibrate testing equipment at reasonable intervals by devices of accuracy, traceable to the National Institute of Standards and Technology or accepted values of natural physical constants.

SC-14.07.A.2. Add the following new paragraph immediately after Paragraph 14.07.A.2:

14.07.A.2.e. In accordance with ORS 279A.120, when out-of-state Contractor is awarded a Contract, Contractor is required to report to the Department of Revenue the Contract Price, terms of payment, length of Contract, and other information as Department of Revenue may require. Owner will verify Contractor has satisfied this requirement prior to issuing final payment.

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

15.01.D.1. Thirty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 15.01.E.) become due and when due will be paid by Owner to Contractor.

SC-15.01.F. Add the following new paragraphs immediately after Paragraph 15.01.E:

15.01.F. Subcontractor Payments:

15.01.F.1. In accordance with ORS 279C.505, Contractor shall: (i) make payment promptly, as due to all persons supplying to Contractor, labor or material for the prosecution of the Work under these Contract Documents, (ii) pay all contributions or amounts due the Industrial Accident Fund from Contractor or Subcontractor incurred in the performance of the Work, (iii) not permit any lien or Claim to be filed or prosecuted against Owner, on account of labor or material furnished, and (iv) pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

15.01.F.2. In accordance with ORS 279C.515:

15.01.F.2.a. If Contractor fails, neglects, or refuses to make prompt payment to Subcontractors or Suppliers of any Claim as such Claim becomes due, Owner may pay such Claim and charge the amount of the payment against funds due Contractor. The payment of a Claim in the manner authorized shall not relieve Contractor or Contractor's surety from obligation with respect to any unpaid Claims.

15.01.F.2.b. If Contractor or first-tier Subcontractor fails, neglects, or refuses to make payments within 30 days after receipt of payment from Owner, Contractor or first-tier Subcontractor shall owe amount due plus interest charges commencing at the end of the 10-day period that payment is due and ending upon payment.

15.01.F.2.c. If Contractor or first-tier Subcontractor fails, neglects, or refuses to make payments to person furnishing labor or materials, person may file a complaint with the Construction Contractors Board.

15.01.F.3. In accordance with ORS 279C.580:

15.01.F.3.a. Contractor shall include in each subcontract for property or services entered in to by Contractor or first-tier Subcontractor, including material Suppliers, for the purpose of performing Work under this Contract, a clause that obligates Contractor to pay first-tier Subcontractor for satisfactory performance under its subcontract within 10 days out of such amounts as are paid to Contractor by Owner.

15.01.F.3.b. Contractor shall include in each subcontract a clause that obligates Contractor to pay first-tier Subcontractor an interest penalty of three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes

Oregon on the date that is 30 days after the date when payment was received from Owner, but the rate of interest shall not exceed 30 percent. The amount of interest may not be waived.

15.01.F.3.c. Contractor shall require first-tier Subcontractors to included same clauses in subcontracts with lower tiered Subcontractors and Suppliers in connection with this Project.

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

SC 15.03.B.1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

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

SC-17.02 Arbitration:

SC-17.02.A. All matters subject to final resolution under this Article will be decided by arbitration in accordance with the rules of the State of Oregon, subject to the conditions and limitations of this paragraph. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

SC-17.02.B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in this Article, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations. The demand for arbitration should include specific reference to Paragraph SC-17.02.D below.

SC-17.02.C. No arbitration arising out of or relating to the Contract shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers,

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directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

SC-17.02.C.1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and

SC-17.02.C.2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.

SC-17.02.D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include a concise breakdown of the award, and a written explanation of the award specifically citing the Contract provisions deemed applicable and relied on in making the award.

SC-17.02.E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

SC-17.02.F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

17.02.F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

SC-17.03. Add the following new paragraph immediately after Paragraph 17.02:

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

END OF SECTION

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PART 3

SPECIFICATIONS

SECTION 01 11 00 SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. The completed Work will provide Owner with a replacement of an existing pipeline and includes:
 - 1. 20,300 feet of new 30-inch Ductile Iron Pipe Size (DIPS) high density polyethylene pipe, air releases and vents, new culvert at Brooks Meadow Creek, pipeline stream crossing at Brooks Meadow Creek, removal of existing fill where existing pipeline crosses through a depression, and new outfall energy dissipation facilities. Certain piping materials are Owner-furnished. Work includes resurfacing certain existing dirt and gravel roads and construction of stormwater and erosion control facilities. All construction is located on lands owned by the United States Forest Service (USFS), and the City operates under a Special Use Permit. Work will be constrained to comply with conditions of multiple permits including those issued by USFS, US Army Corps of Engineers, Oregon Division of State Lands, Oregon Department of Fish and Wildlife, and Oregon Department of Environmental Quality.
- B. Removal of downed wood and stumps (as necessary for construction of the Project) remaining after clearing of timber from pipeline corridor are included in this Contract.

1.02 WORK NOT COVERED BY CONTRACT DOCUMENTS

A. Clearing of timber from pipeline corridor as necessary for the construction of the Project, and other Work areas will be performed by others prior to construction. Some clearing work by others, within the project limits, may occur after Notice to Proceed. Coordinate Work with such clearing work.

1.03 PROVISIONS FOR FUTURE WORK

A. Provisions for future construction are as shown.

1.04 OWNER-FURNISHED PRODUCTS

A. Refer to Section 01 64 00, Owner-Furnished Products.

- PART 2 PRODUCTS (NOT USED)
- PART 3 EXECUTION (NOT USED)

END OF SECTION

SUMMARY OF WORK 01 11 00 - 2

SECTION 01 26 00 CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 PROPOSAL REQUESTS

- A. Owner may, in anticipation of ordering an addition, deletion, or revision to the Work, request Contractor to prepare a detailed proposal of cost and times to perform contemplated change.
- B. Proposal request will include reference number for tracking purposes and detailed description of and reason for proposed change, and such additional information as appropriate and as may be required for Contractor to accurately estimate cost and time impact on Project.
- C. Proposal request is for information only; Contractor is neither authorized to execute proposed change nor to stop Work in progress as result of such request.
- D. Contractor's written proposal shall be transmitted to Engineer promptly, but not later than 14 days after Contractor's receipt of Owner's written request.
 Proposal shall remain firm for a maximum period of 45 days after receipt by Engineer.
- E. Owner's request for proposal or Contractor's failure to submit such proposal within the required time period will not justify a Claim for an adjustment in Contract Price or Contract Times (or Milestones).

1.02 CLAIMS

- A. Include, at a minimum:
 - 1. Specific references including (i) Drawing numbers, (ii) Specification section and article/paragraph number, and (iii) Submittal type, Submittal number, date reviewed, Engineer's comment, as applicable, with appropriate attachments.
 - 2. Stipulated facts and pertinent documents, including photographs and statements.
 - 3. Interpretations relied upon.
 - 4. Description of (i) nature and extent of Claim, (ii) who or what caused the situation, (iii) impact to the Work and work of others, and (iv) discussion of claimant's justification for requesting a change to price or times or both.

- 5. Estimated adjustment in price claimant believes it is entitled to with full documentation and justification.
- 6. Requested Change in Contract Times: Include at least (i) Progress Schedule documentation showing logic diagram for request,
 (ii) documentation that float times available for Work have been used, and (iii) revised activity logic with durations including sub-network logic revisions, duration changes, and other interrelated schedule impacts, as appropriate.
- 7. Documentation as may be necessary as set forth below for Work Change Directive, and as Engineer may otherwise require.

1.03 WORK CHANGE DIRECTIVES

- A. Procedures:
 - 1. Engineer will:
 - a. Initiate, including a description of the Work involved and any attachments.
 - b. Affix signature, demonstrating Engineer's recommendation.
 - c. Transmit one electronic copy to Owner for authorization.
 - 2. Owner will:
 - a. Affix signature, demonstrating approval of the changes involved.
 - b. Return one electronic copy to Engineer, who will provide electronic copies to Resident Project Representative or other field representative, and Contractor through electronic construction management software.
 - 3. Upon completion of Work covered by the Work Change Directive or when final Contract Times and Contract Price are determined, Contractor shall submit documentation for inclusion in a Change Order.
 - 4. Contractor's documentation shall include, but not be limited to:
 - a. Appropriately detailed records of Work performed to enable determination of value of the Work.
 - b. Full information required to substantiate resulting change in Contract Times and Contract Price for Work. On request of Engineer, provide additional data necessary to support documentation.
 - c. Support data for Work performed on a unit price or Cost of the Work basis with additional information such as:
 - 1) Dates Work was performed, and by whom.
 - 2) Time records, wage rates paid, and equipment rental rates.
 - 3) Invoices and receipts for materials, equipment, and subcontracts, all similarly documented.

CONTRACT MODIFICATION PROCEDURES 01 26 00 - 2 B. Effective Date of Work Change Directive: Date of signature by Owner, unless otherwise indicated thereon.

1.04 CHANGE ORDERS

- A. Procedure:
 - 1. Engineer will prepare one copy of proposed Change Order and transmit such with Engineer's written recommendation and request to Contractor for signature.
 - Contractor shall, upon receipt, either: (i) promptly sign, retaining one for its file, and return copy to Engineer for Owner's signature, or (ii) return unsigned copy with written justification for not executing Change Order.
 - 3. Engineer will, upon receipt of Contractor signed copy, promptly forward Engineer's written recommendation and partially executed copy for Owner's signature, or if Contractor fails to execute the Change Order, Engineer will promptly so notify Owner and transmit Contractor's justification to Owner.
 - 4. Upon receipt of Contractor-executed Change Order, Owner will promptly either:
 - a. Execute Change Order, retaining one copy for its file and returning fully executed copy to Engineer; or
 - b. Return to Engineer unsigned copy with written justification for not executing Change Order.
 - 5. Upon receipt of Owner-executed Change Order, Engineer will transmit electronic copies to Contractor, Resident Project Representative or other field representative, and Owner through electronic construction Management software and retain original copy, or if Owner fails to execute the Change Order, Engineer will promptly so notify Contractor and transmit Owner's justification to Contractor.
 - 6. Upon receipt of Owner-executed Change Order, Contractor shall:
 - a. Perform Work covered by Change Order.
 - b. Revise Schedule of Values to adjust Contract Price and submit with next Application for Payment.
 - c. Revise Progress Schedule to reflect changes in Contract Times, if any, and to adjust times for other items of Work affected by change.
 - d. Enter changes in Project record documents after completion of change related Work.

- B. In signing a Change Order, Owner and Contractor acknowledge and agree that:
 - Stipulated compensation (Contract Price or Contract Times, or both) set forth includes payment for (i) the Cost of the Work covered by the Change Order, (ii) Contractor's fee for overhead and profit, (iii) interruption of Progress Schedule, (iv) delay and impact, including cumulative impact, on other Work under the Contract Documents, and (v) extended overheads.
 - 2. Change Order constitutes full mutual accord and satisfaction for the change to the Work.
 - 3. Unless otherwise stated in the Change Order, all requirements of the original Contract Documents apply to the Work covered by the Change Order.

1.05 COST OF THE WORK

- A. In determining the supplemental costs allowed in Paragraph 13.01.B.5 of the General Conditions for rental equipment and machinery, the following will apply.
- B. Rental of construction equipment and machinery and the parts thereof having a replacement value in excess of \$1,000, whether owned by Contractor or rented or leased from others, shall meet the following requirements:
 - 1. Full rental costs for leased equipment shall not exceed rates listed in the Rental Rate Blue Book published by Equipment Watch, as adjusted to the regional area of the Project. Owned equipment costs shall not exceed the single shift rates established in the Cost Reference Guide (CRG) published by Equipment Watch. The most recent published edition in effect at commencement of actual equipment use shall be used.
 - 2. Rates shall apply to equipment in good working condition. Equipment not in good condition, or larger than required, may be rejected by Engineer or accepted at reduced rates.
 - 3. Leased Equipment:
 - a. For equipment leased or rented in arm's length transactions from outside vendors, maximum rates shall be determined by the following actual usage/Payment Category:
 - 1) Less than 8 Hours: Hourly rate.
 - 2) 8 or More Hours but Less than 7 Days: Daily rate.
 - 3) 7 or More Days but Less than 30 Days: Weekly rate.
 - 4) 30 Days or More: Monthly rate.

CONTRACT MODIFICATION PROCEDURES 01 26 00 - 4

- 4. Arm's length rental and lease transactions are those in which the firm involved in the rental or lease of equipment is not associated with, owned by, have common management, directorship, facilities and/or stockholders with the firm renting the equipment.
- 5. Financial arrangements associated with rental and lease transactions that provide Contractor remuneration or discounts not visible to the Owner must be disclosed and integrated with charged rates.
- 6. Leased Equipment in Use: Actual equipment use time documented by Engineer shall be the basis that equipment was on and utilized at the Project Site. In addition to the leasing rate above, equipment operational costs shall be paid at the estimated hourly operating cost rate set forth in the Rental Rate Blue Book if not already included in the lease rate. Hours of operation shall be based upon actual equipment usage to the nearest quarter hour, as recorded by Engineer.
- 7. Leased Equipment, When Idle (Standby): Idle or standby equipment is equipment onsite or in transit to and from the Work Site and necessary to perform the Work under the modification, but not in actual use. Idle equipment time, as documented by Engineer, shall be paid at the leasing rate determined above, excluding operational costs.
- 8. Owned and Other Equipment in Use: Equipment rates for owned equipment or equipment provided in other than arm's length transaction shall not exceed the single shift total hourly costs rate developed in accordance with the CRG and as modified herein for multiple shifts. This total hourly rate will be paid for each hour the equipment actually performs work. Hours of operation shall be based upon actual equipment usage as recorded by Engineer. This rate shall represent payment in full for Contractor's direct costs.
- 9. Owned and Other Equipment, When Idle (Standby): Equipment necessary to be onsite to perform the Work on single shift operations, but not utilized, shall be paid for at the ownership hourly expense rate developed in accordance with the CRG, provided its presence and necessity onsite has been documented by Engineer. Payment for idle time of portions of a normal workday, in conjunction with original contract Work, will not be allowed. In no event shall idle time claimed in a day for a particular piece of equipment exceed the normal Work or shift schedule established for the Project. It is agreed that this rate shall represent payment in full for Contractor's direct costs. When Engineer determines that the equipment is not needed to continuously remain at the Work Site, payment will be limited to actual hours in use.
- 10. Owned and Other Equipment, Multiple Shifts: For multiple shift operations, the CRG single shift total hourly costs rate shall apply to the operating equipment during the first shift. For subsequent shifts, up to two in a 24-hour day, operating rate shall be the sum of the total hourly CRG operating cost and 60 percent of the CRG ownership and overhaul

PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS CONTRACT MODIFICATION PROCEDURES 01 26 00 - 5 expense. Payment for idle or standby time for second and third shifts shall be 20 percent of the CRG ownership and overhaul expense.

- 11. When necessary to obtain owned equipment from sources beyond the Project limits, the actual cost to transfer equipment to the Site and return it to its original location will be allowed as an additional item of expense. Move-in and move-out allowances will not be made for equipment brought to the Project if the equipment is also used on original Contract or related Work.
- 12. If the move-out destination is not to the original location, payment for move-out will not exceed payment for move-in.
- 13. If move is made by common carrier, the allowance will be the amount paid for the freight. If equipment is hauled with Contractor's own forces, rental will be allowed for the hauling unit plus the hauling unit operator's wage. If equipment is transferred under its own power, the rental will be 75 percent of the appropriate total hourly costs for the equipment, without attachments, plus the equipment operator's wage.
- 14. Charges for time utilized in servicing equipment to ready it for use prior to moving and similar charges will not be allowed.
- 15. When a breakdown occurs on any piece of owned equipment, payment shall cease for that equipment and any other owned equipment idled by the breakdown.
- 16. If any part of the Work is shut down by Owner, standby time will be paid during nonoperating hours if diversion of equipment to other Work is not practicable. Engineer reserves the right to cease standby time payment when an extended shutdown is anticipated.
- 17. If a rate has not been established in the CRG for owned equipment, Contractor may:
 - a. If approved by Engineer, use the rate of the most similar model found, considering such characteristics as manufacturer, capacity, horsepower, age, and fuel type, or
 - b. Request Equipment Watch to furnish a written response for a rate on the equipment, which shall be presented to Engineer for approval; or
 - c. Request Engineer to establish a rate.

1.06 FIELD ORDER

- A. Engineer will issue Field Orders, with one electronic copy to Contractor.
- B. Effective date of the Field Order shall be the date of signature by Engineer, unless otherwise indicated thereon.

- C. Contractor shall acknowledge receipt by signing and returning one copy to Engineer.
- D. Field Orders will be incorporated into subsequent Change Orders, as a no-cost change to the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 00 PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Informational Submittals:
 - 1. Schedule of Values: Submit on Contractor's standard form.
 - 2. Schedule of Estimated Progress Payments:
 - a. Submit with initially acceptable Schedule of Values.
 - b. Submit adjustments thereto with Application for Payment.
 - 3. Application for Payment.
 - 4. Final Application for Payment.

1.02 SCHEDULE OF VALUES

- A. Prepare a separate Schedule of Values for each schedule of the Work under the Agreement.
- B. Upon request of Engineer, provide documentation to support the accuracy of the Schedule of Values.
- C. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.
- D. Lump Sum Work:
 - 1. List bonds and insurance premiums, mobilization, demobilization, preliminary and detailed progress schedule preparation, equipment testing, facility startup, and contract closeout separately.
 - a. Mobilization includes, at minimum, items identified in Section 01 50 00, Temporary Facilities and Controls.
 - b. Include item(s) for monthly progress schedule update and maintenance of Engineer's trailer.
 - 2. Break down by Division 02 through 49 with appropriate subdivision of each specification.
- E. An unbalanced or front-end loaded schedule will not be acceptable.
- F. Summation of the complete Schedule of Values representing all the Work shall equal the Contract Price.

G. Submit Schedule of Values in a spreadsheet format compatible with latest version of MS Excel.

1.03 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS

- A. Show estimated payment requests throughout Contract Times aggregating initial Contract Price.
- B. Base estimated progress payments on initially acceptable progress schedule. Adjust to reflect subsequent adjustments in progress schedule and Contract Price as reflected by modifications to the Contract Documents.

1.04 APPLICATION FOR PAYMENT

- A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment for each schedule and include Request for Payment of Materials and Equipment on Hand as applicable. Execute certification by authorized officer of Contractor.
- B. Use detailed Application for Payment Form suitable to Engineer.
- C. Provide separate form for each schedule as applicable.
- D. Include accepted Schedule of Values for each schedule or portion of lump sum Work and the unit price breakdown for the Work to be paid on a unit priced basis.
- E. Include separate line item for each Change Order and Work Change Directive executed prior to date of submission. Provide further breakdown of such as requested by Engineer.
- F. Preparation:
 - 1. Round values to nearest dollar.
 - 2. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form(s) for each schedule as applicable, a listing of materials on hand for each schedule as applicable, and such supporting data as may be requested by Engineer.

1.05 MEASUREMENT—GENERAL

A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and specifications as specified in National Institute of Standards and Technology, Handbook 44.

- B. Whenever pay quantities of material are determined by weight, weigh material on scales furnished by Contractor and certified accurate by state agency responsible. Obtain weight or load slip from weigher and deliver to Owner's representative at point of delivery of material.
- C. If material is shipped by rail, car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff, and provided further that car weights will not be acceptable for material to be passed through mixing plants.
- D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by Engineer. Each vehicle shall bear a plainly legible identification mark.
- E. Haul materials that are specified for measurement by the cubic yard measured in the vehicle in transport vehicles of such type and size that actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. Load vehicles to at least their water level capacity. Loads hauled in vehicles not meeting above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.
- F. Units of measure shown on Bid Form shall be as follows, unless specified otherwise.

Item	Method of Measurement
СҮ	Cubic Yard—Field Measure by Engineer within limits specified or shown
TON	Ton—Weight Measure by Scale (2,000 pounds)
EA	Per Each

- G. Unit Price Items:
 - 1. Foundation Stabilization Material.
 - 2. Hazard Tree Removal.
 - 3. Rock Excavation.

1.06 PAYMENT

- A. Payment for all Lump Sum Work shown or specified in Contract Documents is included in the Contract Price. Payment will be based on a percentage complete basis for each line item of the accepted Schedule of Values.
- B. Payment for Lump Sum Work covers all Work specified or shown within the limits or Specification sections as follows:
 - 1. All Work shown on Drawings and Specifications unless specified as Unit Price Items.
- C. Payment for unit price items covers all the labor, materials, and services necessary to furnish and install the following items.

Item	Description
Foundation Stabilization Material	See Section 31 23 23.15, Trench Backfill.
Hazard Tree Removal	See Section 31 10 00, Site Clearing.
Rock Excavation	See Section 31 23 16, Excavation.

1.07 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

- A. Payment will not be made for following:
 - 1. Loading, hauling, and disposing of rejected material.
 - 2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
 - 3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.
 - 4. Material not unloaded from transporting vehicle.
 - 5. Defective Work not accepted by Owner.
 - 6. Material remaining on hand after completion of Work.

1.08 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

- A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings and preliminary operation and maintenance data is acceptable to Engineer.
- B. Final Payment: Will be made only for products incorporated in Work; remaining products, for which partial payments have been made, shall revert

to Contractor unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

1.09 PARTIAL PAYMENT FOR UNDELIVERED, PROJECT-SPECIFIC MANUFACTURED OR FABRICATED EQUIPMENT

- A. Notwithstanding above provisions, partial payments for undelivered (not yet delivered to Site or not stored in the vicinity of Site) products specifically manufactured for this Project, excluding off the shelf or catalog items, will be made for products listed below when all following conditions exist:
 - 1. Partial payment request is supported by written acknowledgment from Suppliers that invoice requirements have been met.
 - 2. Equipment is adequately insured, maintained, stored, and protected by appropriate security measures.
 - 3. Each equipment item is clearly marked and segregated from other items to permit inventory and accountability.
 - 4. Authorization has been provided for access to storage Site for Engineer and Owner.
 - 5. Equipment meets applicable Specifications of these Contract Documents.
- B. Applicable Items:

Specification Section	Specific Product
33 05 01.10	HDPE Piping
33 05 16.13	Box Culvert

- C. Payment of 15 percent of manufacturer's quoted price for undelivered, Project-specific manufactured equipment will be made following Shop Drawing approval. Thereafter, monthly payments will be made based on progress of fabrication as determined by Engineer, but in no case will total of payments prior to delivery exceed 75 percent of manufacturer's quoted price.
- D. Failure of Contractor to continue compliance with above requirements shall give cause for Owner to withhold payments made for such equipment from future partial payments.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 13 PROJECT COORDINATION

PART 1 GENERAL

1.01 SUBMITTALS

- A. Informational:
 - 1. Statement of Qualification (SOQ) for land surveyor or civil engineer.
 - 2. Videotape survey, photographs, and other data of the preconstruction conditions shall be submitted to the Engineer.
 - a. Photographs:
 - 1) Digital Images: Submit one electronic copy of each photograph.
 - 2) Photo Log: Submit Photo log accompanying all images submitted.
 - b. Video Recordings: Submit one electronic copy.
 - 3. A complete set of all photographs and survey data of the postconstruction conditions.
 - a. Photographs:
 - 1) Digital Images: Submit one electronic copy of each photograph.
 - 2) Photo Log: Submit photo log indicating date, direction, and description of subject matter for all photos submitted.
 - b. Video Recordings: Submit one electronic copy.

1.02 RELATED WORK AT SITE

- A. General:
 - 1. Other work that is either directly or indirectly related to scheduled performance of the Work under these Contract Documents, listed henceforth, is anticipated to be performed at Site by others.
 - 2. Coordinate the Work of these Contract Documents with work of others as specified in General Conditions.
 - 3. Include sequencing constraints specified herein as a part of Progress Schedule.

- B. Corridor and Work Area Clearing:
 - 1. Merchantable timber will be logged from the following areas by others under separate contract prior to commencement of the Work, although it is anticipated that some merchantable timber logging may continue after notice to Proceed. Coordinate Work with ongoing logging:
 - a. Pipeline Corridor.
 - b. Access Road turnouts.
 - c. Staging Areas.
 - d. Brooks Meadow Creek Road Realignment Area.
 - e. Dog River Diversion Dam Work Area.
 - 2. Schedule Work to avoid conflicts.
 - 3. Logging operations will remove standing merchantable timber and blowdown.
 - 4. Slash will be substantially removed by others from the proposed Work areas.
 - 5. Stumps remaining after timber removal will be left in place by others (the logging contractor).
 - 6. Some downed wood may remain within staging areas, corridor, across roads, and other areas required for work. Such incidents of downed wood shall be considered incidental to the work.

1.03 OWNER-FURNISHED PRODUCTS

A. Refer to Section 01 64 00, Owner-Furnished Products.

1.04 UTILITY NOTIFICATION AND COORDINATION

- A. Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work if damage occurs.
 - 1. City of the Dalles Water Department:
 - a. Contact Person: Larry McCollum.
 - b. Telephone: To be provided at pre-bid meeting.
 - 2. City of the Dalles Public Works Department:
 - a. Contact Person: Dave Anderson.
 - b. Telephone: (541) 980-1446.

1.05 PROJECT MILESTONES

A. General: Include the Milestones specified herein as a part of the Progress Schedule required under Section 01 32 00, Construction Progress Documentation.

- B. Project Milestones:
 - 1. Generally described in the Agreement Form. Following is a description of each:
 - a. Milestone 1: A minimum of 10,000 linear feet of pipeline complete by November 30, 2022, including portion from Diversion Dam to FR 44.
 - b. Milestone 2: Pipeline complete, STA 0+00 to STA 27+00 (South of USFS Road 44).
 - c. Milestone 3: Brooks Meadow Creek Culvert, complete.
 - d. Milestone 4: Substantial Completion.
 - e. Milestone 5: Final Completion.

1.06 WORK SEQUENCING/CONSTRAINTS

- A. Construction project in accordance with sequence and constraints listed below. Include the following work sequences and constraints in the Progress Schedule:
 - 1. Start pipeline installation South of USFS Road 44, and east of USFS Road 17 (after July 15, 2022) if required to reduce or avoid conflicts with corridor clearing activities by others.
 - 2. Construction shall be substantially complete south STA 0+00 to STA 27+00 (South of USFS Road 44) by November 30, 3022 to accommodate 2023 construction at intake.
 - 3. Demobilize from Staging Area 2 by November 30, 2022. No use of Staging Area 2 shall be permitted after this date to accommodate 2023 construction at intake.
 - 4. No onsite construction or construction use of roads in project area shall be allowed December 1 to April 1 annually due to USFS winter recreational closure.
 - 5. In water work periods for Dog River and Brooks Meadow Creek July 15 to August 30 annually. (Note that permit condition is expected to be written with period ending August 30, rather than August 31 which is typical.). All in water work must be completed within these dates. Contact and coordinate with ODFW at least 2 weeks prior to any in-water work activities.
 - 6. Seasonal restriction for cutting trees East of Forest Service Road 17 from March 1 to July 15 may exist due to USFS Habitat requirements.
 - 7. Gravity or pumped Bypass of flow from existing Dog River Diversion Pipeline. No pumped bypass shall be allowed during construction inactivity.
 - 8. Seasonal shut down due to snow conditions.

- 9. Temporary fish passage during construction including temporary steam isolation and dewatering at Brooks Meadow Creek.
- 10. Complete minimum 10,000 linear feet of pipe installation by November 30, 2022.

1.07 FACILITY OPERATIONS

- A. Continuous operation of Owner's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.
- B. Perform Work continuously during critical connections and changeovers, and as required to prevent interruption of Owner's operations.
- C. When necessary, plan, design, and provide various temporary services, utilities, connections, temporary piping and heating, access, and similar items to maintain continuous operations of Owner's facility.
- D. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after authorization by Owner and Engineer. Such authorization will be considered within 48 hours after receipt of Contractor's written request.
- E. Process or Facility Shutdown:
 - 1. The existing Dog River Diversion Pipeline may be shut down during the Work as specified in Section 01 57 28, Temporary Flow Control.
 - 2. Provide 7 days advance written request for approval of need to shut down the Dog River Diversion Pipeline to Owner and Engineer.
- F. Install and maintain bypass facilities and temporary connections required to keep Owner's existing Dog River Diversion Pipeline operations online. Sequences other than those specified will be considered upon written request to Owner and Engineer, provided they afford equivalent continuity of operations.
- G. Do not proceed with Work affecting a facility's operation without obtaining Owner's and Engineer's advance approval of the need for and duration of such Work.

1.08 UNITED STATES FOREST SERVICE COORDINATION

A. The project location is within the United States Forest Service (USFS) Mt. Hood National Forest Barlow Ranger District.

PROJECT COORDINATION 01 31 13 - 4

- B. The Forest Service Permit Administrator or their designee will monitor the implementation of key Project Design Criteria (PDCs) during construction and operations on a regular basis and will have the authority to provide direction and/or take action if construction or operations are not conducted according to the project design criteria.
- C. Surveyor's Ridge Trail: Sequence and perform work to minimize disruption and closures to Surveyor's Ridge Trail. Provide notification to USFS a minimum of 30 days in advance of any proposed trail closures, and provide signage at affected trail closure segments for any trail closures. See Section 01 50 00, Temporary Facilities and Controls, for Trail Crossing Plan and trail crossing signage requirements.

1.09 ADJACENT FACILITIES AND PROPERTIES

- A. Examination:
 - 1. After Effective Date of the Agreement and before Work at Site is started, Contractor, Engineer, and affected property owners and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations.
 - 2. Periodic reexamination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions.
- B. Documentation:
 - 1. Record and submit documentation of observations made on examination inspections in accordance with Article Construction Photographs and Article Audio-Video Recordings.
 - 2. Such documentation shall be used as indisputable evidence in ascertaining whether and to what extent damage occurred as a result of Contractor's operations, and is for the protection of adjacent property owners, Contractor, and Owner.

1.10 CONSTRUCTION PHOTOGRAPHS

- A. General:
 - 1. Photographically document all phases of the Project, including preconstruction, construction progress, and post-construction.
 - 2. Engineer shall have right to select subject matter and vantage point from which photographs are to be taken.

- 3. Digital Images: No post-session electronic editing of images is allowed. Stored image shall be actual image as captured without cropping or other edits.
- B. Preconstruction and Post-Construction:
 - 1. After Effective Date of the Agreement and before Work at Site is started, and again upon issuance of Substantial Completion, take a minimum of 150 photographs of Site and property adjacent to perimeter of Site.
 - 2. Particular emphasis shall be directed to structures both inside and outside the Site.
 - 3. Format: Digital, minimum resolution of 2176 by 3264 pixels and 24-bit, millions of color.
- C. Construction Progress Photos:
 - 1. Photographically demonstrate progress of construction, showing every aspect of Site and adjacent properties as well as interior and exterior of new or impacted structures.
 - 2. Weekly: Take 50 photographs using digital, minimum resolution of 2176 by 3264 pixels and 24-bit, millions of color.
- D. Documentation:
 - 1. Digital Images:
 - a. Electronic image shall have date taken embedded into image.
 - b. Archive using a commercially available photo management system that provides listing of photographs, including date, keyword description, and direction of photograph.
 - c. Label each disk, file folder or database record with Project and Owner's name, and month and year images were produced.

1.11 AUDIO-VIDEO RECORDINGS

- A. Prior to beginning the Work on Site or of a particular area of the Work, and again within 10 days following date of Substantial Completion, videograph Site and property adjacent to Site.
- B. In the case of preconstruction recording, no work shall begin in the area prior to Engineer's review and approval of content and quality of video for that area.

- C. Particular emphasis shall be directed to physical condition of existing vegetation, stream channels, wetland areas, structures, and pavements within the Dog River Diversion Dam Work Area, Brooks Meadow Creek Crossing Work Area, Dog River Diversion Pipeline alignment and areas adjacent to and within the pipeline corridor, and on Contractor storage and staging areas.
- D. Engineer shall have right to select subject matter and vantage point from which videos are to be taken.
- E. Video Format and Quality:
 - 1. Digital MP4 format, with sound.
 - 2. Upload to Owner's web-based Construction Management software, and additionally provide DVD hard copies, if requested by Engineer.
 - 3. Video:
 - a. Produce bright, sharp, and clear images with accurate colors, free of distortion and other forms of picture imperfections.
 - b. Electronically, and accurately display the month, day, year, and time of day of the recording.
 - 4. Audio:
 - a. Audio documentation shall be done clearly, precisely, and at a moderate pace.
 - b. Indicate date, project name, and a brief description of the location of recording, including:
 - 1) Work Area.
 - 2) Road names.
 - 3) Direction of coverage, including engineering stationing, if applicable.
- F. Documentation:
 - 1. Label:
 - a. Video number (numbered sequentially, beginning with 001).
 - b. Project name.
 - c. Work Area.
 - d. Applicable location by engineering stationing.
 - e. Date and time of coverage.
 - 2. Project Video Log: Maintain an ongoing log that incorporates above noted label information for videos/DVDs on Project.

1.12 REFERENCE POINTS AND SURVEYS

A. Owner's Responsibilities: Establish benchmarks as shown on Contract Documents.

- B. Location and elevation of benchmarks are shown on Drawings.
- C. Contractor's Responsibilities:
 - 1. Provide all survey and layout required to layout the Work.
 - 2. Notify Engineer at least 3 working days in advance of time when grade and line to be provided by Owner will be needed.
 - 3. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
 - 4. In event of discrepancy in data or staking provided by Owner, request clarification before proceeding with Work.
 - 5. Retain professional land surveyor or civil engineer registered in state of Project who shall perform or supervise engineering surveying necessary for additional construction staking and layout.
 - 6. Maintain complete accurate log of survey work as it progresses as a Record Document.
 - 7. On request of Engineer, submit documentation.
 - 8. Provide competent employee(s), tools, stakes, and other equipment and materials as Engineer may require to:
 - a. Establish control points, lines, and easement boundaries.
 - b. Check layout, survey, and measurement work performed by others.
 - c. Measure quantities for payment purposes.

1.13 ELECTRONIC DOCUMENT MANAGEMENT SYSTEM

- A. The Owner and Contractor shall utilize an Owner-provided electronic document management system (EDMS), PrologTM or similar, for electronic submittal of all data and documents throughout the duration of the Contract. The Owner furnished EDMS will be made available to all Contractors' Project personnel, subcontractor personnel, suppliers, consultants, and the Designer of Record. The joint use of this system is to facilitate; electronic exchange of information, automation of key processes, and overall management of the Contract. The EDMS shall be the primary means of Project information submission and management. When required by the Owners representative, paper documents will also be provided. In the event of discrepancy between the electronic version and paper documents the paper documents will govern.
- B. User Access Limitations:
 - 1. The Owner's Representative will control the Contractor's access to the EDMS by allowing access and assigning user profiles to accepted Contractor personnel. User profiles will define levels of access into the system, determine assigned function-based authorizations (determines

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what can be seen), and user privileges (determines what they can do). Subcontractors and suppliers will be given access to the EDMS through the Contractor. Entry of information exchanged and transferred between the Contractor and its subcontractors and suppliers on the EDMS shall be the responsibility of the Contractor.

- 2. Joint Ownership of Data: Data entered in a collaborative mode (entered with the intent to share as determined by permissions and workflows within the EDMS) by the Owner's Representative and the Contractor will be jointly owned.
- C. Automated System Notification and Audit Log Tracking: Review comments made (or lack thereof) by the Owner on Contractor submitted documentation shall not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for managing, tracking, and documenting the Work to comply with the requirements of the Contract Documents. Owner's acceptance via automated system notifications or audit logs extends only to the face value of the submitted documentation and does not constitute validation of the Contractor's submitted information.
- D. Submittals: See Section 01 33 00, Submittal Procedures.
- E. Computer Requirements: The Contractor shall use computer hardware and software that meets the requirements of the Owner furnished EDMS as recommended by the EDMS supplier to access and utilize the EDMS. As recommendations are modified by the EDMS supplier, the Contractor will upgrade their system(s) to meet the recommendations or better. Upgrading of the Contractor's computer systems will not be justification for a cost or time modification to the Contract.
- F. Contractor Responsibility: The Contractor shall be responsible for the validity of their information placed in the EDMS and for the abilities of their personnel. Accepted users shall be knowledgeable in the use of computers, including Internet browsers, email programs, CAD drawing applications, and Adobe Portable Document Format (PDF) document distribution program. The Contractor shall utilize the existing forms in the EDMS to the maximum extent possible. If a form does not exist in the EDMS, the Contractor must include a form of their own or provided by the Owner's Representative as an attachment to a submittal. Adobe PDF documents will be created through electronic conversion rather than optically scanned whenever possible. The Contractor is responsible for the training of their personnel in the use of the EDMS (outside what is provided by the Owner) and the other programs indicated above as needed.

- G. User Access Administration: Provide a list of Contractor's key EDMS personnel for the Owner's Representative acceptance. Contractor is responsible for adding and removing users from the system. The Owner's Representative reserves the right to perform a security check on all potential users. The Contractor will be allowed to add additional personnel and subcontractors to the EDMS.
- H. Connectivity Problems: The EDMS is a web-based environment and therefore subject to the inherent speed and connectivity problems of the Internet. The Contractor is responsible for its own connectivity to the Internet. The EDMS response time is dependent on the Contractor's equipment, including processor speed, Internet access speed, etc., and current traffic on the Internet. The Owner will not be liable for any delays associated from the usage of the EDMS including, but not limited to slow response time, downtime periods, connectivity problems, or loss of information. The Contractor will ensure that connectivity to the EDMS (whether at the home office or jobsite) is adequate. The minimum bandwidth requirements for using the system is 128 kb/s. It is recommended a faster connection be used when uploading pictures and files into the system. Under no circumstances shall the usage, of the EDMS be grounds for a time extension or cost adjustment to the Contract.
- I. Training:
 - 1. The Project Owner has arranged for the following training to be provided to the Contractor:
 - a. Up to two training sessions will be offered for Contractor and Subcontractor personnel to be coordinated at a time arranged by Contractor with Owner's Representative within 21 days of Notice to Proceed. Contractor participation in training is strongly encouraged and shall be considered incidental to the Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SALVAGE OF MATERIALS

- A. Materials to be salvaged include:
 - 1. Five 20-inch-long, intact sections of existing Dog River pipeline (with existing circular wire wrap) to Owner at primary staging area from portions of pipeline that directly interfere with new alignment. Provide steel strapping and interior cribbing to hold segments in circular shape and prevent segment collapse.

3.02 CUTTING, FITTING, AND PATCHING

- A. Cut, fit, adjust, or patch Work and work of others, including excavation and backfill as required, to make Work complete.
- B. Obtain prior written authorization of Engineer before commencing Work to cut or otherwise alter:
 - 1. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.
 - 2. Weather-resistant or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Work of others.
- C. Refinish surfaces to provide an even finish.
 - 1. Refinish continuous surfaces to nearest intersection.
 - 2. Refinish entire assemblies.
 - 3. Finish restored surfaces to such planes, shapes, and textures that no transition between existing work and the Work is evident in finished surfaces.
- D. Restore existing work, Underground Facilities, and surfaces that are to remain in completed Work including concrete-embedded piping, conduit, and other utilities as specified and as shown on Drawings.
- E. Make restorations with new materials and appropriate methods as specified for new Work of similar nature; if not specified, use recommended practice of manufacturer or appropriate trade association.
- F. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces and fill voids.
- G. Remove specimens of installed Work for testing when requested by Engineer.

END OF SECTION

SECTION 01 31 19 PROJECT MEETINGS

PART 1 GENERAL

1.01 GENERAL

A. Engineer will schedule physical arrangements for meetings throughout progress of the Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within 5 days after each meeting to participants and parties affected by meeting decisions.

1.02 PRECONSTRUCTION CONFERENCE

- A. Contractor shall be prepared to discuss the following subjects, as a minimum:
 - 1. Required schedules.
 - 2. Status of Bonds and insurance.
 - 3. Sequencing of critical path work items.
 - 4. Progress payment procedures.
 - 5. Project changes and clarification procedures.
 - 6. Use of Site, access, office and storage areas, security, and temporary facilities.
 - 7. Major product delivery and priorities.
 - 8. Contractor's safety plan and representative.
 - 9. Transport and disposition of Owner Furnished materials.
- B. Attendees will include:
 - 1. Owner's representatives.
 - 2. Contractor's office representative.
 - 3. Contractor's resident superintendent.
 - 4. Contractor's quality control representative.
 - 5. Subcontractors' representatives whom Contractor may desire or Engineer may request to attend.
 - 6. Engineer's representatives.
 - 7. United States Forest Service (USFS) representatives.
 - 8. Others as appropriate.

1.03 PRELIMINARY SCHEDULES REVIEW MEETING

A. As set forth in General Conditions and Section 01 32 00, Construction Progress Documentation.

1.04 PROGRESS MEETINGS

- A. Engineer will schedule regular progress meetings at Site, and virtually through MS Teams, Zoom or similar teleconference platform, conducted weekly to review the Work progress, Progress Schedule, Schedule of Submittals, Application for Payment, contract modifications, and other matters needing discussion and resolution.
- B. Attendees will include:
 - 1. Owner's representative(s), as appropriate.
 - 2. Contractor, Subcontractors, and Suppliers, as appropriate.
 - 3. Engineer's representative(s).
 - 4. USFS representatives.
 - 5. Others as appropriate.

1.05 QUALITY CONTROL MEETINGS

- A. In accordance with Section 01 45 16.13, Contractor Quality Control.
- B. Scheduled by Engineer on regular basis and as necessary to review test and inspection reports, and other matters relating to quality control of the Work and work of other Contractors.
- C. Attendees will include:
 - 1. Contractor.
 - 2. Contractor's designated quality control representative.
 - 3. Subcontractors and Suppliers, as necessary.
 - 4. Engineer's representatives.

1.06 PREINSTALLATION MEETINGS

- A. When required in individual Specification sections, convene at Site prior to commencing the Work of that section.
- B. Require attendance of entities directly affecting, or affected by, the Work of that section.
- C. Notify Engineer 4 days in advance of meeting date.

D. Provide suggested agenda to Engineer to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

1.07 FACILITY STARTUP MEETINGS

- A. Schedule and attend a minimum of two facility startup meetings. The first of such meetings shall be held prior to submitting Facility Startup Plan, as specified in Section 01 91 14, Equipment Testing and Facility Startup, and shall include preliminary discussions regarding such plan.
- B. Agenda items shall include, but not be limited to, content of Facility Startup Plan, coordination needed between various parties in attendance, and potential problems associated with startup.
- C. Attendees will include:
 - 1. Contractor.
 - 2. Contractor's designated quality control representative.
 - 3. Subcontractors and equipment manufacturer's representatives whom Contractor deems to be directly involved in facility startup.
 - 4. Engineer's representatives.
 - 5. Owner's operations personnel.
 - 6. Others as required by Contract Documents or as deemed necessary by Contractor.

1.08 OTHER MEETINGS

- A. In accordance with Contract Documents and as may be required by Owner and Engineer.
- PART 2 PRODUCTS (NOT USED)
- PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SUBMITTALS

- A. Informational Submittals:
 - 1. Preliminary Progress Schedule: Submit at least 7 days prior to preconstruction conference.
 - 2. Detailed Progress Schedule:
 - a. Submit initial Detailed Progress Schedule within 45 days after Effective Date of the Agreement.
 - b. Submit an Updated Progress Schedule at each update, in accordance with Article Detailed Progress Schedule.
 - 3. Submit with Each Progress Schedule Submission:
 - a. Contractor's certification that Progress Schedule submission is actual schedule being used for execution of the Work.
 - b. Electronic file compatible with latest version of Microsoft Project or Project Planner (P6) by Primavera Systems, Inc. The same software shall be used for entire project.
 - 4. Prior to final payment, submit a final Updated Progress Schedule.

1.02 PRELIMINARY PROGRESS SCHEDULE

- A. In addition to basic requirements outlined in General Conditions, show a detailed schedule, beginning with Notice to Proceed, for minimum duration of 120 days, and a summary of balance of Project through Final Completion.
- B. Show activities including, but not limited to, the following:
 - 1. Notice to Proceed.
 - 2. Permits.
 - 3. Submittals, with review time. Contractor may use Schedule of Submittals specified in Section 01 33 00, Submittal Procedures.
 - 4. Early procurement activities for long lead equipment and materials.
 - 5. Initial Site work.
 - 6. Earthwork.
 - 7. Specified Work sequences and construction constraints.
 - 8. Contract Milestone and Completion Dates.
 - 9. Owner-furnished products delivery dates or ranges of dates.
 - 10. Major structural, mechanical, equipment, electrical, architectural, and instrumentation and control Work.

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- 11. System startup summary.
- 12. Project close-out summary.
- 13. Demobilization summary.
- C. Update Preliminary Progress Schedule monthly as part of progress payment process. Failure to do so may result in the Owner withholding all or part of the monthly progress payment until the Preliminary Progress Schedule is updated in a manner acceptable to Engineer.
- D. Format: In accordance with Article Progress Schedule Critical Path Network.

1.03 DETAILED PROGRESS SCHEDULE

- A. In addition to requirements of General Conditions, submit Detailed Progress Schedule beginning with Notice to Proceed and continuing through Final Completion.
- B. Show the duration and sequences of activities required for complete performance of the Work reflecting means and methods chosen by Contractor.
- C. When accepted by Engineer, Detailed Progress Schedule will replace Preliminary Progress Schedule and become Baseline Schedule. Subsequent revisions will be considered as Updated Progress Schedules.
- D. Format: In accordance with Article Progress Schedule— Critical Path Network.
- E. Update monthly to reflect actual progress and occurrences to date, including weather delays.

1.04 PROGRESS SCHEDULE—CRITICAL PATH NETWORK

- A. General: Comprehensive computer-generated schedule using CPM, generally as outlined in Associated General Contractors of America (AGC) 580, "Construction Project Planning and Scheduling Guidelines." If a conflict occurs between the AGC publication and this specification, this specification shall govern.
- B. Contents:
 - 1. Schedule shall begin with the date of Notice to Proceed and conclude with the date of Final Completion.
 - 2. Identify Work calendar basis using days as a unit of measure.
- 3. Show complete interdependence and sequence of construction and Project-related activities reasonably required to complete the Work.
- 4. Identify the Work of separate stages and other logically grouped activities, and clearly identify critical path of activities.
- 5. Reflect sequences of the Work, restraints, delivery windows, review times, Contract Times and Project Milestones set forth in the Agreement and Section 01 31 13, Project Coordination.
- 6. Include as applicable, at a minimum:
 - a. Obtaining permits, submittals for early product procurement, and long lead time items.
 - b. Mobilization and other preliminary activities.
 - c. Initial Site work.
 - d. Specified Work sequences, constraints, and Milestones, including Substantial Completion date(s) Subcontract Work.
 - e. Major equipment design, fabrication, factory testing, and delivery dates.
 - f. Delivery dates for Owner-furnished products, as specified in Section 01 11 00, Summary of Work.
 - g. Pipeline construction.
 - h. Road surfacing.
 - i. USFS Road 44 and Road 17 crossings.
 - j. Existing stream gage station and weir removal.
 - k. Brooks Meadow Creek Road Realignment and Culvert construction.
 - 1. Brooks Meadow Creek Pipeline Crossing.
 - m. Dog River Diversion screening and passage systems.
 - n. Concrete Work.
 - o. Architectural features Work.
 - p. Mechanical Work.
 - q. Instrumentation and control Work.
 - r. Other important Work for each major facility.
 - s. Equipment and system startup and test activities.
 - t. Site restoration.
 - u. Project closeout and cleanup.
 - v. Demobilization.
- 7. No activity duration, exclusive of those for Submittals review and product fabrication/delivery, shall be less than 1 day nor more than 14 days, unless otherwise approved.
- 8. Activity duration for Submittal review shall not be less than review time specified unless clearly identified and prior written acceptance has been obtained from Engineer.

- C. Network Graphical Display:
 - 1. Plot or print on paper not greater than 30 inches by 42 inches or smaller than 22 inches by 34 inches, unless otherwise approved.
 - 2. Title Block: Show name of Project, Owner, date submitted, revision or update number, and the name of the scheduler. Updated schedules shall indicate data date.
 - 3. Identify horizontally across top of schedule the time frame by year, month, and day.
 - 4. Identify each activity with a unique number and a brief description of the Work associated with that activity.
 - 5. Indicate the critical path.
 - 6. Show, at a minimum, the controlling relationships between activities.
 - 7. Plot activities on a time-scaled basis, with the length of each activity proportional to the current estimate of the duration.
 - 8. Plot activities on an early start basis unless otherwise requested by Engineer.
 - 9. Provide a legend to describe standard and special symbols used.
- D. Schedule Report:
 - 1. On 8-1/2-inch by 11-inch white paper, unless otherwise approved.
 - 2. List information for each activity in tabular format, including at a minimum:
 - a. Activity Identification Number.
 - b. Activity Description.
 - c. Original Duration.
 - d. Remaining Duration.
 - e. Early Start Date (Actual start on Updated Progress Schedules).
 - f. Early Finish Date (Actual finish on Updated Progress Schedules).
 - g. Late Start Date.
 - h. Late Finish Date.
 - i. Total Float.
 - 3. Sort reports, in ascending order, as listed below:
 - a. Activity number sequence with predecessor and successor activity.
 - b. Activity number sequence.
 - c. Early-start.
 - d. Total float.

1.05 PROGRESS OF THE WORK

- A. Updated Progress Schedule shall reflect:
 - 1. Progress of Work to within 5 working days prior to submission.
 - 2. Approved changes in Work scope and activities modified since submission.
 - 3. Delays in Submittals or resubmittals, deliveries, or Work.
 - 4. Adjusted or modified sequences of Work.
 - 5. Other identifiable changes.
 - 6. Revised projections of progress and completion.
 - 7. Report of changed logic.
- B. Produce detailed subschedules during Project, upon request of Owner or Engineer, to further define critical portions of the Work such as facility shutdowns.
- C. If an activity is not completed by its latest scheduled completion date and this failure is anticipated to extend Contract Times (or Milestones), submit, within 7 days of such failure, a written statement as to how nonperformance will be corrected to return Project to acceptable current Progress Schedule. Actions by Contractor to complete the Work within Contract Times (or Milestones) will not be justification for adjustment to Contract Price or Contract Times.
- D. Owner may order Contractor to increase plant, equipment, labor force, or working hours if Contractor fails to:
 - 1. Complete a Milestone activity by its completion date.
 - 2. Satisfactorily execute Work as necessary to prevent delay to overall completion of Project, at no additional cost to Owner.

1.06 NARRATIVE PROGRESS REPORT

- A. Format:
 - 1. Organize same as Progress Schedule.
 - 2. Identify, on a cover letter, reporting period, date submitted, and name of author of report.
- B. Contents:
 - 1. Number of days worked over the period, work force on hand, construction equipment on hand (including utility vehicles such as pickup trucks, maintenance vehicles, stake trucks).

- 2. General progress of Work, including a listing of activities started and completed over the reporting period, mobilization/demobilization of subcontractors, and major milestones achieved.
- 3. Contractor's plan for management of Site (for example, lay down and staging areas, construction traffic), use of construction equipment, buildup of trade labor, and identification of potential Contract changes.
- 4. Identification of new activities and sequences as a result of executed Contract changes.
- 5. Documentation of weather conditions over the reporting period, and any resulting impacts to the work.
- 6. Description of actual or potential delays, including related causes, and the steps taken or anticipated to mitigate their impact.
- 7. Changes to activity logic.
- 8. Changes to the critical path.
- 9. Identification of, and accompanying reason for, any activities added or deleted since the last report.
- 10. Steps taken to recover the schedule from Contractor-caused delays.

1.07 SCHEDULE ACCEPTANCE

- A. Engineer's acceptance will demonstrate agreement that:
 - 1. Proposed schedule is accepted with respect to:
 - a. Contract Times, including Final Completion and all intermediate Milestones, are within the specified times.
 - b. Specified Work sequences and constraints are shown as specified.
 - c. Specified Owner-furnished Equipment or Material arrival dates, or range of dates, are included.
 - d. Access restrictions are accurately reflected.
 - e. Startup and testing times are as specified.
 - f. Submittal review times are as specified.
 - g. Startup testing duration is as specified and timing is acceptable.
 - 2. In all other respects, Engineer's acceptance of Contractor's schedule indicates that, in Engineer's judgment, schedule represents reasonable plan for constructing Project in accordance with the Contract Documents. Engineer's review will not make any change in Contract requirements. Lack of comment on any aspect of schedule that is not in accordance with the Contract Documents will not thereby indicate acceptance of that change, unless Contractor has explicitly called the nonconformance to Engineer's attention in submittal. Schedule remains Contractor's responsibility and Contractor retains responsibility for performing all activities, for activity durations, and for activity sequences required to construct Project in accordance with the Contract Documents.

- B. Unacceptable Preliminary Progress Schedule:
 - 1. Make requested corrections; resubmit within 10 days.
 - 2. Until acceptable to Engineer as Baseline Progress Schedule, continue review and revision process, including updating schedule on a monthly basis to reflect actual progress and occurrences to date.
- C. Unacceptable Detailed Progress Schedule:
 - 1. Make requested corrections; resubmit within 10 days.
 - 2. Until acceptable to Engineer as Baseline Progress Schedule, continue review and revision process.
- D. Narrative Report: All changes to activity duration and sequences, including addition or deletion of activities subsequent to Engineer's acceptance of Baseline Progress Schedule, shall be delineated in Narrative Report current with proposed Updated Progress Schedule.

1.08 ADJUSTMENT OF CONTRACT TIMES

- A. Reference General Conditions and Section 01 26 00, Contract Modification Procedures.
- B. Evaluation and reconciliation of Adjustments of Contract Times shall be based on the Updated Progress Schedule at the time of proposed adjustment or claimed delay.
- C. Float:
 - 1. Float time is a Project resource available to both parties to meet contract Milestones and Contract Times.
 - 2. Use of float suppression techniques, such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited, and use of float time disclosed or implied by use of alternate float-suppression techniques shall be shared to proportionate benefit of Owner and Contractor.
 - 3. Pursuant to above float-sharing requirement, no time extensions will be granted nor delay damages paid until a delay occurs which (i) impacts Project's critical path, (ii) consumes available float or contingency time, and (iii) extends Work beyond contract completion date.

- D. Claims Based on Contract Times:
 - 1. Where Engineer has not yet rendered formal decision on Contractor's Claim for adjustment of Contract Times, and parties are unable to agree as to amount of adjustment to be reflected in Progress Schedule, reflect an interim adjustment in the Progress Schedule as acceptable to Engineer.
 - 2. It is understood and agreed that such interim acceptance will not be binding on either Contractor or Owner, and will be made only for the purpose of continuing to schedule Work until such time as formal decision has been rendered as to an adjustment, if any, of the Contract Times.
 - 3. Revise Progress Schedule prepared thereafter in accordance with Engineer's formal decision.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00 SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by Contractor that requires Engineer's approval.
- B. AIS Documentation: American Iron and Steel (AIS) documentation is verified information, certification or assurance of compliance contractual requirements of the American Iron and Steel requirements.
- C. Informational Submittal: Information submitted by Contractor that requires Engineer's review and determination that submitted information is in accordance with the Conditions of the Contract.

1.02 PROCEDURES

- A. Direct submittals to Engineer at the following, unless specified otherwise.
 - 1. Engineer (Jacobs): Submit via Project's electronic document management system software. See Section 01 31 13, Project Coordination, for description of this software and required use.
- B. Electronic Submittals: Submittals shall, unless specifically accepted, be made in electronic format.
 - 1. Each submittal shall be an electronic file in Adobe Acrobat Portable Document Format (PDF). Use the latest version available at time of execution of the Agreement.
 - 2. Electronic files that contain more than 10 pages in PDF format shall contain internal bookmarking from an index page to major sections of the document.
 - 3. PDF files shall be set to open "Bookmarks and Page" view.
 - 4. Add general information to each PDF file, including title, subject, author, and keywords.
 - 5. PDF files shall be set up to print legibly at 8.5-inch by 11-inch, 11-inch by 17-inch, or 22-inch by 34-inch. No other paper sizes will be accepted.
 - 6. Submit new electronic files for each resubmittal.
 - 7. Include a copy of the Transmittal of Contractor's Submittal form, located at end of section, with each electronic file.

- 8. Engineer will reject submittal that is not electronically submitted, unless specifically accepted.
- 9. Provide Engineer with authorization to reproduce and distribute each file as many times as necessary for Project documentation.
- 10. Detailed procedures for handling electronic submittals will be discussed at the preconstruction conference.
- C. Transmittal of Submittal:
 - 1. Contractor shall:
 - a. Review each submittal and check for compliance with Contract Documents.
 - b. Stamp each submittal with uniform approval stamp before submitting to Engineer.
 - Stamp to include Project name, submittal number, Specification number, Contractor's reviewer name, date of Contractor's approval, and statement certifying submittal has been reviewed, checked, and approved for compliance with Contract Documents.
 - 2) Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
 - 2. Complete, sign, and transmit with each submittal package, one Transmittal of Contractor's Submittal form attached at end of this section.
 - 3. Identify each submittal with the following:
 - a. Numbering and Tracking System:
 - 1) Sequentially number each submittal.
 - 2) Resubmission of submittal shall have original number with sequential alphabetic suffix.
 - b. Specification section and paragraph to which submittal applies.
 - c. Project title and Engineer's project number.
 - d. Date of transmittal.
 - e. Names of Contractor, Subcontractor or Supplier, and manufacturer as appropriate.
 - 4. Identify and describe each deviation or variation from Contract Documents.
- D. Format:
 - 1. Do not base Shop Drawings on reproductions of Contract Documents.
 - 2. Package submittal information by individual specification section. Do not combine different specification sections together in submittal package, unless otherwise directed in specification.

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- 3. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.
- 4. Index with labeled tab dividers in orderly manner.
- E. Timeliness: Schedule and submit in accordance Schedule of Submittals and requirements of individual specification sections.
- F. Processing Time:
 - 1. Time for review shall commence on Engineer's receipt of submittal.
 - 2. Engineer will act upon Contractor's submittal and transmit response to Contractor not later than 21 days after receipt, unless otherwise specified.
 - 3. Resubmittals will be subject to same review time.
 - 4. No adjustment of Contract Times or Price will be allowed as a result of delays in progress of Work caused by rejection and subsequent resubmittals.
- G. Resubmittals: Clearly identify each correction or change made.
- H. Incomplete Submittals:
 - 1. Engineer will return entire submittal for Contractor's revision if preliminary review deems it incomplete.
 - 2. When any of the following are missing, submittal will be deemed incomplete:
 - a. Contractor's review stamp; completed and signed.
 - b. Transmittal of Contractor's Submittal; completed and signed.
- I. Submittals not required by Contract Documents: Will not be reviewed and will be returned stamped "Not Subject to Review."

1.03 ACTION SUBMITTALS

- A. Prepare and submit Action Submittals required by individual specification sections.
- B. Shop Drawings:
 - 1. Copies: Electronic.
 - 2. Identify and Indicate:
 - a. Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.

- b. Equipment and Component Title: Identical to title shown on Drawings.
- c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
- d. Project-specific information drawn accurately to scale.
- 3. Manufacturer's standard schematic drawings and diagrams as follows:
 - a. Modify to delete information that is not applicable to the Work.
 - b. Supplement standard information to provide information specifically applicable to the Work.
- 4. Product Data: Provide as specified in individual specifications.
- 5. Foreign Manufacturers: When proposed, include names and addresses of at least two companies that maintain technical service representatives close to Project.
- C. Samples:
 - 1. Copies: Two, unless otherwise specified in individual specifications.
 - 2. Preparation:
 - a. Mount, display, or package Samples in manner specified to facilitate review of quality. Attach label on unexposed side that includes the following:
 - 1) Manufacturer name.
 - 2) Model number.
 - 3) Material.
 - 4) Sample source.
 - 3. Manufacturer's Color Chart: Units or sections of units showing full range of colors, textures, and patterns available.
 - 4. Full-size Samples:
 - a. Size as indicated in individual specification section.
 - b. Prepared from same materials to be used for the Work.
 - c. Cured and finished in manner specified.
 - d. Physically identical with product proposed for use.
- D. Action Submittal Dispositions:
 - 1. Engineer will review, comment, stamp, and distribute as noted:
 - a. Approved:
 - 1) Contractor may incorporate product(s) or implement Work covered by submittal.
 - 2) Distribution: Electronic.

- b. Approved as Noted:
 - Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.
 - 2) Distribution: Electronic.
- c. Partial Approval, Resubmit as Noted:
 - 1) Make corrections or obtain missing portions, and resubmit.
 - 2) Except for portions indicated, Contractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.
 - 3) Distribution: Electronic.
- d. Revise and Resubmit:
 - 1) Contractor may not incorporate product(s) or implement Work covered by submittal.
 - 2) Distribution: Electronic.

1.04 INFORMATIONAL SUBMITTALS

- A. General:
 - 1. Copies: Electronic.
 - 2. Refer to individual specification sections for specific submittal requirements.
 - 3. Engineer will review each submittal. If submittal meets conditions of the Contract, Engineer will forward copy to appropriate parties. If Engineer determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, Engineer will retain one copy and return remaining copy with review comments to Contractor, and require that submittal be corrected and resubmitted.
- B. Certificates:
 - 1. General:
 - a. Provide notarized statement that includes signature of entity responsible for preparing certification.
 - b. Signed by officer or other individual authorized to sign documents on behalf of that entity.
 - 2. Welding: In accordance with individual specification sections.
 - 3. Installer: Prepare written statements on manufacturer's letterhead certifying installer complies with requirements as specified in individual specification section.
 - 4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

- 5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual specification sections.
- 6. Manufacturer's Certificate of Compliance: In accordance with Section 01 61 00, Common Product Requirements.
- 7. Manufacturer's Certificate of Proper Installation: In accordance with Section 01 43 33, Manufacturers' Field Services.
- C. Construction Photographs and Video: In accordance with Section 01 31 13, Project Coordination, and as may otherwise be required in Contract Documents.
- D. Closeout Submittals: In accordance with Section 01 77 00, Closeout Procedures.
- E. Contractor-design Data (related to temporary construction):
 - 1. Written and graphic information.
 - 2. List of assumptions.
 - 3. List of performance and design criteria.
 - 4. Summary of loads or load diagram, if applicable.
 - 5. Calculations.
 - 6. List of applicable codes and regulations.
 - 7. Name and version of software.
 - 8. Information requested in individual specification section.
- F. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual specification section.
- G. Operation and Maintenance Data: As required in Section 01 78 23, Operation and Maintenance Data.
- H. Payment:
 - 1. Application for Payment: In accordance with Section 01 29 00, Payment Procedures.
 - 2. Schedule of Values: In accordance with Section 01 29 00, Payment Procedures.
 - 3. Schedule of Estimated Progress Payments: In accordance with Section 01 29 00, Payment Procedures.
- I. Quality Control Documentation: As required in Section 01 45 16.13, Contractor Quality Control.

- J. Schedules:
 - 1. Schedule of Submittals: Prepare separately or in combination with Progress Schedule as specified in Section 01 32 00, Construction Progress Documentation.
 - a. Show for each, at a minimum, the following:
 - 1) Specification section number.
 - 2) Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
 - 3) Estimated date of submission to Engineer, including reviewing and processing time.
 - b. On a monthly basis, submit updated Schedule of Submittals to Engineer if changes have occurred or resubmittals are required.
 - 2. Progress Schedules: In accordance with Section 01 32 00, Construction Progress Documentation.
- K. Special Guarantee: Supplier's written guarantee as required in individual specification sections.
- L. Statement of Qualification: Evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty Subcontractor, trade, Specialist, consultant, installer, and other professionals. Reference Paragraph 1.01.A.38.b of Supplementary Conditions for definition of Specialist.
- M. Submittals Required by Laws, Regulations, and Governing Agencies:
 - 1. Promptly submit promptly notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative.
 - 2. Transmit to Engineer for Owner's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.
- N. Test, Evaluation, and Inspection Reports:
 - 1. General: Shall contain signature of person responsible for test or report.
 - 2. Factory:
 - a. Identification of product and specification section, type of inspection or test with referenced standard or code.
 - b. Date of test, Project title and number, and name and signature of authorized person.
 - c. Test results.

- d. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
- e. Provide interpretation of test results, when requested by Engineer.
- f. Other items as identified in individual specification sections.
- 3. Field:
 - a. As a minimum, include the following:
 - 1) Project title and number.
 - 2) Date and time.
 - 3) Record of temperature and weather conditions.
 - 4) Identification of product and specification section.
 - 5) Type and location of test, Sample, or inspection, including referenced standard or code.
 - 6) Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
 - 7) If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
 - 8) Provide interpretation of test results, when requested by Engineer.
 - 9) Other items as identified in individual specification sections.
- O. Testing and Startup Data: In accordance with Section 01 91 14, Equipment Testing and Facility Startup.
- P. Training Data: In accordance with Section 01 43 33, Manufacturers' Field Services.

1.05 SUPPLEMENT

- A. The supplement listed below, following "End of Section," is part of this specification.
 - 1. Transmittal of Contractor's Submittal Form.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

Jacobs (ATTACH TO EACH SUBMITTAL)							
	DATE:						
TO:	Submittal No.:						
SUBMITTAL TYPE: Shop Drawing	Sample Informational						
☐ Deferred							

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

Contractor hereby certifies that (i) Contractor has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By:____

Contractor (Authorized Signature)

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SECTION 01 35 43 ENVIRONMENTAL PROCEDURES

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. This section specifies temporary environmental controls that the Contractor is required to maintain during construction.
- B. Comply with the requirements of permits and approvals listed in Section 01 41 26, Permit Requirements.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Association of Nurserymen (AAN): American Standards for Nursery Stock.
 - 2. U.S. Department of Agriculture (USDA): Urban Hydrology for Small Watersheds.
 - 3. U.S. Weather Bureau: Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years.

1.03 SUBMITTALS

- A. Informational Submittals:
 - 1. Contractor's Environmental Compliance Plan, including environmental training program, approach to meet permit terms and conditions, and schedule for addressing environmental elements.
 - 2. Submit an Environmental Progress Report the first of each month that includes current status of all environmental issues.
 - a. Provide timelines, key stakeholders, and resolution processes for unresolved and/or contentious issues.
 - b. Identify which construction element such as locations, work activities, weather conditions, and times of day that present the greatest risk to the environment.
 - c. Implement Best Management Practices to avoid and minimize risk.
 - d. Use the construction schedules to identify environmental management pertaining to upcoming work activities.

3. Inadvertent Discoveries Plan Inadvertent Discovery Plan (IDP) for human remains, items of cultural patrimony, and intact archaeological deposits.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

- 3.01 GENERAL
 - A. Maintain copies of all permits, approvals, records, logs, and reports at the Project Site.
 - B. Immediately notify the Engineer in the event that a natural resources regulatory agency representative plans, schedules, or conducts a visit to the Project Site.
 - C. Immediately notify the Owner or Engineer if the Project is in violation of an environmental regulation or permit condition that requires reporting to a regulatory agency.
 - D. In connection with the use or occupancy authorized by this USFS Special Use permit, comply with all applicable federal, state, and local environmental laws and regulations including, but not limited to, those established pursuant to the Resource Conservation and Recovery Act, as amended, 42 U.S.C.
 6901 et seq., the Federal Water Pollution Control Act, as amended, 42 U.S.C.
 6901 et seq., the Federal Water Pollution Control Act, as amended, 33 U.S.C.
 1251 et seq., the Oil Pollution Act, as amended, 33 U.S.C. 2701 et seq., the Clean Air Act, as amended, 42 U.S.C. 7401 et seq., CERCLA, as amended 42 U.S.C. 9601 et seq., the Foderal Insecticide, Fungicide, and Rodenticide Act, as amended, 7 U.S.C. 136 et seq., and the Safe Drinking Water Act, as amended 42 U.S.C. 300f et seq.

3.02 ENVIRONMENTAL COMPLIANCE MANAGER

- A. Provide an Environmental Compliance Manager with the following qualifications:
 - 1. At least 5 years of experience managing environmental design and construction compliance issues on projects. At least 3 years of those 5 years must be specific to linear pipeline projects.
 - 2. At least 2 years of experience managing permitting and environmental compliance issues in the Pacific Northwest region.

- 3. Knowledge of the environmental regulations and permits relevant to the Project.
- 4. Certified Erosion and Sediment Control Lead.
- 5. Authority and means to bring the Work into compliance and/or stop Work if the Project is in violation of an environmental regulation or permit condition.
- B. The Environmental Compliance Manager's duties shall include the following:
 - 1. Develop an overall project Environmental Compliance Plan that provides and discusses:
 - a. List of all identified project environmental commitments.
 - b. List of environmental bid items and associated required plans.
 - c. A monitoring process, responsible parties, key contacts, and timelines to address all identified environmental items.
 - d. A plan to address potential environmental issues that come up during the project.
 - e. An environmental compliance matrix that the Contractor uses to attest that permit commitments are fulfilled and to document completeness.
 - 2. Orient and train employees and subcontractors to the Project environmental issues prior to the start of construction, including:
 - a. Environmental regulations, permit conditions, and environmental specifications related to the Project.
 - b. Overall importance of environmental issues.
 - c. Specific environmental sensitivities of the Project.
 - d. Erosion and sediment control procedures and certification.
 - e. Environmental compliance monitoring and reporting procedures.
 - f. Management of known or suspected contamination.
 - g. Unanticipated historic or archaeological discoveries.
 - h. Emergency response procedures.
 - 3. Monitor project environmental commitments and issues and conformance to the Environmental Compliance Plan.
 - 4. Submit monthly Environmental Progress Reports.
 - 5. Coordinate the Project's environmental activities with Owner and Engineer.
 - 6. Attend Progress meetings, when invited, to represent environmental work.
 - 7. Organize, lead, and attend Project meetings specifically scheduled to discuss the environmental issues.
 - 8. Be present at the Project site during active construction.
 - 9. Maintain a 24-hour telephone number at which the Environmental Compliance Manager can be contacted.

3.03 TEMPORARY CONTROLS

- A. See Section 01 50 00, Temporary Facilities and Controls, for other environmental controls required for the following:
 - 1. Air pollution (dust) control.
 - 2. Noise control.
 - 3. Water pollution control.
- B. See Section 01 57 13, Temporary Erosion and Sediment Control, for temporary erosion and sediment controls.

3.04 ENDANGERED AND THREATENED SPECIES

- A. General:
 - Abide by the conservation measures (terms and conditions) of biological opinions under this Contract that have been provided by the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) under the federal Endangered Species Act (ESA) of 1973, 16 U.S.C. 1531 et seq., as amended. Take precautions necessary and prudent to protect endangered and threatened species and critical habitat, if present.
 - 2. Notify the Engineer of construction activities that might harm endangered and threatened species or their critical habitats.
 - 3. Confine construction activities to the Construction Limits shown on Drawings, unless approved by the Engineer.
 - 4. The location of sites within the permit area needing special measures for protection of plants or animals listed as threatened or endangered under the ESA, or within designated critical habitat are shown on a map in an Appendix to the USFS Special Use Permit and may be shown on the ground.
 - a. Take any protective and mitigation measures specified by the authorized USFS officer as necessary and appropriate to avoid or reduce effects on listed species or designated critical habitat affected by the authorized use and occupancy.
 - b. Discovery by the Contractor, Engineer, or the Forest Service of other sites within the permit area containing threatened or endangered species or designated critical habitat not shown on the map in the appendix to the USFS Special Use Permit shall be promptly reported to the other parties and shall be added to the map.

- 5. The location of sites within the permit area needing special measures for protection of plants or animals designated by the Regional Forester as sensitive species or as species of conservation concern pursuant to FSM 2670 are shown on a map in an appendix to this USFS Special Use Permit and may be shown on the ground.
 - a. Take any protective and mitigation measures specified by the authorized USFS officer as necessary and appropriate to avoid or reduce effects on sensitive species or species of conservation concern or their habitat affected by the authorized use and occupancy.
 - b. Discovery by the Contractor, Engineer, or the Forest Service of other sites within the permit area containing sensitive species or species of conservation concern or their habitat not shown on the map in the appendix to the USFS Special Use Permit shall be promptly reported to the other party and shall be added to the map.
- B. Notifications: If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the nearest Service Law Enforcement Office, located at 9025 S.W. Hillman Court, Suite 3134, Wilsonville, Oregon 97070; telephone: (503) 682-6131.

3.05 ARCHAEOLOGICAL AND HISTORICAL FINDS

- A. Under Oregon Revised Statute (ORS 358.905-955 & ORS 97.740) archaeological sites, objects and human remains are protected on both public and private land in Oregon. Supplement 1 to this section provides an Inadvertent Discovery Plan (IDP). Prior to beginning ground disturbing activities:
 - 1. Train construction crews on the contents and importance of the IDP for human remains, items of cultural patrimony, and intact archaeological deposits.
 - 2. Engineer's archeologist will flag archaeological site boundaries for avoidance. A map will be provided by USFS prior to implementation with buffered site boundaries labeled as "Sensitive Resource – Area to Protect." The Engineer's archeologist will consult with a USFS archaeologist on locations of equipment staging and access routes and any modifications in project location or design before any activities proceed.

- 3. Engineer's archaeologist will conduct on-site monitoring during project activities occurring in or adjacent to areas modeled as 'high probability' under the Mount Hood National Forest Cultural Resource Inventory Plan (Burtchard, Greg C. and Keeler, Robert W. Mt. Hood Cultural Resource Reevaluation Project. Laboratory of Archaeology and Anthropology, Portland State University, 1994).
- B. Archaeological or historical objects, such as ruins, sites, buildings, artifacts, bones, fossils, shell, stone tools, hearths, or other objects of antiquity that may have significance from a historical or scientific standpoint, which may be encountered by the Contractor, shall not be further disturbed. In accordance with 36 CFR 800 and Section 106 of the National Historic Preservation Act (1966), all known cultural and archaeological sites within the project planning area which are eligible or potentially eligible (unevaluated) for listing on the National Register of Historic Places (NRHP) will be protected throughout the life of the Project so that there are no adverse impacts caused by Project activities.
 - 1. The Contractor shall immediately notify the Engineer of any archaeological or historical finds, and enact the procedures required by the Inadvertent Discovery Plan under this Contract.
 - 2. The Contractor may be required to stop Work in the vicinity of the discovery until proper disposition is determined. The Engineer may require the Contractor to suspend Work in the vicinity of the discovery until salvage is accomplished.
 - 3. If the Engineer finds that the suspension of Work in the vicinity of the discovery increases or decreases the cost or time required for performance of any part of the Work under this Contract, the Engineer will make an adjustment in payment, or the time required for the performance of the Work in accordance with these specifications.
- C. Inadvertent Discovery of Human Skeletal Remains:
 - 1. If human skeletal remains are encountered, they shall not be further disturbed.
 - 2. Immediately notify the Engineer of any such finds, and enact the procedures required by the Inadvertent Discovery Plan under this Contract.
 - 3. Cease all Work adjacent to the discovery, in an area adequate to provide for the total security and protection of the integrity of the skeletal remains. The Engineer may require the Contractor to suspend Work in the vicinity of the discovery until final determinations are made and removal of the skeletal remains is completed.

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- 4. If the Engineer finds that the suspension of Work in the vicinity of the discovery increases or decreases the cost or time required for performance of any part of the Work under this Contract, the Engineer will make an adjustment in payment, or the time required for the performance of the Work in accordance with these specifications.
- 5. In accordance with 25 U.S.C. 3002(d) and 43 CFR 10.4, if human remains, funerary objects, sacred objects, or objects of cultural patrimony are inadvertently discovered on National Forest System lands, then immediately cease work in the area of the discovery and make a reasonable effort to protect and secure the items. Follow the applicable Native American Graves Protection and Repatriation Act (NAGPRA) protocols for the undertaking provided in the NAGPRA plan of action or the NAGPRA comprehensive agreement; if there are no such agreed-upon protocols, notify the authorized USFS officer of the discovery as soon as practicable and follow up with written confirmation of the discovery.
- D. Notifications:
 - Immediately notify the Engineer and authorized USFS officer of all antiquities or other objects of historic or scientific interest, including but not limited to historic or prehistoric ruins, fossils, or artifacts discovered in connection with the use and occupancy authorized by the USFS Special Use Permit. If any archaeological resources, artifacts, or human remains are encountered during construction. The Oregon State Historic Preservation Office (SHPO) must be contacted at (503) 986-0674. The USFS and Commission on Indian Services must also be contacted. Representatives of an affected Tribe will determine if the project could affect Tribal cultural or archeological resources.
 - a. Follow the applicable inadvertent discovery protocols for the undertaking provided in an agreement executed pursuant to Section 106 of the National Historic Preservation Act, 54 U.S.C. 306108; if there are no such agreed-upon protocols, leave these discoveries intact and in place until consultation has occurred, as informed, if applicable, by any programmatic agreement with tribes.
 - b. Engineer will coordinate preparation of a mitigation plan with USFS, if required, in consultation with SHPO and when appropriate, the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO), Tribal Historic Preservation Office (THPO).

- c. Protective and mitigation measures developed under this clause shall be the responsibility of the Contractor. However, the Contractor shall give the authorized USFS officer written notice before implementing these measures and shall coordinate with the authorized officer for proximate and contextual discoveries extending beyond the permit area.
- E. Payment: All costs to comply with this article and for the protection and repair specified in this article, unless otherwise stated, are incidental to the Contract and are the responsibility of the Contractor. The Contractor shall include all related costs in the lump sum Bid price of the Contract.

3.06 HAZARDOUS MATERIALS STORAGE

A. Hazardous materials shall not be stored at the Site without prior written approval from the authorized USFS officer. This approval shall not be unreasonably withheld. If the authorized officer provides approval, the USFS Special Use permit shall include, or in the case of approval provided after this permit is issued, shall be amended to include specific terms addressing the storage of hazardous materials, including the specific type of materials to be stored, the volume, the type of storage, and a spill plan. Such terms shall be proposed by the holder and are subject to approval by the authorized officer.

3.07 CLEANUP AND REMEDIATION

- A. Immediately notify all appropriate response authorities, including the National Response Center and the authorized officer or the authorized officer's designated representative, of an oil discharge or of the release of a hazardous material in the permit area in an amount greater than or equal to its reportable quantity, in accordance with 33 CFR Part 153, Subpart B, and 40 CFR Part 302. For the purposes of this requirement, "oil" is as defined by Section 311(a)(1) of the Clean Water Act, 33 U.S.C. 1321(a)(1). The holder shall immediately notify the authorized officer or the authorized officer's designated representative of any release or threatened release of any hazardous material in or near the permit area which may be harmful to public health or welfare or which may adversely affect natural resources on federal lands.
- B. Except with respect to any federally permitted release as that term is defined under Section 101(10) of CERCLA, 42 U.S.C. 9601(10), clean up or otherwise remediate any release, threat of release, or discharge of hazardous materials that occurs either in the permit area or in connection with the

Contractor's activities in the USFS Special Use Permit area, regardless of whether those activities are authorized under the permit.

- 1. Perform cleanup or remediation immediately upon discovery of the release, threat of release, or discharge of hazardous materials. Perform the cleanup or remediation to the satisfaction of the authorized USFS officer and at no expense to the United States.
- 2. Upon revocation or termination of this USFS Special Use Permit, deliver the site to the Forest Service free and clear of contamination.

3.08 PESTICIDE USE

- A. Pesticides shall not be used outside of buildings in the permit area to control pests, including undesirable woody and herbaceous vegetation (including aquatic plants), insects, birds, rodents, or fish without prior written concurrence of the authorized USFS officer. Only those products registered or otherwise authorized by the U.S. Environmental Protection Agency and appropriate State authority for the specific purpose planned shall be authorized for use within areas on National Forest System lands.
- B. Requests for concurrence of any planned uses of pesticides shall be provided in advance using the USFS Pesticide-Use Proposal (Form FS-2100-2). The Pesticide-Use Proposal shall be submitted at least 60 days in advance of pesticide application. Information essential for review shall be provided in the form specified. Exceptions to this schedule may be allowed, subject to emergency request and approval, only when unexpected outbreaks of pests require control measures which were not anticipated at the time a Pesticide-Use Proposal was submitted.
- C. Label instructions and all applicable laws and regulations shall be strictly followed in the application of pesticides and disposal of excess materials and containers. No pesticide waste, excess materials, or containers shall be disposed of in any area administered by the Forest Service.

3.09 CONSTRUCTION CORRIDOR

A. No removal of vegetation or heavy equipment operating or traversing outside the designated clearing limits is permitted.

3.10 BROOKS MEADOW CREEK CULVERT INSTALLATION

- A. Construction Area Isolation:
 - 1. Temporary Water Management and subsequent fish salvage and recovery are required prior to all in-water work activities (defined as all

work at or below the Ordinary High Water elevation) associated with the project, assuming the Work area is subject to surface flow.

- 2. Install block nets at up and downstream locations outside of the Work area to exclude fish from entering the Project area.
 - a. Leave nets secured to the stream channel bed and banks until construction activities within the stream channel are complete.
 - b. If block nets or traps remain in place more than one day, monitor the nets and or traps at least on a daily basis to ensure they are secured to the banks and free of organic accumulation and to minimize fish predation in the trap.
- 3. Heavy equipment shall work from top of stream bank and may not be positioned on or traverse areas below ordinary high water at any time. Existing Brooks Meadow Creek ford may not be used for construction traffic prior to construction of road re-alignment and new culvert.
- B. Fish Capture and Release:
 - 1. Pursuant to OAR 635-412-0035 (10e), prior to in-stream construction activities, all fish must be safely collected, removed from the Work area, or dewatered reach, and placed in the flowing stream by an authorized person in possession of a separate valid permit issued by ODFW. An Oregon Scientific Take Permit (OR-STP) from ODFW is required to conduct fish salvage in Oregon and other additional authorization may be needed from NMFS or USFWS if work is in ESA waters.
 - a. Contractor shall provide qualified staff to perform fish capture and release, including a Directing Biologist and Trained Staff.
 - 1) Qualifications for the Directing Biologist (Designated Lead Fish Moving Biologist):
 - a) Completion of a minimum of a 2-day electrofishing principals and safety class.
 - b) Training in fish ecology and identification.
 - c) 100 hours of electrofishing experience in the Pacific Northwest, at least 20 hours of which should have been in the last 5 years in the Pacific Northwest.
 - d) Possession of a current CPR certification.
 - e) Possession of a current first aid certification.
 - f) Demonstrated understanding of aquatic invasive species and the appropriate decontamination methods necessary to prevent introducing aquatic invasive species into the work area.
 - g) Demonstrated ability to interpret contract plan sheets/specification, contactor schedule and plans prepared by the contractor.

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- h) Fish handling and fish salvage methods will follow the National Marine Fisheries Service Guidelines for Electrofishing in Waters with Federally Listed Fish (NMFS 2000) guidelines.
 <u>https://media.fisheries.noaa.gov/dam-</u> migration/electro2000.pdf.
- i) Must develop and deliver on site field training for individuals assisting with fish moving.
- 2) Requirements for Trained Personnel:
 - a) Possess training, knowledge, skills, and ability to ensure safe handling of fish and to ensure the safety of staff conducting the operations.
 - b) Have a current first aid certification.
 - c) Training must be conducted on site by the Designated Lead Fish Moving Biologist prior to initiation of the fish moving and must cover the following:
 - (1) Review of site specific pre- activity safety plan.
 - (2) A site specific job site analysis and fish exclusion plan.
 - (3) A discussion of roles, responsibilities, permit requirements, and species expected.
 - (4) Review of electrofishing guidelines and equipment manufactures recommendations.
 - (5) Definitions of basic terminology (galvanotaxis, narcosis, and tetany) and an explanation of how electrofishing attracts fish.
 - (6) A demonstration and discussion of the proper use of electrofishing equipment (including an explanation of how gear can injure fish and how to recognize signs of injury) and the role of each crew member.
 - (7) A demonstration of proper fish handling including proper netting, sorting by size, keeping buckets cool, releasing small and large fish in different pools, not overcrowding buckets, avoiding sunscreens/insect repellants etc. on hands moving fish.
 - (8) A review of common mistakes.
 - (9) A discussion of the use of personal floatation devices.
 - (10) A discussion of aquatic invasive species and the decontamination methods necessary to prevent introducing aquatic invasives into the work area.

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- 2. Fish trapped within the isolated Work area will be captured and released as prudent to minimize the risk of injury, then released at a safe release site, preferably upstream of the isolated reach in a pool or other area that provides cover and flow refuge.
 - a. Collect fish in the best manner to minimize potential stranding and stress by seine or dip nets as the area is slowly dewatered, baited minnow traps placed overnight, or electrofishing (if other options are ineffective).
 - b. Fish must be handled with extreme care and kept in water the maximum extent possible during transfer procedures. A healthy environment for the stressed fish shall be provided—large buckets (5-gallon minimum to prevent overcrowding) and minimal handling of fish. Place large fish in buckets separate from smaller prey-sized fish.
 - c. Monitor water temperature in buckets and well-being of captured fish. If buckets are not being immediately transported, use aerators to maintain water quality. As rapidly as possible, but after fish have recovered, release fish. In cases where the stream is intermittent upstream, release fish in downstream areas and away from the influence of the construction.
 - d. Capture and release will be supervised by a USFS and/or ODFW fishery biologist experienced with work area isolation and safe handling of all fish.
- 3. Indirect mortality may not exceed 10 percent. Mortality rates are calculated as a percentage of total catch, not to exceed the number as described in the take tables in the authorization. In the event that mortality for any species exceeds this rate, contact ODFW ESA staff (Fish.Research@odfw.oregon.gov, (503) 947-6254 or (541) 464-2185) prior to any further activity.
- 4. Follow FDA approved protocols and use only FDA approved substances for anesthetizing fish.
 - a. MS-222 may not be used where fish may be subject to sport harvest fisheries within 21 days.
 - b. Clove oil may not be used at all.
 - AQUI-S® may be used as an alternative to MS-222. To use AQUI-S® 20E as an immediate release sedative in freshwater fish for field-based activities, applicant must sign up to participate in USFWS-AADAP INAD 11-741 and must comply with the requirements as set forth in the INAD Study Protocol for AQUI-S® 20E https://www.fws.gov/fisheries/aadap/inads/AQUI-S20E-INAD-11 -741.html.
 - d. Carbon dioxide can be used as a fish anesthetic as per FDA rules and requires no withdrawal time.

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- 5. Electrofishing: Use electrofishing only where other means of fish capture may not be feasible or effective. If electrofishing will be used to capture fish for salvage, National Marine Fisheries Services' *Guidelines for Electrofishing Waters Containing Salmonids listed under the Endangered Species Act* (available at: https://media.fisheries.noaa.gov/dam-migration/electro2000.pdf) shall be followed. Reasonable effort should be made to avoid handling fish in warm water temperatures, such as conducting fish evacuation first thing in the morning, when the water temperature would likely be coolest. No electrofishing should occur when water temperatures are above
 - 18 degrees C or are expected to rise above this temperature prior to concluding the fish capture.
- C. Construction Work Area Dewatering: Dewater Work area in accordance with Section 31 23 19.01, Dewatering and as shown on Drawings.
 - 1. When dewatering is necessary, divert flow around the construction site with a coffer dam (built with non-erodible materials), taking care to not dewater downstream channels during dewatering.
 - 2. Pass flow downstream with a by-pass pipe large enough to handle the diverted flow. Small amounts of instream material can be moved to help seal and secure diversion structures. If pumps are used to dewater, the intake must have a fish screen(s) and be operated in accordance with ODFW fish screen criteria.
 - 3. Dissipate flow energy at the bypass outflow to prevent damage to riparian vegetation or stream channel as shown on drawings. Pump seepage water from the de-watered work area to a temporary storage and treatment site or into upland areas and allow water to filter through vegetation prior to reentering the stream channel.
- D. Stream Rewatering: Upon project completion, slowly rewater the construction site to prevent loss of surface water downstream as the construction site streambed absorbs water and to prevent a sudden release of suspended sediment. Monitor downstream during rewatering to prevent stranding of aquatic organisms below the construction site.
- E. Volitional Passage: Safe volitional downstream passage of native migratory fish shall be maintained throughout and during implementation of the project. At any point along, into or through the project, where fish may be exposed to materials necessary to construct the project (concrete, steel, etc.), all potential sharp or abrasive edges and surfaces shall be made smooth as to preclude harm or physical injury to fish.

- F. Turbidity:
 - 1. Implement appropriate Best Management Practices (BMPs) to minimize turbidity during in-water work. Any activity that causes turbidity to exceed 10 percent above natural stream turbidity is prohibited except as specifically provided below:
 - a. Monitoring: Turbidity monitoring must be conducted and recorded as described below. Monitoring must occur at two hour intervals each day during daylight hours when in-water work is being conducted. A properly calibrated turbidimeter is required unless another monitoring method is proposed and authorized by DEQ.
 - 1) Representative Background Point: The Applicant must take and record a turbidity measurement every two hours during in-water work at an undisturbed area. A background location shall be established at a representative location approximately 100 feet upcurrent of the in water activity unless otherwise authorized by DEQ. The background turbidity, location, date, tidal stage (if applicable) and time must be recorded immediately prior to monitoring downcurrent at the compliance point described below.
 - 2) Compliance Point: The Applicant must monitor every two hours. A compliance location shall be established at a representative location approximately 100 feet downcurrent from the disturbance at approximately mid-depth of the waterbody and within any visible plume. The turbidity, location, date, tidal stage (if applicable) and time must be recorded for each measurement.
 - b. Compliance: The Applicant must compare turbidity monitoring results from the compliance points to the representative background levels taken during each 2 hour monitoring interval. Pursuant to OAR 340-041-0036, short term exceedances of the turbidity water quality standard are allowed as specified in the permit.
- G. Reporting: Record all turbidity monitoring required above in daily logs. The daily logs must include calibration documentation; background NTUs; compliance point NTUs; comparison of the points in NTUs; location; date; time; and tidal stage (if applicable) for each reading. Additionally, a narrative must be prepared discussing all exceedances with subsequent monitoring, actions taken, and the effectiveness of the actions. Applicant must make available copies of daily logs for turbidity monitoring to DEQ, USACE, NMFS, USFWS, and ODFW upon request.

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- H. BMPs to Minimize In-stream Turbidity:
 - 1. The Applicant must implement the following BMPs, unless otherwise accepted by DEQ:
 - a. Sequence/Phasing of Work: Schedule work activities so as to minimize in-water disturbance and duration of in-water disturbances.
 - b. Bucket Control: All in-stream digging passes by excavation machinery and placement of fill in-stream using a bucket must be completed so as to minimize turbidity. All practicable techniques such as employing an experienced equipment operator, not dumping partial or full buckets of material back into the wetted stream, adjusting the volume, speed, or both of the load, or using a closed-lipped environmental bucket must be implemented.
 - c. Limit the number and location of stream-crossing events. Establish temporary crossing sites as necessary in the least sensitive areas and amend these crossing sites with clean gravel or other temporary methods as appropriate.
 - d. Machinery may not be driven into the flowing channel, unless authorized by DEQ.
 - e. Excavated material must be placed so that it is isolated from the water edge or wetlands, and not placed where it could re-enter waters of the state uncontrolled.

3.11 OREGON DEQ 401 PERMIT REQUIREMENTS

- A. The 401 Water Quality Certification (WQC) applies to the Applicant. The Applicant is responsible for the work of its Contractors and Subcontractors, as well as any other entity that performs work related to this WQC.
- B. Work authorized by this 401 WQC is limited to the work described in the Application or Pre-Construction Notification submitted to the USACE and additional application materials (hereafter "the permit application materials"), unless otherwise authorized by DEQ. If the project is operated in a manner not consistent with the project description contained in the permit application materials, the Applicant is not in compliance with this 401 WQC and may be subject to enforcement.
- C. A copy of the 401 WQC must be kept on the job site and readily available for reference by Contractor, as well as by DEQ, USACE, National Marine Fisheries Service (NMFS), Oregon Department of Fish and Wildlife (ODFW), and other appropriate state and local government officials.

- D. In accordance with OAR 340-048-0050, DEQ may modify or revoke the 401 WQC if project activities are having an adverse impact on state water quality or beneficial uses, or if the Applicant (or its Contractor or Subcontractor) is otherwise in violation of the conditions of this certification.
- E. The Applicant and its contractors must allow DEQ access to the project site, staging areas, and mitigation sites to monitor compliance with these 401 WQC conditions, including:
 - 1. Access to any records, logs, and reports that must be kept under the conditions of the 401 WQC.
 - 2. To inspect best management practices (BMPs), monitoring or operational equipment or methods.
 - 3. To collect samples or monitor any discharge of pollutants.
- F. Failure of any person or entity to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce its terms.

3.12 OTHER REQUIREMENTS

- A. The following is a list of other specification sections with specific environmental requirements. This list covers other specifications with important environmental requirements; however, the Contractor is responsible for all environmental requirements contained in the Project specifications, including:
 - 1. Section 01 57 13, Temporary Erosion and Sediment Control.
 - 2. Section 02 41 00, Demolition.
 - 3. Section 31 10 00, Site Clearing.
 - 4. Section 31 23 16, Excavation.
 - 5. Section 31 23 19.01, Dewatering.
 - 6. Section 32 91 13, Soil Preparation.
 - 7. Section 32 92 00, Turf and Grasses.
 - 8. Section 32 93 00, Plants.

3.13 SUPPLEMENTS

- A. The supplements listed below, following "End of Section," are part of this specification.
 - 1. Inadvertent Discovery Plan.
 - 2. Tribal Position Paper on the Treatment of Human Remains.

END OF SECTION

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Inadvertent Discovery Plan

PLAN AND PROCEDURES FOR THE INADVERTENT DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS AT THE DOG RIVER PIPELINE REPALCEMENT PROJECT, HOOD RIVER COUNTY, OREGON

1.0 Introduction

City of the Dalles, proposes a pipeline replacement project on US Forest Service lands approximately 21 miles southwest of the City of The Dalles, in Hood River County, Oregon. This Inadvertent Discovery Plan outlines procedures to follow, in accordance with state and federal laws, if cultural resources or human remains are discovered during construction.

2.0 Recognizing Cultural Resources

A cultural resource is an item of historical, traditional, or cultural importance. The item could be prehistoric or historic. Examples are as follows:

- Bones that appear to be human or animal bones associated with a shell-midden (i.e., with associated artifacts or cooking features)
- An area of charcoal or very dark, stained soil with associated artifacts
- Artifacts made of chipped or ground stone (i.e., an arrowhead, adze, or metate) or an accumulation (more than one) of cryptocrystalline stone flakes (lithic debitage)
- Items made of botanical materials
- Clusters of tin cans or bottles, agricultural, or military equipment that appears to be older than 50 years

3.0 Onsite Responsibilities

<u>STEP 1: STOP WORK IMMEDIATELY</u>. If the contractor or subcontractor believes that he or she has uncovered any cultural resource during construction of the Project, all work adjacent to (within 100 feet) the discovery must stop. The discovery location should not be left unsecured at any time.

<u>STEP 2: NOTIFY CONSTRUCTION PROJECT MANAGEMENT IMMEDIATELY</u>. Contact the construction project manager or cultural resources specialist for the Dog River Pipeline Replacement Project, as listed below.

Construction Project Manager

Rick Duca, Jacobs Engineering Group Inc. Phone number to be provided at Preconstruction Meeting.

Cultural Resources Specialist

If the construction project manager cannot be reached, contact one of the designated Cultural Resources Specialists:

James Mayer, Ph.D., RPA Jacobs Cell: (541) 306-6947 james.mayer@Jacobs.com <u>STEP 3: NOTIFY THE STATE HISTORIC PRESERVATION OFFICE IMMEDIATELY</u>. The construction project manager or cultural resources specialist will contact the Oregon State Historic Preservation Office (SHPO) immediately.

Note: If human remains are encountered, treat them with dignity and respect at all times. Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection in place and to shield them from being photographed. Do not call 911 or speak with the media.

<u>STEP 4: PARTICIPATE IN CONSULTATION AND DOCUMENTATION</u>. The construction project manager will participate in consultations with Oregon SHPO and affiliated Tribes. After consultation, the construction project manager will complete a written plan of action describing the disposition of cultural resources pursuant to 43 *Code of Federal Regulations* (CFR) Part 10 and will execute his or her prescribed duties within that plan of action.

4.0 Further Contacts and Consultations

1.4.1 Construction Project Manager

The construction project manager's responsibilities are as follows:

- <u>Secure the Site</u>: The construction project manager is responsible for taking appropriate steps to
 protect and secure the discovery site. All work will stop in an area adequate to provide for the total
 security, protection, and integrity of the resource. Vehicles, equipment, and unauthorized personnel
 will not be permitted to traverse the discovery site. Work in the immediate area will not resume until
 treatment of the discovery has been completed following provisions for treating
 archaeological/cultural material in consultation with the affiliated Tribe(s).
- <u>Direct Construction Elsewhere Onsite</u>: The construction project manager will direct construction to resume away from cultural resources where appropriate and in communication with the affiliated Tribe(s).
- <u>Contact Project Cultural Resources Specialist</u>: If the cultural resources specialist has not yet been reached in earlier attempts, the construction project manager will do so.

1.4.2 Cultural Resources Specialist

The cultural resources specialist's responsibilities are as follows:

- <u>Notify Tribes</u>: If not already notified, the cultural resources specialist will notify the Tribe(s) of the discovery.
- <u>Identify Find</u>: The construction project manager will consult with the Tribes and will ensure that a qualified individual examines the find to determine if it is a cultural resource, as follows:
 - If it is determined to not be a cultural resource, work may proceed with no further delay.
 - If it is determined to be a cultural resource, the cultural resources specialist will send a certified letter to the Tribal Historic Preservation Offices, notifying them that a cultural resource has been discovered and requesting further consultation.
 - If the find may be human remains or funerary objects, the cultural resources specialist will follow the procedures described in Section 5.0.
- <u>Notify State Agencies</u>: The construction project manager will contact Oregon SHPO, and affiliated Tribes.
- <u>Formulate Plan</u>: The construction project manager, affiliated Tribes, and Oregon SHPO will consult to determine a plan for disposition of the cultural resources.

Any required excavation or removal of cultural resources will be carried out under the requirements of 43 CFR Part 10.3 and 16 *United States Code* 470 aa, and will require a permit from Oregon SHPO. The activity that resulted in the inadvertent discovery may resume thirty (30) days after certification of receipt of notification.

1.4.3 Oregon State Historic Preservation Office

Oregon State Archaeologist John Pouley e-mail: john.pouley@oregon.gov (503) 986-0675

1.4.4 Tribes

Confederated Tribes of the Umatilla Indian Reservation Ms. Carey L. Miller, Tribal Historic Preservation Officer <u>CareyMiller@ctuir.org</u> (541) 429-7234

Confederated Tribes of Warm Springs Robert Brunoe, Tribal Historic Preservation Officer <u>THPO@ctwsbnr.org</u> (541) 553-3555

Confederated Tribe of Siletz Indians Robert Kentta Cultural Resources Director RKentta@ctsi.nsn.us 541-444-8244

5.0 Special Procedures for the Discovery of Human Skeletal Material

Any human skeletal remains will at all times be treated with the utmost dignity and respect. The attached document titled *Tribal Position Paper on the Treatment of Human Remains* (Government to Government Cultural Resources Cluster Group, September 2006) describes the appropriate protocol on the treatment of Native American human remains.

STEP 1: STOP WORK. In the event that human remains are discovered, stop all work in the area and secure the site.

<u>STEP 2: NOTIFY APPROPRIATE PARTIES</u>. Notify the construction project manager, law enforcement, and the coroner, immediately. The coroner (with the assistance of law enforcement personnel) will determine if the remains are human and whether the discovery site constitutes a crime scene, and will notify Oregon SHPO and the Tribes.

• Deputy State Medical Examiner

James N. Olson, MD Oregon Department of State Police 4500 Rogue Valley Hwy. Suite A Central Point, OR 97502 (541) 779-6236 Ext 258 Hood River County Sheriff's Department

309 State St, Hood River, OR 97031 (541) 386-2098

<u>STEP 3: PROTECT THE REMAINS</u>. There shall be no photography or drawings and sketches made of the human remains or funerary objects found with the human remains without written permission signed by the affiliated Tribes. Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection in place and to shield them from being photographed. Remains should not be removed from the site prior to identifying the remains as Native American or not. If the remains are determined to be Native American, final disposition will be decided through consultation with the affiliated Tribes, Oregon SHPO, City of The Dalles, and United States Forest Service.

<u>STEP 4: CONSULTATION</u>. If the coroner determines the remains are nonforensic, and if it is determined that the remains constitute a cultural resource, the construction project manager or appointed representative will participate in consultation with the affiliated Tribes and Oregon SHPO. The construction project manager or appointed representative will complete a written plan of action describing the disposition of cultural resources pursuant to 43 CFR Part 10 and will execute its prescribed duties within that plan of action. If the remains are determined to be Native American, final disposition will be decided through consultation with the affiliated Tribes, Oregon SHPO, City of The Dalles, and United States Forest Service. If the medical examiner is not able to make a determination of Native American, a qualified forensic anthropologist from the State, Tribe, or contracted archaeological firm will need to be consulted for final determination.

6.0 Proceeding with Construction

Project construction outside the discovery location may continue while documentation and assessment of the cultural resources proceed. The construction project manager and a qualified archaeologist or Tribal representative must determine the boundaries of the discovery location. Construction may continue at the discovery location only after the process outlined in this plan is followed and Oregon SHPO (and the federal agencies, if any) determines that compliance with state and federal laws is complete.
Attachment Tribal Position Paper on the Treatment of Human Remains

<u>Treatment of Native American Human Remains Discovered Inadvertently or Through</u> <u>Criminal Investigations on Private and Non-Federal Public Lands in Oregon</u>

Native American burial sites are not simply artifacts of the tribe's cultural past, but are considered sacred and represent a continuing connection with their ancestors. Native American ancestral remains, funerary objects, sacred objects and objects of cultural patrimony associated with Oregon Tribes are protected under state law, including criminal penalties (ORS 97.740-.994 and 358.905-.961). The laws recognize and codify the Tribes' rights in the decision-making process regarding ancestral remains and associated objects. Therefore both the discovered ancestral remains and their associated objects should be treated in a sensitive and respectful manner by all parties involved.

Identification of Human Remains

- Oregon laws (ORS 146.090 & .095) outline the types of deaths that require investigation and the accompanying responsibilities for that investigation. The law enforcement official, district medical examiner, and the district attorney for the county where the death occurs are responsible for deaths requiring investigation. Deaths that require investigation include those occurring under suspicious or unknown circumstances.
- If human remains that are inadvertently discovered or discovered through criminal investigations are not clearly modern, then there is high probability that the remains are Native American and therefore ORS 97.745(4) applies, which requires immediate notification with State Police, State Historic Preservation Office, Commission on Indian Services, and all appropriate Native American Tribes. To determine who the "appropriate Native American Tribe" the responsible parties should contact the Legislative Commission on Indian Services (CIS). To determine whether the human remains are Native American the responsible parties should contact the appropriate Native American Tribes at the initial discovery. It should be noted that there may be more than one appropriate Native American Tribe to be contacted.
- If the human remains are possibly Native American then the area should be secured from further disturbance. The human remains and associated objects should not be disturbed, manipulated, or transported from the original location until a plan is developed in consultation with the above named parties. These actions will help ensure compliance with Oregon state law that prohibits any person willfully removing human remains and/or objects of cultural significance from its original location (ORS 97.745).
- All parties involved and the appropriate Native American Tribes shall implement a culturally sensitive plan for reburial.

Notification

- State law [ORS 97.745 (4)] requires that any discovered human remains suspected to be Native American shall be reported to-
 - 1. State Police (current contact Sgt. Chris Allori, Department of State Police, office phone 503-731-4717, cell 503-708-6461, or Dispatch 503-731-3030)
 - 2. State Historic Preservation Office (SHPO)

- Primary contact= Dennis Griffin, State Archaeologist, office phone 503-986-0674, cell phone 503-881-5038
- Secondary contact= John Pouley, Asst. State Archaeologist, office phone 503-986-0675, cell phone 503-480-9164.
- 3. Commission on Indian Services (CIS)
 - Current contact= Karen Quigley, Director, office phone 503-986-1067. Karen will provide the list of appropriate Native American Tribes.
- 4. All appropriate Native American Tribes provided by CIS.
 - <u>Burns Paiute Tribe</u>- Diane Teeman 541-417-1986
 - <u>Confederated Tribes of Coos, Lower Umpqua and Siuslaw</u>- Stacy Scott 541-888-9577 X7513
 - Confederated Tribes of Grand Ronde- Briece Edwards 503-879-2084
 - Confederated Tribes of Siletz- Robert Kentta 541-444-2532
 - <u>Confederated Tribes of the Umatilla Indian Reservation</u>- Teara Farrow 541-276-3629, secondary contact; Catherine Dickson 541-429-7231
 - Confederated Tribes of Warm Springs- Bobby Bruno 541-553-2002
 - Coquille Indian Tribe- Kassie Rippee 541-756-0904 X1216
 - <u>Cow Creek Band of Umpqua Indians</u>- Jessie Plueard 541-677-5575 X5577
 - <u>Klamath Tribes</u>- Perry Chocktoot 541-783-2219 X159

SECTION 01 41 26 PERMIT REQUIREMENTS

PART 1 GENERAL

1.01 DESCRIPTION

A. This section describes the Permits and Approvals applicable to the Contract.

1.02 PERMITS

- A. General:
 - 1. Contractor shall keep fully informed of all local ordinances, as well as state and federal laws, rules, and regulations, which in any manner affect the work herein specified.
 - 2. At all times comply with said ordinances, laws, and regulations, and protect and indemnify the Owner against any claim or liability arising from or based on the violation of such laws, ordinances, or regulations.
 - 3. Secure and pay for all permits and approvals, deferred submittal permits, permit modifications and reinitiations, licenses, and inspection fees necessary for progress and completion of the Work unless otherwise specified.
- B. Permits and Approvals Provided by the Owner:
 - 1. The Owner will provide and pay all fees for the following permits and approvals:
 - a. National Marine Fisheries Service (NMFS) Endangered Species Act (ESA) and Magnuson-Stevens Fishery Conservation and Management Act (MSA) Letter of Concurrence (#WCRO-2109-03698) (#WCRO-2019-03126).
 - b. USACE National Environmental Policy Act (NEPA) Record of Decision.
 - c. U.S. Army Corps of Engineers (USACE) Rivers and Harbors Act Section 10/Clean Water Act (CWA) Section 404 (Nationwide Permit #NWS-2017-25 verification).
 - d. USACE National Historic Preservation Act Section 106 Compliance (Case No. 17-1079).
 - e. US Fish and Wildlife Service (USFWS) Endangered Species Act (ESA) Biological Opinion (#01EOFW00-2017-F-0045 and 17-14).
 - f. U.S. Forest Service Roads Use Permit (to be assigned).
 - g. U.S. Forest Service Special Use Permit BAR166.

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- h. U.S. Forest Service Utilities Permit (to be assigned).
- i. Department of Environmental Quality (DEQ) CWA Section 401 Water Quality Certification (NWS-2017-25).
- j. Oregon Department of Environmental Quality (DEQ) 1200C (NWS-2017-25).
- k. Oregon Department of State Lands (DSL) Removal Fill Permit.
- 1. Oregon Department of Fish and Wildlife (ODFW) Fish Passage.
- m. Oregon Department of Fish and Wildlife (ODFW) Scientific Collection.
- n. Plans SWPPP NPDES Construction Stormwater Discharge Notice of Intent (#WAR309715).
- 2. Copies of permits and approvals obtained by the Owner are found in *Volume 3–Permits and Approvals* of the *Bidding Requirements and Contract Documents* for the City of The Dalles Dog River Pipeline Replacement Project.
- 3. The Owner may obtain additional permits or easements after the bid submittal date which may require changes to the work and could result in a change in the cost of, or the time required for, the performance of the Work. In the event of that occurrence, the Contractor shall submit information sufficient for the Engineer to determine the extent of any and all effect on the Contractor's cost and/or schedule. If the Engineer agrees the cost and/or schedule will be affected by such changes, such effects will be handled in accordance with provisions of the project General and Supplementary Conditions. The Engineer will provide the Contractor with a copy of any such permits or easements. The Contractor shall comply with all applicable terms and conditions contained in such permits or easements.
- C. Obtain all other permits not specifically listed in Paragraph Permits and Approvals Provided by the Owner above and required to do the Work and pay all costs thereof. Examples of permits and approvals that the Contractor may be required to obtain are: ODFW Fish Handling/Salvage.
- D. Comply with all conditions attached to applicable federal, state, and local permits as provided in *Volume 3–Permits and Approvals* of the *Bidding Requirements and Contract Documents* for the City of The Dalles Dog River Pipeline Replacement Project. Post permits and approvals at the site of work. Conduct performance monitoring required by Project permits and approvals, submit required monitoring reports to the applicable agency, maintain monitoring records on site, and provide the Engineer and regulatory agency representatives access to monitoring records upon request.
- E. Provide the Engineer with a copy of each permit or approval obtained by the Contractor.

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- F. Include permit application review and approval times in the Progress Schedule.
- G. Notify the Engineer if a regulatory agency representative makes contact or visits the Project site.
- H. Notify the Engineer immediately in the event of permit noncompliance or Contract nonconformance with Project permits and approvals.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 42 13 ABBREVIATIONS AND ACRONYMS

PART 1 GENERAL

1.01 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES

- A. Reference to standards and specifications of technical societies and reporting and resolving discrepancies associated therewith shall be as provided in Article 3 of the General Conditions, and as may otherwise be required herein and in the individual specification sections.
- B. Work specified by reference to published standard or specification of government agency, technical association, trade association, professional society or institute, testing agency, or other organization shall meet requirements or surpass minimum standards of quality for materials and workmanship established by designated standard or specification.
- C. Where so specified, products or workmanship shall also meet or exceed additional prescriptive or performance requirements included within Contract Documents to establish a higher or more stringent standard of quality than required by referenced standard.
- D. Where two or more standards are specified to establish quality, product and workmanship shall meet or exceed requirements of most stringent.
- E. Where both a standard and a brand name are specified for a product in Contract Documents, proprietary product named shall meet or exceed requirements of specified reference standard.
- F. Copies of standards and specifications of technical societies:
 - 1. Copies of applicable referenced standards have not been bound in these Contract Documents.
 - 2. Where copies of standards are needed by Contractor, obtain a copy or copies directly from publication source and maintain in an orderly manner at the Site as Work Site records, available to Contractor's personnel, Subcontractors, Owner, and Engineer.

1.02 ABBREVIATIONS

A. Abbreviations for trade organizations and government agencies: Following is a list of construction industry organizations and government agencies to which references may be made in the Contract Documents, with abbreviations used.

1.	AA	Aluminum Association
2.	AABC	Associated Air Balance Council
3.	AAMA	American Architectural Manufacturers
		Association
4.	AASHTO	American Association of State Highway and
		Transportation Officials
5.	ABMA	American Bearing Manufacturers' Association
6.	ACI	American Concrete Institute
7.	AEIC	Association of Edison Illuminating Companies
8.	AGA	American Gas Association
9.	AGMA	American Gear Manufacturers' Association
10.	AI	Asphalt Institute
11.	AIS	American Iron and Steel
12.	AISC	American Institute of Steel Construction
13.	AISI	American Iron and Steel Institute
14.	AITC	American Institute of Timber Construction
15.	ALS	American Lumber Standards
16.	AMCA	Air Movement and Control Association
17.	ANSI	American National Standards Institute
18.	APA	APA – The Engineered Wood Association
19.	API	American Petroleum Institute
20.	APWA	American Public Works Association
21.	AHRI	Air-Conditioning, Heating, and Refrigeration
		Institute
22.	ASA	Acoustical Society of America
23.	ASABE	American Society of Agricultural and
		Biological Engineers
24.	ASCE	American Society of Civil Engineers
25.	ASHRAE	American Society of Heating, Refrigerating and
		Air-Conditioning Engineers, Inc.
26.	ASME	American Society of Mechanical Engineers
27.	ASNT	American Society for Nondestructive Testing
28.	ASSE	American Society of Sanitary Engineering
29.	ASTM	ASTM International
30.	AWI	Architectural Woodwork Institute
31.	AWPA	American Wood Preservers' Association
32.	AWPI	American Wood Preservers' Institute
33.	AWS	American Welding Society

ABBREVIATIONS AND ACRONYMS 01 42 13 - 2

34.	AWWA	American Water Works Association
35.	BHMA	Builders Hardware Manufacturers' Association
36.	CBM	Certified Ballast Manufacturer
37.	CDA	Copper Development Association
38.	CGA	Compressed Gas Association
39.	CISPI	Cast Iron Soil Pipe Institute
40.	CLDI	Cement Lined Ductile Iron
41.	CMAA	Crane Manufacturers' Association of America
42.	CRSI	Concrete Reinforcing Steel Institute
43.	CS	Commercial Standard
44.	CSA	Canadian Standards Association
45.	CSI	Construction Specifications Institute
46.	DI	Ductile Iron
47.	DIPS	Ductile Iron Pipe Size
48.	DIN	Deutsches Institut für Normung e.V.
49.	DIPRA	Ductile Iron Pipe Research Association
50.	EIA	Electronic Industries Alliance
51.	EJCDC	Engineers Joint Contract Documents'
		Committee
52.	ESA	Endangered Species Act of 1973
53.	ETL	Electrical Test Laboratories
54.	FAA	Federal Aviation Administration
55.	FCC	Federal Communications Commission
56.	FDA	Food and Drug Administration
57.	FEMA	Federal Emergency Management Agency
58.	FIPS	Federal Information Processing Standards
59.	FM	FM Global
60.	Fed. Spec.	Federal Specifications (FAA Specifications)
61.	FS	Federal Specifications and Standards
		(Technical Specifications)
62.	GA	Gypsum Association
63.	GANA	Glass Association of North America
64.	HDPE	High Density Polyethylene
65.	HI	Hydraulic Institute
66.	HMI	Hoist Manufacturers' Institute
67.	IBC	International Building Code
68.	ICBO	International Conference of Building Officials
69.	ICC	International Code Council
70.	ICEA	Insulated Cable Engineers' Association
71.	IFC	International Fire Code
72.	IEEE	Institute of Electrical and Electronics Engineers,
73	IESNA	Inc. Illuminating Engineering Society of North
13.		America

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74.	IFI	Industrial Fasteners Institute
75.	IFPL	Industrial Fire Precaution Level
76.	IGMA	Insulating Glass Manufacturer's Alliance
77.	IMC	International Mechanical Code
78.	INDA	Association of the Nonwoven Fabrics Industry
79.	IPC	International Plumbing Code
80.	IPS	Iron Pipe Size
81.	ISA	International Society of Automation
82.	ISO	International Organization for Standardization
83.	ITL	Independent Testing Laboratory
84.	JIC	Joint Industry Conferences of Hydraulic
		Manufacturers
85.	MIA	Marble Institute of America
86.	MIL	Military Specifications
87.	MMA	Monorail Manufacturers' Association
88.	MSS	Manufacturer's Standardization Society
89.	NAAMM	National Association of Architectural Metal
		Manufacturers
90.	NACE	NACE International
91.	NBGQA	National Building Granite Quarries Association
92.	NEBB	National Environmental Balancing Bureau
93.	NEC	National Electrical Code
94.	NECA	National Electrical Contractor's Association
95.	NEMA	National Electrical Manufacturers' Association
96.	NESC	National Electrical Safety Code
97.	NETA	InterNational Electrical Testing Association
98.	NFPA	National Fire Protection Association
99.	NHLA	National Hardwood Lumber Association
100.	NICET	National Institute for Certification in
		Engineering Technologies
101.	NIST	National Institute of Standards and Technology
102.	NMFS	National Marine Fisheries Service
103.	NRCA	National Roofing Contractors Association
104.	NRTL	Nationally Recognized Testing Laboratories
105.	NSF	NSF International
106.	NSPE	National Society of Professional Engineers
107.	NTMA	National Terrazzo and Mosaic Association
108.	NWWDA	National Wood Window and Door Association
109.	ODEQ	Oregon Department of Environmental Quality
110.	ODFW	Oregon Department of Fish and Wildlife
111.	OSHA	Occupational Safety and Health Act (both
		Federal and State)
112.	PCI	Precast/Prestressed Concrete Institute
113.	PEI	Porcelain Enamel Institute

ABBREVIATIONS AND ACRONYMS 01 42 13 - 4

114.	PPI	Plastic Pipe Institute
115.	PS	Product Standards Section-U.S. Department of
		Commerce
116.	RMA	Rubber Manufacturers' Association
117.	RUS	Rural Utilities Service
118.	SAE	SAE International
119.	SDI	Steel Deck Institute
120.	SDI	Steel Door Institute
121.	SJI	Steel Joist Institute
122.	SMACNA	Sheet Metal and Air Conditioning Contractors
		National Association
123.	SPI	Society of the Plastics Industry
124.	SSPC	The Society for Protective Coatings
125.	STI/SPFA	Steel Tank Institute/Steel Plate Fabricators
		Association
126.	SWI	Steel Window Institute
127.	TEMA	Tubular Exchanger Manufacturers' Association
128.	TCA	Tile Council of North America
129.	TIA	Telecommunications Industry Association
130.	UBC	Uniform Building Code
131.	UFC	Uniform Fire Code
132.	UL	formerly Underwriters Laboratories Inc.
133.	UMC	Uniform Mechanical Code
134.	USACE	U.S. Army Corps of Engineers
135.	USBR	U.S. Bureau of Reclamation
136.	USFS	U.S. Forest Service
137.	USFWS	U.S. Fish and Wildlife Service
138.	WCLIB	West Coast Lumber Inspection Bureau
139.	WI	Wood Institute
140.	WWPA	Western Wood Products Association

- PART 2 PRODUCTS (NOT USED)
- PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 43 33 MANUFACTURERS' FIELD SERVICES

PART 1 GENERAL

1.01 DEFINITIONS

A. Person-Day: One person for 8 hours within regular Contractor working hours.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Training Schedule: Submit, in accordance with requirements of this Specification, not less than 21 days prior to start of equipment installation and revise as necessary for acceptance.
 - 2. Lesson Plan: Submit, in accordance with requirements of this Specification, proposed lesson plan not less than 21 days prior to scheduled training and revise as necessary for acceptance.

1.03 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

- A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified in the individual specification section.
- B. Representative subject to acceptance by Owner and Engineer. No substitute representatives will be allowed unless prior written approval by such has been given.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

- A. Furnish manufacturers' services, when required by an individual specification section, to meet the requirements of this section.
- B. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, time required to perform specified services shall be considered incidental.

- C. Schedule manufacturer' services to avoid conflict with other onsite testing or other manufacturers' onsite services.
- D. Determine, before scheduling services, that conditions necessary to allow successful testing have been met.
- E. Only those days of service approved by Engineer will be credited to fulfill specified minimum services.
- F. When specified in individual specification sections, manufacturer's onsite services shall include:
 - 1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of Contractor's assembly, erection, installation or application procedures.
 - 2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish Manufacturer's Certificate of Proper Installation.
 - 3. Providing, on a daily basis, copies of manufacturers' representatives field notes and data to Engineer.
 - 4. Revisiting the Site as required to correct problems and until installation and operation are acceptable to Engineer.
 - 5. Resolution of assembly or installation problems attributable to or associated with respective manufacturer's products and systems.
 - 6. Assistance during functional and performance testing, and facility startup and evaluation.
 - 7. Training of Owner's personnel in the operation and maintenance of respective product as required.

3.02 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

- A. When so specified, a Manufacturer's Certificate of Proper Installation form, a copy of which is attached to this section, shall be completed and signed by equipment manufacturer's representative.
- B. Such form shall certify signing party is a duly authorized representative of manufacturer, is empowered by manufacturer to inspect, approve, and operate their equipment and is authorized to make recommendations required to ensure equipment is complete and operational.

3.03 SUPPLEMENT

- A. The supplement listed below, following "End of Section," is part of this specification.
 - 1. Manufacturer's Certificate of Proper Installation.

END OF SECTION

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

OWNER	EOPT SERIAL NO:				
EOPT TAG NO:	EOPT/SYSTEM:				
PROJECT NO:	SPEC. SECTION:				
I hereby certify that the above-referenced equipment/system has been:					
(Check Applicable)					
Installed in accordance with Manufacturer's recommendations.					
Inspected, checked, and adjusted.					
Serviced with proper initial lubricants.					
Electrical and mechanical connections meet quality and safety standards.					
All applicable safety equipment has been properly installed.					
Functional tests.					
System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)					
Note: Attach any performance test docum	entation from manufacturer.				
Comments:					
I, the undersigned Manufacturer's Representation authorized representative of the manufacturer inspect, approve, and operate their equipment recommendations required to ensure equipment and operational, except as may be otherwise in information contained herein is true and accurate	tive, hereby certify that I am (i) a duly (ii) empowered by the manufacturer to and (iii) authorized to make ent furnished by the manufacturer is complete indicated herein. I further certify that all rate.				
Date:	_, 20				
Manufacturer:					

By Manufacturer's Authorized Representative:

(Authorized Signature)

SECTION 01 45 16.13 CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. D3740, Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - b. E329, Use in the Evaluation of Testing and Inspection Agencies as Used in Construction.

1.02 DEFINITIONS

A. Contractor Quality Control (CQC): The means by which Contractor ensures that the construction, to include that performed by subcontractors and suppliers, complies with the requirements of the Contract.

1.03 OWNER'S QUALITY ASSURANCE

- A. All Work is subject to Owner's quality assurance inspection and testing at all locations and at all reasonable times before acceptance to ensure strict compliance with the terms of the Contract Documents.
- B. Owner's quality assurance inspections and tests are for the sole benefit of Owner and do not:
 - 1. Relieve Contractor of responsibility for providing adequate quality control measures;
 - 2. Relieve Contractor of responsibility for damage to or loss of the material before acceptance;
 - 3. Constitute or imply acceptance; or
 - 4. Affect the continuing rights of Owner after acceptance of the completed Work.
- C. The presence or absence of a quality assurance inspector does not relieve Contractor from any Contract requirement.

- D. Promptly furnish all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by Engineer.
- E. Owner may charge Contractor for any additional cost of inspection or test when Work is not ready at the time specified by Contractor for inspection or test, or when prior rejection makes re-inspection or retest necessary. Quality assurance inspections and tests will be performed in a manner that will not unnecessarily delay the Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

- 3.01 GENERAL
 - A. Maintain an adequate inspection system and perform such inspections as will ensure that the Work conforms to the Contract Documents.
 - B. Maintain complete inspection records and make them available at all times to Owner and Engineer.
 - C. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the Contract Documents. The system shall cover all construction and demolition operations, both onsite and offsite, including Work by subcontractors, fabricators, suppliers and purchasing agents, and shall be keyed to the proposed construction sequence.

3.02 SUBMITTAL QUALITY CONTROL

A. Submittals shall be as specified in Section 01 33 00, Submittal Procedures. The Contractor shall be responsible for certifying that all submittals are in compliance with the Contract requirements. Owner will furnish copies of test report forms upon request by Contractor. Contractor may use other forms as approved.

3.03 TESTING QUALITY CONTROL

- A. Testing Procedure:
 - 1. Perform tests specified or required to verify that control measures are adequate to provide a product which conforms to Contract requirements. Procure services of a licensed testing laboratory. Perform the following activities and record the following data:
 - a. Verify testing procedures comply with contract requirements.
 - b. Verify facilities and testing equipment are available and comply with testing standards.
 - c. Check test instrument calibration data against certified standards.
 - d. Verify recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
 - e. Documentation:
 - 1) Record results of all tests taken, both passing and failing.
 - 2) Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test.
 - 3) Actual test reports may be submitted later, if approved by Engineer, with a reference to the test number and date taken.
 - 4) Provide directly to Engineer an information copy of tests performed by an offsite or commercial test facility. Test results shall be signed by an engineer registered in the state where the tests are performed.
 - 5) Failure to submit timely test reports, as stated, may result in nonpayment for related Work performed and disapproval of the test facility for this Contract.
- B. Testing Laboratories: Laboratory facilities, including personnel and equipment, utilized for testing soils, concrete, asphalt and steel shall meet criteria detailed in ASTM D3740 and ASTM E329, and be accredited by the American Association of Laboratory Accreditation (AALA), National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program (NVLAP), the American Association of State Highway and Transportation Officials (AASHTO), or other approved national accreditation authority. Personnel performing concrete testing shall be certified by the American Concrete Institute (ACI).

3.04 COMPLETION INSPECTION

- A. Contractor shall conduct an inspection of the Work at the completion of all Work or any milestone established by a completion time stated in the Contract.
- B. Punchlist:
 - 1. Contractor shall develop a punchlist of items which do not conform to the Contract requirements.
 - 2. Include punchlist indicating the estimated date by which the deficiencies will be corrected.
 - 3. Contractor shall make a second inspection to ascertain that all deficiencies have been corrected and so notify the Owner.
 - 4. These inspections and any deficiency corrections required will be accomplished within the time stated for completion of the entire Work or any particular increment thereof if the Project is divided into increments by separate completion dates.

END OF SECTION

SECTION 01 50 00 TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Association of Nurserymen (AAN): American Standards for Nursery Stock.
 - 2. Federal Emergency Management Agency (FEMA).
 - 3. National Fire Prevention Association (NFPA): 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 - 4. Telecommunications Industry Association (TIA); Electronic Industries Alliance (EIA): 568B, Commercial Building Telecommunications Cabling Standard.
 - 5. U.S. Department of Agriculture (USDA): Urban Hydrology for Small Watersheds.
 - U.S. Weather Bureau: Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years.

1.02 SUBMITTALS

A. Informational Submittals:

- 1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
- 2. Temporary Construction Submittals:
 - a. Access Roads: Routes, cross-sections, and drainage facilities.
 - b. Parking area plans.
 - c. Contractor's field office, storage yard, and storage building plans, including gravel surfaced area.
 - d. Fencing and protective barrier locations and details.
 - e. Engineer's field office plans.
 - f. Staging area location plan.
 - g. Traffic and Pedestrian Control and Routing Plans: As specified herein, and proposed revisions thereto.
 - h. Plan for maintenance of existing plant operations.
- 3. Temporary Control Submittals:
 - a. Noise control plan.
 - b. Dust control plan.
 - c. Plan for disposal of waste materials and intended haul routes.

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1.03 MOBILIZATION

- A. Mobilization includes, but is not limited to, these principal items:
 - 1. Obtaining required permits.
 - 2. Moving Contractor's field office and equipment required for first month operations onto Site.
 - 3. Installing temporary construction power, wiring, and lighting facilities.
 - 4. Providing onsite Internet service and telephones.
 - 5. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
 - 6. Arranging for and erection of Contractor's work and storage yard.
 - 7. Posting OSHA required notices and establishing safety programs and procedures.
 - 8. Posting other notices per State Revolving Fund requirements.
 - 9. Having Contractor's superintendent at Site full time.
 - 10. Providing Engineer's facilities.
- B. Use area designated for Contractor's temporary facilities as shown on Drawings.
- C. Progress payment for mobilization will not be approved. prior to installation of Engineer's Field Office, including internet service.

1.04 PROTECTION OF WORK AND PROPERTY

- A. Comply with Owner's safety rules while on Owner's property.
- B. Keep Owner informed of serious onsite accidents and related claims.
- C. Use of Explosives: No blasting or use of explosives will be allowed onsite.
- D. Contractor shall comply with all current Industrial Fire Precaution Levels (IFPL) requirements for the project area.
 - 1. Contractor to apply for a waiver as needed.
- E. Take reasonable measures to prevent and discourage vandalism and disorderly conduct and when necessary, contact the appropriate law enforcement officer.

1.05 VEHICULAR TRAFFIC

- A. Traffic Control Plan: Adhere to traffic control plan reviewed and accepted by Engineer. Changes to this plan shall be made only by written approval of the Engineer. Secure approvals for necessary changes so as not to delay progress of the Work.
 - 1. 4400-000 and 1700-000 Forest Service Roads need to maintain one 12-foot traffic lane at all times. Any full road closures need to be approved in writing, and may not last more than one working day.
- B. Traffic Routing Plan: Show sequences of construction affecting use of roadways, time required for each phase of the Work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and striping to provide passages for pedestrians and vehicles.
- C. Trail Crossings:
 - 1. Two Type 3 Barricades, in accordance with the MUTCD, shall be placed on both sides of the intersection between existing trails and construction access roads.
 - a. Provide advanced warning sign minimum 50 feet prior to barricade.
 - b. Barricades shall be placed at all trails crossing the work zone.
 - c. Barricades shall be placed on both sides of the trail crossing.
 - d. Barricades shall be placed 10 feet back, along the trail, from the work zone.
 - e. Barricades shall be staggered 10 feet apart and on opposite sides of the trail with 3 feet of overlap between barricades. Placement shall ensure bikers will need to slow down to get around barricades to cross the work zone.
 - f. LOOK BOTH WAYS Signs: Black on orange, 24 inches by 24 inches, shall be attached to one barricade on each side of the trail. Sign shall be placed so that it is visible to approaching pedestrians and bikes.
 - 2. TRAIL CROSSING AHEAD Sign: Black on orange, minimum 24 inches by 24 inches, to be placed 100 feet away from trail crossing, on each side.
 - 3. During nonwork hours, all trail crossings are to be fully and safely passable by pedestrians and bikes. Notify USFS representatives a minimum of 14 days prior to any planned trail closures.

4. Trail Crossing Plan: Contractor to submit a site specific traffic control plan when working in an area that is in direct conflict with a trail crossing. Include provisions (e.g., fencing/barricades) for prevention of pedestrian and bicycle traffic from entering active work zones. The plan shall include construction sequencing to minimize trail closures and reduce impacts during times of high trail usage.

1.06 DEMOBILIZATION

- A. Demobilization shall consist of:
 - 1. Work and operations necessary to disband all mobilized items and clean up the Site.
 - 2. Removal of all temporary ramps, access ways, signs, BMPs, fencing, and facilities.
 - 3. Restoration of all disturbed areas to an equal or better than existing condition shall also be included as part of demobilization. The following:
 - a. Removal of project related waste from the National Forest.
 - b. Spreading of nonvegetation stockpiled materials (soil, etc.).
 - c. Seeding or planting with weed-free local native seed mixes or plants.
 - d. Restoration of stream channel bed and banks.

PART 2 PRODUCTS

2.01 ENGINEER'S FIELD OFFICES

- A. Furnish equipment specified for exclusive use of Engineer and its' representatives.
- B. Ownership of equipment furnished under this article will remain, unless otherwise specified, that of Contractor.
- C. Equipment furnished shall be new or like new in appearance and function.
- D. Minimum Features:
 - 1. 110-volt lighting and wall plugs.
 - 2. Fluorescent or LED ceiling lights.
 - 3. Propane heating properly sized for Project locale and conditions. Provide ample electric power to operate installed systems.
 - 4. Provide railed stairways, and landings and exterior lighting at entrances.
 - 5. Sign on entrance door reading JACOBS, letter height 4-inch minimum, and City of The Dalles.

- 6. Exterior Door(s):
 - a. Number: One.
 - b. Type: Solid core.
 - c. Lock(s): Cylindrical.
- 7. Number of Windows: Two.
- 8. Minimum Interior Height: 8 feet.
- E. Floor Space: Minimum 225 square feet.
- F. Rooms: Two, with minimum private office floor space of 80 square feet, and remainder configured for open meeting or storage space.
- G. Plan table; plan rack; one double desk(s) with desk surface located 29 inches from floor; two 2-drawer, steel file cabinets; and overhead shelf(s).
- H. Office Equipment—General:
 - 1. Bottled Water Service: One.
 - 2. Paper Cup Dispenser with Cups: One.
 - 3. Paper Towel Dispenser with Towels: One.
 - 4. Desk Chair:
 - a. Two, with the following characteristics:
 - 1) Five castor base.
 - 2) Adjustable height.
 - 3) Swivels.
 - 4) Locking Back.
 - 5) Adjustable seat back for height and angle.
 - 6) Adjustable arms.
 - 5. Folding Table: One, 36 inches by 72 inches.
 - 6. Steel Folding Chairs: Four.
 - 7. Four-Drawer Steel File with Lock: One legal width.
 - 8. Drawing Rack with Drawing Hangers: One.
 - 9. Bookcase: Two, 36 inches wide by 48 inches high.
 - 10. Wastepaper Basket: Two.
 - 11. Blue Recycling Basket: Two.
 - 12. Clothes Rack: One.
 - 13. First-Aid Kit: One.
 - 14. Tri-Class (ABC), Dry Chemical Fire Extinguisher, 10-Pound: One.
- I. Computer Hardware:
 - 1. Power Supply Surge Protector: Two; rated at 15 amps minimum.

- 2. Uninterruptible Power Supply (UPS): APC Smart, sized for minimum 15-minute run time for computers.
- 3. Maintenance service agreements for all hardware for duration of Contract.

2.02 PROJECT SIGN

A. Refer to Division 00, Procurement and Contracting Requirements, for Drinking Water State Revolving Fund requirements for project signage. Owner will provide, a banner type sign from the Infrastructure Finance Authority (IFA) mounted, installed, and maintained on sign board provided by Contractor. Secure funding agency banner to sign board of matching size (8-foot-wide by 4-foot-high or smaller). Additionally, provide and maintain one, 8-foot-wide by 4-foot-high sign constructed of 3/4-inch exterior high density overlaid plywood mounted to 4-inch by 4-inch posts. Banner and sign may be mounted to same posts and shall face roadway. Sign shall bear name of Project, Owner, Contractor, Engineer, and other participating agencies. Lettering shall be blue applied on white background by an experienced sign painter. Provide exterior type enamel paint. Information to be included and logo graphic will be provided by Engineer. Locate project sign at location approved by Engineer.

2.03 PIPE CONNECTIONS

A. Conform to requirements in Section 01 57 28, Temporary Flow Control.

PART 3 EXECUTION

3.01 ENGINEER'S FIELD OFFICE

- A. Make available for Engineer's use prior to start of the Work at Site and to remain on Site for minimum of 5 days after final acceptance of the Work.
- B. Locate where directed by Engineer; level, block, tie down, skirt, provide stairways, and relocate when necessary and approved. Construct on proper foundations, and provide proper surface drainage and connections for utility services.
- C. Provide minimum 100 square feet of gravel or crushed rock base, minimum depth of 4 inches, at each entrance.
- D. Raise grade under field office, as necessary, to elevation adequate to avoid flooding.

- E. Provide sanitary facilities in compliance with state and local health authorities.
- F. Exterior Door Keys: Furnish two sets of keys.
- G. Local Area Network (LAN):
 - 1. Provide Ethernet network prewired in compliance with EIA/TIA 568B.
 - 2. Ethernet wireless hub shall be capable of a minimum of two connections.
 - 3. LAN shall be designed and installed by personnel experienced in similar LAN systems.
- H. Telecommunications:
 - 1. Provide satellite Internet connection with minimum of two live portable computer (PC) ports. Basis of Bid shall be service provided by HughesNet, Starlink, "or-equal."
 - 2. Provide appropriate jacks, wiring, and equipment required for a complete telecommunications system.
 - 3. Arrange and provide for telecommunication service for use during construction. Pay costs of installation, maintenance, and monthly service of internet connection.
- I. Maintain in good repair and appearance, and provide weekly cleaning service and replenishment, as required, of paper towels, paper cups, hand soap, toilet paper, first-aid kit supplies, and bottled water.

3.02 TEMPORARY UTILITIES

- A. Power:
 - 1. No electric power is available at Site. Make arrangements to provide and pay for "whisper quiet" engine generator capable of single phase, 120V, 30 amp minimum for Engineer's office facilities and pay for electrical power and fuel used until final payment and acceptance by Owner, unless otherwise recommended by Engineer at Substantial Completion. It is acceptable to power Engineer's trailer from common generator power system used by Contractor. If such system is unreliable as deemed solely be Engineer, within 5 days, Contractor shall provide stand-alone generator power system dedicated only to Engineer's office trailer use for duration of the Contract with no interconnection or use of such power by Contractor.

- 2. Cost of electric power will be borne by Contractor.
- 3. Provision of electrical power and internet service is not required during anticipated winter construction shutdown but shall be restored and provided continually upon resumption of construction following winter construction shutdown.
- B. Lighting: Provide temporary lighting to meet applicable safety requirements to allow erection, application, or installation of materials and equipment, and observation or inspection of the Work.
- C. Heating, Cooling, and Ventilating:
 - 1. Provide as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for installation of materials, and to protect materials, equipment, and finishes from damage because of temperature or humidity.
 - 2. Provide adequate forced air ventilation of enclosed areas to cure installed materials, to dispense humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
 - 3. Pay costs of installation, maintenance, operation, removal, and fuel consumed.
 - 4. Provide portable unit heaters, complete with controls, oil- or gas-fired, and suitably vented to outside as required for protection of health and property.
 - 5. If permanent natural gas piping is used for temporary heating units, do not modify, or reroute gas piping without approval of utility company. Provide separate gas metering as required by utility.
- D. Water:
 - 1. Owner will provide a location of temporary connection for construction water at Site. This is anticipated to be at diversion dam, and Adjacent to USFS Road 44 on Dog River Pipeline, and adjacent to USFS Road 17 on Dog River Pipeline. Provide temporary facilities and piping required to bring water to point of use and remove when no longer needed. Water for hydrostatic testing is expected to be obtained by Contractor from the Dog River Pipeline at the intake at the diversion dam or an approved temporary downstream connection.
 - 2. Provide and bear costs of necessary water required for testing equipment, tanks or basins, and piping prior to Substantial Completion, unless otherwise specifically stated in Specifications for equipment, systems, or facilities to be tested.

- E. Sanitary and Personnel Facilities: Provide and maintain facilities for Contractor's employees, Subcontractors, and other onsite employers' employees. Service, clean, and maintain facilities and enclosures.
- F. Telephone Service:
 - 1. Contractor: Arrange and provide onsite telephone service for use during construction. Provide VOIP telephone service in combination with satellite internet. Provide unlimited local and long distance calling plan. Cellular telephone coverage is understood to be nonexistent over most of Project Site. Provide satellite internet based telephone service at Contractor's construction trailer. Pay costs of installation and monthly bills.
 - 2. Engineer: Arrange and provide VOIP onsite telephone system for use during construction with a single dedicated phone line and number for Engineer's use. Provide unlimited local and long distance calling plan option for Engineer's use. Pay for installation and all billing charges. Basis of bid shall be RingCentral Standard Service, "or-equal."
- G. Fire Protection:
 - 1. Furnish and maintain on Site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of NFPA 241.
 - 2. Comply with USFS requirements for Industrial Fire Protection Level and all other USFS requirements.

3.03 PROTECTION OF WORK AND PROPERTY

- A. General:
 - 1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.
 - 2. Maintain existing fences and keep gates closed and secure.
 - 3. Maintain in continuous service existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and other utilities encountered along line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
 - 4. Where completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate activities with owner of said utility and perform work to their satisfaction.

- 5. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
- 6. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
- 7. In areas where Contractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Contractor.
- 8. Notify property owners and utility offices that may be affected by construction operation at least 2 days in advance. Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to Contractor's operation, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
- 9. Do not impair operation of existing sewer system. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures.
- 10. Maintain original Site drainage wherever possible.
- B. Site Security: Provide and maintain additional temporary security fences as necessary to protect the Work and Contractor-furnished products not yet installed.
- C. Barricades and Lights:
 - 1. Provide as required by the "Oregon Temporary Traffic Control Handbook" and in sufficient quantity to safeguard public and the Work.
 - 2. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of Contractor's employees, other employer's employees, and others who may be affected by the Work.
 - 3. Provide to protect existing facilities and adjacent properties from potential damage.
 - 4. Locate to enable access by facility operators and property owners.
 - 5. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
 - 6. Locate barricades at the nearest intersecting public thoroughfare on each side of blocked section.
 - 7. Illuminate barricades and obstructions with warning lights from sunset to sunrise.

- D. Signs and Equipment:
 - 1. Conform to requirements of manual published by the State of Oregon Department of Transportation.
 - 2. CONSTRUCTION AHEAD Signs: Contractor to provide and install two, size 48 inches by 48 inches. Place in conspicuous locations, approximately 1,500 feet in advance of the work entrance, and facing approaching traffic. During nonwork hours signs are to be covered or removed. All other work impacting the roadway shall require site specific traffic control drawings meeting the requirements of the MUTCD and the Oregon Temporary Traffic Control Handbook. (2016)
 - a. USFS 44:
 - 1) 1,500 feet in advance of USFS 4400-011 Road. (2 Signs Total.)
 - 1,500 feet in advance of USFS 1700-690 Road. (2 Signs Total.)
 - 3) 200 feet east of US 35 for northbound traffic. (1 Sign Total.)
 - 4) 200 feet east of the USFS 44 and USFS 17 intersection for westbound traffic.
 - b. USFS 17:
 - 1) 1,500 feet in advance of work entrance at access road leading to South Fork Mill Creek. (2 Signs Total.)
 - 2) 1,500 feet in advance of Staging Area 3. (2 Signs Total.)
 - c. USFS 172000-1720: 1,500 feet in advance of the USFS 172000-1720 and USFS 17 intersection for southbound traffic. (1 Sign Total.)
 - 3. CONSTRUCTION ENTRANCE AHEAD Signs: Contractor to provide and install two, size 48 inches by 48 inches. Place in conspicuous locations, approximately 500 feet in advance of the work entrance, and facing approaching traffic. During nonwork hours signs are to be covered or removed. All other work impacting the roadway shall require site specific traffic control drawings meeting the requirements of the MUTCD and the Oregon Temporary Traffic Control Handbook. (2016)
 - a. USFS 44:
 - 500 feet in advance of USFS 4400-011 Road. (2 Signs Total.)
 - 500 feet in advance of USFS 4400-011 Road. (2 Signs Total.)
 - b. USFS 17:
 - 500 feet in advance of USFS 4400-011 Road. (2 Signs Total.)
 - 2) 500 feet in advance of USFS 4400-011 Road. (2 Signs Total.)

- 4. Traffic signage on Dufur Valley Road half a mile from the Town of Dufur. Provide variable message sign:
 - a. Construction zone 20 miles ahead, possible delay.
- 5. ROAD CLOSED AHEAD Signs: Provide one, place at intersection of open road and road to be closed.
- 6. Use to alert general public of construction hazards, which would include surface irregularities, unramped walkways, grade changes, and trenches or excavations in roadways and in other public access areas.
- E. Trees and Plantings:
 - 1. Protect from damage and preserve trees, shrubs, and other plants outside limits of the Work and within limits of the Work, which are designated on Drawings to remain undisturbed.
 - a. Where practical, tunnel beneath trees when on or near line of trench.
 - b. Employ hand excavation as necessary to prevent tree injury.
 - c. Do not stockpile materials or permit traffic within drip lines of trees.
 - d. Provide and maintain temporary barricades around trees.
 - e. Water vegetation as necessary to maintain health.
 - f. Cover temporarily exposed roots with wet burlap, and keep burlap moist until soil is replaced around roots.
 - g. No trees, except those specifically shown on Drawings to be removed, shall be removed without written approval of Engineer.
 - h. Dispose of removed trees in a legal manner off the Site.
 - 2. Balling and burlapping of trees indicated for replacement shall conform to recommended specifications set forth in the American Standards for Nursery Stock, published by American Association of Nurserymen. Balls shall be firm and intact and made-balls will not be accepted. Handle ball and burlap trees by ball and not by top.
 - 3. In event of damage to bark, trunks, limbs, or roots of plants that are not designated for removal, treat damage by corrective pruning, bark tracing, application of a heavy coating of tree paint, and other accepted horticultural and tree surgery practices.
- F. Existing Structures:
 - 1. Where Contractor contemplates removal of small structures such as mailboxes, signposts, and culverts that interfere with Contractor's operations, obtain approval of property owner and Engineer.
 - 2. Move mailboxes to temporary locations accessible to postal service.
 - 3. Replace items removed in their original location and a condition equal to or better than original.
- G. Finished Construction: Protect finished floors and concrete floors exposed as well as those covered with composition tile or other applied surfacing.
- H. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.
- I. Dewatering: Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.

3.04 TEMPORARY CONTROLS

- A. Air Pollution Control:
 - 1. Minimize air pollution from construction operations.
 - 2. Burning: Of waste materials, rubbish, or other debris will not be permitted on or adjacent to Site.
 - 3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or periodically water to prevent dust. Strictly adhere to applicable environmental regulations for dust prevention.
 - 4. Provide and maintain temporary dust-tight partitions, bulkheads, or other protective devices during construction to permit normal operation of existing facilities. Construct partitions of plywood, insulating board, plastic sheets, or similar material. Construct partitions in such a manner that dust and dirt from demolition and cutting will not enter other parts of existing building or facilities. Remove temporary partitions as soon as need no longer exists.
- B. Water Pollution Control:
 - 1. Divert sanitary sewage and nonstorm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.
 - 2. Prior to commencing excavation and construction, obtain Engineer's agreement with detailed plans showing procedures intended to handle and dispose of groundwater, and dewatering pump discharges.
 - 3. Comply with Section 01 57 13, Temporary Erosion and Sediment Control, for stormwater flow and surface runoff.

- 4. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.
- C. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities as specified in Section 01 57 13, Temporary Erosion and Sediment Control, to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

3.05 STORAGE YARDS AND BUILDINGS

- A. Coordinate requirements with Section 01 61 00, Common Product Requirements.
- B. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.
- C. Temporary Storage Buildings:
 - 1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
 - 2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
 - 3. Store combustible materials (paints, solvents, fuels) in a well-ventilated and remote building meeting safety standards.
- D. Establish staging areas for storage of vehicles, equipment, and fuels to minimize erosion into or contamination of streams and floodplains.
- E. Staging areas shall be decompacted at completion of construction by soil ripping and decompaction techniques approved by the USFS, with the exceptions noted below and as shown on Drawings.
 - 1. Portions of Staging Area 1 to be left as a future trail head parking area as shown on Drawings.
 - 2. Staging Area 2 shall be left for future use by Dog River Diversion Fish Screening and Passage project Contractor in the 2023 construction season.
 - a. Remove all equipment and stockpiled materials at the end of the Work in 2022.
 - b. Stockpiles of rock materials salvaged from pipeline trench excavation for use in the Dog River Diversion Fish Screening and Passage may remain in Staging Area 2 as approved by Engineer.

- c. All spills of fuels, lubricants, and other hazardous materials (including contaminated gravel or subgrade soils) shall be removed and disposed off-site at Contractor's sole expense prior to demobilization in 2022.
- 3. Staging Area 2, and portions of Staging Area 1 to remain as gravel surface (as shown on Drawings) shall be left free from ruts, potholes, or erosion damage and shall be graded to prevent ponding of stormwater or snow melt. Any disturbed or exposed soils shall be stabilized in accordance with Section 01 57 13, Temporary Erosion and Sediment Control, prior to the end of the 2022 construction season.
- F. All staging areas shall be restored by hydroseeding following construction.

3.06 ACCESS ROADS AND DETOURS

- A. Construct access roads as shown and within rights-of-way, or Project limits. Use existing roads where shown. Alignments for new routes shall be approved by Engineer.
- B. Maintain drainage ways. Install and maintain culverts to allow water to flow beneath access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.
- C. Provide gravel, 3-inch minus crushed rock, or other stabilization material to permit access by all motor vehicles at all times and prevent rutting, sediment laden stormwater runoff and dust from construction traffic.
- D. Maintain road grade and crown to eliminate potholes, rutting, and other irregularities that restrict access.
- E. Coordinate with Engineer detours and other operations affecting traffic and access. Provide at least 72 hours' notice to Engineer of operations that will alter access to Site.
- F. Upon completion of construction, restore ground surface disturbed by access road construction to original grade. Replace damaged or broken culverts with new culvert pipe of same diameter and material.

3.07 PARKING AREAS

A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.

- B. Provide parking facilities for personnel working on Project.
- C. Staging areas and shoulders of existing roadways shall be used for parking of Contractor's and Contractor's employees' vehicles.

3.08 VEHICULAR TRAFFIC

- A. Comply with Laws and Regulations regarding closing or restricting use of public streets or highways. No public or private road shall be closed, except by written permission of proper authority. Ensure the least possible obstruction to traffic and normal commercial pursuits.
- B. Conduct the Work to interfere as little as possible with public travel, whether vehicular or pedestrian.
- C. Whenever it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.
- D. Road Closures: Maintain satisfactory means of exit for persons residing or having occasion to transact business along route of the Work. If it is necessary to close off roadway or alley providing sole vehicular access to property for periods greater than 2 hours, provide written notice to each owner so affected 3 days prior to such closure. In such cases, closings of up to 4 hours may be allowed. Closures of up to 10 hours may be allowed if a week's written notice is given and undue hardship does not result.
- E. Maintenance of traffic is not required if Contractor obtains written permission from Owner and tenant of private property, or from authority having jurisdiction over public property involved, to obstruct traffic at designated point.
- F. In making street crossings, do not block more than one-half the street at a time. Whenever possible, widen shoulder on opposite side to facilitate traffic flow. Provide temporary surfacing on shoulders as necessary.
- G. Maintain top of backfilled trenches before they are paved, to allow normal vehicular traffic to pass over. Provide temporary access driveways where required. Cleanup operations shall follow immediately behind backfilling.
- H. When flaggers and guards are required by regulation or when deemed necessary for safety, furnish them with approved orange wearing apparel and other regulation traffic control devices.

- I. Provide snow removal to facilitate normal vehicular traffic on public or private roads affected by construction. Perform snow removal promptly and efficiently by means of suitable equipment whenever necessary for safety, and as may be directed by proper authority.
- J. Notify fire department and police department before closing street or portion thereof. Notify said departments when streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without written permission from fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish Contractor's night emergency telephone numbers to police department.
- K. Temporary Bridges:
 - 1. No vehicular travel across or through Brooks Meadow Creek at Forest Service Road 1700014 is allowed, except by new culvert facilities, or if Contractor elects to provide a temporary bridge. Active trenching and construction of buried Dog River Pipeline is an exception to this requirement after stream bypass is in service, and all fish salvage has been completed.
 - 2. Temporary bridges shall be approved by USFS prior to installation.
 - 3. Construct temporary bridges at points where maintenance of traffic is necessary.
 - 4. Make bridges over public streets, roads, and highways acceptable to authority having jurisdiction thereover.
 - 5. Bridges erected over private roads and driveways shall be adequate for service to which they will be subjected.
 - 6. Provide substantial guardrails and suitably protected approaches.
 - 7. Maintain bridges in place as long as conditions of the Work require their use for safety of public, except that when necessary for proper prosecution of the Work in immediate vicinity of bridge. Bridge may be relocated or temporarily removed for such period as Engineer may permit.
- L. Detours: Where authority having jurisdiction requires that traffic be maintained over construction work in a public street, road, or highway, and traffic cannot be maintained on original roadbed or pavement, construct and maintain detour around the Work.
- M. Coordinate traffic routing with that of others working in same or adjacent areas.

3.09 CLEANING DURING CONSTRUCTION

- A. In accordance with General Conditions, as may be specified in other Specification sections, and as required herein.
- B. At least weekly, pick up and dispose of debris.
- C. Provide bear-resistant approved containers for collection and disposal of waste materials, debris, and rubbish. At least weekly, dispose of such waste materials, debris, and rubbish offsite.
- D. At least weekly, brush sweep paved roadways within the project limits, affected by the Work and where adjacent to the Work.

END OF SECTION

SECTION 01 57 13 TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SUMMARY

- A. This section covers Work to implement structural and nonstructural Best Management Practices (BMP) to control soil erosion by wind or water and keep eroded sediments and other construction-generated pollutants from moving off Project Sites. Requirements described in this specification and shown on Drawings are part of the Project Temporary Erosion and Sediment Control Plan (TESC Plan) and are the minimum for all project construction sites and conditions. This specification covers all project activities, including material sources, disposal sites, and offsite mitigation areas unless specific project activities are excluded elsewhere in this specification or in other Contract Documents controlling the Work.
- B. National Pollutant Discharge Elimination System: Comply with Federal, state, and local laws, rules and regulations, and the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Discharge Permit or Permits applicable to the Project. A copy of the Project's General Construction Permit, if applicable to the Project, is available from Owner. NPDES General Construction permits are required on projects that involve disturbance of 1 acre or more with potential to discharge stormwater to surface waters.
- C. Other Regulations: A local government erosion and sediment control permit may apply and some local agency requirements may be more stringent than this specification. Adequate erosion and sediment control is essential for complying with the federal Endangered Species Act where construction runoff enters waters inhabited by protected species.

1.02 REFERENCES

A. Activities shall conform to the Oregon DEQ Construction Stormwater Erosion and Sediment Control Manual, the Standard Specifications, the Project 1200-C NPDES General Permit, permits listed in this specification and in the Supplementary Conditions of the General Conditions and Contract Drawings. In the event of a conflict, the more stringent requirement shall apply.

- B. Additionally, activities and BMPs shall conform to the permits listed in Section 01 41 26, Permit Requirements. Project permit requirements shall be considered part of the Construction Documents. Contractor shall adhere to all Permit requirements for BMPs, where BMPs identified elsewhere in the Contract Documents are in conflict with the permit requirements the more conservative BMP requirement shall control. The Contractor shall comply with all permits and licenses, including but not limited to the permits listed in Section 01 41 26, Permit Requirements. Contractor to note that some permits will not be issued at the time of construction. Contractor to review permits for conformance once issued.
- C. The following is a list of standards that may be referenced in this section:
 - 1. American Association of State Highway and Transportation Officials (AASHTO): M252, Standard Specification for Corrugated Polyethylene Drainage Pipe.
 - 2. ASTM International (ASTM):
 - a. D638, Standard Test Method for Tensile Properties of Plastics.
 - b. D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
 - c. D3776/D3776M, Standard Test Methods for Mass Per Unit Area (Weight) of Fabric.
 - d. D4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
 - e. D4397, Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
 - f. D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - g. D4533, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
 - h. D4632/D4632M, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - i. D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 - j. D6241, Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.
 - k. D6459, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Hillslopes from Rainfall-Induced Erosion.
 - 1. D6460, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion.

- m. D6475, Standard Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets.
- n. D7322, Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Ability to Encourage Seed Germination and Plant Growth Under Bench-Scale Conditions.
- o. D7367, Standard Test Method for Determining Water Holding Capacity of Fiber Mulches for Hydraulic Planting.
- 3. National Weather Service:
 - a. Precipitation-Frequency of the United States by State/Territory, 2012.
 - b. Precipitation Frequency Data Server, 2012.
- 4. North American Weed Management Association (NAWMA).
- 5. Oregon Department of Environmental Quality:
 - a. Construction Stormwater Best Management Practices Manual, latest edition.
 - b. Construction Stormwater Erosion and Sediment Control Manual, latest edition.
- 6. Oregon Department of Transportation (ODOT): Hydraulics Manual (latest edition).
- 7. U.S. Department of Agriculture, Natural Resources Conservation Service: *Urban Hydrology for Small Watersheds*; 1986. Technical Release 55.
- 8. U.S. Environmental Protection Agency:
 - a. Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites, latest edition. EPA-833-R-06-004.
 - b. National Menu of BMPs, latest edition.

1.03 DEFINITIONS

A. Slash: Residual tree material, whole or part, including leaves, needles, bark, wood and root tissue, that is created as a result of a logging operation or clearing and grubbing.

1.04 SYSTEM DESCRIPTION

- A. Erosion and Sediment Control:
 - 1. Provide, maintain, and operate temporary facilities to control erosion and sediment releases during construction period.

- 2. Design erosion and sediment controls to handle peak runoff resulting from 25-year, 24-hour storm event based on rainfall data provided in the ODOT Hydraulics Manual, Chapter 7 Hydrology.
 - a. Install all erosion and sediment controls in accordance with the ODOT Erosion Control Manual and applicable manufacturer's instructions.
- 3. Size temporary stormwater conveyances based on procedures and data presented in the ODOT Hydraulics Manual, Chapter 7 Hydrology.
- B. Erosion and Sediment Control (ESC) Lead:
 - 1. Identify the ESC Lead at the preconstruction discussions and in the TESC Plan and submit written name, phone number, and address in TESC Plan.
 - 2. The ESC Lead shall have certification in construction site erosion and sediment control from a course approved by Owner and Engineer.
 - 3. The ESC Lead shall implement the TESC Plan including, but not limited to:
 - a. Installing and maintaining all temporary erosion and sediment control Best Management Practices (BMPs) included in the TESC Plan to assure continued performance of their intended function. Damaged or inadequate TESC BMPs shall be corrected immediately.
 - 1) Follow maintenance recommendations from the manufacturer and utilize appropriate, recognized and generally accepted engineering and professional practices based on site conditions. The registrant must document deviations from manufacturer recommendations in the inspection report.
 - b. Updating TESC Plan to reflect current field conditions. Record any stormwater controls installed (where none had previously been), repaired, replaced, or removed.
 - c. Terminating TESC Plan when final stabilization is complete, and construction is complete.
 - d. Responsibilities as required for inspection logs and requirements as stated in their certification.
 - e. Comply with any specific maintenance requirements for the stormwater controls implemented as required in this permit and in the ESCP. Regular maintenance is required and is not limited to response actions that result from inspections or identified problems.

- f. Before construction activities commence the permit registrant must identify and protect any:
 - 1) Riparian areas and vegetation including trees and associated root zones, and vegetation areas to be preserved.
 - 2) Vegetated buffer zones between the site and sensitive areas (e.g. wetlands, springs, groundwater seeps, etc.), and other areas required to be preserved, especially in perimeter areas.
 - 3) Post-construction stormwater facilities designed and engineered to infiltrate or filter stormwater.
- g. Sequence clearing, grading and other land disturbing actives to the maximum extent practicable to prevent exposed inactive areas from causing erosion.
- h. When a surface water of the state is located within 50 feet of the site's land disturbances:
 - 1) The registrant must comply with local natural buffer zone requirements before proposing the following compliance alternatives. For any discharges to surface waters of the state located within 50 feet of the site's land disturbances, the registrant must comply with one of the following alternatives:
 - a) Maintain a 50-foot undisturbed natural buffer zone.
 - b) Maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer (see Appendix B).
 - c) If infeasible to provide and maintain an undisturbed natural buffer zone of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer zone.
 - 2) If DEQ determines that the project requires a 401 water quality certification or impacts waters of the state, construction activities, including stockpiling and staging of materials, are prohibited from encroaching into the existing 50 foot natural buffer zone of any water of the state, unless otherwise authorized in the 401 water quality certification or any other applicable agency authorization; and the project may not claim the natural buffer zone alternatives of 2.2.4.a in the 1200-C Construction Stormwater General Permit.
 - If a registrant's project has the potential to discharge to a waterbody that is listed as impaired and requiring a Total Daily Maximum Load (TMDL) for turbidity or sedimentation on the most recently approved Oregon 303(d)

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list (found on the "Water Quality Assessment" page of DEQ's website), or has an established TMDL for turbidity or sedimentation, the registrant must maintain established vegetated buffers that are sized at 50 feet (horizontally) plus an additional 25 feet (horizontally) per five degrees of slope, or propose control measures of equal effectiveness to DEQ or Agent for approval (when the discharge enters an impaired watershed unit, the listing will only be applied if there is a hydrologic connection between the receiving water and assessment water body causing the impairment).

- 4) Sediment and erosion control measures installed for any natural buffer zone requirement must be maintained and disposed of appropriately before project completion. See Appendix B of the 1200-C Construction Stormwater General Permit for natural buffer zone guidance, additional conditions applicable to each compliance alternative, and for exceptions to the compliance alternatives. For permit registrants that received permit coverage prior to December 14, 2020, the approved natural buffer zone width and approved erosion and sediment controls are deemed appropriate.
- 4. When a TESC Plan is included in the Contract Plans, ESC Lead shall also inspect all areas disturbed by construction activities, all onsite erosion and sediment control BMPs, all stormwater discharge points, and all temporarily stabilized inactive sites per schedule in the Construction Stormwater Discharge Permit(s) or as directed by Engineer. Complete erosion and sediment control inspection form provided by water resource agency or Owner for each inspection and submit a copy to Engineer no later than end of the next working day following inspection.
- C. Personnel Training:
 - 1. Prior to commencement of construction, applicable personnel must have an understanding of the Construction Stormwater Discharge Permit's requirements and their specific responsibilities under the permit. At a minimum, personnel must be trained to understand the following as it relates to the scope of their job duties:
 - a. The location of all stormwater controls and how to maintain them.
 - b. Procedures for complying with the pollution prevention requirements.
 - c. Procedures for conducting inspections, recording findings, and taking corrective action.

- D. Temporary Erosion and Sediment Control Plan (Stormwater Pollution Prevention Plan):
 - 1. In addition to the 1200-C Permit, TESC Drawings are furnished as part of the Documents, which helps fulfill part of the TESC Plan requirement of the NPDES Permit. These initial TESC Drawings, are the minimum required, and may be used as part of the basis of the construction TESC Plan, developed by the Contractor. Additional or revised erosion and sediment control features, not shown on the initial TESC Drawings, may be required depending on Contractor's methods of operation and schedule.
 - 2. For each phase of the scheduled work, indicate in the TESC Plan all the BMPs proposed and installed for erosion and sediment control to minimize clearing, stabilize exposed soil, divert or temporarily store flows, limit runoff from exposed areas, and filter transported sediment. Include all temporary slopes, constructed for staging or other reasons, which may not have been identified in the original Contract plans. Refer to the current Oregon DEQ Construction Stormwater Erosion and Sediment Control Manual.
 - 3. Include the following BMPs for all construction waste:
 - a. Procedures based on best management practices to confine, remove, and dispose of construction waste, including every type of debris, discharge water, concrete, cement, grout, washout facility, welding slag, petroleum product, or other hazardous materials generated, used, or stored on-site.
 - b. Temporarily store any waste liquids generated at the staging areas under cover on an impervious surface, such as tarpaulins, until such time they can be properly transported to and treated at an approved facility for treatment of hazardous materials.
 - c. Procedures to contain and control a spill of any hazardous material generated, used or stored on-site, including notification of proper authorities. Ensure that materials for emergency erosion and hazardous materials control are onsite (e.g., silt fence, straw bales, oil-absorbing floating boom whenever surface water is present).
 - d. Best management practices to confine vegetation and soil disturbance to the minimum area, and minimum length of time, as necessary to complete the action, and otherwise prevent or minimize erosion associated with the action area.
 - 4. Some TESC Plan required elements typically required by NPDES permits:
 - a. Narrative Site Description:
 - 1) Nature of construction activity planned for the Site.

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- 2) Estimates of total site area and the areas of the Site expected to be disturbed.
- 3) Soil types found onsite and their erosion potential.
- 4) The types of fill materials to be used.
- 5) Timetable for sequence of major construction events.
- 6) List of BMPs planned for use during construction.
- b. Site Map:
 - 1) All areas of development.
 - 2) Drainage patterns.
 - 3) Areas of soil disturbance, including pre-development and post-development elevation contours.
 - 4) Areas used for storage of soils or wastes.
 - 5) Areas where vegetative practices are to be implemented.
 - 6) Location of all erosion and sediment control BMP or structures.
 - 7) Location of all impervious structures and surfaces after Project is completed.
 - 8) Springs, wetlands, and other surface waters located onsite.
 - 9) Boundaries of the 100-year floodplain, if determined.
 - 10) Ordinary High Water line, if determined.
 - 11) Location of storm drainage outfalls to receiving waters, if applicable.
 - 12) Details of sediment and erosion controls.
 - 13) Details of detention ponds, storm drain piping, inflow and outflow details.
- c. Required BMPs and Procedures for Erosion Prevention, Runoff Control, and Sediment Control:
 - 1) Construction entrances and parking areas.
 - 2) Unpaved site roads such as haul roads.
 - 3) Hauling saturated soils from the Site.
 - 4) Water washed from concrete trucks.
 - 5) Correct installation of erosion and sediment control BMPs.
 - 6) Prompt maintenance and repair of BMPs.
 - 7) Clearing and grading practices to minimize area of exposed soil throughout life of the Project.
 - 8) Schedule of phased clearing operations to limit soils to what can be stabilized.
 - 9) Vegetative practices, including preservation of existing vegetation, seeding, mulching, and buffer strips.
 - 10) Preventing erosion of exposed areas.
 - 11) Maintenance plan for seeding.
 - 12) Diverting flows from exposed slopes.
 - 13) Limiting runoff from exposed areas.

- 14) Limiting sediment transport within work sites and keeping it from moving off of Project areas.
- 15) Perimeter controls for all clearing and grubbing, both planned and installed.
- 16) Additional controls for wet season work and temporary work suspensions.
- 17) Sensitive areas such as wetlands.
- 18) Offsite material source and waste areas.
- 19) Dust.
- 20) Emergency materials stockpiled onsite.
- 21) Storing flows and filtering sediment.
- 22) Soil stockpiles.
- 5. Contractor's construction TESC Plan and implementation schedules must be prepared by a competent individual. Furnish a signed copy of the TESC Plan with individual's name, title, state certifications, and employing firm if different than Contractor's firm.
- 6. Do not begin any Site activities that have potential to cause erosion or sediment movement until the TESC Plan and implementation schedules are approved by Engineer.
- Keep a copy of the approved TESC Plan with updated changes onsite during all construction activities. During inactive periods longer than 7 calendar days, keep the TESC Plan onsite or provide a copy to Engineer to retain.
- 8. Continually update the TESC Plan and schedules as needed for unexpected storm or other events to ensure that sediment-laden water does not leave the construction site. Add approved changes to the TESC Plan no later than 24 hours after implementation.
- E. Avoid and protect from harm, all wetlands and riparian areas located within 50 feet of USACE jurisdictional waters, unless proposed, necessary, and approved as part of the Work. Install clearing limit fence outside of work limits and within clearing limits and along wetlands or other protected areas as noted on Drawings or as instructed by Engineer. Space posts and attach fence fabric to posts as shown on Drawings. Do not fasten fence to trees. Throughout the life of the Project, preserve and protect delineated area, acting immediately to repair or restore any fencing damaged or removed.
- F. Preventing erosion, and controlling runoff, sedimentation, and nonstormwater pollution, requires Contractor to perform temporary Work items including, but not limited to:
 - 1. Providing ditches, berms, culverts, and other measures to control surface water.

- 2. Building dams, settling basins, energy dissipaters, and other measures, to control downstream flows.
- 3. Controlling underground water found during construction.
- 4. Covering or otherwise protecting slopes until permanent erosion control measures are working.
- G. To the degree possible, coordinate this temporary Work with permanent drainage and erosion control work the Contract requires.
- H. Owner or Engineer may require additional temporary control measures if it appears pollution or erosion may result from weather, nature of materials, or progress on the Work.
- I. When natural elements rut or erode the slope, restore and repair damage with eroded material where possible, and remove and dispose of any remaining material found in ditches and culverts. When Engineer orders replacement with additional or other materials, unit Contract prices will cover quantities needed.
- J. Install all sediment control devices including, but not limited to, sediment ponds, perimeter silt fencing, or other sediment trapping BMPs prior to any ground disturbing activity. Do not expose more erodible earth than necessary during clearing, grubbing, excavation, borrow, or fill activities without written approval by Engineer. Engineer may increase or decrease the limits based on Project conditions. Erodible earth is defined as any surface where soils, grindings, or other materials may be capable of being displaced and transported by rain, wind, or surface water runoff. Cover inactive areas of erodible earth, whether at final grade or not, within specified time period (see 1200-C NPDES Erosion and Sediment Control Permit), using an approved soil covering practice. Phase clearing and grading to maximum extent practical to prevent exposed inactive areas from becoming a source of erosion.
- K. Water Management (see also Section 31 23 19.01, Dewatering):
 - 1. Manage site water in accordance with the conditions of the waste discharge permit from a local permitting authority. If site water management is not subject to permit, manage as follows:
 - a. Groundwater:
 - 1) When groundwater is encountered in an excavation, treat and discharge as follows:
 - a) When groundwater conforms to State of Oregon Water Quality Standards, it may bypass detention and treatment facilities and be routed directly to its normal

discharge point at a rate and method that will not cause erosion.

- b) When turbidity of groundwater is similar to turbidity of site runoff, groundwater may be treated using same detention and treatment facilities being used to treat the site runoff and then discharged at a rate that will not cause erosion.
- c) When groundwater turbidity is greater than turbidity of site runoff, treat ground water separately until turbidity is similar to or better than site runoff, and then it may be combined with site runoff and treated as described above.
- b. Process Water:
 - Do not discharge high pH process water or wastewater (nonstormwater) that is generated onsite, including water generated during concrete grinding, rubblizing, washout, and hydrodemolition activities, to adjacent water bodies including wetlands. Water may be infiltrated upon approval of Engineer. Offsite disposal of concrete process water is subject to approval of Engineer.
 - 2) Treat all water generated onsite from construction or washing activities that is more turbid than site runoff separately until turbidity is the same or less than site runoff, and then it may be combined with site runoff and treated as described above. Water may be infiltrated upon approval of Engineer.
- c. Offsite Water: Prior to disruption of normal watercourse, intercept offsite stormwater and pipe it either through or around the Project Site. This water shall not be combined with onsite stormwater. Discharge offsite water at its preconstruction outfall point preventing an increase in erosion below the site. Submit proposed method for performing this Work for Engineer's approval.
- L. Dispersion/Infiltration: Convey water only to dispersion or infiltration areas designated in the TESC Plan or to sites approved by Engineer. Water shall be conveyed to designated dispersion areas at a rate such that, when runoff leaves the area and enters adjacent water bodies turbidity standards are achieved. Convey water to designated infiltration areas at a rate that does not produce surface runoff.

- M. Detention/Retention Pond Construction: Whether permanent or temporary, construct before beginning other grading and excavation Work in the area that drains into that pond. Install temporary conveyances concurrently with grading in accordance with the TESC Plan so that newly graded areas drain to the pond as they are exposed.
- N. Pollution Control:
 - 1. Use BMPs to prevent or minimize stormwater exposure to pollutants from spills; vehicle and equipment fueling, maintenance, and storage; other cleaning and maintenance activities; fresh concrete and waste handling activities. These pollutants include all hazardous materials, chemicals, fuel, hydraulic fluid, and other oils from vehicles and machinery, as well as debris, leftover paints, solvents, and glues from construction operations. Implement the following BMPs:
 - a. List and describe all pollutants and hazardous material that would be used at the project site.
 - b. Procedures for inventory, storage, handling, and monitoring.
 - c. Written spill prevention, response, and notification procedures.
 - Project-related spills into waters of this state or onto land with a potential to enter waters of this state must be reported to the Oregon Emergency Response System (OERS) at (1-800) 452-0311.
 - 2) If the project operations result in distressed or dying fish, the operator must immediately: cease operations; take appropriate corrective measures to prevent further environmental damage; and immediately notify DEQ and ODFW.
 - d. Written clean-up and disposal instructions for specific products available on site.
 - e. Written methods for disposal of spilled material.
 - f. Employee training on spill prevention, containment, and proper disposal procedures.
 - g. Spill kits in all vehicles.
 - h. Regular maintenance schedule for vehicles and machinery.
 - i. Material delivery and storage controls.
 - j. Training and signage.
 - k. Covered storage areas for waste and supplies. Temporarily store any waste liquids generated at the staging areas under cover on an impervious surface, such as tarpaulins, until such time they can be properly transported to and treated at an approved facility for treatment of hazardous materials.

- 1. All equipment used for instream work will be cleaned for petroleum accumulations, dirt, plant material (to prevent the spread of noxious weeds), and leaks repaired prior to entering the project area. Such equipment includes large machinery, stationary power equipment (e.g., generators, canes, etc.), and gas-powered equipment with tanks larger than 5 gallons.
- m. Store and fuel equipment in staging areas after daily use. Machinery and equipment staging, cleaning, maintenance, refueling, and fuel storage must be at least 150 feet from ordinary high water level and wetlands to prevent contaminants from entering waters of the state. Refueling is to be confined to a designated area to prevent spillage into waters of the state.
- n. inspect equipment daily for fluid leaks before leaving the vehicle staging area for operation.
- o. Thoroughly clean equipment before operation below ordinary high water or within 50 feet of any natural water body or areas that drain directly to streams or wetlands and as often as necessary during operation to remain grease free.
- p. Separate hazardous or toxic waste from construction and domestic waste.
- q. Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are clearly labeled with their contents in accordance with all applicable federal, state, tribal, or local requirements.
- r. Store all outside containers within appropriately-sized secondary containment (e.g., spill berms, decks, spill containment pallets) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas (e.g., storing chemicals in a covered area, having a spill kit available on site).
- s. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, tribal, and local requirements.
- 2. No uncured concrete or form materials will be allowed to enter the active stream channel.
- O. If Owner or Engineer orders the Work suspended, continue to control erosion, pollution, and runoff during the shutdown.
- P. Choice of Equipment: Heavy equipment will be commensurate with the project and operated in a manner that minimizes adverse effects to the environment (e.g., minimally-sized, low pressure tires, minimal hard turn paths for tracked vehicles, temporary mats or plates within wet areas or sensitive soils).

- Q. Unless part of the authorized permanent fill, all construction access points through, and staging areas in, riparian and wetland areas must use removable pads or mats to prevent soil compaction. However, in some wetland areas under dry summer conditions, this requirement may be waived upon approval by Oregon Department of State Lands (DSL). At project completion, disturbed areas with soil exposed by construction activities must be stabilized by mulching and native vegetative plantings/seeding. Sterile grass may be used instead of native vegetation for temporary sediment control. If soils are to remain exposed more than 7 days after completion of the work, they must be covered with erosion control pads, mats or similar erosion control devices until vegetative stabilization is installed.
- R. Nothing in this section shall relieve Contractor from complying with other Contract requirements.

1.05 SUBMITTALS

- A. Informational Submittals:
 - 1. In addition to the approved 1200-C permit, when a TESC Plan is included on Drawings, either adopt or modify the TESC Plan. Provide a schedule for TESC Plan implementation and incorporate it into Contractor's progress schedule. Obtain Engineer's approval of the TESC Plan and schedule before any Work begins.
 - 2. Modified TESC Plans shall meet all requirements of the applicable jurisdictions.
 - a. The TESC Plan shall cover all areas that may be affected inside and outside the limits of the Project (including all Owner-provided sources, disposal sites, and haul roads, and all nearby land, streams, and other bodies of water).
 - b. Allow at least 5 working days for Engineer to review any original or revised TESC Plan. Failure to approve all or part of any such Plan shall not make Owner liable to Contractor for any Work delays.
 - 3. List of all BMPs contractor expects to use throughout the duration of the Project.
 - 4. Product data sheets for all erosion control best management practices to be used on site during construction.

PART 2 PRODUCTS

- 2.01 CHECK DAMS
 - A. Specified by Contractor with approval of Engineer.

2.02 EROSION CONTROL BLANKET (MATTING), BIODEGRADABLE

A. Temporary erosion control blanket shall be made of natural plant fibers. Supply independent test results meeting the following:

Properties	ASTM Test Method	Requirements	
Protecting Slopes from Rainfall-Induced Erosion	D6459: Test in one soil type. Soil tested shall be sandy loam as defined by the NRCS Soil Texture Triangle.	Maximum C factor of 0.15 using Revised Universal Soil Loss Equation (RUSLE)	
Dry Weight per Unit Area	D6475	0.36 lb/sq. yd. minimum	
Performance in Protecting Earthen Channels from Stormwater-Induced Erosion	D6460: Test in one soil type. Soil tested shall be loam as defined by the NRCS Soil Texture Triangle.	1.0 lb/sq. ft. minimum	
Seed Germination Enhancement	D7322	200 percent minimum	
Netting if present shall be biodegradable with a life span not to exceed 1 year			

2.03 PERMANENT EROSION CONTROL BLANKET

- A. Excelsior mat or straw blanket; staples as recommended by matting manufacturer.
- B. Manufacturers and Products:
 - 1. Akzo Industries, Asheville, NC; Curlex Mat.
 - 2. North American Green, Evansville, IN; S150 blanket.

2.04 GEOTEXTILE

A. Geotextiles shall consist only of long chain polymeric fibers or yarns formed into a stable network such that the fibers or yarns retain their position relative to each other during handling, placement, and design service life. At least 95 percent by weight of the material shall be polyolefins or polyesters. The material shall be free from defects or tears. Geotextile shall also be free of any treatment or coating which might adversely alter its hydraulic or physical

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

Table 1 Geotextile for Permanent Erosion Control							
			Geotextile Property Requirements				
			Permanent E	rosion Contro	ol		
C 4 41-	ASTM	Moderate S	Survivability	High Su	rvivability	Ditc	h Lining
Property	Method	Woven	Nonwoven	Woven	Nonwoven	Woven	Nonwoven
AOS	D4751	See 7	Table 2	See	Table 2	U.S. N	lo. 30 max.
Water Permittivity	D4491	See T	Table 2	See	Table 2	0.02	sec ⁻¹ min.
Grab Tensile Strength, in machine and x-machine direction	D4632/ D4632M	250 lb min.	160 1b min.	315 lb min.	200 lb min.	250 lb min.	160 lb min.
Grab Failure Strain, in machine and x-machine direction	D4632/ D4632M	15% -50%	≥50%	15% -50%	≥50%	<50%	≥50%
Seam Breaking Strength	D4632/ D4632M	220 lb min.	140 lb min.	270 lb min.	180 lb min.	220 lb min.	140 lb min.
Puncture Resistance	D6241	495 lb min.	310 lb min.	620 lb min.	430 lb min.	495 lb min.	310 lb min.
Tear Strength, in machine and x- machine direction	D4533	80 lb min.	50 lb min.	112 lb min.	79 lb min.	80 lb min.	50 lb min.
Ultraviolet (UV) Radiation Stability	D4355	,	70% strength re	tained min., af	iter 500 hours in 2	xenon arc de	vice

properties after installation. Geotextile properties shall be as specified in Section 31 32 19.16, Geotextile, or as described in Table 1 through Table 3.

Table 2 Filtration Properties for Geotextile for Permanent Erosion Control				
Contentile	Geotextile Property Requirements			
Property	Method	Class A	Class B	Class C
AOS	D4751	U.S. No. 40 max.	U.S. No. 60 max.	U.S. No. 70 max.
Water Permittivity	D4491	0.7 sec ⁻¹ min.	0.4 sec ⁻¹ min.	0.2 sec ⁻¹ min.

Table 3 Geotextile for Temporary Silt Fence			
		Geotextile Proper	ty Requirements
Geotextile Property	ASTM Test Method	Unsupported Between Posts	Supported Between Posts with Wire or Polymeric Mesh
AOS	D4751	U.S. No. 30 max. for silt for all other geotextile typ	wovens, U.S. No. 50 pes, U.S. No. 100 min.
Water Permittivity	D4491	0.2 sec ⁻¹ min.	
Grab Tensile Strength, in machine and x- machine direction	D4632/ D4632M	180 lb min. in machine direction, 100 lb min. in x-machine direction	100 lb min.
Grab Failure Strain, in machine and x-machine direction	D4632/ D4632M	30% max. at 180 lb or more	
Ultraviolet (UV) Radiation Stability	D4355	70% strength retained mi xenon arc device	n., after 500 hours in

2.05 CLEARING LIMIT FENCE

- A. High Visibility Fence: UV stabilized, orange, high-density polyethylene or polypropylene mesh.
- B. Height: 4 feet minimum.
- C. Support Posts: Wood or steel with sufficient strength and durability to support the fence through the life of the Project.

2.06 MULCH

A. All mulch will be USFS approved weed free.

B. Short-Term: Provide independent test results documenting that the mulch meets the requirements in Table 4, Short-Term Mulch Test Requirements.

Table 4 Short-Term Mulch Test Requirements				
Properties	Test Method	Requirements		
Performance in Protecting Slopes from Rainfall- Induced Erosion.	ASTM D6459. Test in one soil type. Soil tested shall be sandy loam as defined by the National Resources Conservation Service (NRCS) Soil Texture Triangle.	C Factor = 0.15 maximum using Revised Universal Soil Loss Equation (RUSLE)		

C. Moderate-Term: Within 48 hours of application, the Moderate-Term Mulch shall bond with soil surface to create a continuous, absorbent, flexible, erosion-resistant blanket that allows for seed germination and plant growth and conforms to the requirements in Table 5, Moderate-Term Mulch Test Requirements. Provide test results documenting that the mulch meets the requirements in Table 5, Moderate-Term Mulch Test Requirements in Table 5, Moderate-Term Mulch meets the requirements in Table 5, Moderate-Term Mulch Test Requirements. Supply independent test results.

Table 5 Moderate-Term Mulch Test Requirements				
Properties	Test Method	Requirements		
Performance in Protecting Slopes from Rainfall-Induced Erosion.	ASTM D6459. Test in one soil type. Soil tested shall be sandy loam as defined by the NRCS Soil Texture Triangle.	C Factor = 0.05 maximum using Revised Universal Soil Loss Equation (RUSLE)		

- D. Long-Term:
 - 1. Provide Long-Term Mulch with Demonstrated ability:
 - a. To adhere to soil and create a blanket-like mass within 2 hours of application.
 - b. To bond with the soil surface to create a continuous, porous, absorbent, and flexible erosion-resistant blanket that allows for seed germination and plant growth.
 - c. To conform to the requirements in Table 6, Long-Term Mulch Test Requirements.

d. Provide test results documenting that mulch meets requirements in Table 6, Long-Term Mulch Test Requirements. Supply independent test results.

Table 6 Long-Term Mulch Test Requirements			
Properties	Test Method	Requirements	
Performance in Protecting Slopes from Rainfall-Induced Erosion.	ASTM D6459. Test in one soil type. Soil tested shall be sandy loam as defined by the NRCS Soil Texture Triangle.	C Factor = 0.01 maximum using Revised Universal Soil Loss Equation (RUSLE)	

- E. Hydroseeding Mulch:
 - 1. Specially processed wood fiber containing no growth or germination inhibiting factors.
 - 2. Dyed suitable color to facilitate inspection of material placement.
 - 3. Manufactured such that after addition and agitation in slurry tanks with water, material fibers become uniformly suspended to form homogenous slurry.
 - 4. When hydraulically sprayed on ground, material will allow absorption and percolation of moisture.

2.07 PLASTIC COVERING

A. Clear plastic meeting requirements of ASTM D4397 for polyethylene sheeting having a minimum thickness of 6 mils.

2.08 SEEDING

A. See Section 32 92 00, Turf and Grasses.

2.09 SEDIMENT FENCE

- A. Geotextile: As specified in Article Geotextile.
- B. Reinforcing: Welded wire fabric, 14-gauge minimum with 2-inch by 4-inch mesh.
- C. Support Posts: As recommended by manufacturer of geotextile.
- D. Fasteners: Heavy-duty wire staples at least 1-inch long, tie wires, or hog rings, as recommended by manufacturer of geotextile.

2.10 STABILIZED CONSTRUCTION ENTRANCE

- A. Construct temporary stabilized construction entrance in accordance with Drawings, prior to beginning any clearing, grubbing, earthwork, or excavation. When stabilized entrance no longer prevents track out of sediment or debris, either rehabilitate existing entrance to original condition or construct a new entrance.
- B. Provide aggregate free of extraneous materials that may cause or contribute to track out.
- C. Place separation geotextile under the rock to prevent fine sediment from pumping up into the rock pad. See Article Geotextile for required geotextile properties.
- D. Use of constructed or constructed/manufactured steel plates with ribs (such as, shaker/rumble plates or corrugated steel plates) for entrance/exit access is allowable.

2.11 STRAW BALES

- A. All straw bales will be USFS approved weed free.
- B. Straw:
 - 1. Air dried condition free of noxious weeds, seeds, and other materials detrimental to plant life. Hay is not acceptable. Provide weed-free documentation:
 - a. Certified Weed Free Straw using North American Weed Management Association (NAWMA) standards.
 - b. Provide documentation that material is steam or heat treated to kill seeds.
 - c. Provide U.S. or state's Department of Agriculture laboratory test reports, dated within 90 days prior to date of application, showing there are no viable seeds in the straw.
- C. Straw Mulch: Suitable for spreading with mulch blower equipment.
- D. Posts for Straw Bales: 2-inch by 2-inch untreated wood or commercially manufactured metal posts.

2.12 TACKIFIERS

- A. Biodegradable Hydraulically Applied Erosion Control Products (HECPs) in a dry condition, free of noxious weeds, seeds, chemical printing ink, germination inhibitors, herbicide residue, chlorine bleach, rock, metal, plastic, and other materials detrimental to plant life. Up to 5 percent by weight may be photodegradable material.
- B. Suitable for spreading with a hydroseeder.
- C. Furnish HECPs premixed by the manufacturer. Under no circumstances will field mixing of additives or components be acceptable.
- D. Provide test results, dated within 3 years prior to the date of application, from an independent, accredited laboratory, as approved by Engineer, showing that the product meets the HECP requirements in Table 7.

Table 7 HECP Requirements				
Properties	Test Method	Requirem	ents	
Acute Toxicity	EPA-821-R-02-012 Methods for Measuring Acute Toxicity of Effluents. Test leachate from recommended application rate receiving 2 inches of rainfall per hour using static test for No-Observed-Adverse- Effect-Concentration (NOEC).	Four replicates are requestatistically significant survival in 100 percent Daphnid at 48 hours ar Oncorhynchus mykiss at 96 hours.	uired with no reduction in leachate for a ad (rainbow trout)	
Solvents	EPA 8260B	Benzene:	< 0.03 mg/kg	
		Methylene chloride:	< 0.02 mg/kg	
		Naphthalene:	< 5 mg/kg	
		Tetrachloreoethylene:	< 0.05 mg/kg	
		Toluene:	< 7 mg/kg	
		Trichloroethylene:	< 0.03 mg/kg	
		Xylenes:	< 9 mg/kg	

Table 7 HECP Requirements				
Properties	Test Method	Requir	ements	
Heavy Metals	EPA 6020A Total Metals	Antimony:	< 4 mg/kg	
		Arsenic:	< 6 mg/kg	
		Barium:	< 80 mg/kg	
I		Boron:	< 100 mg/kg	
I		Cadmium:	< 2 mg/kg	
I		Chromium:	< 2 mg/kg	
		Copper:	< 5 mg/kg	
		Lead:	< 5 mg/kg	
		Mercury:	< 2 mg/kg	
		Nickel:	< 2 mg/kg	
		Selenium:	< 10 mg/kg	
		Strontium:	< 30 mg/kg	
		Zinc:	< 5 mg/kg	
Water Holding Capacity	ASTM D7367	900 percent minim	um	
Organic Matter Content	ASTM D2974	90 percent minimu	m	
Moisture Content	ASTM D2974	15 percent		
Seed Germination	ASTM D7322	Long-Term: 420 pe	ercent minimum	
Enhancement		Moderate-Term: 40 minimum	00 percent	
		Short-Term: 200 pe	ercent minimum	

2.13 WATTLES

- A. All wattles will be USFS approved weed free.
- B. Cylinders of biodegradable plant material such as weed-free straw, coir, compost, wood chips, excelsior, or wood fiber or shavings encased within biodegradable netting.
- C. Diameter: 5 inches minimum.

- D. Netting Material: Clean, evenly woven, and free of encrusted concrete or other contaminating materials, such as preservatives. Also free from cuts, tears, or weak places with a minimum lifespan of 6 months. Netting must be biodegradable.
- E. Compost Filler: Coarse compost, wood chips, or wood shavings.
- F. Wood Stakes: Untreated softwood species, 2-inch by 2-inch nominal dimension and 36 inches in length.

PART 3 EXECUTION

3.01 PREPARATION

- A. Engineer's acceptance of the TESC Plan is required prior to starting earth disturbing activities.
- B. Include proposed stockpile areas and installation of temporary erosion control devices, ditches, or other facilities in Work phasing plans.
 - 1. Place sediment barriers prior to construction around Sites where significant levels of erosion may enter the streams directly or through road ditches. Temporary erosion controls will be in place before any significant alteration of the site and will be removed once the site has been stabilized following construction activities.
- C. Areas designated for Contractor's use during Project may be temporarily developed as specified to provide working, staging, and administrative areas. Include control of sediment from these areas in the TESC Plan.
- D. Check Dams: Install check dams as soon as construction will allow, or when designated by Engineer. Contractor may substitute a different check dam, in lieu of what is specified in the Contract, with approval of Engineer. Check dam is a temporary or permanent structure, built across a minor channel. Water shall not flow through check dam structure. Construct check dams to create a ponding area upstream of dam to allow pollutants to settle, with water from increased flows channeled over a spillway in check dam. Construct check dams perpendicular to flow of water and install in accordance with Drawings. Extend outer edges up sides of conveyance to prevent water from going around check dam. Provide check dams of sufficient height to maximize detention, without causing water to leave ditch. Place sandbags so that initial row makes tight contact with ditch line for length of dam. Stagger subsequent rows so center of bag is placed over space between bags on previous lift.

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- E. Erosion Control Blanket (Matting), Biodegradable: Temporary Erosion Control Blankets are used as an erosion prevention device and to enhance establishment of vegetation. Install erosion control blankets according to manufacturer's recommendations.
 - 1. Erosion control blankets with an open area of 60 percent or greater may be installed prior to seeding and fertilizing. Install blankets with less than 60 percent open space immediately following seeding and fertilizing operation.
 - 2. Select erosion control blanket material for an area based on the intended function; slope or ditch stabilization and Site-specific factors including soil, slope gradient, rainfall, and flow exposure. Do not use erosion Control Blankets on slopes or in ditches that exceed manufacturer's recommendations.
 - 3. For permanent erosion control blanket, place on seeded slopes 3H:1V and steeper, staple/stake in place and with the appropriate overlap in accordance with manufacturer's instruction.
- F. Clearing Limit Fence: Install fencing in accordance with Drawings.
- G. Mulch: Furnish, haul, and evenly apply at rates indicated and spread on seeded areas within 48 hours after seeding unless otherwise specified.
 - 1. Distribute straw mulch material with an approved mulch spreader that uses forced air to blow mulch material on seeded areas.
 - 2. Apply wood strand mulch by hand or by straw blower on seeded areas.
 - 3. Hydraulically apply Short-Term Mulch at the rate of 2,500 pounds per acre. May be applied in one lift.
 - 4. Hydraulically apply Moderate-Term Mulch and Long-Term Mulch at the rate of 3,500 pounds per acre with no more than 2,000 pounds applied in any single lift. Mulch may be applied with seed and fertilizer in moist climates. In dry climates, apply seed and fertilizer in a single application followed by mulch application. Provide mulch suitable for application with a hydroseeder.
 - 5. Cover temporary seed applied outside application windows established in Section 32 92 00, Turf and Grasses, with a mulch containing either Moderate-Term Mulch or Long-Term Mulch, as designated by Engineer.
 - 6. Mulch areas not accessible by mulching equipment by approved hand methods.
- H. Plastic Covering: Use clear plastic covering to promote seed germination when seeding is performed outside of specified dates. Use black plastic covering for stockpiles or other areas where vegetative growth is unwanted.

Place plastic with at least a 12-inch overlap of all seams. Install and maintain plastic cover tolon prevent water from cutting under the plastic and to prevent cover from blowing open in the wind.

- I. Polyacrylamide (PAM): See Tackifiers.
- J. Seeding: See Section 32 92 00, Turf and Grasses.
- K. Sediment Fence:
 - 1. Silt fence shall be installed in accordance with Drawings. When backup support is used, use steel wire with a maximum mesh spacing of 2 inches by 4 inches, or plastic mesh as resistant to ultraviolet radiation as the geotextile it supports. Provide wire or plastic mesh with strength equivalent to or greater than as required for unsupported geotextile (for example, 180 pounds grab tensile strength in the machine direction).
 - 2. Attach geotextile to posts and support system using staples, wire, or in accordance with manufacturer's recommendations. Geotextile shall be sewn together at the point of manufacture, or at a location approved by Engineer, to form geotextile lengths as required.
 - 3. Provide wood or steel support posts at sewn seams and overlaps and as shown on Drawings and necessary to support fence.
 - 4. Wood Posts: Minimum dimensions of 1-1/4-inch by 1-1/4-inch by the minimum length shown on Drawings.
 - 5. Steel Posts: Minimum weight of 0.90 lb/ft.
 - 6. When sediment deposits reach approximately one-third the height of the silt fence, remove and stabilize deposits.
- L. Tackifiers:
 - 1. Mix and apply tackifier in accordance with manufacturer's recommendations. If applied with a hydroseeder, add Short-Term Mulch as a tracer at a rate of 125 pounds to 250 pounds per acre to visibly aid uniform application.
 - 2. Soil Binding Using Polyacrylamide (PAM): Apply PAM on bare soil completely dissolved and mixed in water or applied as a dry powder. Apply dissolved PAM at a rate of not more than 2/3 pound per 1,000 gallons of water per acre. Apply a minimum of 200 pounds per acre of Short-Term Mulch with the dissolved PAM. Dry powder

applications may be at a rate of 5 pounds per acre using a hand-held fertilizer spreader or a tractor-mounted spreader.

- a. Apply PAM only to areas that drain to completed sedimentation control BMPs in accordance with the TESC Plan. PAM may be reapplied on actively worked areas after a 48-hour period.
- b. PAM shall not be applied during rainfall or to saturated soils.
- M. Wattles: Install wattles as soon as construction will allow or when designated by Engineer. Begin trench construction and wattle installation at base of slope and work uphill. Spread excavated material evenly along the uphill slope and compact using hand tamping or other method approved by Engineer. On gradually sloped or clay-type soils, provide trenches 2 inches to 3 inches deep. On loose soils, in high rainfall areas, or on steep slopes, provide trenches 3 inches to 5 inches deep, or half the thickness of the wattle. Exercise care when installing wattles to minimize disturbance of waterways and prevent sediment or pollutant discharge into waterbodies.
 - 1. When sediment deposits reach approximately two inches above ground, remove and stabilize deposits.
- N. Create smooth surfaces between the soil surface and erosion and sediment controls when possible to prevent stormwater from bypassing controls or ponding.

3.02 ADDITIONAL REQUIREMENTS

- A. Natural Buffer or Equivalent:
 - 1. Unless natural buffer between the Project Site and receiving waters has previously been eliminated by pre-existing development disturbances, comply with one of the following alternatives if stormwater from construction will discharge to surface water:
 - a. Provide a 50-foot, undisturbed natural buffer between construction disturbances and surface water.
 - b. Provide an undisturbed natural buffer that is less than 50 feet supplemented by additional erosion and sediment controls, which in combination, achieve a sediment load reduction that is equivalent to a 50-foot buffer.
 - c. If it is infeasible to provide an undisturbed natural buffer of any size, implement erosion and sediment controls that achieve a sediment load reduction that is equivalent to a 50-foot buffer.

3.03 MAINTENANCE

- A. The TESC measures described in this specification are minimum requirements for anticipated Site conditions. During the construction period, upgrade these measures as needed to comply with all applicable local, state, and federal erosion and sediment control regulations.
- B. Maintain erosion and sediment control BMPs so they properly perform their function until Engineer determines they are no longer needed.
- C. Construction activities must avoid or minimize excavation and creation of bare ground during wet weather.
- D. The intentional washing of sediment into storm sewers or drainage ways must not occur. Vacuuming or dry sweeping and material pickup must be used to cleanup released sediments.
- E. Inspect BMPs in accordance with the schedule in the Construction Stormwater Discharge Permit(s) or as directed by Engineer.
- F. Complete an inspection report within 24 hours of an inspection. Each inspection report shall be signed and identify corrective actions. Document that corrective actions are performed within 7 days of identification. Keep a copy of all inspection reports at the Site or at an easily accessible location.
- G. Unless otherwise specified, remove deposits before the depth of accumulated sediment and debris reaches approximately height of BMP. Dispose of debris or contaminated sediment at approved locations. Clean sediments may be stabilized onsite using BMPs as approved by Engineer.
- H. Sediment Fence: Remove trapped sediment before it reaches one-third of the above ground fence height and before fence removal.
- I. Initiate repair or replacement of damaged erosion and sediment control BMPs immediately, and work completed by end of next work day. Significant replacement or repair must be completed within 7 days, unless infeasible.
- J. Within 24 hours, remediate any significant sediment that has left construction site. Investigate cause of the sediment release and implement steps to prevent a recurrence of discharge within same 24 hours. Perform in-stream cleanup of sediment according to applicable regulations.
- K. At end of each work day, stabilize or cover soil stockpiles or implement other BMPs to prevent discharges to surface waters or conveyance systems leading to surface waters.

- L. Temporarily stabilize soils at end of shift before holidays and weekends, if needed. Ensure soils are stable during rain events at all times of year.
- M. Initiate stabilization by no later than end of next work day after construction work in an area has stopped permanently or temporarily.
- N. Within 14 days of initiating stabilization or as specified in permit, either seed or plant stabilized area (see Section 32 92 00, Turf and Grasses); or apply nonvegetative measures and cover all areas of exposed soil. Seed dry areas as soon as Site conditions allow. Ensure that vegetation covers at least 70 percent of stabilized area. In areas where Contractor's activities have compromised erosion control functions of existing grasses, overseed existing grass. Nonvegetative measures may include blown straw and a tackifier, loose straw, or an adequate covering of compost mulch. Complete initial stabilization within 7 days if storm water discharges to surface waters impaired for sediment or nutrients, or high quality waters.
- O. Provide permanent erosion control measures on all exposed areas. Do not remove temporary sediment control practices until permanent vegetation or other cover of exposed areas is established. However, do remove all temporary erosion control measures as exposed areas become stabilized, unless doing so conflicts with local requirements. Properly dispose of construction materials and waste, including sediment retained by temporary BMPs.

3.04 EMERGENCY MATERIALS

A. Provide, stockpile, and protect the following emergency erosion and sediment control materials on the Project Site for unknown weather or erosion conditions. Emergency materials are in addition to other erosion control materials required to implement and maintain the TESC Plan. Replenish emergency materials as they are used. Remove all unused emergency materials from the Project Site at completion of the Project.

Item	Quantity
Silt (sediment) fence	100 lin. ft
Plastic sheeting	260 sq. ft.
Rope	1,000 ft
Sandbags (empty, to be filled as needed)	50
Straw bales	10

Item	Quantity
Inflatable pipe plugs	One for each size of pipe
Water pump and hose with fish	One
screen	

3.05 REMOVAL

- A. When Engineer determines that an erosion control BMP is no longer required, remove BMP and all associated hardware from the Project limits. When materials are biodegradable, Engineer may approve leaving temporary BMP in place.
- B. Permanently stabilize all bare and disturbed soil after removal of erosion and sediment control BMPs. Dress sediment deposits remaining after BMPs have been removed to conform to existing grade. Prepare and seed graded area. If installation and use of erosion control BMPs have compacted or otherwise rendered soil inhospitable to plant growth, such as construction entrances, take measures to rehabilitate soil to facilitate plant growth. This may include, but is not limited to, ripping the soil, incorporating soil amendments, or seeding with specified seed.

END OF SECTION
SECTION 01 57 28 TEMPORARY FLOW CONTROL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - Institute of Inspection, Cleaning, and Restoration Certification (IICRC): S500, Standard and Reference Guide for Professional Water Damage Restoration.

1.02 DEFINITIONS

- A. Diversion Bypass Piping System: Temporary Flow Control accomplished by diverting flow away from the Work area using one or more gravity pipes.
- B. Diversion Bypass Pumping System: Temporary Flow Control accomplished by diverting flow away from the Work area using one or more pumps.
- C. Temporary Flow Control Plan: Plan prepared by Contractor containing complete information on how Contractor proposes to perform and implement a temporary flow control system in accordance with specified requirements.
- D. Temporary Flow Control: Reducing, limiting, or excluding flow in or to a raw water pipeline, diversion structure, headworks, outfall, creek or other facility as required for performing the Work under the Contract. Draining, handling, and disposal of raw water from pipelines and other facilities as required for performing the Work under the Contract is also part of temporary flow control.

1.03 SYSTEM DESCRIPTION

- A. Provide facilities and controls required to intercept, convey, and discharge flow to be controlled; include standby and emergency equipment.
- B. Conform to regulatory requirements.
- C. Protect water resources, wetlands, and other natural resources.
- D. Temporary flow control shall be done in a manner that will not damage private or public property, or create a nuisance or public menace. Flow shall be conveyed in enclosed pipes that are adequately protected from traffic, construction activities, or other hazards.

- E. Discharge:
 - 1. To downstream raw water pipeline or outfall.
 - 2. Dumping or free flow on private or public property, or roads, is prohibited.

1.04 SITE CONDITIONS

- A. Follow Project permit requirements for placement of temporary flow control facilities within Project right-of-ways.
- B. Existing facilities are shown on Drawings.
- C. Diversion Bypass:
 - 1. Provide Temporary Flow Control Diversion Bypass Piping with a minimum ID of 11.9-inches.
 - a. Commercially available IPS 12-inch HDPE SDR 32.5 meets this criteria.
 - 2. Contractor shall coordinate with Owner on management of the flow diversion head gate while any Temporary Flow Control Diversion Bypass Piping is active.
 - 3. Contractor will be allowed a maximum of 15 days (24-hour periods) of diversion shutdown during each construction season to accommodate construction activities but shall manage Work to reduce and minimize required diversion shutdowns.
- D. For in-water work, the contractor shall stop work and temporarily stabilize the active in-water work construction area for a rainstorm event causing active visibly turbid stormwater runoff.

1.05 SUBMITTALS

- A. Informational Submittals:
 - 1. Prepare and submit each Temporary Flow Control Plan at least 20 working days before starting the Work requiring temporary flow control.
 - 2. Special permits required for temporary flow control.
 - 3. Information describing equipment and materials to be used and showing conformance with specified requirements.
 - 4. Pipe connection shop drawings.
 - 5. Shop Drawings of fitting for temporary water supply connection to existing wood stave pipe.

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- 6. Plan and Shop Drawings of bypass pipe connection and plug to existing wood stave pipe.
- 7. Plan and Shop Drawings of connection between wood stave pipe and newly constructed pipe for intermediate winter season.

1.06 QUALITY ASSURANCE

A. Bypass piping shall be leak free and subject to an in-service test to observe leakage. Repair all leaks.

1.07 SEQUENCING AND SCHEDULING

- A. Plan and prosecute the Work requiring shutdown of Dog River Diversion Pipeline so as to complete it during normal working hours of a single day but develop, and execute, if necessary, contingency plans for overtime work and multiple crews in case unforeseen difficulties are encountered.
- B. Provide 7 days' notice of temporary flow control to Owner. Confirm schedule and arrangements for temporary flow control that requires shutdown of Owner's Diversion Pipeline.
- C. Carefully coordinate construction activities with weather forecasts to reduce chance of high flows during time of temporary flow control. Diversion Pipeline may only be shut down when no rainfall is occurring, no rainfall has occurred during previous 48 hours, and no rainfall is forecast for 48 hours beginning at time scheduled for the Diversion Pipeline to be shutdown.

1.08 TEMPORARY FLOW CONTROL PLAN

- A. General: Temporary Flow Control Plans shall be stamped by an engineer registered in the State of Oregon.
- B. Bypass Pipe and Pumping Temporary flow control systems shall provide a minimum pipe diameter in accordance with Article Site Conditions.
 - 1. Bypass Pipe and Pumping Temporary Flow Control Plans shall include, but not limited to, the following information:
 - a. Drawings indicating location of bypass connections and bypass pipelines, pumps, isolation details, connection to existing pipe details, and discharge details.
 - b. Locations where flow will be intercepted and discharged.
 - c. Complete descriptions and performance characteristics of pumps, electric power generators, and standby equipment.

- d. Acoustical information for equipment to be used showing compliance with noise control requirements of Section 01 50 00, Temporary Facilities and Control.
- e. Details of temporary force mains and gravity piping, including horizontal and vertical alignments, pipe sizes and materials, protection of existing buried and above ground facilities and improvements, maintenance of traffic and access to properties.
- f. Design calculations proving adequacy of temporary system and selected equipment to convey required flows, including system operating and discharge pressures.
- g. Drawings showing layouts and configurations of temporary flow control facilities and also showing locations relative to right-of-way easement, and property boundaries.
- h. Drawings and design calculations of temporary fittings, adaptors, and plugs.
- i. Drawings and design calculations for thrust restraint of temporary piping.
- j. Calculations showing a maximum upstream pressure of 2 psi in existing piping.
- k. Anticipated schedule for the Work.
- 1. Other information to completely describe temporary flow control facilities and conformance to specified requirements.
- m. Anticipate coordination needs with Owner including, shutting off, starting and throttling diversion flow of the Dog River Diversion.

1.09 EMERGENCY CLEANUP PLAN

- A. Prepare an Emergency Cleanup Plan to include, but not limited to, the following information:
 - 1. Procedures for removal of water.
 - 2. Procedures for determining nature and extent of damage and required restoration where restoration is possible.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

- A. General:
 - 1. Provide materials and equipment that will ensure continuous and successful operation of temporary flow control systems.
 - 2. Repair or modify systems as necessary.
 - 3. Unless otherwise shown or specified, materials and equipment may be new or used at Contractor's option.

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- B. Pipe Connections:
 - 1. Pipe connections shall be watertight and able to withstand 5 psi of water pressure.
 - 2. Corrosion potential for fitting shall be managed by appropriate coating, such as priming and painting, powder coating or liquid applied epoxy.
 - 3. Existing wire wrap around the wood stave pipe shall be secured to itself by butterfly clamps or welding prior to cutting and removing sections for fitting installation.
 - 4. Provide material around outside of wood stave pipe to account for surface variations, such as two layers of wax tape.
 - 5. Fitting shall include full circumference jacket gasket.
 - 6. Butt connections to wood stave pipe require an insertable stiffener.
- C. Temporary water supply connection to existing wood stave pipe.
 - 1. Pipe will not run full at all times. Contractor to locate tap for gravity flow or will need to provide system to pump out of pipe.
 - a. Connection shall be near the Diversion access road, location to be determined and approved by Owner and Engineer in the field.
- D. Bypass pipe connection and plug to existing wood stave pipe.
 - 1. If fitting does not provide butt connection to bypass pipe, provide plug or other means to prevent loss of water.
- E. Connection between wood stave pipe and newly constructed pipe for intermediate winter season.
 - 1. Connection shall provide largest practical tap for gravity flow during intermediate winter season.
 - 2. Contractor shall provide reducer for connection of pump for pumped bypass.
- F. Plugs:
 - 1. Provide with taps for connection of pressure gauges and air hoses, and flow-through capability.
 - 2. Pipe Diameters 24 Inches and Smaller: Use mechanical plugs with rubber gaskets or pneumatic plugs with rubber boots.
 - 3. Wood stave pipe may require external clamp on sleeve to withstand inflatable plug pressure.
 - 4. Pipe Diameters Larger than 24 Inches:
 - a. Use inflatable bag stoppers made in two or more pieces.

- b. Manufacturers:
 - 1) Lansas.
 - 2) Cherne Industries.
- G. Pipe Adapter:
 - 1. Provide pipe adapters and stiffening inserts for connecting bypass system to existing steel wrapped wood stave pipe. Some bypass system locations will connect to the existing steel wrapped wood stave pipe on both ends.
 - 2. Pipe Diameter 20 Inches: Existing pipeline is steel wire wrapped wood stave pipe. Contractor shall field verify pipe diameter for adapter and stiffening insert.
- H. Pumps:
 - 1. Fully automatic, self-priming units that do not require use of foot valves or vacuum pumps in priming system.
 - 2. Solids handling design with ability to pump minimum 3-inch diameter sphere.
 - 3. Able to run dry for long periods of time to accommodate cyclical nature of flows.
 - 4. Engine: Equipped to minimize noise. Noise levels shall not exceed 86 dBA at a distance of 50 feet from source.
- I. Electric Power Generators:
 - 1. Be able to simultaneously start and run electric powered pumps required for flow to be controlled.
 - 2. Equipped to minimize noise. Noise levels shall not exceed 86 dBA at a distance of 50 feet from source.
 - 3. Include automatic transfer switch if flow control system is to operate unattended.
- J. Standby Equipment:
 - 1. Standby Pump: One of each size to be available onsite.
 - 2. Electric Power Generators: Minimum of one if temporary flow control system contains electric powered pump. Able to simultaneously start and run electric powered pumps required for flow to be controlled.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Install temporary flow control facilities only within public right-of-way, Owner's property, access corridor, or easement obtained by Contractor.
- B. Operate and maintain temporary flow control 24 hours per day, 7 days per week, including without limitation, holidays, as required to control flows.
- C. Promptly remove temporary flow control facilities as soon as they are no longer needed.

3.02 TEMPORARY FLOW CONTROL PLAN

A. Contractor shall implement the acknowledged Temporary Flow Control Plan. Contractor is responsible for modifying the plan as necessary to meet field conditions.

3.03 EMERGENCY CLEANUP PLAN

A. Contractor shall be prepared to implement the acknowledged Emergency Cleanup Plan. Contractor is responsible for modifying the plan as necessary to meet field conditions.

3.04 BLOCKING FLOW

- A. Flow control may consist of blocking flow with mechanical or pneumatic plugs if only small amount of flow needs to be controlled and adequate storage is available.
- B. Use primary and secondary plugs for each flow control location.
- C. When blocking flow is no longer needed for performance and acceptance of the Work, remove plugs in a manner that permits flow to slowly return to normal without surcharging or causing other major disturbances downstream.
- D. Remove temporary plugs at end of each working day and restore normal flow. If downstream work is not or cannot be completed during workday provide, operate, and maintain bypass pumping system or other method of flow control to accommodate flows.

3.05 PIPING

A. Minimize disturbance of existing utilities.

- B. Must stay within the permitted access corridor.
- C. Where temporary flow control pipelines crossroads and active trails, install pipeline in trench and cover with gravel surfacing.
- D. Installation of bypass pipelines is prohibited in marsh/wetland areas.

3.06 DRAINING EXISTING PIPELINE

- A. Before initiating shutdown, ensure required materials, equipment, and labor are available onsite. Excavate and expose portions of existing pipeline to be removed.
- B. Provide tap and piping in place to drain water from existing pipeline before it is cut and to capture contents that may drain out when pipe is cut.
- C. Water drained from the Dog River Diversion Pipeline shall be conveyed and discharged to the ground adjacent to the Project with measures in place to prevent erosion and damage.

3.07 FIELD QUALITY CONTROL

- A. Hydrostatic Pressure Test for Pump Bypass Systems:
 - 1. Prior to operation, test each section of discharge piping with maximum pressure equal to 1.5 times maximum operating pressure of system.
 - 2. Notify Engineer 24 hours prior to testing.
- B. Hydrostatic Pressure Test for Gravity Bypass Systems:
 - 1. Prior to operation, test each section of discharge piping with maximum pressure equal to 5 psi at highest centerline elevation in bypass pipeline.
 - 2. Notify Engineer 24 hours prior to testing.

END OF SECTION

SECTION 01 61 00 COMMON PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 DEFINITIONS

A. Products:

- 1. New items for incorporation in the Work, whether purchased by Contractor or Owner for the Project, or taken from previously purchased stock, and may also include existing materials or components required for reuse.
- 2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent and is not intended to change meaning of such other terms used in Contract Documents, as those terms are self-explanatory and have well recognized meanings in construction industry.
- 3. Items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of the date of the Contract Documents.

1.02 ENVIRONMENTAL REQUIREMENTS

- A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at 4,500 feet above sea level.
- B. Provide equipment and devices installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of minus 20 degrees F to 110 degrees F.

1.03 PREPARATION FOR SHIPMENT

- A. When practical, factory assemble products. Mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable protective coating.
- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of Project and Contractor, equipment number, and approximate weight. Include complete packing list and bill of materials with each shipment.

- C. Extra Materials, Special Tools, Test Equipment, and Expendables:
 - 1. Furnish as required by individual Specifications.
 - 2. Schedule:
 - a. Ensure that shipment and delivery occurs concurrent with shipment of associated equipment.
 - b. Transfer to Owner shall occur immediately subsequent to Contractor's acceptance of equipment from Supplier.
 - 3. Packaging and Shipment:
 - a. Package and ship extra materials and special tools to avoid damage during long term storage in original cartons insofar as possible, or in appropriately sized, hinged-cover, wood, plastic, or metal box.
 - b. Prominently displayed on each package, the following:
 - 1) Manufacturer's part nomenclature and number, consistent with Operation and Maintenance Manual identification system.
 - 2) Applicable equipment description.
 - 3) Quantity of parts in package.
 - 4) Equipment manufacturer.
 - 4. Deliver materials to Site.
 - 5. Notify Engineer upon arrival for transfer of materials.
 - 6. Replace extra materials and special tools found to be damaged or otherwise inoperable at time of transfer to Owner.
- D. Request a minimum 7-day advance notice of shipment from manufacturer. Upon receipt of manufacturer's advance notice of shipment, promptly notify Engineer of anticipated date and place of arrival.
- E. Factory Test Results: Reviewed and accepted by Engineer before product shipment as required in individual Specification sections.

1.04 DELIVERY AND INSPECTION

- A. Deliver products in accordance with accepted current Progress Schedule and coordinate to avoid conflict with the Work and conditions at Site. Deliver anchor bolts and templates sufficiently early to permit setting prior to placement of structural concrete.
- B. Deliver products in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable.

- C. Unload products in accordance with manufacturer's instructions for unloading or as specified. Record receipt of products at Site. Promptly inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from Site and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

1.05 HANDLING, STORAGE, AND PROTECTION

- A. Handle and store products in accordance with manufacturer's written instructions and in a manner to prevent damage. Store in approved storage yards or sheds provided in accordance with Section 01 50 00, Temporary Facilities and Controls. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.
- B. Manufacturer's instructions for material requiring special handling, storage, or protection shall be provided prior to delivery of material.
- C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered, but not installed in the Work.
- D. Store electrical, instrumentation, and control products, and equipment with bearings in weather-tight structures maintained above 60 degrees F. Protect electrical, instrumentation, and control products, and insulate against moisture, water, and dust damage. Connect and operate continuously space heaters furnished in electrical equipment.
- E. Store fabricated products above ground on blocking or skids, and prevent soiling or staining. Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
- F. Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.
- G. After installation, provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.

H. Hazardous Materials: Prevent contamination of personnel, storage area, and Site. Meet requirements of product specification, codes, and manufacturer's instructions.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide manufacturer's standard materials suitable for service conditions, unless otherwise specified in the individual Specifications.
- B. Where product specifications include a named manufacturer, with or without model number, and also include performance requirements, named manufacturer's products must meet the performance specifications.
- C. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement, manufacturer's services, and implement same or similar process instrumentation and control functions in same or similar manner.
- D. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- E. Provide interchangeable components of the same manufacturer, for similar components, unless otherwise specified.
- F. Equipment, Components, Systems, and Subsystems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OSHA, state, and local health and safety regulations.
- G. Regulatory Requirement: Coating materials shall meet federal, state, and local requirements limiting the emission of volatile organic compounds and for worker exposure.
- H. Safety Guards: Provide for all belt or chain drives, fan blades, couplings, or other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier; galvanized steel, aluminum coated steel, or galvanized or aluminum coated 1/2-inch mesh expanded steel. Provide galvanized steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water.

- I. Authority Having Jurisdiction (AHJ):
 - 1. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval under NEC.
 - 2. Materials and equipment manufactured within the scope of standards published by Underwriters Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark.
- J. Equipment Finish:
 - 1. Provide manufacturer's standard finish and color, except where specific color is indicated.
 - 2. If manufacturer has no standard color, provide equipment with gray finish as approved by Engineer.
- K. Special Tools and Accessories: Furnish to Owner, upon acceptance of equipment, all accessories required to place each item of equipment in full operation. These accessory items include, but are not limited to, adequate oil and grease (as required for first lubrication of equipment after field testing), light bulbs, fuses, hydrant wrenches, valve keys, handwheels, chain operators, special tools, and other spare parts as required for maintenance.
- L. Lubricant: Provide initial lubricant recommended by equipment manufacturer in sufficient quantity to fill lubricant reservoirs and to replace consumption during testing, startup, and operation until final acceptance by Owner.
- M. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
 - 1. Use or reuse of components and materials without a traceable certification is prohibited.

2.02 FABRICATION AND MANUFACTURE

- A. General:
 - 1. Manufacture parts to U.S.A. standard sizes and gauges.

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- 2. Two or more items of the same type shall be identical, by the same manufacturer, and interchangeable.
- 3. Design structural members for anticipated shock and vibratory loads.
- 4. Use 1/4-inch minimum thickness for steel that will be submerged, wholly or partially, during normal operation.
- 5. Modify standard products as necessary to meet performance Specifications.
- B. American Iron and Steel (AIS) Requirements:
 - 1. See requirements for AIS in the Supplementary Conditions, Article 7.10.D.
 - 2. This Project is being funded, in part, with monies made available by the Drinking Water State Revolving Fund (DWSRF). Therefore, this Project is subject to the statutory requirements known as "American Iron and Steel" that requires all of the iron and steel products used in the Project to be produced in the United States ("American Iron and Steel Requirements") including iron and steel products provided by the Contractor.
 - 3. All of the iron and steel products used in this Project are required to be produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved by the State.
 - 4. Contractor will provide any further verified information, certification or assurance of compliance, or information necessary to support a waiver of the American Iron and Steel requirement, as may be requested by the purchaser or the state.

2.03 SOURCE QUALITY CONTROL

- A. Where Specifications call for factory testing to be witnessed by Engineer, notify Engineer not less than 14 days prior to scheduled test date, unless otherwise specified.
- B. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous 12 months to a standard endorsed by the National Institute of Standards and Technology (NIST).
- C. Factory Tests: Perform in accordance with accepted test procedures and document successful completion.

PART 3 EXECUTION

3.01 INSPECTION

A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install material or equipment showing such effects. Remove damaged material or equipment from the Site and expedite delivery of identical new material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays within Contractor's control.

3.02 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

- A. When so specified, a Manufacturer's Certificate of Compliance, a copy of which is attached to this section, shall be completed in full, signed by entity supplying the product, material, or service, and submitted prior to shipment of product or material or execution of the services.
- B. Engineer may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.
- C. Such form shall certify proposed product, material, or service complies with that specified. Attach supporting reference data, affidavits, and certifications as appropriate.
- D. May reflect recent or previous test results on material or product, if acceptable to Engineer.

3.03 INSTALLATION

- A. Equipment Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. No shimming between machined surfaces is allowed.
- C. Install the Work in accordance with NECA Standard of Installation, unless otherwise specified.
- D. Repaint painted surfaces that are damaged prior to equipment acceptance.
- E. Do not cut or notch any structural member or building surface without specific approval of Engineer.
- F. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions, and as may be specified. Retain a copy of manufacturers' instruction at Site, available for review at all times.

- G. For material and equipment specifically indicated or specified to be reused in the Work:
 - 1. Use special care in removal, handling, storage, and reinstallation to assure proper function in the completed Work.
 - 2. Arrange for transportation, storage, and handling of products that require offsite storage, restoration, or renovation. Include costs for such Work in the Contract Price.

3.04 FIELD FINISHING

- A. In accordance with Section 09 90 00, Painting and Coating, and individual Specification sections.
- 3.05 ADJUSTMENT AND CLEANING
 - A. Perform required adjustments, tests, operation checks, and other startup activities.
- 3.06 LUBRICANTS
 - A. Fill lubricant reservoirs and replace consumption during testing, startup, and operation prior to acceptance of equipment by Owner.

3.07 SUPPLEMENT

- A. The supplement listed below, following "End of Section," is part of this specification.
 - 1. Manufacturer's Certificate of Compliance.

END OF SECTION

MANUFACTURER'S CERTIFICATE OF COMPLIANCE

OWNER:	_ PRODUCT, MATERIAL, OR SERVICE		
PROJECT NAME:	SUBMITTED:		
PROJECT NO:			
Comments:			
I hereby certify that the above-referenced pro Contract for the named Project will be furnis requirements. I further certify that the product specified and conform in all respects with the quantity shown.	oduct, material, or service called for by the hed in accordance with all applicable ct, material, or service are of the quality e Contract requirements, and are in the		
Date of Execution:	, 20		
Manufacturer:			
Manufacturer's Authorized Representative (print):		

(Authorized Signature)

SECTION 01 64 00 OWNER-FURNISHED PRODUCTS

PART 1 GENERAL

1.01 DEFINITIONS

- A. Buyer: The City of The Dalles is known as "Buyer" in the Procurement contract with pipe and fittings supplier.
- B. Seller: The party under separate contract with Owner to furnish the products or special services specified herein.

1.02 OWNER-FURNISHED PRODUCTS

- A. HDPE Pipe Materials and Appurtenances.
 - 1. Quantity:
 - a. 30-Inch Diameter DIPS DR 26 HPDE: 13,150 LF, in pipes of 50 linear feet each.
 - b. Twenty-six 30-inch Diameter DIPS DR 17 HDPE fittings, with approximately 24-inch length of 30-inch Diameter DIPS DR 26 HDPE pipe fused to each end.
 - c. Summary Table:

Bid Item No.	Item	Station Location	Description: 30-inch Diameter DIPS Pipe OR (degree) Elbow	Quantity
1	NA	NA	DR 26 Pipe	13,250 feet
2	1	25+22.81	33.6-degree elbow	1
	2	26+39.21	46.4-degree elbow	1
	3	31+77.98	11.3-degree elbow	1
	4	32+03.14	03.14 21.0-degree elbow	
	5	32+34.89	27.7-degree elbow	1
	6	32+50.16	31.9-degree elbow	1
	7	34+71.39	4.5-degree elbow	1
	8	35+01.30	22.8-degree elbow	1
	9	35+39.07	18.4-degree elbow	1
	10	35+62.50	21.6-degree elbow	1
	11	102+43.07	14.8-degree elbow	1

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

Bid Item No.	Item	Station Location	Description: 30-inch Diameter DIPS Pipe OR (degree) Elbow	Quantity
	12	102+59.97	11.3-degree elbow	1
	13	102+76.06	8.3-degree elbow	1
	14	138+32.46	38.9-degree elbow	1
	15	145+92.73	15.9-degree elbow	1
	16	150+16.84	25.9-degree elbow	1
	17	150+54.12	17.0-degree elbow	1
	18	170+13.90	88.5-degree elbow	1
	19	178+00.94	26.5-degree elbow	1
	20	178+55.98	23.9-degree elbow	1
	21	193+58.12	37.3-degree elbow	1
	22	193+79.06	37.5-degree elbow	1
	23	194+37.17	22.8-degree elbow	1
	24	194+95.18	19.5-degree elbow	1
	25	195+17.29	19.5-degree elbow	1
	26	195+83.28	13.0-degree elbow	1

- 2. Point of Receipt:
 - a. Port of The Dalles. Port of The Dalles leased storage parcel, 4380 River Trail Way, The Dalles, Oregon, 97058.
 - b. Aerial photo/map of leased storage parcel is shown below:



OWNER-FURNISHED PRODUCTS 01 64 00 - 2

- 3. Estimated Date of Arrival:
 - a. Delivery Requirement A: All fabricated HDPE fittings will be delivered by June 30, 2022.
 - b. Delivery Requirement B: A minimum of 5,000 feet of 30-inch DIPS HDPE pipe will be delivered by June 30, 2022.
 - c. Delivery Requirement C: A minimum of 8,000 feet of 30-inch DIPS HDPE pipe will be delivered by July 15, 2022.
 - d. Delivery Requirement D: All 30-inch DIPS HDPE pipe will be delivered by July 29, 2022.
- 4. Equipment or Facility Necessary for Receipt and Unloading of Product: None. Owner's will unload all piping to staging area at Port of The Dalles property.
- 5. Contractor shall arrange for all loading and transport from the Point of Receipt to the Site and all other subsequent handling.
- 6. Special Handling or Storage Instructions: Do not stack pipe bundles higher than manufacturer recommendations. Other handling and storage instructions will be provided to Contractor at preconstruction meeting.
- 7. Associated special services to be provided by Owner: Storage at the Port of The Dalles until October 31, 2022. Storage of materials beyond this date shall not be allowed, unless Contractor secures its own separate agreement with Port of The Dalles for such storage.

1.03 INFORMATION FURNISHED BY OWNER

- A. Product Data and Shop Drawings related to Owner-furnished products will be made available for Contractor's use in performing the work under this section.
- B. Manufacturer's installation, operation, and maintenance instructions for Owner-furnished products will be made available.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings: None.
- B. Informational Submittals: None.

1.05 TRANSFER OF PRODUCTS

A. Unless indicated otherwise, items will be furnished on the ground at the designated temporary storage location.

- B. Upon delivery, conduct with Owner or Engineer a joint inspection for the purpose of identifying product, general verification of quantities, and observation of apparent condition. Such inspection will not be construed as final or as receipt of any product that, as a result of subsequent inspections and tests, are determined to be nonconforming.
- C. Damaged or incomplete products to be returned for replacement will not be unloaded, except as necessary to expedite return shipment. Owner will submit claims for transportation damage and expedite replacement of damaged, defective, or deficient items.
- D. Indicate signed acceptance of delivery on a copy of the invoice.
- E. If Contractor is not prepared to accept delivery of Owner-furnished products by either the specified Estimated Date of Arrival or such Owner-confirmed delivery date, as specified herein, associated costs incurred by Owner shall be borne by Contractor. Such costs may include, but not be limited to, demurrage, interest, insurance costs, additional administrative and engineering costs, additional factory and field technical support, additional storage and reshipping costs, cost escalation, and extended warranty costs due.

1.06 UNLOADING, STORAGE AND MAINTENANCE

- A. Subsequent to transfer, Contractor shall have complete responsibility for loading Owner-furnished products at the storage location and transport to the Project Site for unloading. Load and unload product in accordance with manufacturers' instructions, or as specified.
- B. Store, protect, and maintain product to prevent damage until final acceptance of completed work. Damage to or loss of products after date of transfer to Contractor shall be repaired to original condition, or replaced with new identical products, at the discretion of Engineer.
- C. Maintain complete inventory of all Owner-furnished products after their transfer to Contractor.

1.07 SCHEDULING AND SEQUENCING

- A. Include sequencing constraints specified herein as part of Progress Schedule.
- B. Owner will keep Contractor informed of probable delivery date changes.
- C. Owner will confirm delivery date with Contractor 10 days prior to scheduled delivery at designated storage location, and within 24 hours of expected delivery time.

OWNER-FURNISHED PRODUCTS 01 64 00 - 4

1.08 EXTRA MATERIALS

A. Unless otherwise specified, Owner will not take acceptance of, and be responsible for storing associated extra materials and special tools upon delivery. Contractor is responsible for all materials delivery, storage, and transportation to the project site.

1.09 PREINSTALLATION MEETING

- A. Arrange and attend a preinstallation meeting with the Engineer to review general procedures, erection and installation instructions, and installation sequence.
- B. Additional meetings prior to installation may be required, as determined by Owner, to transmit Owner's installation instructions to Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install products in conformance with Owner-furnished product Shop Drawings and installation instructions.
- B. Provide all interconnecting structures, equipment, piping, electrical and instrumentation work, finish painting, and appurtenances to achieve a complete and functional system.

3.02 PRODUCT PROTECTION

- A. Immediately after installation, lubricate components in accordance with manufacturer's instructions.
- B. Follow manufacturer's instructions for protection and maintenance during storage, after installation but prior to testing and startup, and after startup but prior to acceptance.
- C. Furnish incidental supplies including lubricants, cleaning fluids, and similar products as needed for protecting and maintaining the Owner-furnished products.

3.03 TESTS AND INSPECTION

A. Perform tests and inspections of installed products in accordance with requirements shown herein, Section 01 91 14, Equipment Testing and Facility Startup, and manufacturer's instructions.

END OF SECTION

SECTION 01 77 00 CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Informational Submittals:
 - 1. Submit prior to application for final payment.
 - a. Record Documents: As required in General Conditions.
 - b. Special bonds, Special Guarantees, and Service Agreements.
 - c. Consent of Surety to Final Payment: As required in General Conditions.
 - d. Releases or Waivers of Liens and Claims: As required in General Conditions.
 - e. Releases from Agreements.
 - f. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01 29 00, Payment Procedures.
 - g. Extra Materials: As required by individual Specification sections.

1.02 RECORD DOCUMENTS

- A. Quality Assurance:
 - 1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
 - 2. Accuracy of Records:
 - a. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
 - b. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive Site measurement, investigation, and examination.
 - 3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.
 - 4. Prior to submitting each request for progress payment, request Engineer's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by Engineer to recommend whole or any part of Contractor's Application for Payment, either partial or final.

1.03 RELEASES FROM AGREEMENTS

- A. Furnish Owner written releases from property owners or public agencies where side agreements or special easements have been made, or where Contractor's operations have not been kept within the Owner's construction right-of-way.
- B. In the event Contractor is unable to secure written releases:
 - 1. Inform Owner of the reasons.
 - 2. Owner or its representatives will examine the Site, and Owner will direct Contractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
 - 3. Should Contractor refuse to perform this Work, Owner reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Contractor to furnish a satisfactory bond in a sum to cover legal Claims for damages.
 - 4. When Owner is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if: (i) Contractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate Claims that Contractor has failed to fulfill terms of side agreement or special easement, or (ii) Contractor is unable to contact or has had undue hardship in contacting grantor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
 - 1. Promptly following commencement of Contract Times, secure from Engineer at no cost to Contractor, one complete set of Contract Documents. Drawings will be full size.
 - 2. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
 - 3. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.

- B. Preservation:
 - 1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
 - 2. Make documents and Samples available at all times for observation by Engineer.
- C. Making Entries on Drawings:
 - 1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
 - a. Color Coding:
 - 1) Green when showing information deleted from Drawings.
 - 2) Red when showing information added to Drawings.
 - 3) Blue and circled in blue to show notes.
 - 2. Date entries.
 - 3. Call attention to entry by "cloud" drawn around area or areas affected.
 - 4. Legibly mark to record actual changes made during construction including, but not limited to:
 - a. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
 - b. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
 - d. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
 - e. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, and Engineer's written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.
 - 5. Dimensions on Schematic Layouts: Show on Record Drawings, by dimension, the centerline of each run of items such as are described in previous subparagraph above.
 - a. Clearly identify the item by accurate note such as "cast iron drain," "galv. water," and the like.

- b. Show, by symbol or note, vertical location of item ("under slab," "in ceiling plenum," "exposed," and the like).
- c. Make identification so descriptive that it may be related reliably to Specifications.

3.02 FINAL CLEANING

- A. At completion of the Work or of a part thereof and immediately prior to Contractor's request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to Contractor's notice of completion, clean entire Site or parts thereof, as applicable.
 - 1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner and Engineer.
 - 2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
 - 3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
 - 4. Rake clean all other surfaces.
 - 5. Remove snow and ice from access to buildings.
 - 6. Leave water courses, ditches open and clean.
- B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

END OF SECTION

SECTION 01 78 23 OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Detailed information for the preparation, submission, and Engineer's review of Operations and Maintenance (O&M) Data, as required by individual Specification sections.

1.02 DEFINITIONS

- A. Final Data: Engineer-accepted data, submitted as specified herein.
- B. Maintenance Operation: As used on Maintenance Summary Form is defined to mean any routine operation required to ensure satisfactory performance and longevity of equipment. Examples of typical maintenance operations are lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.
- C. Preliminary Data: Initial and subsequent submissions for Engineer's review.

1.03 SEQUENCING AND SCHEDULING

- A. Equipment and System Data:
 - 1. Preliminary Data:
 - a. Do not submit until Shop Drawing for equipment or system has been reviewed and approved by Engineer.
 - b. Submit prior to shipment date.
 - 2. Final Data: Submit Instructional Manual Formatted data not less than 30 days prior to installation of equipment or system.
- B. Materials and Finishes Data:
 - 1. Preliminary Data: Submit at least 15 days prior to request for final inspection.
 - 2. Final Data: Submit within 10 days after final inspection.

1.04 DATA FORMAT

A. Prepare preliminary and final data in the form of an instructional manual. Prepare final data on electronic media in addition to hard copy.

- B. Instructional Manual Format:
 - 1. Binder: Commercial quality, permanent, three-ring or three-post binders with durable plastic cover.
 - 2. Size: 8-1/2 inches by 11 inches, minimum.
 - 3. Cover:
 - a. Identify manual with typed or printed title "OPERATION AND MAINTENANCE DATA" and list:
 - 1) Project title.
 - 2) Designate applicable system, equipment, material, or finish.
 - 3) Identity of separate structure as applicable.
 - 4) Identify volume number if more than one volume.
 - 5) Identity of general subject matter covered in manual.
 - 6) Identity of equipment number and Specification section.
 - 4. Spine:
 - a. Project title.
 - b. Identify volume number if more than one volume.
 - 5. Title Page:
 - a. Contractor name, address, and telephone number.
 - b. Subcontractor, Supplier, installer, or maintenance contractor's name, address, and telephone number, as appropriate.
 - 1) Identify area of responsibility of each.
 - 2) Provide name and telephone number of local source of supply for parts and replacement.
 - 6. Table of Contents:
 - a. Neatly typewritten and arranged in systematic order with consecutive page numbers.
 - b. Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
 - 7. Paper: 20-pound minimum, white for typed pages.
 - 8. Text: Manufacturer's printed data, or neatly typewritten.
 - 9. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
 - 10. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs.
- C. Electronic Media Format:
 - 1. Portable Document Format (PDF):
 - a. After all preliminary data has been found to be acceptable to Engineer, submit Operation and Maintenance data in PDF format on CD.

- b. Files to be exact duplicates of Engineer-accepted preliminary data. Arrange by specification number and name.
- c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.

1.05 SUBMITTALS

- A. Informational:
 - 1. Data Outline: Submit electronic copy of a detailed outline of proposed organization and contents of Final Data prior to preparation of Preliminary Data.
 - 2. Preliminary Data:
 - a. Submit for Engineer's review.
 - b. If data meets conditions of the Contract it will be marked as "Meets Project Criteria".
 - c. If data does not meet conditions of the Contract it will be marked as "Does Not Meet Project Criteria."
 - 1) Resubmit revised in accordance with Engineer's comments.
 - 3. Final Data: Submit two hard copies in format specified herein plus electronic format.

1.06 DATA FOR EQUIPMENT AND SYSTEMS

- A. Content For Each Unit (or Common Units) and System:
 - 1. Product Data:
 - a. Include only those sheets that are pertinent to specific product.
 - b. Clearly annotate each sheet to:
 - 1) Identify specific product or part installed.
 - 2) Identify data applicable to installation.
 - 3) Delete references to inapplicable information.
 - c. Function, normal operating characteristics, and limiting conditions.
 - d. Performance curves, engineering data, nameplate data, and tests.
 - e. Complete nomenclature and commercial number of replaceable parts.
 - f. Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.
 - g. Spare parts ordering instructions.
 - h. Where applicable, identify installed spares and other provisions for future work (such as: reserved panel space, unused components, wiring, terminals).

- 2. As-installed, color-coded piping diagrams.
- 3. Charts of valve tag numbers, with the location and function of each valve.
- 4. Drawings:
 - a. Supplement product data with Drawings as necessary to clearly illustrate:
 - 1) Format:
 - a) Provide reinforced, punched, binder tab; bind in with text.
 - b) Reduced to 8-1/2 inches by 11 inches, or 11 inches by 17 inches folded to 8-1/2 inches by 11 inches.
 - c) Where reduction is impractical, fold and place in 8-1/2-inch by 11-inch envelopes bound in text.
 - d) Identify Specification section and product on Drawings and envelopes.
 - b. Relations of component parts of equipment and systems.
 - c. Control and flow diagrams.
 - d. Coordinate Drawings with Project record documents to assure correct illustration of completed installation.
- 5. Instructions and Procedures: Within text, as required to supplement product data.
 - a. Format:
 - 1) Organize in consistent format under separate heading for each different procedure.
 - 2) Provide logical sequence of instructions for each procedure.
 - 3) Provide information sheet for Owner's personnel, including:
 - a) Proper procedures in event of failure.
 - b) Instances that might affect validity of guarantee or Bond.
 - b. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
 - c. Operating Procedures:
 - 1) Startup, break-in, routine, and normal operating instructions.
 - 2) Test procedures and results of factory tests where required.
 - 3) Regulation, control, stopping, and emergency instructions.
 - 4) Description of operation sequence by control manufacturer.
 - 5) Shutdown instructions for both short and extended duration.
 - 6) Summer and winter operating instructions, as applicable.
 - 7) Safety precautions.
 - 8) Special operating instructions.
 - d. Maintenance and Overhaul Procedures:
 - 1) Routine maintenance.

- 2) Guide to troubleshooting.
- 3) Disassembly, removal, repair, reinstallation, and reassembly.
- 6. Guarantee, Bond, and Service Agreement: In accordance with Section 01 77 00, Closeout Procedures.
- B. Maintenance Summary:
 - 1. Compile individual Maintenance Summary for each applicable equipment item, respective unit, or system, and for components or sub-units.
 - 2. Format:
 - a. Use Maintenance Summary Form bound with this section or electronic facsimile of such.
 - b. Each Maintenance Summary may take as many pages as required.
 - c. Use only 8-1/2-inch by 11-inch size paper.
 - d. Complete using typewriter or electronic printing.
 - 3. Include detailed lubrication instructions and diagrams showing points to be greased or oiled; recommend type, grade, and temperature range of lubricants and frequency of lubrication.
 - 4. Recommended Spare Parts:
 - a. Data to be consistent with manufacturer's Bill of Materials/Parts List furnished in O&M manuals.
 - b. "Unit" is the unit of measure for ordering the part.
 - c. "Quantity" is the number of units recommended.
 - d. "Unit Cost" is the current purchase price.

1.07 DATA FOR MATERIALS AND FINISHES

- A. Content for Moisture Protection and Weather Exposed Products:
 - 1. Manufacturer's data, giving full information on products:
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 - 2. Instructions for inspection, maintenance, and repair.

1.08 SUPPLEMENT

- A. The supplement listed below, following "End of Section", is part of this Specification.
 - 1. Maintenance Summary Form.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

OPERATION AND MAINTENANCE DATA 01 78 23 - 6

MAINTENANCE SUMMARY FORM

PROJECT:	CONTRACT NO.:
1. EQUIPMENT ITEM	
2. MANUFACTURER	
3. EQUIPMENT/TAG NUMBER(S)	
4. WEIGHT OF INDIVIDUAL COMPONENTS (C	OVER 100 POUNDS)
	,

5. NAMEPLATE DATA (hp, voltage, speed, etc.)

6. MANUFACTURER'S LOCAL REPRESENTATIVE _____

- a. Name_____ Telephone No. _____
- b. Address

7. MAINTENANCE REQUIREMENTS

Maintenance Operation Comments	Frequency	Lubricant (If Applicable)
List briefly each maintenance operation required and refer to specific information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable.)	List required frequency of each maintenance operation.	Refer by symbol to lubricant required.

8. LUBRICANT LIST

Reference Symbol	Shell	Exxon Mobile	Chevron Texaco	BP Amoco	Or Equal
List symbols used in No. 7 above.	List equivalent lubricants, as distributed by each manufacturer for the specific use recommended.				

9. RECOMMENDED SPARE PARTS FOR OWNER'S INVENTORY.

Part No.	Description	Unit	Quantity	Unit Cost
Note: Identify parts provided by this Contract with two asterisks.				

OPERATION AND MAINTENANCE DATA 01 78 23 SUPPLEMENT - 2
SECTION 01 91 14 EQUIPMENT TESTING AND FACILITY STARTUP

PART 1 GENERAL

1.01 DEFINITIONS

- A. Facility: Entire Project, or an agreed-upon portion, including all of its unit processes.
- B. Facility Performance Demonstration:
 - 1. A demonstration, conducted by Contractor, with assistance of Owner, to demonstrate and document the performance of the entire operating facility, both manually and automatically (if required), based on criteria developed in conjunction with Owner and as accepted by Engineer.
 - 2. Such demonstration is for the purposes of (i) verifying to Owner entire facility performs as a whole, and (ii) documenting performance characteristics of completed facility for Owner's records. Neither the demonstration nor the evaluation is intended in any way to make performance of a unit process or entire facility the responsibility of Contractor, unless such performance is otherwise specified.
- C. Functional Test: Test or tests in presence of Engineer and Owner to demonstrate that installed equipment meets manufacturer's installation, calibration, and adjustment requirements and other requirements as specified.
- D. Performance Test: Test or tests performed after any required functional test in presence of Engineer and Owner to demonstrate and confirm individual equipment meets performance requirements specified in individual sections.
- E. Unit Process: As used in this section, a unit process is a portion of the facility that performs a specific process function, such as raw water screening.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Facility Startup and Performance Demonstration Plan.
 - 2. Functional and performance test results.
 - 3. Completed Unit Process Startup Form for each unit process.
 - 4. Completed Facility Performance Demonstration/Certification Form.

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1.03 FACILITY STARTUP AND PERFORMANCE DEMONSTRATION PLAN

- A. Develop a written plan, in conjunction with Owner's operations personnel; to include the following:
 - 1. Step-by-step instructions for startup of each unit process and the complete facility.
 - 2. Unit Process Startup Form (sample attached), to minimally include the following:
 - a. Description of the unit process, including equipment numbers/nomenclature of each item of equipment and all included devices.
 - b. Detailed procedure for startup of the unit process, including valves to be opened/closed, order of equipment startup, etc.
 - c. Startup requirements for each unit process, including water, power, chemicals, etc.
 - d. Space for evaluation comments.
 - 3. Facility Performance Demonstration/Certification Form (sample attached), to minimally include the following:
 - a. Description of unit processes included in the facility startup.
 - b. Sequence of unit process startup to achieve facility startup.
 - c. Description of computerized operations, if any, included in the facility.
 - d. Contractor certification facility is capable of performing its intended function(s), including fully automatic operation.
 - e. Signature spaces for Contractor and Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

- 3.01 GENERAL
 - A. Facility Startup Meetings: Schedule, in accordance with requirements of Section 01 31 19, Project Meetings, to discuss test schedule, test methods, materials, chemicals and liquids required, facilities operations interface, and Owner involvement.
 - B. Contractor's Testing and Startup Representative:
 - 1. Designate and furnish one or more personnel to coordinate and expedite testing and facility startup.
 - 2. Representative(s) shall be present during startup meetings and shall be available at all times during testing and startup.

EQUIPMENT TESTING AND FACILITY STARTUP 01 91 14 - 2

- C. Provide temporary valves, gauges, piping, test equipment and other materials and equipment required for testing and startup.
- D. Provide Subcontractor and equipment manufacturers' staff adequate to prevent delays. Schedule ongoing work so as not to interfere with or delay testing and startup.
- E. Owner will:
 - 1. Allow Contractor use of Dog River in-stream water or in pipeline as water source for all testing and pipeline startup, unless otherwise indicated.
 - 2. Operate facility with support of Contractor.

3.02 EQUIPMENT TESTING

- A. Preparation:
 - 1. Complete installation before testing.
 - 2. Furnish qualified manufacturers' representatives, when required by individual Specification sections.
 - 3. Obtain and submit from equipment manufacturer's representative Manufacturer's Certificate of Proper Installation Form, in accordance with Section 01 43 33, Manufacturers' Field Services, when required by individual Specification sections.
 - 4. Equipment Test Report Form:
 - a. Provide written test report for each item of equipment to be tested, to include the minimum information:
 - 1) Owner/Project Name.
 - 2) Equipment or item tested.
 - 3) Date and time of test.
 - 4) Type of test performed (Functional or Performance).
 - 5) Test method.
 - 6) Test conditions.
 - 7) Test results.
 - 8) Signature spaces for Contractor and Engineer as witness.
 - 5. Cleaning and Checking:
 - a. Prior to beginning functional testing:
 - 1) Calibrate testing equipment in accordance with manufacturer's instructions.
 - 2) Inspect and clean equipment, devices, connected piping, and structures to ensure they are free of foreign material.

- 3) Open and close valves by hand and operate other devices to check for binding, interference, or improper functioning.
- 4) Test piping for leaks.
- 6. Ready-to-test determination will be by Engineer based at least on the following:
 - a. Acceptable Operation and Maintenance Data.
 - b. Notification by Contractor of equipment readiness for testing.
 - c. Receipt of Manufacturer's Certificate of Proper Installation, if so specified.
 - d. Adequate completion of work adjacent to, or interfacing with, equipment to be tested including items to be furnished by Owner.
 - e. Availability and acceptability of manufacturer's representative, when specified, to assist in testing of respective equipment.
 - f. Satisfactory fulfillment of other specified manufacturer's responsibilities.
 - g. Delivery of all spare parts and special tools.
- B. Functional Testing:
 - 1. Conduct as specified in individual Specification sections.
 - 2. Notify Owner and Engineer in writing at least 10 days prior to scheduled date of testing.
 - 3. Prepare Equipment Test Report summarizing test method and results.
 - 4. When, in Engineer's opinion, equipment meets functional requirements specified, such equipment will be accepted for purposes of advancing to performance testing phase, if so required by individual Specification sections. Such acceptance will be evidenced by Engineer/Owner's signature as witness on Equipment Test Report.
- C. Performance Testing:
 - 1. Conduct as specified in individual Specification sections.
 - 2. Notify Engineer and Owner in writing at least 10 days prior to scheduled date of test.
 - 3. Performance testing shall not commence until equipment has been accepted by Engineer as having satisfied functional test requirements specified.
 - 4. Water source for testing shall be as specified.
 - 5. Unless otherwise indicated, furnish labor, materials, and supplies for conducting the test and taking samples and performance measurements.
 - 6. Prepare Equipment Test Report summarizing test method and results.

7. When, in Engineer's opinion, equipment meets performance requirements specified, such equipment will be accepted as to conforming to Contract requirements. Such acceptance will be evidenced by Engineer's signature on Equipment Test Report.

3.03 STARTUP OF UNIT PROCESSES

- A. Prior to unit process startup, equipment within unit process shall be accepted by Engineer as having met functional and performance testing requirements specified.
- B. Startup sequencing of unit processes shall be as chosen by Contractor to meet schedule requirements.
- C. Make adjustments, repairs, and corrections necessary to complete unit process startup.
- D. Startup shall be considered complete when, in opinion of Engineer, unit process has operated in manner intended for 5 continuous days without significant interruption. This period is in addition to functional or performance test periods specified elsewhere.
- E. Significant Interruption:
 - 1. May include any of the following events:
 - a. Failure of Contractor to provide and maintain qualified onsite startup personnel as scheduled.
 - b. Failure to meet specified functional operation for more than 2 consecutive hours.
 - c. Failure of any critical equipment or unit process that is not satisfactorily corrected within 5 hours after failure.
 - d. Failure of any noncritical equipment or unit process that is not satisfactorily corrected within 8 hours after failure.
 - e. As determined by Engineer.
- F. A significant interruption will require startup then in progress to be stopped. After corrections are made, startup test period to start from beginning again.

3.04 FACILITY PERFORMANCE DEMONSTRATION

- A. When, in the opinion of Engineer, startup of all unit processes has been achieved, sequence each unit process to the point that facility is operational.
- B. Demonstrate proper operation of required interfaces within and between individual unit processes.

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- C. After facility is operating, complete performance testing of equipment and systems not previously tested.
- D. Document, as defined in Facility Startup and Performance Demonstration Plan, the performance of the facility.
- E. Certify, on the Facility Performance Demonstration/Certification Form, that facility is capable of performing its intended function(s), including fully automatic operation.

3.05 SUPPLEMENTS

- A. Supplements listed below, following "End of Section," are a part of this Specification:
 - 1. Unit Process Startup Form.
 - 2. Facility Performance Demonstration/Certification Form.

END OF SECTION

UNIT PROCESS STARTUP FORM

OWNER:	PROJECT:
Unit Process Description: (Includ	e description and equipment number of all equipment and devices):
Startup Procedure (Describe proc opened/closed, order of equipmen	edure for sequential startup and evaluation, including valves to be t startup, etc.):
Startup Requirements (Water, po	wer, chemicals, etc.):
Evaluation Comments:	

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FACILITY PERFORMANCE DEMONSTRATION/CERTIFICATION FORM

OW	NER:
----	------

PROJECT:

Unit Processes Description (List unit processes involved in facility startup):

Unit Processes Startup Sequence (Describe sequence for startup, including computerized operations, if any):

Contractor Certification that Facility is capable of performing its intended function(s), including fully automatic operation:

Contractor:

Date: _____, 20____

Engineer: _____

Date: _____, 20____

(Authorized Signature)

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SECTION 02 41 00 DEMOLITION

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American National Standards Institute (ANSI): A10.6, Safety Requirements for Demolition Operations.
 - 2. Environmental Protection Agency (EPA), U.S. Code of Federal Regulations (CFR), Title 40:
 - a. Part 61—National Emission Standards for Hazardous Air Pollutants.
 - b. Part 82—Protection of Stratospheric Ozone.
 - c. Part 273—Standards for Universal Waste Management.
 - 3. Occupational Safety and Health Administration (OSHA), U.S. Code of Federal Regulations (CFR) Title 29 Part 1926—Occupational Safety and Health Regulations for Construction.

1.02 DEFINITIONS

- A. ACM: Asbestos-containing material.
- B. Demolition: Dismantling, razing, destroying, or wrecking of any fixed building or structure or any part thereof. Demolition also includes removal of pipes, manholes tanks, conduit, and other underground facilities, whether as a separate activity or in conjunction with construction of new facilities.
- C. Modify: Provide all necessary material and labor to modify an existing item to the condition indicated or specified.
- D. Relocate: Remove, protect, clean, and reinstall equipment, including electrical, instrumentation, and all ancillary components required to make the equipment fully functional, to the new location identified on Drawings.
- E. Renovation: Altering a facility or one or more facility components in any way.
- F. Salvage/Salvageable: Remove and deliver, to the specified location(s), the equipment, building materials, or other items so identified to be saved from destruction, damage, or waste; such property to remain that of Owner. Unless otherwise specified, title to items identified for demolition shall revert to Contractor.

1.03 SUBMITTALS

- A. Informational Submittals:
 - 1. Submit proposed Demolition/Renovation Plan, in accordance with requirements specified herein, for approval before such Work is started.
 - 2. Submit copies of any notifications, authorizations and permits required to perform the Work.
 - 3. Copies of reports and other documentation required for abandoning wells.

1.04 REGULATORY AND SAFETY REQUIREMENTS

- A. When applicable, demolition Work shall be accomplished in strict accordance with 29 CFR 1926-Subpart T.
- B. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the General Conditions, Contractor's safety requirements shall conform to ANSI A10.6.
- C. Furnish timely notification of this demolition project to applicable federal, state, regional, and local authorities in accordance with 40 CFR 61-Subpart M.

1.05 DEMOLITION/RENOVATION PLAN

- A. Demolition/Renovation Plan shall provide for safe conduct of the Work and shall include:
 - 1. Detailed description of methods and equipment to be used for each operation.
 - 2. The Contractor's planned sequence of operations, including coordination with other work in progress.

1.06 SEQUENCING AND SCHEDULING

- A. The Work of this Specification shall not commence until Contractor's Demolition/Renovation Plan has been approved by Engineer.
- B. Include the Work of this Specification in the progress schedule, as specified in Section 01 32 00, Construction Progress Documentation.
- 1.07 USE OF EXPLOSIVES
 - A. Not allowed.

1.08 ENVIRONMENTAL PROTECTION

A. Follow all Federal, State and Local regulations and permits.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXISTING FACILITIES TO BE DEMOLISHED OR RENOVATED

- A. Utilities and Related Equipment:
 - 1. Remove existing utilities as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by Engineer.
 - 2. When utility lines are encountered that are not indicated on Drawings, notify Engineer prior to further work in that area.
- B. Paving and Slabs: Provide neat sawcuts at limits of pavement removal to facilitate repaying of road crossings.

3.02 PROTECTION

- A. Traffic Control Signs: Where pedestrian and driver safety is endangered in the area of removal Work, use traffic barricades with flashing lights.
- B. Existing Work:
 - 1. Survey the Site and examine Drawings and Specifications to determine the extent of the Work before beginning any demolition or renovation.
 - 2. Take necessary precautions to avoid damage to existing items scheduled to remain in place, to be reused, or to remain the property of Owner; any Contractor-damaged items shall be repaired or replaced as directed by Engineer.
 - 3. Ensure that structural elements are not overloaded as a result of or during performance of the Work. Responsibility for additional structural elements or increasing the strength of existing structural elements as may be required as a result of any Work performed under this Contract shall be that of the Contractor. Repairs, reinforcement, or structural replacement must have Engineer approval.
 - 4. Do not overload pavements to remain.

- C. Protection of Personnel:
 - 1. During demolition, continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site.
 - 2. Provide temporary barricades and other forms of protection to protect Owner's personnel and the general public from injury due to demolition Work.
 - 3. Provide protective measures as required to provide free and safe passage of Owner's personnel and the general public to occupied portions of the structure.

3.03 BURNING

A. The use of burning at the Site for the disposal of refuse and debris will not be permitted.

3.04 RELOCATIONS

A. Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Clean all items to be relocated prior to reinstallation, to the satisfaction of Engineer. Repair items to be relocated which are damaged or replace damaged items with new undamaged items as approved by Engineer.

3.05 BACKFILL

- A. Do not use demolition debris as backfill material.
- B. Fill excavations and other hazardous openings to existing ground level or foundation level of new construction in accordance with Section 31 23 23, Fill and Backfill.

3.06 TITLE TO MATERIALS

- A. All salvaged equipment will remain the property of Owner.
- B. With the exception of the following listed salvaged equipment all items designated to be removed shall become the property of Contractor.
- C. Title to equipment and materials resulting from demolition is vested in the Contractor upon approval by Engineer of Contractor's Demolition/Renovation Plan, and the resulting authorization by Engineer to begin demolition.

3.07 DISPOSITION OF MATERIAL

- A. Do not remove equipment and materials without approval of Contractor's Demolition/Renovation Plan by Engineer.
- B. Remove salvaged items designated as the property of Owner in a manner to prevent damage.
- C. Deliver salvaged items that are designated as the property of Owner to a storage site as directed.

3.08 UNSALVAGEABLE MATERIAL

- A. Concrete, masonry, and other noncombustible material shall be disposed of in the following manner and location.
 - 1. Permitted waste disposal facility.
- B. Combustible material shall be disposed of off the Site.

3.09 CLEANUP

A. Debris and rubbish shall be removed from basement and similar excavations. Debris and rubbish shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

END OF SECTION

SECTION 03 30 10 STRUCTURAL CONCRETE

PART 1 GENERAL

1.01 GENERAL

- A. Work shall conform to requirements of ACI 301, Specifications for Structural Concrete, unless otherwise specified.
- B. American Iron and Steel Requirements apply for this Project. See Section 00 73 00, Supplementary Conditions and Section 01 61 00, Common Product Requirements.

1.02 REFERENCES

- A. In accordance with ACI 301 and the following:
 - 1. American Concrete Institute (ACI):
 - a. 301, Specifications for Structural Concrete.
 - b. 305.1, Specification for Hot Weather Concreting.
 - c. 306.1, Specification for Cold Weather Concreting.
 - d. 308.1, Specification for Curing Concrete.
 - e. 350.1, Specification for Tightness Testing of Environmental Engineering Concrete Containment Structures and Commentary.
 - f. SP-66, Detailing Manual.
 - 2. ASTM International (ASTM):
 - a. C1260, Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method).
 - b. D1056, Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.
 - 3. Concrete Reinforcing Steel Institute (CRSI):
 - a. Manual of Standard Practice. Placing Reinforcing Bars.
 - b. ANSI/CRSI RB 4.1, CRSI Standard for Supports for Reinforcement Used in Concrete.
 - 4. Corps of Engineers (COE): CRD-C-572, Corps of Engineers Specifications for Polyvinylchloride Waterstop.
 - 5. National Ready Mixed Concrete Association (NRMCA).

1.03 DEFINITIONS

A. Cold Weather: When ambient temperature is below 40 degrees F or is approaching 40 degrees F and falling.

- B. Defective Area: Surface defects that include honeycomb, rock pockets, indentations, and surface voids greater than 3/16-inch deep, surface voids greater than 3/4 inch in diameter, cracks in liquid containment structures and below grade habitable spaces that are 0.005-inch wide and wider, and cracks in other structures that are 0.010-inch wide and widerspalls, chips, embedded debris, sand streaks, mortar leakage from form joints, deviations in formed surface that exceed specified tolerances and include but are not limited to fins, form pop-outs, and other projections. At exposed concrete, defective areas also include texture irregularities, stains, and other color variations that cannot be removed by cleaning.
- C. Exposed Concrete: Concrete surface that can be seen inside or outside of structure regardless of whether concrete is above water, dry at all times, or can be seen when structure is drained.
- D. Hot Weather: As defined in ACI 305.1.
- E. Hydraulic Structure: Liquid containment structure.
- F. New Concrete: Concrete less than 60 days old.
- G. Top Bars: Horizontal bars placed such that 12 inches of fresh concrete is cast below in single placement.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Formwork and Formwork Accessories: Unless otherwise specified, conform to requirements of ACI 301.
 - b. Reinforcing steel prepared in accordance with CRSI Manual of Standard Practice and ACI SP-66 Detailing Manual:
 - 1) Bending lists.
 - 2) Placing drawings.
 - c. Waterstop: Details of splices, method of securing and supporting waterstop in forms to maintain proper orientation and location during concrete placement.
 - d. Construction Joints, Expansion Joints, and Control Joints: Layout and location for each type.
 - 2. Mix Design:
 - a. Contain proportions of materials and admixtures to be used on Project, signed by mix designer.
 - b. Documentation of average strength for each proposed mix design in accordance with ACI 301.

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- c. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common product Requirements, for the following:
 - 1) Portland cement.
 - 2) Fly ash.
 - 3) Slag cement.
 - 4) Aggregates, including specified class designation for coarse aggregate.
 - 5) Admixtures.
 - 6) Concrete producer has verified compatibility of constituent materials in design mix.
 - When required concrete mixture shall be certified in accordance with ANSI Standard 61 for contact with potable water.
- d. Test Reports:
 - 1) Cement: Chemical analysis report.
 - 2) Supplementary Cementitious Materials: Chemical analysis report and report of other specified test analyses.
 - 3) Aggregates:
 - a) Deleterious substances in fine aggregate per ASTM C33/C33M, Table 2.
 - b) Deleterious substances in coarse aggregate per ASTM C33/C33M, Table 4.
 - 4) Water-Soluble Chloride-Ion Content in Hardened Concrete: One of the following:
 - a) Test report in accordance with ASTM C1218/C1218M at an age between 28 days and 42 days.
 - b) Calculation of water-soluble chloride content based on certified chloride content of each constituent material and proportion of constituent material in concrete mixture.
 - c) All of the following:
 - Manufacturer's Certificate of Compliance that each admixture does not intentionally add chlorides and/or that the chloride content of each admixture does not exceed trace amounts.
 - (2) Verification that potable water is used in the concrete mix or test data documenting the chloride content of the water.
 - (3) Letter from the concrete supplier stating that fine and coarse aggregates are from sources that are not known to be susceptible to chlorides in the aggregates.

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- 5) Alkali Aggregate Reactivity: Where required, in accordance with Paragraph Concrete Mix Design. Include documentation of test results per applicable standards.
- 6) Shrinkage Test Results: In accordance with ASTM C157/C157M as modified herein.
- e. Product Data:
 - 1) Admixtures: Manufacturer's product data sheets for each admixture used in proposed mix designs.
- 3. Samples: PVC waterstop splice, joint, and fabricated cross of each size, shape, and fitting of waterstop.
- 4. Letter stating compatibility between liquids being contained and materials used for waterstops and joint fillers.
- 5. Detailed plan for curing and protection of concrete placed and cured in cold weather. Details shall include, but not be limited to, the following:
 - a. Procedures for protecting subgrade from frost and accumulation of ice or snow on reinforcement, other metallic embeds, and forms prior to placement.
 - b. Documentation of embeds that must be at a temperature above freezing prior to placement of concrete.
 - c. Procedures for measuring and recording temperatures of reinforcement and other embedded items prior to concrete placement.
 - d. Methods for temperature protection during placement.
 - e. Types of covering, insulation, housing, or heating to be provided.
 - f. Curing methods to be used during and following protection period.
 - g. Use of strength accelerating admixtures.
 - h. Methods for verification of in-place strength.
 - i. Procedures for measuring and recording concrete temperatures.
 - j. Procedures for preventing drying during dry, windy conditions.
- Detailed plan for hot-weather placements including curing and protection for concrete placed in ambient temperatures over 80 degrees F. Plan shall include, but not be limited to, the following:
 - a. Procedures for measuring and recording temperatures of reinforcement and other embedded items prior to concrete placement.
 - b. Use of retarding admixture.
 - c. Methods for controlling temperature of reinforcement and other embedded items and concrete materials before and during placement.
 - d. Types of shading and wind protection to be provided.
 - e. Curing methods, including use of evaporation retardant.
 - f. Procedures for measuring and recording concrete temperatures.
 - g. Procedures for preventing drying during dry, windy conditions.

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- 7. Thermal Control Plan: For concrete sections with a minimum specified dimension that is equal to or greater than 2 feet 6 inches.
- 8. Concrete repair techniques.
- B. Informational Submittals:
 - 1. Preinstallation Conference minutes.
 - 2. Manufacturer's application instructions for bonding agent and bond breaker.
 - 3. Manufacturer's Certificate of Compliance to specified standards:
 - a. Bonding agent.
 - b. Bond breaker.
 - c. Repair materials.
 - 4. Statement of Qualification:
 - a. Batch Plant: Certification as specified herein.
 - b. Mix designer.
 - c. Installer.
 - d. Testing agency.
 - 5. Manufacturer's written instructions for product shipment, storage, handling, installation/application, and repair for:
 - a. Waterstop.
 - b. Joint filler and primer.
 - c. Preformed control joint.
 - 6. Recorded temperature data from concrete placement where specified.
 - 7. Concrete Delivery Tickets:
 - a. For each batch of concrete before unloading at Site.
 - b. In accordance with ASTM C94/C94M, including Requirement 14.2.1. through Requirement 14.2.10.
 - c. Indicate amount of mixing water withheld and maximum amount that may be permitted to be added at Site.

1.05 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Batch Plant: NRMCA Program for Certification of Ready-Mixed Concrete Production Facilities or approved equivalent program.
 - 2. Mix Designer: Person responsible for developing concrete mixture proportions certified as NRMCA Concrete Technologist Level 2 or DOT certified mix designer in jurisdiction of the Work. Requirement may be waived if individual is Contractor's Licensed Design Engineer.
 - 3. Flatwork Finisher: Unless otherwise permitted, at least one person on finishing crew shall be certified as an ACI Flatwork Finisher, or equivalent.

- 4. Testing Agency: Unless otherwise permitted, an independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 for testing indicated.
 - a. Where field testing is required of Contractor, personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - b. Personnel performing laboratory tests shall be 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.
- B. Preinstallation Conference:
 - 1. Required Meeting Attendees:
 - a. Contractor, including pumping, placing, and finishing, and curing subcontractors.
 - b. Ready-mix producer.
 - c. Admixture representative.
 - d. Testing and sampling personnel.
 - e. Steel Reinforcement Installer.
 - 2. Schedule and conduct prior to incorporation of respective products into Project. Notify Engineer of location and time.
 - 3. Agenda shall include:
 - a. Admixture types, dosage, performance, and redosing at Site.
 - b. Mix designs, test of mixes, and Submittals.
 - c. Placement methods, techniques, equipment, consolidation, and form pressures.
 - d. Slump or slump flow and placement time to maintain slump and slump flow.
 - e. Finish, curing, and water retention.
 - f. Steel reinforcement details.
 - g. Protection procedures for weather conditions.
 - h. Thermal control plan.
 - i. Other specified requirements requiring coordination.
 - 4. Conference minutes as specified in Section 01 31 19, Project Meetings.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Form Materials:
 - 1. For exposed areas, use hard plastic finished plywood, overlaid waterproof particle board, or steel in new and undamaged condition, of sufficient strength and surface smoothness to produce specified finish.
 - 2. For unexposed areas, use new shiplap or plywood.
 - 3. Earth cuts may be used for forming footings.
- B. Beveled Edge Corner Strips: Nonabsorbent material, compatible with form surface, fully sealed on all sides prohibiting loss of paste or water between the two surfaces.
- C. Form Ties:
 - 1. Material: Steel.
 - 2. Spreader Inserts:
 - a. Conical or spherical type.
 - b. Design to maintain positive contact with forming material.
 - c. Furnish units that will leave no metal closer than 1-1/2 inches to concrete surface when forms, inserts, and tie ends are removed.
 - 3. Wire ties not permitted.
 - 4. Form Ties with Water Stop:
 - a. For water-holding structures, basements, pipe galleries, and accessible spaces below finish grade, furnish one of the following:
 - 1) Integral steel waterstop 0.103-inch thick and 0.625-inch diameter tightly and continuously welded to tie.
 - 2) Neoprene waterstop 3/16-inch thick and 15/16-inch diameter whose center hole is one half diameter of tie or molded plastic water stop of comparable size.
 - 3) Orient waterstop perpendicular to tie and symmetrical about center of tie.
 - 4) Design ties to prevent rotation or disturbance of center portion of tie during removal of ends and to prevent water leaking along tie.

- 2.02 CONCRETE
 - A. Materials:
 - 1. Cementitious Materials:
 - a. Cement:
 - 1) Portland Cement: Unless otherwise specified, conform to requirements of ASTM C150/C150M.
 - 2) Blended Hydraulic Cement:
 - a) Unless otherwise specified, conform to requirements of ASTM C595/C595M.
 - b) Portland cement used in blended hydraulic cement; conform to requirements of ASTM C150/C150M.
 - 3) Furnish from one source.
 - b. Supplementary Cementitious Materials (SCM):
 - 1) Fly Ash (Pozzolan):
 - a) Class F and Class C fly ash in accordance with ASTM C618, except as modified herein:
 - (1) ASTM C618, Table 1, Loss on Ignition: Unless permitted otherwise, maximum 3 percent.
 - 2) Slag Cement: In accordance with ASTM C989/C989M, Grade 100 or Grade 120.
 - 2. Aggregates: Unless otherwise permitted, furnish from one source for each aggregate type used in a mix design.
 - a. Aggregates:
 - 1) In accordance with ASTM C33/C33M, except as modified herein.
 - a) Class Designation: 4S, unless otherwise specified.
 - b) Free of materials and aggregate types causing popouts, discoloration, staining, or other defects on surface of concrete.
 - c) Alkali Silica Reactivity: See Paragraph Concrete Mix Design.
 - 2) Fine Aggregates:
 - a) In accordance with ASTM C33/C33M, except as modified herein.
 - b) In the event manufactured sand is included in the mix design, the material shall be from the same source as the coarse aggregate.
 - c) Limit deleterious substances in accordance with ASTM C33/C33M, Table 2 and as follows:
 - Limit material finer than 75-μm (No. 200) sieve to 3 percent mass of total sample.
 - (2) Limit coal and lignite to 0.5 percent.

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- 3) Coarse Aggregate:
 - a) Natural gravels, combination of gravels and crushed gravels, crushed stone, or combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension).
 - b) Limit deleterious substances in accordance with ASTM C33/C33M, Table 4 for specified class designation.
- 3. Admixtures:
 - a. Characteristics:
 - 1) Compatible with other constituents in mix.
 - 2) Contain at most, only trace amount chlorides in solution.
 - 3) Furnish type of admixture as recommended by manufacturer for anticipated temperature ranges.
 - b. Air-Entraining Admixture: ASTM C260/C260M.
 - c. Water-Reducing Admixture: ASTM C494/C494M, Type A or Type D.
 - d. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - e. Accelerating Admixture: ASTM C 494/C 494M, Type C.
 - f. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F or Type G.
 - g. Plasticizing Admixture: ASTM C1017/C1017M, Type I or Type II.
 - h. Shrinkage Reducing Admixture:
 - 1) Manufacturers and Products:
 - a) Master Builders Solutions, Shakopee, MN; MasterLife SRA 20.
 - b) Euclid Chemical Co., Cleveland, OH; Eucon SRA Series.
 - c) W. R. Grace & Co., Cambridge, MA; Eclipse Series.
 - i. Do not use calcium chloride as an admixture.
 - j. Admixtures with no standard, ASTM or other, designation may be used where permitted.
- 4. Water and Ice: Mixing water for concrete and water used to make ice shall be potable water, unless alternative sources of water are permitted.
 - a. Water from alternative sources shall comply with requirements of ASTM C1602/C1602M, and concentration of chemicals in combined mixing water shall be less than:
 - 1) Chloride Content: 1,000 ppm.
 - 2) Sulfate Content as SO₄: 3,000 ppm.
 - 3) Alkalis as (Na₂O + 0.658 K₂O): 600 ppm.
 - 4) Total Solids by Mass: Less than 50,000 ppm.

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- B. Concrete Mix Design:
 - 1. General:
 - a. When required concrete mixture shall be certified in accordance with ANSI Standard 61 for contact with potable water. See Supplement at the end of this section for mix design requirements for each class of concrete used on Project.
 - b. Prepare design mixtures for each type and strength of concrete, selecting and proportioning ingredients in accordance with requirements of ACI 301, unless otherwise specified.
 - c. Selection of constituent materials and products in mix design are optional, unless specified otherwise.
 - d. Unless otherwise permitted, use water-reducing admixture or water-reducing admixture and high-range, water-reducing admixture, or plasticizing admixture in pumped concrete, in concrete with a water-cementitious materials ratio below 0.50, and in concrete that is part of a liquid-containment structure.
 - e. Unless otherwise permitted, use water-reducing admixture and high-range, water-reducing admixture, or plasticizing admixture in columns, piers, pilasters, and walls.
 - f. Use water-reducing admixture or high-range, water-reducing admixture, or plasticizing admixture to achieve fresh properties that facilitate handling, placing, and consolidating of concrete, and specified hardened properties.
 - g. Use water-reducing and retarding admixture when anticipated high temperatures, low humidity, or other adverse placement conditions can adversely affect fresh properties of concrete.
 - h. Unless otherwise specified, desired fresh properties of concrete shall be determined by Contractor, and coordinated with concrete producer. Fresh properties of concrete shall remain stable to satisfaction of Contractor, for duration of placement and consolidation, and shall remain in conformance with requirements of Contract Documents.
 - i. Contractor is encouraged to consider using environmentally sustainable concrete mix design technologies such as use of supplementary cementitious materials, aggregate packing, and self-consolidating concrete.
 - 2. Potential Alkali-Aggregate Reactivity of Concrete:
 - a. Do not use aggregates known to be susceptible to alkali-carbonate reaction (ACR).
 - Unless otherwise specified, or unless members are assigned to Exposure Class C0, use one of the three options below for qualifying concrete mixtures to reduce the potential of alkali-silica reaction. Option 3) shall not be used with natural pozzolans, or fly

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ash that has a CaO content more than 18 percent, or for aggregates with expansions greater than or equal to 0.24 percent when tested in accordance with ASTM C1293. Fly ash with an alkali content greater than 4.0 percent shall not be used in option 2) or 3).

- For each aggregate used in concrete, the expansion result determined in accordance with ASTM C1293 shall not exceed 0.04 percent at 1 year.
- 2) For each aggregate used in concrete, the expansion result of the aggregate and cementitious materials combination determined in accordance with ASTM C1567 shall not exceed 0.10 percent at an age of 16 days. Submit supporting data for each aggregate showing expansion in excess of 0.10 percent at 16 days when tested in accordance with ASTM C1260.
- 3) Alkali content in concrete (LBA), excluding that from supplementary cementitious materials and the pozzolans and slags in blended cements, shall not exceed 4 pounds per cubic yard for aggregates with expansions more than or equal to 0.04 percent and less than 0.12 percent or 3 pounds per cubic yard for aggregates with expansions greater than or equal to 0.12 percent and less than 0.24 percent. Reactivity shall be determined by testing in accordance with ASTM C1293. Alkali content shall be calculated as follows:
 - a) LBA = (cement content, pound per cubic yard) × (equivalent alkali content of portland cement in percent/100 percent).
- 3. Proportions:
 - a. Design mix to meet aesthetic, durability, and strength requirements.
 - b. Where fly ash is included in mix, minimum fly ash content shall be a minimum of 15 percent of weight of total cementitious materials.
 - c. Concrete Shrinkage Limits:
 - Where shrinkage limits are specified, design mix for following shrinkage limits and test in accordance with ASTM C157/C157M, with the following modifications:
 - a) Prisms shall be moist cured for 7 days prior to 28-day drying period.
 - b) Comparator reading at end of 7-day moist cure shall be used as initial length in length change calculation.
 - c) Reported results shall be average of three prisms.
 - d) If shrinkage of a specimen departs from average of that test age by more than 0.004 percent, disregard results obtained from that specimen.

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- e) Unless otherwise specified, results of 28-day drying period shall not exceed 0.040 percent if 3-inch prisms are used, or exceed 0.038 percent if 4-inch prisms are used. Aggregate will be rejected if test values exceed these limits.
- 4. Slump:
 - Unless otherwise specified, and prior to submitting mix design, select a target slump at the point of delivery for concrete mixtures used for Work. Selected target slump shall not exceed 9 inches. Concrete shall not show visible signs of segregation. The target slump indicated on the submittal shall be used as the basis for acceptance during the Project. Determine the slump by ASTM C143/C143M.
 - b. Slump tolerance shall meet requirements of ACI 117.
- 5. Self-Consolidating Concrete:
 - a. Unless otherwise specified, select a target slump flow at the point of delivery for self-consolidating concrete mixtures. Selected target slump flow shall not exceed 30 inches. Concrete shall not show visible signs of segregation. The target slump flow value indicated on the submittal shall be used as the basis for acceptance during the project. Determine slump flow in accordance with ASTM C1611/C1611M.
 - b. Slump flow tolerances shall be in accordance with ASTM C94/C94M.
 - c. If specified, evaluate during the mixture qualification stage, proposed concrete mixtures for passing ability in accordance with ASTM C1621/C1621M and for static segregation in accordance with ASTM C1610/C1610M to meet criteria indicated in Contract Documents.
- C. Concrete Mixing:
 - 1. General: In accordance with ACI 301, except as modified herein.
 - 2. Truck Mixers:
 - a. For every truck, test slump, or slump flow of samples taken per ASTM C94/C94M, Paragraph 12.5.1.
 - b. Where specified slump is more than 4 inches, and if slump tests differ by more than 2 inches, discontinue use of truck mixer, unless causing condition is corrected and satisfactory performance is verified by additional slump tests.

2.03 REINFORCING STEEL

- A. Deformed Steel Reinforcing Bars: ASTM A615/A615M, Grade 60. Welding of reinforcing bars is not permitted.
- B. Fabrication: Follow CRSI Manual of Standard Practice.
- C. Forcing Bars: ASTM A615/A615M, Grade 60. Welding of reinforcing bars is not permitted.

2.04 ANCILLARY MATERIALS

- A. Bonding Agent:
 - 1. Unless otherwise specified, in accordance with the following:
 - a. ASTM C881/C881M, Type V.
 - b. Two-component, moisture-insensitive, 100 percent solids epoxy.
 - c. Consult manufacturer for surface finish, pot life, set time, vertical or horizontal application, and forming restrictions.
 - d. Manufacturers and Products:
 - Master Builders Solutions, Shakopee, MN; MasterInject 1500.
 - 2) Euclid Chemical Co., Cleveland, OH; Euco # 352 Epoxy System LV.
 - 3) Prime Resins, Conyers, GA; Prime Bond 3000 to 3900 Series.
 - 4) Sika Chemical Corp., Lyndhurst, NJ; Sikadur 32 Hi-Mod.
- B. Bond Breaker:
 - 1. Nonstaining type, providing positive bond prevention.
 - 2. Manufacturers and Products:
 - a. Dayton Superior Corporation, Miamisburg, OH; Sure Lift J6WB.
 - b. Nox-Crete Products Group, Omaha, NE; Silcoseal Select.
- C. Reinforcing Steel Accessories:
 - 1. Plastic Protected Wire Bar Supports: In compliance with ANSI/CRSI RB 4.1 Class 1 Reinforcement Supports.
 - 2. Stainless Steel Protected Wire Bar Supports: In compliance with ANSI/CRSI RB 4.1 Class 2 Reinforcement Supports, except legs shall be made wholly from stainless steel wire.
 - Bar Supports with No Special Requirements for Corrosion Resistance: In compliance with ANSI/CRSI – RB 4.1 Class 3 Reinforcement Supports.

- 4. Precast Concrete Bar Supports: In compliance with ANSI/CRSI RB 4.1 Cementitious (Precast) Reinforcement Supports.
 - a. Precast concrete bar supports shall have equal or greater strength than the surrounding concrete.
 - b. Precast concrete bar supports shall be four square inches minimum, in plan.
 - c. Precast concrete bar supports shall have tie wires.
- D. Tie Wire:
 - 1. Black, soft-annealed 16-gauge wire.
 - 2. Nylon-coated, epoxy-coated, or plastic-coated wire.
- E. Plastic Waterstop:
 - 1. Extruded from elastomeric plastic compound of which basic resin shall be prime virgin polyvinyl chloride (PVC). Compound shall not contain scrapped material, reclaimed material, or pigment.
 - 2. Specific Gravity: Approximately 1.37.
 - 3. Shore Durometer Type A Hardness: Approximately 80.
 - 4. Performance Requirements: COE Specification CRD-C-572.
 - 5. Type Required in Contraction and Control Joints: 6 inches wide and parallel longitudinal ribs or protrusions on each side of strip center, as indicated on Drawings.
 - 6. Type Required in Construction Joints: Flat ribbed with same dimensional properties as described above.
 - 7. Corrugated or tapered type waterstops are not acceptable.
 - 8. Thickness: Constant from center bulb (or center of waterstop), to outside stop edge.
 - 9. Waterstop Weight: 1.60 pounds for 3/8 inch by 6 inches, minimum per foot.
 - 10. Factory Fabrications: Use only factory fabrications for intersections, transitions, and changes of direction.
 - 11. Manufacturers and Products:
 - a. Center Bulb Type:
 - Vinylex Corp., Knoxville, TN; Catalog No. 03250/VIN: No. RB6-38H (6 inches by 3/8 inch).
 - 2) Greenstreak Plastic Products, St. Louis, MO; Catalog No. 03150/GRD: Style 732 (6 inches by 3/8 inch).
 - Four Seasons Industries Durajoint, Garrettsville, OH; Catalog No. CSP-162: Type 9 (6 inches by 3/8 inch).
 - 4) BoMetals, Carrollton, GA; Catalog No. RCB-638LB (6 inches by 3/8 inch).

- 5) Dacon Plastics LLC, Portland, OR, (903) 245-0048; Catalog No. RCB17 (6 inches by 3/8 inch).
- b. Flat Ribbed Profile: Use same manufacturers as bulb type.
- F. Hydrophilic Waterstop:
 - 1. For use at construction joints only, where new concrete is placed against existing concrete and as shown on Drawings.
 - 2. Material shall be a nonbentonite hydrophilic rubber compound.
 - 3. Manufacturers and Products:
 - 4. Greenstreak Plastic Products, St. Louis, MO; Hydrotite CJ-1020-2K with Leakmaster LV-1 adhesive and sealant.
 - 5. Adeka Ultra Seal, JLM Associates, Spearfish, SD; MC-2010M with 3M-2141 adhesive and P-201 sealant.
- G. Premolded Joint Filler:
 - 1. Bituminous Type: ASTM D994/D994M or ASTM D1751.
 - 2. Sponge Rubber:
 - a. Neoprene, closed-cell, expanded; ASTM D1056, Type 2C5, with compression deflection, 25 percent deflection (limits), 119 kPa to 168 kPa (17 psi to 24 psi) minimum.
 - b. Manufacturer and Product: Monmouth Rubber and Plastics Corporation, Long Branch, NJ; Durafoam DK515IHD.
 - 3. Self-Expanding Cork:
 - a. ASTM D1752, Type III.
 - b. Manufacturer and Product: WR Meadows, Inc., Hampshire, IL; Self-expanding cork. (800) 342-5976.
- H. Curing Compound:
 - 1. Water-based, high-solids content, nonyellowing, curing compound meeting requirements of ASTM C1315 Type I, Class A.
 - 2. Manufacturers and Products:
 - a. Euclid Chemical Co., Cleveland, OH; Super Diamond Clear VOX.
 - b. WR Meadows, Inc., Hampshire, IL; VOCOMP-30.
 - c. Vexcon Chemical, Inc., Philadelphia, PA; Starseal 1315.
 - d. Dayton Superior; Safe Cure and Seal 1315 EF.
- I. Evaporation Retardant:
 - 1. Optional: Fluorescent fugitive dye color tint that disappears completely upon drying.

- 2. Manufacturers and Products:
 - a. Master Builders Solutions, Shakopee, MN; MasterKure ER 50.
 - b. Euclid Chemical Co., Cleveland, OH; Eucobar.
- J. Nonshrink Grout:
 - 1. Nonmetallic, nongas-liberating.
 - 2. Prepackaged natural aggregate grout requiring only the addition of water.
 - 3. Aggregate shall show no segregation or settlement at fluid consistency at specified times or temperatures.
 - 4. Test in accordance with ASTM C1107/C1107M:
 - a. Fluid consistency 20 seconds to 30 seconds in accordance with ASTM C939.
 - b. Temperatures of 40 degrees F, 80 degrees F, and 100 degrees F.
 - 5. Pass fluid grout through flow cone with continuous flow 1 hour after mixing.
 - 6. Minimum Strength of Fluid Grout:
 - a. 3,500 psi at 1 day.
 - b. 4,500 psi at 3 days.
 - c. 7,500 psi at 28 days.
 - 7. Maintain fluid consistency when mixed in 1-yard to 9-yard loads in ready-mix truck.
 - 8. Manufacturers and Products:
 - a. Master Builders Solutions, Shakopee, MN; MasterFlow 928.
 - b. Five Star Products, Inc., Fairfield, CT; Five Star Fluid Grout 100.
 - c. Euclid Chemical Co., Cleveland, OH; Hi Flow Grout.
 - d. Dayton Superior Corp., Miamisburg, OH; Sure Grip High Performance Grout.
- K. Repair Material:
 - 1. Contain only trace amounts of chlorides and other chemicals that can potentially cause steel to oxidize.
 - 2. Where repairs of exposed concrete are required, prepare mockup using proposed repair materials and methods, for confirmation of appearance compatibility prior to use.
 - 3. Obtain Manufacturer's Certificate of Compliance that products selected are appropriate for specific applications.
 - 4. Repair mortar shall be Site mixed.
 - 5. Prepare concrete substrate and mix, place, and cure repair material in accordance with manufacturer's written recommendations.

- 6. Manufacturers and Products:
 - a. Master Builders Solutions, Shakopee, MN; MasterEmaco S Series products.
 - b. Sika Chemical Corp., Lyndhurst, NJ; SikaTop Series.
- L. Crack Repair:
 - 1. Obtain Letter of Certification from manufacturer's technical representative, that products selected are appropriate for the specific applications.
 - 2. Prepare concrete substrate and mix, place, and cure repair material in accordance with manufacturer's written recommendations.
 - 3. Use part epoxy injection resin for structural crack repairs.
 - a. Manufacturers and Products:
 - 1) Master Builders Solutions, Shakopee, MN; MasterInject Series.
 - 2) Euclid Chemical Co., Cleveland, OH.; Euco Series (#452).
 - 3) Sika Chemical Corp., Lyndhurst, NJ.; Sikadur Series.
 - 4. Use hydrophilic polyurethane injection resin for nonstructural crack repairs.
 - a. Manufacturers and Products:
 - 1) Master Builders Solutions, Shakopee, MN; MasterInject 1210 IUG.
 - 2) Euclid Chemical Co., Cleveland, OH.; Dural Aqua-Fil.
 - 3) Sika Chemical Corp., Lyndhurst, NJ.; SikaFix HH Hydrophilic.
 - 4) Prime Resins, Inc., Conyers, GA.; Prime Flex 900 XLV.

2.05 SOURCE QUALITY CONTROL

A. Source Quality Control Inspection: Engineer shall have access to and have right to inspect batch plants, cement mills, and supply facilities of suppliers, manufacturers, and subcontractors, providing products included in this section.

PART 3 EXECUTION

3.01 FORMWORK

- A. Form Construction:
 - 1. Construct forms and provide smooth-form finish.
 - 2. Form 3/4-inch bevels at concrete edges, unless otherwise shown.
 - 3. Make joints tight to prevent escape of mortar and to avoid formation of fins.

- 4. Brace as required to prevent distortion during concrete placement.
- 5. On exposed surfaces, locate form ties in uniform pattern or as shown.
- 6. Construct so ties remain embedded in the member with no metal within 1 inch of concrete surface when forms, inserts, and tie ends are removed.
- B. Form Removal:
 - 1. Nonsupporting forms (walls and similar parts of Work) may be removed after cumulatively curing at not less than 50 degrees F for 24 hours from time of concrete placement if:
 - a. Concrete is sufficiently hard so as not to sustain damage by form removal operations.
 - b. Curing and protection operations are maintained.
 - 2. Remove forms with care to prevent scarring and damaging the surface.
 - 3. Prior to form removal, provide thermal protection for concrete being placed under the requirements of cold weather concreting.

3.02 PLACING REINFORCING STEEL

- A. Unless otherwise specified, in accordance with ACI 301.
- B. Accessories:
 - 1. Bar Supports in Contact with Ground: Provide precast concrete block supports.
 - a. Do not use brick, broken concrete masonry units, spalls, rocks, construction debris, or similar material for supporting reinforcing steel.
 - 2. Bar Supports in Contact with Forms: Unless otherwise noted, bar supports shall be plastic protected wire bar supports, stainless steel protected wire bar supports, or precast concrete block bar supports.
 - a. Use stainless steel protected wire bar supports or precast concrete block bar supports at formed surfaces that will receive abrasive blasting, hydro-blasting, or grinding.
 - 3. Bar Supports with No Special Requirements for Corrosion Resistance: Class 3 bar supports may be used in the following facilities, where the concrete surface in the finished construction will be in a dry conditioned space and will be concealed by architectural treatment such as ceiling or wall treatment, but not including sealer, paint, or other membrane coating.
 - 4. Bar supports shall have sufficient strength and stiffness to carry loads without failure, displacement, or significant deformation. Space bar supports so minimum concrete cover is maintained for reinforcing

between supports, and location of reinforcement remains within tolerance throughout work.

- C. Splices and Laps:
 - 1. Lap Splice Reinforcing: Refer to Structural General Notes on Drawings for additional information.
 - 2. Tie splices with 18-gauge annealed wire as specified in CRSI Standard.

3.03 INSTALLATION OF WATERSTOPS

- A. General:
 - 1. Continuous waterstop, as specified, shall be installed in all construction joints in walls and slabs of water holding basins and channels and in walls of belowgrade structures, unless specifically noted otherwise.
 - 2. Join waterstop at intersections to provide continuous seal.
 - 3. Center waterstop on joint.
 - 4. Secure waterstop in correct position. Tie waterstop to reinforcing steel using grommets, hog rings, or tie wire at maximum spacing of 12 inches. Do not displace waterstop during concrete placement.
 - 5. Repair or replace damaged waterstop.
 - 6. Place concrete and vibrate to obtain impervious concrete in vicinity of joints.
 - 7. Joints in Footings and Slabs:
 - a. Ensure space beneath plastic waterstop is completely filled with concrete.
 - b. Make visual inspection of waterstop area during concrete placement.
 - c. Limit concrete placement to elevation of waterstop in first pass, vibrate concrete under waterstop, lift waterstop to confirm full consolidation without voids, then place remaining concrete to full height of slab.
 - 8. Plastic Waterstop:
 - a. Install in accordance with manufacturer's written instructions.
 - b. Splice in accordance with waterstop manufacturer's written instructions using Teflon-coated thermostatically controlled heating iron at approximately 380 degrees F.
 - 1) Allow at least 10 minutes before new splice is pulled or strained in any way.
 - Finished splices shall provide cross section that is dense and free of porosity with tensile strength of not less than 80 percent of unspliced materials.

- 3) Use only factory made waterstop fabrications for all intersections, changes of directions and transitions.
- 4) Field splice permitted only for straight butt welds.
- c. Wire looped plastic waterstop may be substituted for plastic waterstop.
- 9. Hydrophilic Waterstop:
 - a. Prepare concrete surfaces and install in accordance with waterstop manufacturer's written instructions and the following:
 - 1) Surface Preparation:
 - a) Concrete surface must be smooth, clean, and dry. Grind concrete as required.
 - b) Clean debris, dirt, dust, and foreign material from concrete surface.
 - 2) Installation:
 - a) Provide minimum of 2-1/2 inches of concrete cover over waterstop. When structure has two layers of steel reinforcement, locate centered between layers of steel or as shown.
 - b) Apply adhesive to concrete surface and allow to dry for specified time before applying waterstop strip.
 - c) Lap ends of waterstop strip together at splices and corners and join with sealant.
 - d) Verify that waterstop is anchored firmly in place before placing concrete. Do not allow vibrator to come into contact with waterstop.
 - e) Lap hydrophilic waterstop 2 feet minimum with intersecting plastic waterstops.

3.04 CONCRETE PLACEMENT INTO FORMWORK

- A. Inspection: Notify Engineer and Special Inspector at least 1 work day in advance before starting to place concrete.
- B. Placement into Formwork:
 - 1. Reinforcement: Secure in position before placing concrete.
 - 2. Place concrete as soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 1.5 feet deep, except for slabs that shall be placed full depth. Place and consolidate successive layers prior to initial set of first layer to prevent cold joints.
 - 3. Placement frequency shall be such that lift lines will not be visible in exposed concrete finishes.
- 4. Use placement devices (such as, chutes, pouring spouts, and pumps) as required to prevent segregation.
- 5. Vertical Free Fall Drop to Final Placement:
 - a. Forms 8 Inches or Less Wide: 5 feet.
 - b. Forms Wider than 8 Inches: 8 feet, except as specified.
- 6. For placements where drops are greater than specified, use placement device such that free fall below placement device conforms to required value.
 - a. Limit free fall to prevent segregation caused by aggregates hitting steel reinforcement.
- 7. Provide sufficient illumination in the interior of forms so concrete deposition is visible, permitting confirmation of consolidation quality.
- 8. Joints in Footings and Slabs:
 - a. Ensure space beneath plastic waterstop completely fills with concrete.
 - b. During concrete placement, make visual inspection of entire waterstop area.
 - c. Limit concrete placement to elevation of waterstop in first pass, vibrate concrete under waterstop, lift waterstop to confirm full consolidation without voids, and place remaining concrete to full height of slab.
 - d. Apply procedure to full length of waterstop.
- 9. Trowel and round off top exposed edges of walls with 1/4-inch radius steel edging tool.
- C. Conveyor Belts and Chutes:
 - 1. Design and arrange ends of chutes, hopper gates, and other points of concrete discharge throughout conveying, hoisting, and placing system for concrete to pass without becoming segregated.
 - 2. Do not use chutes longer than 50 feet.
 - 3. Wipe clean with device that does not allow mortar to adhere to belt.
 - 4. Cover conveyor belts and chutes.
- D. Retempering: Not permitted for concrete where cement has partially hydrated.
- E. Pumping of Concrete:
 - 1. Provide standby pump, conveyor system, crane and concrete bucket, or other system onsite during pumping, for adequate redundancy to ensure completion of concrete placement without cold joints in case of primary placing equipment breakdown.
 - 2. Minimum Pump Hose (Conduit) Diameter: 4 inches.

- 3. Replace pumping equipment and hoses (conduits) that are not functioning properly.
- F. Maximum Size of Concrete Placements:
 - 1. Limit size of each placement to allow for strength gain and volume change as a result of shrinkage.
 - 2. Construction Joints:
 - a. Unless otherwise shown or permitted, locate construction joints as follows:
 - 1) Locate construction joints as shown on Drawings or where approved in the joint location submittal.
 - 2) Uniformly space vertical construction joints within straight sections of walls, avoiding penetrations.
 - 3. Consider beams, girders, brackets, column capitals, and haunches as part of floor or roof system and place monolithically with floor or roof system.
 - 4. Should placement sequence result in cold joint located below finished water surface, install waterstop in joint.
- G. Minimum Time between Adjacent Placements:
 - 1. Typical Unless Noted Otherwise: As soon as can safely be done without damaging previously cast concrete or interrupting curing thereof, but not less than 24 hours.
 - 2. Expansion or Contraction Joints: 1 day.
 - 3. If continuous placement of beams, girders, or slabs with columns or walls is indicated in Contract Documents, do not place horizontal elements until the underlying concrete is consolidated and bleed water is not on the surface of the supporting member, unless otherwise specified.

3.05 CONSOLIDATION AND VISUAL OBSERVATION

A. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete.

3.06 COLD WEATHER PLACEMENT

- A. Unless otherwise permitted, shall be in accordance with requirements of ACI 301, ACI 306.1, and as follows:
 - 1. Cold weather requirements shall apply when ambient temperature is below 40 degrees F or approaching 40 degrees F and falling.
 - 2. Do not place concrete over frozen earth or against surfaces with frost or ice present. Frozen earth shall be thawed to acceptance of Engineer.

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- 3. Unless otherwise permitted, do not place concrete in contact with surfaces less than 35 degrees F; requirement is applicable to all surfaces including reinforcement and other embedded items.
- 4. Provide supplemental external heat as needed when other means of thermal protection are unable to maintain minimum surface temperature of concrete as specified in ACI 306.1.
- 5. Maintain minimum surface temperature of concrete as specified in ACI 306.1 for no less than 3 days during cold weather conditions.
- 6. Protect concrete from freezing until end of curing period and until concrete has attained a compressive strength of 3,500 psi or design compressive strength if less than 3,500 psi.
- B. Provide maximum and minimum temperature sensors placed on concrete surfaces spaced throughout Work to allow monitoring of concrete surface temperatures representative of Work. Unless otherwise permitted, record surface temperature of concrete at least once every 12 hours during specified curing period.
- C. External Heating Units: Do not exhaust heater flue gases directly into enclosed area as it causes concrete carbonation as a result of concentrated carbon dioxide.
- D. Cure as specified.

3.07 HOT WEATHER PLACEMENT

- A. Prepare ingredients, mix, place, cure, and protect in accordance with ACI 301, ACI 305.1, and as follows:
 - 1. Maintain concrete temperature below 95 degrees F at time of placement, or furnish test data or other proof that admixtures and mix ingredients do not produce flash set plastic shrinkage, or cracking as a result of heat of hydration. Cool ingredients before mixing to maintain fresh concrete temperatures as specified or less.
 - Internal concrete temperature in structure shall not exceed 158 degrees F, and maximum temperature differential between center of section and external surfaces of concrete shall not exceed 35 degrees F.
 - 3. Provide for windbreaks, shading, fog spraying, sprinkling, ice, wet cover, or other means as necessary to maintain concrete at or below specified temperature.
 - 4. Cure as specified.

3.08 CONCRETE BONDING

- A. Construction Joints at Existing Concrete:
 - 1. Thoroughly clean and roughen existing concrete surfaces to roughness profile of 1/4 inch.
 - 2. Saturate surface with water for 24 hours prior to placing new concrete.

3.09 PREMOLDED JOINT FILLER INSTALLATION

- A. Sufficient in width to completely fill joint space where shown.
- B. Drive nails approximately 1 foot 6 inches on center through filler, prior to installing, to provide anchorage embedment into concrete during concrete placement.
- C. Secure premolded joint filler in forms before concrete is placed.

3.10 FINISHING FORMED SURFACES

- A. Provide surface finish 2.0 (SF-2.0) in accordance with ACI 301 and as herein specified.
- B. Tie Holes: Unless otherwise specified, fill with specified repair material.
- C. Prepare substrate and mix, place, and cure repair material per manufacturer's written recommendations.
- D. Repair defective areas of concrete.
 - 1. Cut edges perpendicular to surface at least 1/2 inch deep. Do not feather edges. Soak area with water for 24 hours.
 - 2. Patch with specified repair material.
 - 3. Repair concrete surfaces using specified materials. Select system, submit for review, and obtain approval from Engineer prior to use.
 - 4. Develop repair techniques with material manufacturer on surface that will not be visible in final construction prior to starting actual repair work and show how finish color will blend with adjacent surfaces. Obtain approval from Engineer.
 - 5. Obtain quantities of repair material and manufacturer's detailed instructions for use to provide repair with finish to match adjacent surface or apply sufficient repair material adjacent to repair to blend finish appearance.

- 6. Repair of concrete shall provide structurally sound surface finish, uniform in appearance or upgrade finish by other means until acceptable to Engineer.
- E. Inject cracks that leak.
 - 1. When crack repair is deemed by Engineer as requiring a structural repair, use part epoxy injection resin.
 - 2. When crack repair is deemed by Engineer as requiring a nonstructural repair, use hydrophilic polyurethane injection resin.

3.11 FINISHING UNFORMED SURFACES

- A. General:
 - 1. Use manual screeds, vibrating screeds, or roller compacting screeds to place concrete level and smooth.
 - 2. Do not use "jitterbugs" or other special tools designed for purpose of forcing coarse aggregate away from surface and allowing layer of mortar, which will be weak and cause surface cracks or delamination, to accumulate.
 - 3. Do not dust surfaces with dry materials nor add water to surfaces.
 - 4. Cure concrete as specified.
- B. Slab Tolerances:
 - 1. Exposed Slab Surfaces: Comprise of flat planes as required within tolerances specified.
 - 2. Slab Finish Tolerances and Slope Tolerances: Crowns on floor surface not too high as to prevent 10-foot straightedge from resting on end blocks, nor low spots that allow block of twice the tolerance in thickness to pass under supported 10-foot straightedge.
 - 3. Steel gauge block 5/16 inch thick.
 - 4. Finish Slab Elevation: Slope slabs to floor drain and gutter, and shall adequately drain regardless of tolerances.
 - 5. Thickness: Maximum 1/4 inch minus or 1/2 inch plus from thickness shown. Where thickness tolerance will not affect slope, drainage, or slab elevation, thickness tolerance may exceed 1/2 inch plus.
- C. Interior Slab Finish: Provide trowel finish unless specified otherwise.

- D. Exterior Slab Finish:
 - 1. Provide broom finish unless specified otherwise.
 - 2. Finish exposed edges with steel edging tool.
 - 3. Mark sidewalks transversely at 5-foot intervals with jointing tool.

3.12 EXPOSED METAL OBJECTS

- A. Remove metal objects not intended to be exposed in as-built condition of structure including wire, nails, and bolts, by chipping back concrete to depth of 1 inch and then cutting or removing metal object.
- B. Repair area of chipped-out concrete as specified for defective areas.

3.13 BLOCKOUTS AT PIPES OR OTHER PENETRATIONS

A. Where shown, install in accordance with requirements of Drawings.

3.14 PROTECTION AND CURING

- A. Protect and cure concrete in accordance with requirements of ACI 301, ACI 308.1, and as follows:
 - 1. Protect fresh concrete from direct rays of sunlight, drying winds, and wash by rain.
 - 2. Keep concrete slabs continuously wet for a 7-day period. Intermittent wetting is not acceptable.
 - 3. Use curing compound only where approved by Engineer.
 - 4. Cure formed surfaces with curing compound applied in accordance with manufacturer's written instructions as soon as forms are removed and finishing is completed.
 - 5. Remove and replace concrete damaged by freezing.
 - 6. Repair areas damaged by construction, using specified repair materials and approved repair methods.

3.15 NONSHRINK GROUT

- A. General: Mix, place, and cure nonshrink grout in accordance with grout manufacturer's written instructions.
- B. Grouting Machinery Foundations:
 - 1. Block out original concrete or finish off at distance shown below bottom of machinery base with grout. Prepare concrete surface by sandblasting,

chipping, or by mechanical means to remove any soft material. Surface roughness in accordance with manufacturer's written instructions.

- 2. Clean metal surfaces of all paint, oil, grease, loose rust, and other foreign material that will be in contact with grout.
- 3. Set machinery in position and wedge to elevation with steel wedges, or use cast-in leveling bolts. Remove wedges after grout is set and pack void with grout.
- 4. Form with watertight forms at least 2 inches higher than bottom of plate.
- 5. Fill space between bottom of machinery base and original concrete in accordance with manufacturer's written instructions.

3.16 BACKFILL AGAINST STRUCTURES

- A. Do not backfill against walls until concrete has obtained specified 28-day compressive strength.
- B. Refer to General Structural Notes on Drawings for additional requirements, including elevated slab and diaphragm completion prior to backfill.
- C. Unless otherwise permitted, place backfill simultaneously on both sides of structure, where such fill is required, to prevent differential pressures.

3.17 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

- A. General:
 - 1. Contractor-Furnished Quality Control: Inspection and testing as required in Section 01 45 16.13, Contractor Quality Control.
 - 2. Provide adequate facilities for safe storage and proper curing of concrete test specimens onsite for first 24 hours and for additional time as may be required before transporting to test lab.
 - 3. Unless otherwise specified, sample concrete for testing for making test specimens, from point of delivery.
 - 4. When concrete is pumped, sample and test air content at point of delivery and at point of placement.
 - a. For Each Concrete Mixture: Provided results of air content tests for first load of the day are within specified limits, testing need only be performed at point of delivery for subsequent loads of that concrete mixture except that testing should be performed at point of placement every 4 hours.
 - 5. Evaluation will be in accordance with ACI 301 and Specifications.
 - 6. Test specimens shall be made, cured, and tested in accordance with ASTM C31/C31M and ASTM C39/C39M.
 - 7. Frequency of testing may be changed at discretion of Engineer.

- 8. Pumped Concrete: Take concrete samples for slump, ASTM C143/C143M, and test specimens, ASTM C31/C31M and ASTM C39/C39M.
- 9. If measured air content at delivery is greater than specified limit, check test of air content will be performed immediately on a new sample from delivery unit. If check test fails, concrete has failed to meet requirements of Contract Documents. If measured air content is less than lower specified limit, adjustments will be permitted in accordance with ASTM C94/C94M, unless otherwise specified. If check test of adjusted mixture fails, concrete has failed to meet requirements of Contract Documents. Concrete that has failed to meet requirements of Contract Documents shall be rejected.
- B. Concrete Strength Test:
 - 1. Unless otherwise specified, one specimen at age of 7 days for information, and two 6-inch diameter or when permitted three 4-inch diameter test specimens at age of 28 days for acceptance.
 - 2. If result of 7-day concrete strength test is less than 50 percent of specified 28-day strength, extend period of moist curing by 7 additional days.
 - 3. Provide a minimum of one spare test specimen per sample. Test spare cylinder as directed by Engineer.
 - 4. Segregation Test Objective: Concrete shall stay together when slumped. Segregation is assumed to cause mortar to flow out of mix even though aggregate may stay piled enough to meet slump or slump flow test.
 - 5. Test Procedure: Make slump or slump flow test and check for excessive slump or slump flow. Observe to see if mortar or moisture flows from slumped concrete.
 - 6. Reject concrete if mortar or moisture separates and flows out of mix.
- C. Cold Weather Placement Tests:
 - 1. During cold weather concreting, cast cylinders for field curing as follows. Use method that will produce greater number of specimens:
 - a. Six extra test cylinders from last 100 cubic yards of concrete.
 - b. Minimum three specimens for each 2 hours of placing time or for each 100 cubic yards.
 - 2. These specimens shall be in addition to those cast for lab testing.
 - 3. Protect test cylinders from weather until they can be placed under same protection provided for concrete of structure that they represent.
 - 4. Keep field test cylinders in same protective environment as parts of structure they represent to determine if specified strength has been obtained.

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- 5. Test cylinders in accordance with applicable sections of ASTM C31/C31M and ASTM C39/C39M.
- 6. Use test results to determine specified strength gain prior to falsework removal.
- D. Slab Finish Tolerances and Slope Tolerances:
 - 1. Support 10-foot-long straightedge at each end with steel gauge blocks of thicknesses equal to specified tolerance.
 - 2. Compliance with designated limits in four of five consecutive measurements is satisfactory, unless defective conditions are observed.

3.18 MANUFACTURER'S SERVICES

- A. Provide representative at Site for installation assistance, inspection, and certification of proper installation for concrete ingredients, mix design, mixing, and placement.
- B. Concrete Producer Representative:
 - 1. Observe how concrete mixes are performing.
 - 2. Assist with concrete mix design, performance, placement, weather problems, and problems as may occur with concrete mix throughout Project, including instructions for redosing.
 - 3. Establish control limits on concrete mix designs.
 - 4. Provide equipment for control of concrete redosing for air entrainment or high-range, water-reducing admixture, superplasticizers, at Site to maintain proper slump or slump flow, and air content when specified.
- C. Admixture Manufacturer's Representative: Available for consultations as required to ensure proper installation and performance of specified products.
- D. Bonding Agent Manufacturer's Representative: Available for consultations as required to ensure proper installation and performance of specified products.

3.19 SUPPLEMENT

- A. Requirements of concrete mix designs following "End of Section," are a part of this Specification and supplement requirements of Part 1 through Part 3 of this section:
 - 1. Concrete Mix Design, Class 5000F3S1P2C2.

END OF SECTION

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CONCRETE MIX DESIGN, CLASS 5000F3S1P2C2

- A. Mix Locations: Typical, unless otherwise specified.
- B. Exposure Categories and Classifications: F3S1P2C2.
- C. Mix Properties:
 - 1. Limit water to cementitious materials ratio (W/Cm) in mix design to maximum value of 0.40.
 - 2. Minimum concrete compressive strength (f'c) shall be 5,000 psi at 28 days.
 - 3. Concrete mix shall be certified to comply with ANSI STD 61 for contact with potable water.
 - 4. Designed to conform to shrinkage limits.
 - 5. Air-entraining admixtures are prohibited in concrete mixtures and total air content shall not be greater than 3 percent, for the following:
 - a. Slabs to receive hard-troweled finish.
 - b. Slabs to receive dry shake floor hardener.
 - c. Slabs to receive topping placed monolithically as two-course floor on top of plastic concrete.
 - 6. Unless otherwise specified, provide air content based on nominal maximum size of aggregate as follows:

Nominal Maximum Aggregate Size in.‡	Air Content (%)*
3/8	7.5
1/2	7.0
3/4	6.0
1	6.0
1-1/2	5.5
2 [§]	5.0

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

Nominal Maximum Aggregate Size	Air Content
in.‡	(%)*
3 [§]	4.5

[‡]See ASTM C33/C33M for tolerance on oversize for various nominal maximum size designations.

*Tolerance of air content is $\pm 1-1/2$ percent.

\$Air contents apply to total mixture. When testing concretes, however, aggregate particles larger than 1-1/2 inches are to be removed by sieving and air content will be measured on sieved fraction (tolerance on air content as delivered applies to this value). Air content of total mixture is computed from value measured on the sieved fraction passing the 1-1/2-inch sieve in accordance with ASTM C231/C231M.

- 7. Limit supplementary cementitious materials measured as a percent of weight of total cementitious materials in mix design, as follows:
 - a. Fly Ash and Other Pozzolans: 25 percent.
 - b. Slag Cement: 50 percent.
 - c. Silica Fume: 10 percent.
 - d. Combined Fly Ash and other Pozzolans and Slag Cement lag Cement, and Silica Fume: 50 percent, with fly ash and other pozzolans not exceeding 25 percent, and silica fume not exceeding 10 percent.
 - e. Combined Fly Ash and other Pozzolans and Silica Fume: 35 percent, with fly ash and other pozzolans not exceeding 25 percent, and silica fume not exceeding 10 percent.
 - f. Total cementitious materials include ASTM C150/C150M and ASTM C595/C595M cement.
 - 1) Fly ash and other pozzolans in Type IP, blended cement, ASTM C595/C595M.
 - 2) Slag used in the manufacture of an IS blended cement, ASTM C595/C595M.
 - 3) Silica fume, ASTM C1240, present in blended cement.
- 8. Provide cementitious materials in accordance with one of the following:
 - a. ASTM C150/C150M Type II; inclusion of supplementary cementitious materials in design mix is optional.
 - b. ASTM C150/C150M types other than Type II, plus supplementary cementitious materials in accordance with one of the following:
 - 1) Tricalcium Aluminate Content of Total Cementitious Materials: Maximum 8 percent by weight.

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- 2) Provide documentation of test results in accordance with ASTM C1012/C1012M, for combinations of cementitious materials providing sulfate resistance with expansion less than 0.10 percent at 6 months.
- c. ASTM C595/C595M Type IP or Type IS (less than 70), tested to comply with moderate sulfate resistance option (MS).
 - 1) Provide documentation of test results in accordance with ASTM C1012/C1012M, for combinations of cementitious materials providing sulfate resistance with expansion less than 0.10 percent at 6 months.
- 9. Unless otherwise permitted, minimum cementitious materials content in mix design shall be as follows:
 - a. 515 pounds per cubic yard for concrete with 1-1/2-inch nominal maximum size aggregate.
 - b. 535 pounds per cubic yard for 1-inch nominal maximum size aggregate.
 - c. 560 pounds per cubic yard for 3/4-inch nominal maximum size aggregate.
 - d. 580 pounds per cubic yard for 1/2-inch nominal maximum size aggregate.
 - e. 600 pounds per cubic yard for 3/8-inch nominal maximum size aggregate.
 - f. Unless otherwise permitted, limit cementitious materials content to 100 pounds per cubic yard greater than specified minimum cementitious materials content in mix design.
- 10. Limit water-soluble, chloride-ion content in hardened concrete to 0.10 percent, unless otherwise specified.
 - a. Limits are stated in terms of chloride ions in percent by weight of cement.
 - b. Unless otherwise permitted, provide documentation from concrete tested in accordance with ASTM C1218/C1218M at an age between 28 days and 42 days.
- D. Refer to PART 1 through PART 3 of this section for additional requirements.

SECTION 09 90 00 PAINTING AND COATING

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. Environmental Protection Agency (EPA).
 - 2. NACE International (NACE): SP0188, Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
 - 3. NSF International (NSF): 61, Drinking Water System Components Health Effects.
 - 4. Occupational Safety and Health Act (OSHA).
 - 5. Research Council on Structural Connections (RCSC): Specification for Structural Joints using High-Strength Bolts.
 - 6. The Society for Protective Coatings (SSPC):
 - a. PA 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements.
 - b. PA 10, Guide to Safety and Health Requirements for Industrial Painting Projects.
 - c. SP 1, Solvent Cleaning.
 - d. SP 2, Hand Tool Cleaning.
 - e. SP 3, Power Tool Cleaning.
 - f. SP 5, White Metal Blast Cleaning.
 - g. SP 6, Commercial Blast Cleaning.
 - h. SP 7, Joint Surface Preparation Standard Brush-Off Blast Cleaning.
 - i. SP 10, Near-White Blast Cleaning.
 - j. SP 11, Power Tool Cleaning to Bare Metal.
 - k. SP 16, Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.
 - 1. Guide 15, Field Methods for Retrieval and Analysis of Soluble Salts on Steel and Other Nonporous Substrates.

1.02 DEFINITIONS

- A. Terms used in this section:
 - 1. Coverage: Total minimum dry film thickness in mils or square feet per gallon.
 - 2. FRP: Fiberglass Reinforced Plastic.
 - 3. HCl: Hydrochloric Acid.

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- 4. MDFT: Minimum Dry Film Thickness, mils.
- 5. MDFTPC: Minimum Dry Film Thickness per Coat, mils.
- 6. Mil: Thousandth of an inch.
- 7. PPDS: Paint Product Data Sheet.
- 8. PSDS: Paint System Data Sheet.
- 9. PVC: Polyvinyl Chloride.
- 10. SFPG: Square Feet per Gallon.
- 11. SFPGPC: Square Feet per Gallon per Coat.
- 12. SP: Surface Preparation.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Data Sheets:
 - For each product, furnish a Paint Product Data Sheet (PPDS), the manufacturer's technical data sheets, and paint colors available (where applicable). The PPDS form is appended to the end of this section.
 - 2) For each paint system, furnish a Paint System Data Sheet (PSDS). The PSDS form is appended to the end of this section.
 - 3) Technical and performance information that demonstrates compliance with specification.
 - 4) Furnish copies of paint system submittals to the coating applicator.
 - 5) Indiscriminate submittal of only manufacturer's literature is not acceptable.
 - b. Detailed chemical and gradation analysis for each proposed abrasive material.
 - 2. Applicator's Qualification: List of references substantiating experience.
 - 3. Factory Applied Coatings: Manufacturer's certification stating factory applied coating system meets or exceeds requirements specified.
 - 4. Manufacturer's written verification that submitted material is suitable for the intended use.
- B. Informational Submittals:
 - 1. Coating Manufacturer's Certificate of Compliance, in accordance with Section 01 43 33, Manufacturers' Field Services.
 - 2. If the manufacturer of finish coating differs from that of shop primer, provide finish coating manufacturer's written confirmation that materials are compatible.

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3. Manufacturer's written instructions and special details for applying each type of paint.

1.04 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 5 years' experience in application of specified products.
- B. Regulatory Requirements:
 - 1. Meet federal, state, and local requirements limiting the emission of volatile organic compounds.
 - 2. Perform surface preparation and painting in accordance with recommendations of the following:
 - a. Paint manufacturer's instructions.
 - b. SSPC PA 10.
 - c. Federal, state, and local agencies having jurisdiction.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Shipping:
 - 1. Where precoated items are to be shipped to the Site, protect coating from damage. Batten coated items to prevent abrasion.
 - 2. Protect shop painted surfaces during shipment and handling by suitable provisions including padding, blocking, and use of canvas or nylon slings.
- B. Storage:
 - 1. Store products in a protected area that is heated or cooled to maintain temperatures within the range recommended by paint manufacturer.
 - 2. Primed surfaces shall not be exposed to weather for more than 2 months before being topcoated, or less time if recommended by coating manufacturer.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Do not apply paint in temperatures or moisture conditions outside of manufacturer's recommended maximum or minimum allowable.
 - 2. Do not perform final abrasive blast cleaning whenever relative humidity exceeds 85 percent, or whenever surface temperature is less than 5 degrees F above dew point of ambient air.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Nationally recognized manufacturers of paints and protective coatings who are regularly engaged in the production of such materials for essentially identical service conditions.
- B. Minimum of 5 years' verifiable experience in manufacture of specified product.
- C. Each of the following manufacturers is capable of supplying most of the products specified herein:
 - 1. Tnemec, Kansas City, MO.
 - 2. Carboline, St. Louis, MO.
 - 3. Sherwin Williams, Cleveland, OH.
 - 4. PPG, Pittsburgh, PA.
 - 5. International Paint (includes Akzo Nobel), Houston, TX.

2.02 ABRASIVE MATERIALS

A. Select abrasive type and size to produce surface profile that meets coating manufacturer's recommendations for specific primer and coating system to be applied.

2.03 PAINT MATERIALS

- A. General:
 - 1. Manufacturer's highest quality products suitable for intended service.
 - 2. Compatibility: Only compatible materials from a single manufacturer shall be used in the Work. Particular attention shall be directed to compatibility of primers and finish coats.
 - 3. Thinners, Cleaners, Driers, and Other Additives: As recommended by coating manufacturer.
- B. Products:

Product	Definition
Acrylic Latex	Single-component, finish as required
Coal-Tar Epoxy	Amine, polyamide, or phenolic epoxy type 70% volume solids minimum, suitable for immersion service

Product	Definition
NSF 61 – Potable Water Contact Epoxy	Epoxy compatible with NSF 61 requirements for potable water contact
Epoxy Primer—Other	Epoxy primer, high-build, as recommended by coating manufacturer for specific galvanized metal, copper, or nonferrous metal alloy to be coated
High Build Epoxy	Polyamidoamine epoxy, minimum 69% volume solids, capability of 4 to 8 MDFT per coat
Epoxy, High Solids	Polyamidoamine epoxy, 80% volume solids, minimum, suitable for immersion service
Polyurethane Enamel	Two-component, aliphatic or acrylic based polyurethane; high gloss finish

2.04 MIXING

- A. Multiple-Component Coatings:
 - 1. Prepare using each component as packaged by paint manufacturer.
 - 2. No partial batches will be permitted.
 - 3. Do not use multiple-component coatings that have been mixed beyond their pot life.
 - 4. Furnish small quantity kits for touchup painting and for painting other small areas.
 - 5. Mix only components specified and furnished by paint manufacturer.
 - 6. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.
- B. Colors: Formulate paints with colorants free of lead, lead compounds, or other materials that might be affected by presence of hydrogen sulfide or other gas likely to be present at Site.

2.05 SHOP FINISHES

- A. Shop Blast Cleaning: Reference Paragraph Shop Coating Requirements.
- B. Surface Preparation: Provide Engineer minimum 7 days' advance notice to start of shop surface preparation work and coating application work.

- C. Shop Coating Requirements:
 - 1. When required by equipment specifications, such equipment shall be primed, and finish coated in shop by manufacturer and touched up in field with identical material after installation.
 - 2. Where manufacturer's standard coating is not suitable for intended service condition, Engineer may approve use of a tie-coat to be used between manufacturer's standard coating and specified field finish. In such cases, tie-coat shall be surface tolerant epoxy as recommended by manufacturer of specified field finish coat. Coordinate details of equipment manufacturer's standard coating with field coating manufacturer.

D. Pipe:

- 1. Steel Pipe:
 - a. Surface preparation and application of primer and finish coats shall be performed by pipe manufacturer.
 - b. For pipe with epoxy lining, do not place end cap seals until pipe lining material has sufficiently dried.

PART 3 EXECUTION

3.01 GENERAL

- A. Provide Engineer minimum 7 days' advance notice to start of field surface preparation work and coating application work.
- B. Perform the Work only in presence of Engineer, unless Engineer grants prior approval to perform the Work in Engineer's absence.
- C. Schedule inspection of cleaned surfaces and all coats prior to succeeding coat in advance with Engineer.

3.02 EXAMINATION

- A. Factory Finished Items:
 - 1. Schedule inspection with Engineer before repairing damaged factoryfinished items delivered to Site.
 - 2. Repair abraded or otherwise damaged areas on factory-finished items as recommended by coating manufacturer. Carefully blend repaired areas into original finish. If required to match colors, provide full finish coat in field.

B. Surface Preparation Verification: Inspect and provide substrate surfaces prepared in accordance with these Specifications and printed directions and recommendations of paint manufacturer whose product is to be applied. The more stringent requirements shall apply.

3.03 PROTECTION OF ITEMS NOT TO BE PAINTED

- A. Remove, mask, or otherwise protect hardware, lighting fixtures, switchplates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not specified elsewhere to be painted.
- B. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces.
- C. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process.
- D. Mask openings in motors to prevent paint and other materials from entering.
- E. Protect surfaces adjacent to or downwind of Work area from overspray.

3.04 SURFACE PREPARATION

- A. Field Abrasive Blasting:
 - 1. Perform blasting for items and equipment where specified and as required to restore damaged surfaces previously shop or field blasted and primed or coated.
 - 2. Refer to coating systems for degree of abrasive blasting required.
 - 3. Where the specified degree of surface preparation differs from manufacturer's recommendations, the more stringent shall apply.
- B. Metal Surface Preparation:
 - 1. Where indicated, meet requirements of SSPC Specifications summarized below:
 - a. SP 1, Solvent Cleaning: Removal of visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants by cleaning with solvent.
 - b. SP 2, Hand Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using nonpower hand tools.

- c. SP 3, Power Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using power-assisted hand tools.
- d. SP 5, White Metal Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter by blast cleaning.
- e. SP 6, Commercial Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 33 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.
- f. SP 7, Brush-Off Blast Cleaning: Removal of visible rust, oil, grease, soil, dust, loose mill scale, loose rust, and loose coatings. Tightly adherent mill scale, rust, and coating may remain on surface.
- g. SP 10, Near-White Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 5 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.
- h. SP 11, Power Tool Cleaning to Bare Metal: Removal of visible oil, grease, dirt, dust, mill scale, rust, paint, oxide, corrosion products, and other foreign matter using power-assisted hand tools capable of producing suitable surface profile. Slight residues of rust and paint may be left in lower portion of pits if original surface is pitted.
- i. SP 16, Brush Blasting of Non-Ferrous Metals: A brush-off blast cleaned non-ferrous metal surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, metal oxides (corrosion products), and other foreign matter. Intact, tightly adherent coating is permitted to remain. A coating is considered tightly adherent if it cannot be removed by lifting with a dull putty knife. Bare metal substrates shall have a minimum profile of 19 micrometers (0.75 mil).
- 2. The words "solvent cleaning", "hand tool cleaning", "wire brushing", and "blast cleaning", or similar words of equal intent in these Specifications or in paint manufacturer's specification refer to the applicable SSPC Specification.
- 3. Where OSHA or EPA regulations preclude standard abrasive blast cleaning, wet, or vacu-blast methods may be required. Coating

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manufacturers' recommendations for wet blast additives and first coat application shall apply.

- 4. Ductile Iron Pipe Supplied with Asphaltic Varnish Finish: Remove asphaltic varnish finish prior to performing specified surface preparation.
- 5. Hand tool clean areas that cannot be cleaned by power tool cleaning.
- 6. Round or chamfer sharp edges and grind smooth burrs, jagged edges, and surface defects.
- 7. Welds and Adjacent Areas:
 - a. Prepare such that there is:
 - 1) No undercutting or reverse ridges on weld bead.
 - 2) No weld spatter on or adjacent to weld or any area to be painted.
 - 3) No sharp peaks or ridges along weld bead.
 - b. Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead.
- 8. Preblast Cleaning Requirements:
 - a. Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.
 - b. Cleaning Methods: Steam, open flame, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.
 - c. Clean small, isolated areas as above or solvent clean with suitable solvent and clean cloth.
- 9. Blast Cleaning Requirements:
 - a. Type of Equipment and Speed of Travel: Design to obtain specified degree of cleanliness. Minimum surface preparation is as specified herein and takes precedence over coating manufacturer's recommendations.
 - b. Select type and size of abrasive to produce surface profile that meets coating manufacturer's recommendations for particular primer to be used.
 - c. Use only dry blast cleaning methods.
 - d. Do not reuse abrasive, except for designed recyclable systems.
 - e. Meet applicable federal, state, and local air pollution and environmental control regulations for blast cleaning, confined space entry (if required), and disposition of spent aggregate and debris.
- 10. Post-Blast Cleaning and Other Cleaning Requirements:
 - a. Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapor) air blast cleaning or other method prior to painting. Vacuum clean enclosed areas and other areas where dust settling is a problem and wipe with a tack cloth.

- b. Paint surfaces the same day they are blasted. Reblast surfaces that have started to rust before they are painted.
- C. Galvanized Metal, Copper, and Nonferrous Metal Alloy Surface Preparation:
 - 1. Remove soil, cement spatter, and other surface dirt with appropriate hand or power tools.
 - 2. Brush blast in accordance with SSPC SP 16.
 - 3. Obtain and follow coating manufacturer's recommendations for additional preparation that may be required.

3.05 SURFACE CLEANING

- A. Brush-off Blast Cleaning:
 - 1. Equipment, procedure, and degree of cleaning shall meet requirements of SSPC SP 7.
 - 2. Abrasive: Either wet or dry blasting sand, grit, or nutshell.
 - 3. Select various surface preparation parameters, such as size and hardness of abrasive, nozzle size, air pressure, and nozzle distance from surface such that surface is cleaned without pitting, chipping, or other damage.
 - 4. Verify parameter selection by blast cleaning a trial area that will not be exposed to view.
 - 5. Engineer will review acceptable trial blast cleaned area and use area as a representative sample of surface preparation.
 - 6. Repair or replace surface damaged by blast cleaning.
- B. Solvent Cleaning:
 - 1. Consists of removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by using solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods that involve a solvent or cleaning action.
 - 2. Meet requirements of SSPC SP 1.

3.06 APPLICATION

- A. General:
 - 1. The intention of these Specifications is for new, interior, and exterior metal, and submerged metal surfaces to be painted, whether specifically mentioned or not, except as specified otherwise.
 - 2. Extent of Coating (Immersion): Coatings shall be applied to internal vessel and pipe surfaces, nozzle bores, flange gasket sealing surfaces,

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carbon steel internals, and stainless steel internals, unless otherwise specified.

- 3. For coatings subject to immersion, obtain full cure for completed system. Consult coatings manufacturer's written instructions for these requirements. Do not immerse coating until completion of curing cycle.
- 4. Apply coatings in accordance with these Specifications and paint manufacturers' printed recommendations and special details. The more stringent requirements shall apply. Allow sufficient time between coats to assure thorough drying of previously applied paint.
- 5. Sand wood lightly between coats to achieve required finish.
- 6. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
- 7. Fusion Bonded Coatings Method Application: Electrostatic, fluidized bed, or flocking.
- 8. Coat units or surfaces to be bolted together or joined closely to structures or to one another prior to assembly or installation.
- 9. On pipelines, terminate coatings along pipe runs to 1 inch inside pipe penetrations.
- 10. Keep paint materials sealed when not in use.
- 11. Where more than one coat is applied within a given system, alternate colors to provide a visual reference showing required number of coats have been applied.
- B. Galvanized Metal, Copper, and Nonferrous Metal Alloys:
 - 1. Concealed galvanized, copper, and nonferrous metal alloy surfaces (behind building panels or walls) do not require painting, unless specifically indicated herein.
 - 2. Prepare surface and apply primer in accordance with System No. 10 specification.
 - 3. Apply intermediate and finish coats of the coating system appropriate for the exposure.
- C. Film Thickness and Coverage:
 - 1. Number of Coats:
 - a. Minimum required without regard to coating thickness.
 - b. Additional coats may be required to obtain minimum required paint thickness, depending on method of application, differences in manufacturers' products, and atmospheric conditions.
 - 2. Application Thickness:
 - a. Do not exceed coating manufacturer's recommendations.
 - b. Measure using a wet film thickness gauge to ensure proper coating thickness during application.

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- 3. Film Thickness Measurements and Electrical Inspection of Coated Surfaces:
 - a. Perform with properly calibrated instruments.
 - b. Recoat and repair as necessary for compliance with specification.
 - c. Coats are subject to inspection by Engineer and coating manufacturer's representative.
- 4. Visually inspect nonferrous metal and plastic surfaces to ensure proper and complete coverage has been attained.
- 5. Give particular attention to edges, angles, flanges, and other similar areas, where insufficient film thicknesses are likely to be present, and ensure proper millage in these areas.
- 6. Apply additional coats as required to achieve complete hiding of underlying coats. Hiding shall be so complete that additional coats would not increase the hiding.

3.07 PROTECTIVE COATINGS SYSTEMS AND APPLICATION SCHEDULE

- A. Unless otherwise shown or specified, paint surfaces in accordance with the following application schedule. In the event of discrepancies or omissions in the following, request clarification from Engineer before starting work in question.
- B. System No. 2 Submerged Metal:

Surface Prep.	Paint Material	Min. Coats, Cover
SP 5, White Metal Blast Cleaning	Prime in accordance with manufacturer's recommendations	
	Coal-Tar Epoxy -OR- High Build Epoxy	2 coats, 16 MDFT 2 coats, 16 MDFT

- 1. Use on the following items or areas:
 - a. Steel surfaces below a plane 1 foot above maximum liquid surface, metal surfaces above maximum liquid surface that are a part of immersed equipment, concrete embedded surfaces of metallic items, such as wall pipes, pipes, pipe sleeves, access manholes, gate guides and thimbles, and structural steel.

C. System No. 2A Potable Water Contact Submerged Metal:

Surface Prep.	Paint Material	Min. Coats, Cover
SP 5, White Metal Blast Cleaning	Prime in accordance with manufacturer's recommendations	
	NSF 61 – Potable Water Contact Epoxy	2 coats, 16 MDFT

- 1. Use on the following items or areas:
 - a. Interior of carbon steel air release vent riser pipe.
 - b. Interior of air release valve assembly riser pipe and tee.
 - c. Interior of access port blind flanges.
 - d. Interior of pump out blowoff blind flanges.
- D. System No. 5 Exposed Metal—Mildly Corrosive:

Surface Prep.	Paint Material	Min. Coats, Cover
SP 10, Near-White Blast Cleaning	Epoxy Primer— Ferrous Metal	1 coat, 2.5 MDFT
	Polyurethane Enamel	1 coat, 3 MDFT

- 1. Use on the following items or areas:
 - a. Exposed metal surfaces, located inside or outside of structures and exposed to weather or in a highly humid atmosphere, such as pipe galleries and similar areas, and the following specific surfaces:
 - 1) Exterior of carbon steel air release vent riser pipe.
 - 2) Exterior of air release valve assembly riser pipe and tee.
 - 3) Exterior of pump out blowoff blind flanges.
- E. System No. 8 Buried Metal—General:

Surface Prep.	Paint Material	Min. Coats, Cover
SP 10, Near-White Blast Cleaning	NSF 61 – Potable Water Contact Epoxy	2 coats, 16 MDFT

1. For steel pipe and fittings, follow AWWA C209.

- 2. Use on the following items or areas:
 - a. Buried, belowgrade portions of steel items, except buried stainless steel or ductile iron, and the following specific surfaces:
 - 1) Type A Access Port, 100 percent of interior and exterior steel surfaces. Field apply polyurethane enamel topcoat to atmospherically exposed section of manway.
 - 2) Type B Access Port, 100 percent of interior and exterior steel surfaces.
- F. System No. 27 Aluminum and Dissimilar Metal Insulation:

Surface Prep.	Paint Material	Min. Coats, Cover
In Accordance with Coating	High Build Epoxy	1 coat, 10 MDFT
Manufacturer's		
Recommendations		

- 1. Use on aluminum surfaces embedded or in contact with concrete.
- 2. Use to isolate miscellaneous dissimilar metal connections not specified to receive other means of isolation.

3.08 COLORS

- A. Provide as designated herein and as selected by Owner or Engineer.
- B. Submit color swatches for approval by Owner or Engineer.
- C. Field paint atmospherically exposed metallic piping brown to blend in with park setting.

3.09 FIELD QUALITY CONTROL

- A. Testing Equipment:
 - 1. Provide calibrated electronic type dry film thickness gauge to test coating thickness specified in mils.
 - 2. Provide low-voltage wet sponge electrical holiday detector to test completed coating systems, 20 mils dry film thickness or less, except zinc primer, high-build elastomeric coatings, and galvanizing, for pinholes, holidays, and discontinuities, as manufactured by Tinker and Rasor, San Gabriel, CA, Model M-1.

- B. Testing:
 - 1. Thickness and Continuity Testing:
 - a. Measure coating thickness specified in mils with a magnetic type, dry film thickness gauge, in accordance with SSPC PA 2. Check each coat for correct millage. Do not make measurement before a minimum of 8 hours after application of coating.
 - b. Holiday detect coatings 20 mils thick or less, except zinc primer and galvanizing, with low voltage wet sponge electrical holiday detector in accordance with NACE SP0188.
 - c. After repaired and recoated areas have dried sufficiently, retest each repaired area. Final tests may also be conducted by Engineer.
- C. Inspection: Leave staging and lighting in place until Engineer has inspected surface or coating. Replace staging removed prior to approval by Engineer. Provide additional staging and lighting as requested by Engineer.
- D. Unsatisfactory Application:
 - 1. If item has an improper finish color or insufficient film thickness, clean surface, and topcoat with specified paint material to obtain specified color and coverage. Obtain specific surface preparation information from coating manufacturer.
 - 2. Evidence of runs, bridges, shiners, laps, or other imperfections is cause for rejection.
 - 3. Repair defects in accordance with written recommendations of coating manufacturer.
- E. Damaged Coatings, Pinholes, and Holidays:
 - 1. Hand or power sand visible areas of chipped, peeled, or abraded paint, and feather edges. Follow with primer and finish coat. Depending on extent of repair and appearance, a finish sanding and topcoat may be required.
 - 2. Remove rust and contaminants from metal surface. Provide surface cleanliness and profile in accordance with surface preparation requirements for specified paint system.
 - 3. Feather edges and repair in accordance with recommendations of paint manufacturer.
 - 4. Apply finish coats, including touchup and damage-repair coats in a manner that will present a uniform texture and color-matched appearance.

3.10 MANUFACTURER'S SERVICES

A. None.

3.11 CLEANUP

- A. Place cloths and waste that might constitute a fire hazard in closed metal containers or destroy at end of each day.
- B. Upon completion of the Work, remove staging, scaffolding, and containers from Site or destroy in a legal manner.
- C. Remove paint spots, oil, or stains upon adjacent surfaces and floors and leave entire job clean.

3.12 SUPPLEMENTS

- A. The supplements listed below, following "End of Section," are a part of this specification:
 - 1. Paint System Data Sheet (PSDS).
 - 2. Paint Product Data Sheet (PPDS).

END OF SECTION

PAINT SYSTEM DATA SHEET (PSDS)

Complete this PSDS for <u>each</u> coating system, include all components of the system (surface preparation, primer, intermediate coats, and finish coats). Include all components of a given coating system on a single PSDS.

Paint System Number (from S	Spec.):	
Paint System Title (from Spec	2.):	
Coating Supplier:		
Representative:		
Surface Preparation:		
Paint Material (Generic)	Product Name/Number (Proprietary)	Min. Coats, Coverage

PAINT PRODUCT DATA SHEET (PPDS)

Complete and attach manufacturer's Technical Data Sheet to this PPDS for <u>each</u> product submitted. Provide manufacturer's recommendations for the following parameters at temperature (F)/relative humidity:

Temperature/RH	50/50	70/30	90/25
Induction Time			
Pot Life			
Shelf Life			
Drying Time			
Curing Time			
Min. Recoat Time			
Max. Recoat Time			

Provide manufacturer's recommendations for the following:

Mixing Ratio:		
Maximum Permissible Thinning:		
Ambient Temperature Limitations:	min.:	max.:
Surface Temperature Limitations:	min.:	max.:
Surface Profile Requirements:	min.:	max.:

SECTION 31 10 00 SITE CLEARING

PART 1 GENERAL

1.01 DEFINITIONS

- A. Clearing: Removal of interfering or objectionable material lying on or protruding above ground surface.
- B. Grubbing: Removal of vegetation and other organic matter including stumps, buried logs, and roots greater than 2-inch caliper to a depth of 6 inches below subgrade or to bottom of trench depth as applicable.
- C. Hazard Tree: Tree or snag that is leaning and/or dead with the potential to fall into the clearing limits.
- D. Interfering or Objectionable Material: Trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead, or decaying; topsoil.
- E. Merchantable Timber: All sound, commercially viable logs or portion of tree volume that can be sold and utilized in a manufacturing process.
- F. Project Limits: Areas, as shown or specified, within which Work is to be performed within permitted access corridors and areas.
- G. Salvaged Riparian Vegetation Clump: Contiguous mass of above-ground and below-ground portions of multiple or single stemmed willow, alder, birch, or other shrubs amenable to transplanting and marked by the Owner's Project Representative within the Project Limits. Soil bound by roots shall be considered a component of the clump.
- H. Stripping: Removal of topsoil to a depth of 6 inches.

1.02 QUALITY ASSURANCE

A. Obtain Engineer's approval of staked clearing, grubbing, and stripping limits, prior to commencing clearing, grubbing, and stripping.

1.03 SUBMITTALS

- A. Informational Submittals:
 - 1. Salvaged Riparian Vegetation Clump Harvest and Storage Plan:
 - a. A minimum of 10 days prior to harvesting Salvaged Riparian Vegetation Clumps, the Contractor shall submit a plan to the Owner's Project Representative describing the proposed harvest and storage methods. Riparian Vegetation Clumps to be harvested shall be marked by the Owner's Project Representative, so the plan is not required to identify harvest site(s) or determine the number of harvested clumps. Information included in the plan shall include:
 - 1) Methods and equipment proposed to harvest the Salvaged Riparian Vegetation Clumps.
 - 2) Methods and equipment proposed to transport and store the Salvaged Riparian Vegetation Clumps until the time of installation on the Project Site.
 - 2. The Owner's Project Representative will require up to 10 working days for review of the proposed Salvaged Riparian Vegetation Clump Harvest and Storage Plan. In addition to reviewing the Contractor's submittal, the review process may include visiting the harvest site(s) identified by the Owner's Project Representative with the Contractor and surveying plant populations.
 - 3. Hazard Tree Removal Plan showing locations of hazard trees proposed to be removed, noting quantity and type of trees.

1.04 SCHEDULING AND SEQUENCING

A. Prepare Site only after adequate erosion and sediment controls are in place. Limit areas exposed uncontrolled to erosion during installation of temporary erosion and sediment controls to maximum of 0.1 acre.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

- 3.01 GENERAL
 - A. Prior to clearing and grubbing, the Contractor shall excavate and stockpile/store Salvaged Riparian Vegetation Clumps marked by the Owner's Project Representative within the Project Limits.
 - B. Clear, grub, and strip areas required for waste disposal, borrow, staging, and stockpile areas, or Site improvements within the Project Limits.

SITE CLEARING 31 10 00 - 2
- C. Protect vegetation that is not designated for removal.
- D. All felled hazard trees shall be left on site to provide large down wood.
 - 1. Trees to be laid within clearing limits, not within 5 feet of roads. Laid trees should be placed at an angle of 45 degrees to 135 degrees to the clearing limits.
- E. Removal of a spotted owl nest tree is not included in the Work. If a nest tree is a hazard, notify Engineer. Removal of spotted owl nest trees shall be addressed by a separate U.S. Fish and Wildlife Service Biological Opinion consultation under the provisions of emergency consultation and authorized in writing by the Owner's Project Representative.
- F. Large wood, topsoil, and native channel material displaced by construction will be stockpiled in a previously disturbed site as feasible for use during site restoration. Materials used for implementation of aquatic restoration categories (e.g., large wood, boulders, fencing material) may be staged within the 100-year floodplain, but not within 100 feet of a stream course. All boles remaining on site shall be limbed and piled.
- G. Broadcast all slash outside of riparian areas in a manner to minimize damage to residual trees. Slash layer thickness shall be 6 inches minimum and 18 inches maximum. Slash shall not be placed on or in the following areas:
 - 1. Pavement, road surface, ditch lines, or within 100 feet of a stream course.

3.02 LIMITS

- A. As follows, but not to extend beyond Project Limits.
 - 1. Excavation Excluding Trenches: 5 feet beyond top of cut slopes.
 - 2. Trench Excavation: 6 feet from trench centerline, regardless of actual trench width.
 - 3. Fill:
 - a. Clearing and Grubbing: 5 feet beyond toe of permanent fill.
 - b. Stripping 2 feet beyond toe of permanent fill.
 - 4. Structures: 15 feet outside of new structures.
 - 5. Roadways: Clearing, grubbing, scalping, and stripping 12 feet from centerline.
- B. Remove rubbish, trash, and junk from within the Project Limits.

3.03 RIPARIAN VEGETATION CLUMPS SALVAGE AND STORAGE

- A. Salvage harvested riparian vegetation clumps and store them in a shade area protected from the wind.
- B. Keep the salvaged riparian vegetation clumps moist until they are planted as described in Section 32 93 00, Plants.

3.04 CLEARING

- A. Clear areas within clearing limits shown.
- B. Fell trees so they fall away from facilities and vegetation not designated for removal.
 - 1. Tree removal within clearing limits is by Others and only subsequently identified hazard trees will require removal.
- C. Cut stumps not designated for grubbing flush with ground surface.
- D. Cut shrubs, brush, weeds, and grasses to within 2 inches of ground surface.

3.05 GRUBBING

A. Grub areas within limits shown or specified.

3.06 STRIPPING

- A. Do not remove topsoil until after grubbing is completed.
- B. Strip areas within limits to minimum depths shown or specified. Do not remove subsoil with topsoil.
- C. Stockpile strippings, meeting requirements of Section 32 91 13, Soil Preparation, for topsoil, separately from other excavated material.

3.07 MERCHANTABLE TIMBER

A. All merchantable timber is expected to be removed by others through a corridor clearing contract prior to construction. All saleable logs will remain property of USFS.

3.08 HAZARD TREE REMOVAL OUTSIDE CLEARING LIMITS

A. Dead, dying, leaning, or otherwise unsound trees that may strike and damage Project facilities in falling. Keep felled trees on site outside of roads and do

SITE CLEARING 31 10 00 - 4 not obstruct access. Hazard trees shall not be exported offsite, sold, or transferred to any third party.

- B. Cut stumps off flush with ground, remove debris, and if disturbed, restore surrounding area to its original condition.
- C. Measurement and Payment:
 - 1. Payment shall be inclusive of all Work to identify, and fell, and remove from Work area each Hazard Tree in accordance with US Forest Service Standards. Measurement and Payment on unit price basis shall apply only to trees 12 inches and larger DBH. Hazard Trees less than 12 inches DBH shall be identified, felled, and removed from Work area as part of the lump sum price. On daily basis, coordinate with Resident Project Representative to document Hazard Tree Removal count.
 - 2. Payment:
 - a. The accepted quantities of Hazard Tree Removal will be paid for at the Contract unit price, per unit of measurement, for the following items:
 - 1) Pay Item: Per unit of measurement.
 - 2) Hazard Tree Removal: Per each.

3.09 DISPOSAL

- A. Clearing and Grubbing Debris:
 - 1. Naturally occurring vegetation, stumps, slash, and similar woody debris may be scattered outside of roadways, in an even layer, within the pipeline corridor.
 - 2. Dispose of trash and other debris offsite.
 - 3. Burning of debris onsite will not be allowed.
- B. Strippings:
 - 1. Dispose of strippings that are unsuitable for topsoil or that exceed quantity required for topsoil in waste disposal areas shown or approved by Engineer. Strippings shall not be disposed of within 100 feet of a water course.
 - 2. Stockpile topsoil in sufficient quantity to meet Project needs. Dispose of excess strippings as specified for clearing and grubbing.

END OF SECTION

SECTION 31 23 13 SUBGRADE PREPARATION

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³)).
 - b. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.02 DEFINITIONS

- A. Optimum Moisture Content: As defined in Section 31 23 23, Fill and Backfill.
- B. Prepared Ground Surface: Ground surface after completion of clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and scarification and compaction of subgrade.
- C. Relative Compaction: As defined in Section 31 23 23, Fill and Backfill.
- D. Relative Density: As defined in Section 31 23 23, Fill and Backfill.
- E. Subgrade: Layer of existing soil after completion of clearing, grubbing, scalping of topsoil prior to placement of fill, roadway structure or base for floor slab.
- F. Unsuitable Material: The term unsuitable material refers to (1) in-situ or site soil materials that are unsuitable as foundation or subgrade materials because of their density, moisture content, organic content, plasticity, or gradation; and (2) soil (onsite or imported) that is not suitable as fill or backfill because it does not meet the requirements of the Specifications.

1.03 SEQUENCING AND SCHEDULING

A. Complete applicable Work specified in Section 02 41 00, Demolition; Section 31 10 00, Site Clearing; and Section 31 23 16, Excavation, prior to subgrade preparation.

1.04 QUALITY ASSURANCE

A. Notify Owner's Project Representative when subgrade is ready for compaction or whenever compaction is resumed after a period of extended inactivity.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Prepare subgrade when unfrozen and free of ice and snow.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Keep subgrade free of water, debris, and foreign matter during compaction.
- B. Bring subgrade to proper grade and cross-section and uniformly compact surface.
- C. Do not use sections of prepared ground surface as haul roads. Protect prepared subgrade from traffic.
- D. Maintain prepared ground surface in finished condition until next course is placed.

3.02 COMPACTION

- A. Under Transmission Pipeline: Compact bottom of trench to a firm and unyielding surface.
- B. Under Pavement Structure, Slabs on Grade, Foundations, or Granular Fill Under Structures: Compact the upper 8 inches to minimum of 98 percent relative compaction as determined in accordance with ASTM D698.

3.03 MOISTURE CONDITIONING

- A. Dry Subgrade: Add water, then mix to make moisture content uniform throughout.
- B. Wet Subgrade: Aerate material by blading, discing, harrowing, or other methods, to hasten drying process.

3.04 TESTING

- A. Under Transmission Pipeline: Visual observation and metal probing to detect soft or loose subgrade or unsuitable material, as determined by Owner's Project Representative.
- B. Under Pavement Structure, Slabs on Grade, Foundations, or Granular Fill around structures:
 - 1. Visual observation and metal probing to detect soft or loose subgrade or unsuitable material, as determined by Owner's Project Representative.
 - 2. Develop a minimum of one moisture density compaction curve per ASTM D698 for each soil type present at the subgrade level.
 - 3. Complete density tests of subgrade in accordance with ASTM D6938 at locations identified by the Owner's Project Representative.

3.05 CORRECTION

- A. Soft or Loose Subgrade:
 - 1. Adjust moisture content and recompact, or
 - 2. Over excavate as specified in Section 31 23 16, Excavation, and replace with suitable material from the excavation, as specified in Section 31 23 23, Fill and Backfill.
- B. Unsuitable Material: Over excavate as specified in Section 31 23 16, Excavation, and replace with suitable material from the excavation, as specified in Section 31 23 23, Fill and Backfill.

END OF SECTION

SECTION 31 23 16 EXCAVATION

PART 1 GENERAL

1.01 DEFINITIONS

- A. Common Excavation: Removal of material not classified as rock excavation.
- B. Rock Excavation:
 - General: Removal of solid material which by actual demonstration cannot, in Owner's Project Representative's opinion, be reasonably excavated using conventional excavation equipment and must be systematically broken by power-operated hammer, hydraulic rock breaker, expansive compounds, or other similar means prior to removal. For trench excavation, removal of solid material that cannot be removed using an excavator in good working condition having a minimum flywheel power of 170-mechanical horsepower (127 kilowatt) and equipped with manufacturer's standard boom, two rippers, and rock points on a rock ripping bucket no wider than 36 inches, or similar approved equipment, will be considered rock for the purpose of payment.
 - 2. Term "rock excavation" indicates removal of solid material, as specified above, and does not necessarily correspond to "rock" or "bedrock" as implied by names, geologic formations, or other definitions provided in the Oregon Standard Specifications for Construction or other documents outside of this specification.
 - 3. Removal of boulders larger than 1 cubic yard will be classified as rock excavation, if breaking them apart with power-operated hammer, hydraulic rock breaker, expansive compounds, or other similar means is both necessary and actually used for their removal.
 - 4. The quantities of rock excavation and boulder excavation will be measured as follows:
 - a. Rock Excavation:
 - Rock excavation will be measured on the volume basis. Measurement will be of the actual dimensions of rock removed within the following limits:
 - a) Length: Length will be the horizontal distance measured along the centerline of the trench excluding manholes, inlets, and other structures.

- b) Width: Width will be of the rock removed but will not be greater than the outside diameter of the pipe bell (for ductile iron pipe) or pipe outside diameter (for HDPE pipe) plus 12 inches.
- c) Depth: Depth will be measured at 30-foot intervals, or as specified, along the centerline of the trench. The depth will not be greater than 6 inches below the outside bell of the pipe.
- b. Rock excavation for manholes, inlets, and other structures will be computed from the rock excavated to a depth 6 inches below the bottom of the structure and an area within a line parallel with, and 12 inches outside of, the actual dimensions of the manhole, inlet, or structure.
- c. No separate measurement will be made for the following:
 - 1) Soft or disintegrated rock.
 - 2) Hardpan or cemented gravel that can be removed with a hand pick or power-operated excavator or shovel.
 - 3) Loose, shaken, or previously blasted rock or broken stone in rock fillings, or elsewhere.
 - 4) Rock outside of the minimum limits of measurement allowed, which may fall into the excavation.
- d. Payment:
 - 1) The accepted quantities of rock excavation will be paid for at the Contract unit price, per unit of measurement, for the following items:
 - a) Pay Item: Per unit of measurement.
 - b) Rock Excavation: Per cubic yard.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Excavation Plan, Detailing:
 - a. Methods and sequencing of excavation.
 - b. Proposed locations of stockpiled excavated material.
 - c. Proposed onsite and offsite spoil disposal sites.
 - d. Anticipated difficulties and proposed resolutions.
 - e. Reclamation of onsite spoil disposal areas.

1.03 QUALITY ASSURANCE

A. Provide adequate survey control to avoid unauthorized overexcavation.

1.04 WEATHER LIMITATIONS

- A. Material excavated when frozen or when air temperature is less than 32 degrees F shall not be used as fill or backfill until material completely thaws.
- B. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

1.05 SEQUENCING AND SCHEDULING

- A. Demolition: Complete applicable Work specified in Section 02 41 00, Demolition, prior to excavating.
- B. Clearing, Grubbing, and Stripping: Complete applicable Work specified in Section 31 10 00, Site Clearing, prior to excavating.
- C. Dewatering: Conform to applicable requirements of Section 31 23 19.01, Dewatering, prior to initiating excavation.
- D. 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.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

- 3.01 GENERAL
 - A. Excavate to lines, grades, and dimensions shown and as necessary to accomplish Work. Excavate to within tolerance of plus or minus 0.1 foot, except where dimensions or grades are shown or specified as maximum or minimum. Allow for forms, working space, granular base, topsoil, and similar items, wherever applicable. Trim to neat lines where concrete is to be deposited against earth.
 - B. Do not overexcavate without written authorization of Owner's Project Representative.
 - C. Remove or protect obstructions as shown and as specified in Section 01 50 00, Temporary Facilities and Controls, Article Protection of Work and Property.

3.02 CLASSIFIED EXCAVATION

- A. Excavation is classified; see Article Definitions for classifications. Notify Owner's Project Representative whenever rock is encountered.
- B. Before beginning rock excavation, comply with following requirements:
 - 1. Remove overlying material as common excavation and expose rock surface for examination by Owner's Project Representative.
 - 2. Demonstrate that removal of remaining material classifies as rock excavation unless waived by Owner's Project Representative.
 - 3. Assist Owner's Project Representative with measurement and documentation of rock excavation.
- C. In event of disputed quantities, excavate additional correlation trenches to apparent rock as considered necessary by Owner's Project Representative to resolve dispute.

3.03 TRENCH WIDTH

- A. Minimum Width of Trenches:
 - 1. As shown on Drawings.
 - 2. Increase trench widths by thicknesses of sheeting.
- B. Maximum Trench Width: 15 feet at the top of the trench and pipe diameter plus 5 feet at pipe springline, unless otherwise shown or specified, or unless excess width will result in work outside of work limits or cause damage to existing facilities, adjacent property, or completed Work. Limit trench widths to minimize tree removal in general, and at specific locations shown on Drawings. Note that measurement of trench width for rock excavation quantity is limited as described in this section.

3.04 EMBANKMENT AND CUT SLOPES

- A. Shape, trim, and finish cut slopes to conform with lines, grades, and crosssections shown, with proper allowance for topsoil or slope protection, where shown.
- B. Remove stones and rock that exceed 3-inch diameter and that are loose and may roll down slope. Remove exposed roots from cut slopes.
- C. Round tops of cut slopes in soil to not less than a 6-foot radius, provided such rounding does not extend offsite or outside easements and rights-of-way, or adversely impacts existing facilities, adjacent property, or completed Work.

3.05 STOCKPILING EXCAVATED MATERIAL

- A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.
- B. Post signs indicating proposed use of material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable by equipment operators from their normal seated position.
- C. Confine stockpiles to within easements, rights-of-way, and approved work areas. Do not obstruct roads or streets.
- D. Do not stockpile excavated material adjacent to trenches and other excavations, unless excavation side slopes and excavation support systems are designed, constructed, and maintained for stockpile loads.
- E. Do not stockpile dredged or excavated material in or adjacent to streams, waterways, or wetlands. Dredged or other excavated material must be placed on upland areas having stable slopes and must be prevented from eroding back into waterways and wetlands.
- F. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed Work, if weight of stockpiled material could induce excessive settlement.
- G. At completion of backfilling and placing topsoil, remove all material placed in temporary stockpile area. Restore area and perform final grading, seeding, and erosion control as specified.

3.06 STOCKPILING EXCAVATED ROUGHNESS BOULDERS

- A. General:
 - 1. Provide 400 roughness boulders for use by others on diversion fish screening and passage project, and stockpile at east end of Staging Area 2 by November 30, 2022. Prevent from movement with temporary soil berm.
 - 2. Roughness boulders shall have the following characteristics:
 - a. Durable clean natural boulders free from laminations, fractures, bedding planes, pronounced weathering, calcite intrusions, earth, or other adherent coatings.
 - b. Angularity: Rounded to Subrounded as defined by ASTM D2488 and free of sharp edges.

- c. Shape: The smallest dimension of a single boulder shall not be less than one-third its longest dimension. Elongated boulders are not allowed unless otherwise approved by the Owner's Project Representative.
- d. Size: 36 inches in average diameter with a minimum of 24 inches and maximum 54 inches.
- e. As directed and approved by the Owner's Project Representative.
- B. Stockpile excavated roughness boulders in Staging Area 2, as shown on Drawings, which is suitable for storing 400 individual boulders.

3.07 DISPOSAL OF SPOIL

- A. Dispose of excavated materials, which are unsuitable or exceed quantity needed for fill or backfill, offsite in accordance with all local, state, and federal regulations. Contractor is responsible for identifying appropriate disposal site and all applicable fees and permits.
- B. Dispose of debris resulting from removal of underground facilities as specified in Section 02 41 00, Demolition, for demolition debris.
- C. Dispose of debris resulting from removal of organic matter, trash, refuse, and junk as specified in Section 31 10 00, Site Clearing, for clearing and grubbing debris.

END OF SECTION

SECTION 31 23 19.01 DEWATERING

PART 1 GENERAL

1.01 SUBMITTALS

- A. Informational Submittals:
 - 1. Water control plan.
 - 2. Discharge permits.

1.02 WATER CONTROL PLAN

- A. As a minimum, include:
 - 1. Descriptions of proposed groundwater and surface water control including, but not limited to, equipment; methods; standby equipment and power supply; and discharge locations to be utilized.
 - 2. Drawings showing locations, dimensions, and relationships of elements of each system.
 - 3. Details showing locations of erosion control measures to be used for dewatering and water control facilities.
- B. If system is modified during installation or operation revise or amend and resubmit Water Control Plan.
- C. Brooks Meadow Creek Bypass Plan:
 - 1. Descriptions and drawings of methods to meet requirements for Brooks Meadow Creek Culvert Installation, including, but not limited to, construction area isolation and bypass plan, fish capture and release, construction work area dewatering, stream re-watering, volitional passage, and turbidity, as specified in Section 01 35 43, Environmental Procedures.

PART 2 PRODUCTS

2.01 SANDBAGS

A. Individual bags filled with approximately 25 pounds of sand prior to delivery to the site. Bags shall be strong enough to persist for the duration of the Project so that they do not fail and leave sand on site.

2.02 IMPERVIOUS MEMBRANE

A. Plastic sheeting at least 4 millimeter (0.004-inch-thick) constructed from lowdensity polyethylene (LDPE).

2.03 BYPASS PIPE

A. Flexible or rigid pipe to convey the required flow without leakage or failure.

PART 3 EXECUTION

3.01 GENERAL

A. Continuously control water during course of construction, including weekends and holidays and during periods of work stoppages, and provide adequate backup systems to maintain control of water.

3.02 SURFACE WATER CONTROL

- A. Construct, maintain, and operate channels, ditches, berms, and/or other temporary measures to divert surface water away from Work areas to protect Work.
- B. Remove surface runoff controls when no longer needed.

3.03 DEWATERING SYSTEMS

- A. Provide, operate, and maintain dewatering systems of sufficient size and capacity to facilitate excavation and subsequent construction in dry and to lower and maintain groundwater level a minimum of 2 feet below the lowest point of excavation. Continuously maintain excavations free of water, regardless of source, and until backfilled to final grade.
- B. Design and Operate Dewatering Systems:
 - 1. To prevent loss of ground as water is removed.
 - 2. To avoid inducing settlement or damage to existing facilities, completed Work, or adjacent property.
- C. To relieve artesian pressures and resultant uplift of excavation bottom

3.04 BROOKS MEADOW CREEK FLOW BYPASS

- A. Design and Operate Creek Flow Bypass:
 - 1. To stop flow in creek using cofferdam.
 - 2. To divert flow in creek through bypass pipe large enough to convey up to a 2-year recurrence interval flow (7.4 cubic feet per second equals 3,300 gallons per minute).
 - 3. To return flow to creek at bypass pipe outlet without causing creek erosion.
 - 4. To allow safe volitional (passive) downstream passage of fish.
 - 5. To allow construction of creek, placement of culvert, and construction of road.
- B. Provide, operate, and maintain creek bypass pipe of sufficient size and capacity to facilitate excavation and subsequent construction in dry and to lower and maintain groundwater below the lowest point of excavation. Continuously maintain excavations free of water, regardless of source, and until backfilled to final grade.
- C. Place sandbags as shown on Drawings to block flow in creek.
- D. Place bypass pipe as shown on Drawings to divert flow in creek.
- E. Place impervious membrane as shown on Drawings to control seepage in creek below cofferdam.

3.05 DISPOSAL OF WATER

- A. Obtain discharge permit for water disposal from authorities having jurisdiction.
- B. Treat water collected by dewatering operations, as required by regulatory agencies, prior to discharge.
- C. Discharge water as required by discharge permit and in manner that will not cause erosion or flooding, or otherwise damage existing facilities, completed Work, or adjacent property.
- D. Remove solids from treatment facilities and perform other maintenance of treatment facilities as necessary to maintain their efficiency.

3.06 PROTECTION OF PROPERTY

- A. Make assessment of potential for dewatering induced settlement. Provide and operate devices or systems necessary to prevent damage to existing facilities, completed Work, and adjacent property.
- B. Securely support existing facilities, completed Work, and adjacent property vulnerable to settlement due to dewatering operations.

END OF SECTION

SECTION 31 23 23 FILL AND BACKFILL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. C117, Standard Test Method for Materials Finer Than 75-Micrometers (No. 200) Sieve in Mineral Aggregates by Washing.
 - b. C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
 - c. D75, Standard Practice for Sampling Aggregates.
 - d. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - e. D1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - f. D2216, Standard Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
 - g. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 - 2. Oregon Department of Transportation Standard Specifications for Construction, 2021.

1.02 DEFINITIONS

- A. Borrow Material: Material from required excavations or from borrow areas on or near Site.
- B. Completed Course: A course or layer that is ready for next layer or next phase of Work.
- C. Controlled Low Strength Material (CLSM): As specified in Section 31 23 23.15, Trench Backfill.
- D. Earthfill: Excavation and fill material obtained from sources onsite, suitable for specified use.

- E. Embankment Material: Fill materials required to raise existing grade in areas other than under structures.
- F. Engineered Streambed Material: Granular fill materials placed on the channel bed upstream, through, and downstream of structures in Brooks Meadow Creek.
- G. Final Ground Surface: Ground surface after completion of required construction and placement of backfill and fill.
- H. Geosynthetics: Geotextiles, geogrids, or geomembranes.
- I. Imported Material: Materials obtained from USFS approved weed-free sources offsite, suitable for specified use.
- J. Influence Area:
 - 1. Area within planes sloped downward and outward at 60-degree angle from horizontal measured from:
 - a. 1 foot outside outermost edge at base of foundations or slabs.
 - b. 1 foot outside outermost edge at surface of roadways or shoulder.
 - c. 0.5 foot outside exterior at spring line of pipes or culverts.
- K. Lift: Loose (uncompacted) layer of material.
- L. 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.
- M. Prepared Ground Surface: Ground surface after completion of required demolition, clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and subgrade preparation.
- N. Relative Compaction:
 - 1. Ratio, in percent, of as-compacted field dry density to laboratory maximum dry density as determined in accordance with ASTM D698.
 - 2. Apply corrections for oversize material to either as-compacted field dry density or maximum dry density, as determined by Owner's Project Representative.

- O. Riprap: Cobble and boulder sized fill materials placed on the channel bed downstream of pipeline outlet. Large Riprap is minimum 10-inch intermediate axis, and Medium Riprap is minimum 6-inch intermediate axis.
- P. Sand: Granular fill material placed on the channel bed upstream, through, and downstream of structures in Brooks Meadow Creek.
- Q. Standard Specifications, as used in this section, refer to Oregon Department of Transportation Standard Specifications for Construction, 2021.
- R. Structural Fill: Fill materials as required under structures, pavements, and other facilities.
- S. Well-Graded:
 - 1. A mixture of particle sizes with no 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. Used to define material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Culvert manufacturer's recommendations for Backfill and Structural Fill around each culvert.
 - b. Description and location of proposed sources of Engineered Streambed Material.
 - c. Description and location of proposed sources of Riprap.
 - 2. Gradation test results for each imported material.
- B. Informational Submittals:
 - 1. Manufacturer's data sheets for compaction equipment.
 - 2. Certified Gradation Analysis: Submit not less than 30 days prior to delivery for imported materials or anticipated use for excavated materials, except for trench stabilization material that will be submitted prior to material delivery to Site. Certified gradation results shall be from testing that has been completed within 120 days prior to the submittal date.
 - 3. Certified test results from independent testing agency.

- 4. Certified weed-free material documentation meeting United States Forest Service requirements for each imported fill and backfill material.
- 5. Quarry Certificate of Conformance and supporting documentation showing proposed riprap meets Standard Specification gradation and materials requirements for the Class or Type specified.
- 6. Certified Test Results:
 - a. Riprap:
 - 1) Gradation.
 - 2) Abrasion resistance (soundness).
 - 3) Degradation.
 - 4) Specific Gravity.
- 7. Trip tickets showing source, type, and weight of each load of material delivered to Site.

1.04 QUALITY ASSURANCE

- A. Source: Quarry that has produced weed-free source material and has performed satisfactorily on other projects for at least 5 years.
- B. Site Visit: Make arrangements for Owner's Project Representative to visit quarry site to observe and approve materials proposed for use prior to transport to the Project Site.
- C. Notify Owner's Project Representative when:
 - 1. Structure is ready for backfilling, and whenever backfilling operations are resumed after a period of inactivity.
 - 2. Soft or loose subgrade materials are encountered wherever site fill is to be placed.
 - 3. Fill material appears to be deviating from Specifications.

1.05 SEQUENCING AND SCHEDULING

- Complete applicable Work specified in Section 02 41 00, Demolition; Section 31 10 00, Site Clearing; Section 31 23 16, Excavation; and Section 31 23 13, Subgrade Preparation, prior to placing fill or backfill.
- B. Backfill against structures only after Owner's Project Representative's acceptance of structure placement.
- C. Backfill around water-retaining structures only after completion of satisfactory leakage tests as specified in Section 03 30 10, Structural Concrete.
- D. Do not place granular base, subbase, or surfacing until after subgrade has been prepared as specified in Section 31 23 13, Subgrade Preparation.

FILL AND BACKFILL 31 23 23 - 4

PART 2 PRODUCTS

2.01 SOURCE QUALITY CONTROL

- A. Gradation Tests:
 - 1. One or more tests as necessary to locate acceptable sources of imported material.
 - 2. Gradation tests to locate acceptable sources of material must have been performed within 120 days of the submittal date.
 - 3. During production of imported material, complete additional tests if gradation appears to be deviating from the accepted material based on the observation of the Owner's Project Representative.
 - 4. Contractor shall remove and replace material that is found to not meet the specification requirements.
- B. Samples: Collected in accordance with ASTM D75.

2.02 EARTHFILL

- A. Native material from required excavations free from rocks larger than 6 inches, from roots and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.
- B. Consisting of sand or silty sand with a maximum of 50 percent passing the No. 200 sieve, as determined in accordance with ASTM D1140.

2.03 GRANULAR FILL

- A. 3/4-inch or 1-inch minus dense graded aggregate conforming to the requirements of Section 02630.10 of the Standard Specifications.
- B. Free from dirt, clay balls, and organic material.
- C. Maximum 8 percent by weight passing No. 200 sieve.

2.04 WATER FOR MOISTURE CONDITIONING

A. Free of hazardous or toxic contaminates, or contaminants deleterious to proper compaction.

2.05 BASE COURSE ROCK

A. As specified in Section 32 11 23, Aggregate Base Courses.

2.06 FOUNDATION STABILIZATION MATERIAL

A. As specified for Foundation Stabilization Material in Section 31 23 23.15, Trench Backfill.

2.07 ENGINEERED STREAMBED MATERIAL

- A. Natural stone that forms a well-graded, low-permeability mass.
- B. Free of overburden, spoil, and organic material.
- C. Angular and meeting the following gradation requirements:

Table 1		
PERCENT PASSING BY WEIGHT	SIZE	
100	2.5-inch	
80-99	2.0-inch	
60-80	1.0-inch	
40-60	0.5-inch	
20-40	#4 sieve	
10	#200 sieve	

D. Minimum dimension of individual pieces: Not less than 1/3 maximum dimension measured along the longest axis of the stone.

2.08 SAND

- A. Natural unwashed material, having hard, strong, durable particles free from adherent coating or deleterious matter.
- B. Free of overburden, spoil, and organic material.

Table 2		
PERCENT PASSING BY WEIGHT	SIZE	
99-100	1/2-inch	
90-100	3/8-inch	
90	#4 sieve	
32-67	#8 sieve	
2-7	#200 sieve	

C. Angular and meeting the following gradation requirements:

2.09 RIPRAP

- A. Hard and durable quarry stone free from overburden, spoil, organic matter, fractures, bedding planes, pronounced weathering, and earth or other adherent coatings and resistant to weathering and water action.
- B. Minimum dimension of individual pieces: Not less than 1/3 maximum dimension measured along the longest axis of the stone.
- C. Meeting requirements of Standard Specifications Section 00390.11 Class 50 and Class 100 material. Riprap class is designated as shown on Drawings.
- D. Gradation: Smaller pieces shall generally fill voids between larger pieces without either excess or deficiency of one or more sizes of stone.
- E. Each load of riprap shall be well-graded from the smallest to the maximum size specified. Rocks and quarry spalls smaller than the specified 10 percent size will not be permitted in an amount exceeding 10 percent by weight of each load delivered to the Site.
- F. Control of gradation shall be by visual inspection by the Owner's Project Representative. The Contractor shall provide two samples of rock consisting of at least one truck load each meeting the specified gradation. One sample shall be kept at the construction site and may be a part of the finished riprap placed material. The other sample shall be provided at the quarry. These samples shall be used as frequent reference for judging the gradation of the riprap supplied.

2.10 SOIL COVER OVER GEOTEXTILES

- A. Particle Size: Maximum 1 inch.
- B. Free of sharp angular pieces that may damage geotextile.

PART 3 EXECUTION

3.01 GENERAL

- A. Keep placement surfaces free of water, debris, and foreign material during placement and compaction of fill and backfill materials.
- B. Place and spread fill and backfill materials in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specified densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.
- C. During filling and backfilling, keep level of fill and backfill around each structure even.
- D. Do not place fill or backfill, if fill or backfill material is frozen, or if surface upon which fill or backfill is to be placed is frozen.
- E. Tolerances:
 - 1. Final Lines and Grades: Within a tolerance of 0.1 foot unless dimensions or grades are shown or specified otherwise.
 - 2. Grade to establish and maintain slopes and drainage as shown. Reverse slopes are not permitted.
- F. Settlement: Correct and repair any subsequent damage to structures, pavements, curbs, slabs, piping, and other facilities, caused by settlement of fill or backfill material.

3.02 BACKFILL UNDER AND AROUND STRUCTURES

- A. Under Facilities: Within influence area beneath structures, slabs, pavements, curbs, piping, conduits, duct banks, and other facilities, backfill with granular fill, unless otherwise shown. Place granular fill in lifts of 8-inch maximum thickness and compact each lift to minimum of 95 percent relative compaction as determined in accordance with ASTM D698.
- B. Other Areas: Backfill with granular fill to lines and grades shown, with proper allowance for topsoil thickness where shown. Place in lifts of 8-inch

maximum thickness and compact each lift to minimum 95 percent relative compaction as determined in accordance with ASTM D698.

3.03 FILL

- A. Outside Influence Areas beneath Structures, Tanks, Pavements, Curbs, Slabs, Piping, and Other Facilities:
 - 1. Unless otherwise shown, place earthfill as follows:
 - a. Allow for 6-inch thickness of topsoil where required.
 - b. Maximum (uncompacted) 8-inch thick lifts.
 - c. Place and compact fill across full width of embankment.
 - d. Compact to minimum 95 percent relative compaction as determined in accordance with ASTM D698.
 - e. Dress completed embankment with allowance for topsoil, crest surfacing, and slope protection, where applicable.

3.04 SITE TESTING

- A. Gradation:
 - 1. As required in Table 3 or more often as determined by Owner's Project Representative, if variation in gradation is occurring, or if material appears to depart from Specifications.
 - 2. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken.
 - 3. Remove material placed in Work that does not meet Specification requirements.
- B. In-Place Density and Moisture Tests:
 - 1. In accordance with ASTM D6938 and ASTM D2216, during placement of materials, test as shown in Table 3.

Table 3Minimum Sampling and Testing Requirements				
Property	Test Method	Frequency	Sampling Point	
Gradation	ASTM C117 and ASTM C136	One sample from each 1,000 tons of finished product	Production output or stockpile	

Table 3Minimum Sampling and Testing Requirements					
Property	Test Method	Frequency	Sampling Point		
Moisture Density (Maximum Density)	ASTM D698	One test for every material grading produced	Production output or stockpile		
In-Place Density and Moisture Content	ASTM D6938 and ASTM D2216 for moisture content	One for each 500 ton of each material, but at least one test per structure	In-place completed, compacted area		

3.05 GRANULAR BASE, SUBBASE, AND SURFACING

- A. Maximum Completed Lift Thickness: 6 inches.
- B. Completed Course Total Thickness: As shown.
- C. Spread lift on preceding course to required cross-section.
- D. Lightly blade and roll surface until thoroughly compacted.
- E. Add keystone to achieve compaction and as required when aggregate does not compact readily because of lack of fines or natural cementing properties, as follows:
 - 1. Use leveling course or surfacing material as keystone.
 - 2. Spread evenly on top of base course, using spreader boxes or chip spreaders.
 - 3. Roll surface until keystone is worked into interstices of base course without excessive displacement.
 - 4. Continue operation until course has become thoroughly keyed, compacted, and will not creep or move under roller.
- F. Blade or broom surface to maintain true line, grade, and cross-section.

3.06 REPLACING OVEREXCAVATED MATERIAL

- A. Replace excavation carried below grade lines shown or established by Owner's Project Representative as follows:
 - 1. Beneath Footings: Granular Fill.
 - 2. Beneath Fill or Backfill: Same material as specified for overlying fill or backfill.
 - 3. Beneath Slabs-On-Grade: Granular fill.
 - 4. Trenches:
 - a. Unauthorized Overexcavation: Trench stabilization material, as specified in Section 31 23 23.15, Trench Backfill.
 - b. Authorized Overexcavation: Trench stabilization material, as specified in Section 31 23 23.15, Trench Backfill.
 - 5. Permanent Cut Slopes (Where Overlying Area is Not to Receive Fill or Backfill):
 - a. Flat to Moderate Steep Slopes (3:1, Horizontal Run: Vertical Rise or Flatter): Earthfill.
 - b. Steep Slopes (Steeper than 3:1):
 - 1) Correct overexcavation by transitioning between overcut areas and designed slope adjoining areas, provided such cutting does not extend offsite or outside easements and right-of-ways, or adversely impacts existing facilities, adjacent property, or completed Work.
 - 2) Backfilling overexcavated areas is prohibited, unless in Owner's Project Representative's opinion, backfill will remain stable, and overexcavated material is replaced as compacted earthfill.

3.07 PLACING RIPRAP

- A. Riprap shall be placed to the lines, grade, elevation, and configuration as shown on Drawings or as directed by the Owner's Project Representative.
- B. Areas where riprap shall be placed shall be free of brush, trees, stumps, organics, and other objectionable material. Areas shall be prepared to smooth surface. All soft, spongy, or saturated materials shall be removed to the depth shown on Drawings or as directed by the Owner's Project Representative and replaced with Backfill Class 1 or a suitable alternate approved by the Owner's Project Representative. Overexcavation and haul required for placing riprap and backfill shall be incidental to the placement of riprap.
- C. Riprap shall be placed in a manner that produces a well-graded mass of riprap with the minimal practicable percentage of voids. The preferred approach for

the placement of riprap material is with an excavator that has a bucket and an opposable thumb suitable for handling the specified rock sizes.

- D. Placing riprap in layers, by dumping from trucks, or by dumping in chutes, or by similar methods likely to cause segregation of the riprap sizes will not be permitted.
- E. No mechanical compaction of riprap is required; however, work riprap bedding as necessary to distribute it and to eliminate detrimental voids. Avoid overworking or long pushes that result in segregation of particle sizes.
- F. All riprap materials shall be placed and distributed so that there will be no large accumulations of either larger or smaller sizes of riprap.
- G. Grade surface of riprap bedding free from irregularities and to tolerances of 0.4 foot from established grade.
- H. Place and grade riprap in a manner that avoids subgrade disturbance.
- I. The Contractor shall be responsible for complying with all applicable regulations and permit authorizations related to hauling and stockpiling riprap materials.

3.08 PLACING ENGINEERED STREAMBED MATERIAL AND SAND

- A. Place Engineered Streambed Material in one or more lifts, not to exceed 6 inches each, to meet the lines and grades as shown on Drawings.
- B. Material cannot be placed by dumping from trucks, chutes, or similar methods likely to cause segregation.
- C. After placement of each Engineered Streambed Material lift, place a 1-inch lift of Sand to facilitate filling the interstitial voids and prevent low flows from flowing subsurface. (Loss of surface flow would block fish passage at low flows.) To fill voids, apply water to the "stacked" (Engineered Streambed Material and Sand) lifts to wash fines into the interstitial spaces. Applied water shall be free from contaminants, chlorination, and any additive that has a risk on fish and other ecological life.
- D. Compact each lift to a firm and unyielding surface and Owner's Project Representative provides visual acceptance of the Engineered Streambed Material and Sand, before initiating each subsequent lift.
- E. Following placement of the upper lifts of Engineered Streambed Material and Sand, place individual pieces of Large Riprap and Medium Riprap into

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Engineered Streambed Material and Sand with 50 percent embedded in the configuration and at locations as shown on Drawings.

- F. Following installation of all substrate materials through the culvert work area, Contractor shall apply water at the low flow rate to the stream channel for visual acceptance by the Owner's Project Representative. The interstitial voids are satisfactorily filled when water equivalent to the low flow rate of the stream does not go subsurface, and the surface flow rate remains constant and continuous from upstream of the Project limits to the downstream of Project limits.
- G. Overexcavation and haul required for placing Engineered Stream Material, Sand, Medium Riprap, and Large Riprap shall be incidental to placement of Engineered Streambed Material, Sand, Medium Riprap, and Large Riprap.

3.09 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 or stops that could damage geosynthetics.
- B. Hauling: Operate hauling equipment on minimum of 3 feet of covering.
- C. Spreading:
 - 1. Spreading equipment shall be track mounted, low ground pressure, D-6 or lighter.
 - 2. Operate spreading equipment on minimum of 12 inches of fill over geosynthetics.
 - 3. Spread fill in same direction as unseamed overlaps to avoid separation of seams and joints.
 - 4. Never push fill downslope. Spread fill over sideslopes by pushing up from slope bottom.
 - 5. Flatten wrinkles of geosynthetics in direction of spreading. Correct wrinkles in geotextiles as specified in Section 31 32 19.16, Geotextile.
 - 6. Maintain proper overlap of unseamed geosynthetics.
 - 7. Avoid overstressing geosynthetics and seams.
- D. Compaction: Compact fill only after uniformly spread to full thickness shown.

- E. Geosynthetic Damage:
 - 1. Mark punctures, tears, or other damage to geosynthetics, so repairs may be made.
 - 2. Clear overlying fill as necessary to repair damage.
 - 3. Repairs to geosynthetics shall be made by respective installers as specified in respective specification section for each geosynthetic.

3.10 FINISHED GRADING

- A. Finished grades shall match the grades shown on Contract Drawings within one-tenth (0.1) of a foot, both horizontal and vertical, unless otherwise approved by the Owner's Project Representative.
- B. Tops, toes, and transitions of all slopes shall be graded to produce a gradual and natural-appearing transition between relatively level areas and slopes, with a minimum 0.5 percent slope for positive drainage.
- C. Acceptance of Finished Grades will be based upon inspection by the Owner's Project Representative. Acceptance includes survey documentation to validate horizontal and vertical locations of Finished Grade per Contract Drawings.

END OF SECTION

SECTION 31 23 23.15 TRENCH BACKFILL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Public Works Association (APWA): Uniform Color Code.
 - 2. ASTM International (ASTM):
 - a. C33/C33M, Standard Specification for Concrete Aggregates.
 - b. C94/C94M, Standard Specification for Ready-Mixed Concrete.
 - c. C117, Standard Test Method for Materials Finer than 75 Micrometer (No. 200) Sieve in Mineral Aggregates by Washing.
 - d. C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - e. C150/C150M, Standard Specification for Portland Cement.
 - f. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - g. C1012/C1012M, Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.
 - h. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - i. D1140, Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75 micrometer) Sieve.
 - j. D2216, Standard Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
 - k. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - 1. D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - m. D4832, Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
 - n. D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 - 3. National Electrical Manufacturers Association (NEMA): Z535.1, Safety Colors.

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1.02 DEFINITIONS

- A. Base Rock: Granular material upon which manhole bases and other structures are placed.
- B. Bedding Material: Granular material upon which pipes, conduits, cables, or duct banks are placed.
- A. Imported Material: Materials obtained from USFS approved weed-free sources offsite, suitable for specified use.
- B. Lift: Loose (uncompacted) layer of material.
- C. Pipe Zone: Backfill zone that includes full trench width and extends from prepared trench bottom to an upper limit above top outside surface of pipe, conduit, cable or duct bank.
- D. Prepared Trench Bottom: Graded trench bottom after excavation and installation of stabilization material, if required, but before installation of bedding material.
- E. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D698. Corrections for oversize material may be applied to either as-compacted field dry density or maximum dry density, as determined by Engineer.
- F. Standard Specifications, as used in this section, refer to Oregon Department of Transportation Standard Specifications for Construction, 2021.
- G. Well-Graded:
 - 1. A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes producing a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids. Satisfying both of the following requirements, as defined in ASTM D2487:
 - a. Coefficient of Curvature: Greater than or equal to 1 and less than or equal to 3.
 - b. Coefficient of Uniformity: Greater than or equal to 4 for materials classified as gravel, and greater than or equal to 6 for materials classified as sand.

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1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings: Manufacturer's descriptive literature for marking tapes and tracer wire.
- B. Informational Submittals:
 - 1. Catalog and manufacturer's data sheets for compaction equipment.
 - 2. Certified Gradation Analysis: Submit not less than 30 days prior to delivery for processed and imported materials or anticipated use for excavated materials.
 - 3. Certified test results from independent testing agency.
 - 4. Certified weed-free material documentation meeting United States Forest Service requirements for each imported trench backfill material.
 - 5. Controlled Low Strength Material: Certified mix design and test results. Include material types and weight per cubic yard for each component of mix. Provide 28-day unconfined compressive strength tests from same certified mix design that have been completed within 120 days prior to the submittal date.

PART 2 PRODUCTS

2.01 GEOTEXTILE

A. As specified in Section 31 32 19.16, Geotextile.

2.02 MARKING TAPE

- A. Nondetectable:
 - 1. Inert polyethylene, impervious to known alkalis, acids, chemical reagents, and solvents likely to be encountered in soil.
 - 2. Thickness: Minimum 5 mils.
 - 3. Width: 6 inches.
 - 4. Identifying Lettering: Minimum 1 inch high, permanent black lettering imprinted continuously over entire length.
 - 5. Manufacturers and Products:
 - a. Reef Industries; Terra Tape.
 - b. Mutual Industries; Non-detectable Tape.
 - c. Presco; Non-detectable Tape.

- B. Detectable:
 - 1. Solid aluminum foil, visible on unprinted side, encased in protective high visibility, inert polyethylene plastic jacket.
 - 2. Foil Thickness: Minimum 0.35 mils.
 - 3. Laminate Thickness: Minimum 5 mils.
 - 4. Width: 6 inches.
 - 5. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.
 - 6. Joining Clips: Tin or nickel-coated furnished by tape manufacturer.
 - 7. Manufacturers and Products:
 - a. Reef Industries; Terra Tape, Sentry Line Detectable.
 - b. Mutual Industries; Detectable Tape.
 - c. Presco; Detectable Tape.
- C. Color: In accordance with APWA Uniform Color Code.

Table 1		
Color*	Facility	
Red	Electric power lines, cables, conduit, and lightning cables	
Orange	Communicating alarm or signal lines, cables, or conduit	
Yellow	Gas, oil, steam, petroleum, or gaseous materials	
Green	Sewers and drain lines	
Blue	Potable water, and raw water	
Purple	Reclaimed water, irrigation, and slurry lines	
*As specified in NEMA Z535.1, Safety Color Code.		

2.03 TRACER WIRE

- A. Material: Minimum 12-gauge solid copper or copper jacket with a steel core, with high-density polyethylene (HDPE) or high-molecular weight polyethylene (HMWPE) insulation suitable for direct bury.
- B. Splices: Use wire nut or lug suitable for direct burial as recommended by tracer wire manufacturer.
- C. Manufacturers:
 - 1. Copperhead Industries, LLC.
 - 2. Performance Wire & Cable Inc.
 - 3. Pro-line Safety Products Company.

2.04 FOUNDATION STABILIZATION MATERIAL

- A. Foundation Stabilization Material: Clean, hard, durable, open-graded, 2-inch to 1/4-inch crushed aggregate, with less than 8 percent by weight passing the 1/4-inch sieve. Free from clay balls, other organic materials, or debris.
- B. Measurement and Payment:
 - 1. The quantities of foundation stabilization material will be measured on a volume basis as follows:
 - a. Volume Basis:
 - 1) Length: Length will be the horizontal distance measured along the centerline of the trench.
 - 2) Width: Width will be the nominal pipe diameter plus 18 inches each side of pipe regardless of actual quantity placed.
 - 3) Depth: Depth will be the vertical distance between bottom of excavation and bottom of bedding layer. The depth will be measured at intervals of 30 feet, or as specified, along the centerline of the trench and the average depth between points will be used for the volume computation.
 - 2. Payment:
 - a. Payment shall be inclusive of furnishing and placing of foundation stabilization material, and excavation and disposal of material being replaced by foundation stabilization material per the previously defined volume. The accepted quantities of Foundation Stabilization Material will be paid for at the Contract unit price, per unit of measurement, for the following items:
 - 1) Pay Item: Per unit of measurement.
 - 2) Foundation Stabilization Material: Per cubic yard.

2.05 IMPORTED TRENCH BACKFILL MATERIAL

- A. Unfrozen, friable, and no clay balls, roots, or other organic material.
- B. Hard, durable 3/4-inch or 1-inch minus crushed aggregate meeting the requirements of Section 02630.10 of the Standard Specifications.

C. Upon approval by Engineer, Contractor may use imported material in lieu of excavated material meeting the requirements of Select Native Backfill Material.

2.06 SELECT NATIVE BACKFILL MATERIAL

- A. Excavated material from required excavations free from rocks larger than 1.5 inches, from roots and other organic matter larger than 1/4 inch and a maximum of 2 percent by weight, from ashes, cinders, trash, debris, and other deleterious materials.
- B. Sand or silty sand with a maximum of 30 percent passing the No. 200 sieve as determined in accordance with ASTM D1140, or gravel or crushed rock within maximum particle size of 1.5 inches.

2.07 EARTHFILL

A. Earthfill as specified in Section 31 23 23, Fill and Backfill.

2.08 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

- A. Select and proportion ingredients to obtain compressive strength between 100 psi and 250 psi at 28 days in accordance with ASTM D4832.
- B. Materials:
 - 1. Cement: ASTM C150/C150M, Type I or Type II.
 - 2. Aggregate: ASTM C33/C33M, Size 7.
 - 3. Fly Ash (Pozzolan):
 - a. Class F or Class C fly ash in accordance with ASTM C618, except as modified herein:
 - 1) ASTM C618, Table 1, Loss on Ignition: Unless permitted otherwise, maximum 3 percent.
 - 2) Test in accordance with ASTM C1012/C1012M to verify sulfate resistance is acceptable.
 - 4. Water: Clean, potable, containing less than 500 ppm of chlorides.
- 2.09 TOPSOIL
 - A. As specified in Section 32 91 13, Soil Preparation.
- 2.10 GRAVEL SURFACING
 - A. As specified in Section 32 11 23, Aggregate Base Course.

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PART 3 EXECUTION

3.01 TRENCH PREPARATION

- A. Water Control:
 - 1. Promptly remove and dispose of water entering trench as necessary to grade trench bottom and to compact backfill and install manholes, pipe, conduit, direct-buried cable, or duct bank. Do not place concrete, lay pipe, conduit, direct-buried cable, or duct bank in water as specified in Section 31 23 19.01, Dewatering.
 - 2. Remove water in a manner that minimizes soil erosion from trench sides and bottom.
 - 3. Provide continuous water control until trench backfill is complete.
- B. Remove foreign material and backfill contaminated with foreign material that falls into trench.

3.02 TRENCH BOTTOM

- A. Firm Subgrade: Grade with hand tools, remove loose and disturbed material, and trim off high areas and ridges left by excavating bucket teeth. Allow space for bedding material if shown or specified.
- B. Soft Subgrade: If subgrade is encountered that may require removal to prevent pipe settlement, notify Engineer. Engineer will determine depth of overexcavation, if any required.

3.03 GEOTEXTILE INSTALLATION

A. Where shown and as specified in Section 31 32 19.16, Geotextile.

3.04 TRENCH STABILIZATION MATERIAL INSTALLATION

- A. Rebuild trench bottom with trench stabilization material.
- B. Place material over full width of trench in 6-inch lifts to required grade, providing allowance for bedding thickness.
- C. Compact each lift so as to provide a firm, unyielding support for the bedding material prior to placing succeeding lifts.

3.05 BEDDING

A. Furnish imported bedding material where, in the opinion of Engineer, excavated material is unsuitable for bedding or insufficient in quantity.

- B. Place over full width of prepared trench bottom in two equal lifts when required depth exceeds 8 inches.
- C. Hand grade and compact each lift to provide a firm, unyielding surface.
- D. Minimum Thickness:
 - 1. As shown on Drawings or as follows if not shown:
 - a. Pipe 15 Inches and Smaller: 4 inches.
 - b. Pipe Greater than 15 Inches to 36 Inches: 6 inches.
 - c. Pipe Greater than 36 Inches and Larger: 12 inches.
- E. Check grade and correct irregularities in bedding material. Loosen top 1 inch to 2 inches of compacted bedding material with a rake or by other means to provide a cushion before laying each section of pipe, conduit, direct-buried cable, or duct bank.
- F. Install to form continuous and uniform support except at bell holes, if applicable, or minor disturbances resulting from removal of lifting tackle.
- G. Bell or coupling holes for pipe materials except butt-fused HDPE. Excavate in bedding at each joint to permit proper assembly and inspection of joint and to provide uniform bearing along barrel of pipe or conduit.

3.06 BACKFILL PIPE ZONE

- A. Upper limit of pipe zone shall not be less than following:
 - 1. Pipe: 12 inches above top of pipe, unless shown otherwise.
 - 2. Conduit: 3 inches above top of conduit, unless shown otherwise.
- B. Place CLSM backfill in pipe bedding and pipe zone where shown.
 - 1. Prior to pouring CLSM, support pipe on small sandbags, or other approved support measures.
- C. Restrain pipe, conduit, cables, and duct banks as necessary to prevent their movement during backfill operations.
- D. Place material simultaneously in lifts on both sides of pipe and, if applicable, between pipes, conduit, cables, and duct banks installed in same trench.
 - 1. Pipe 10-Inch and Smaller Diameter: First lift less than or equal to 1/2 pipe diameter.
 - 2. Pipe Over 10-Inch Diameter: Maximum 8-inch uncompacted lifts.

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- E. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by "walking in" and slicing material under haunches with a shovel to ensure voids are completely filled before placing each succeeding lift.
- F. Do not use power-driven impact compactors to compact pipe zone material. Each lift shall be compacted with a minimum of two passes by a vibratory plate compactor. Take care to avoid damaging pipe.

3.07 MARKING TAPE INSTALLATION

- A. Continuously install marking tape along centerline of buried piping shown on Drawings. Coordinate with piping installation drawings.
 - 1. Detectable Marking Tape: Install with nonmetallic piping and waterlines.
 - 2. Nondetectable Marking Tape: Install with nonmetallic piping and waterlines.

3.08 TRACER WIRE INSTALLATION AND TESTING

- A. Install tracer wire continuously along centerline of nonmetallic buried piping.
- B. Attach wire to top of pipe using tape at maximum of 10-foot intervals.
- C. Install splices in accordance with manufacturer's instructions for direct bury applications. Tie ends of wire to be joined in a knot as required to reduce tension on splice.
- D. Tracer wire shall be brought to surface at least every 1,000 feet, install valve box to allow access to tracer wire. Mark valve box cover with the word "TRACER". Coil enough excess tracer wire at each appurtenance to extend wire 12 inches above ground.
- E. Test continuity of tracer wire in presence of Engineer.

3.09 BACKFILL ABOVE PIPE ZONE

A. General:

- 1. Process excavated material to meet specified gradation requirements.
- 2. Adjust moisture content as necessary to obtain specified compaction.
- 3. Do not allow backfill to free fall into trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 2 feet of backfill has been provided over top of pipe.

- 4. Do not use power driven impact type compactors for compaction until at least 4 feet of backfill is placed over top of pipe. Prior to placing 4 feet of backfill over pipe, each lift shall be compacted with a minimum of two passes by a vibratory plate compactor.
- 5. Backfill to grade with proper allowances for topsoil, crushed rock surfacing, and pavement thicknesses, wherever applicable.
- 6. Backfill around structures with same class backfill as specified for adjacent trench, unless otherwise shown or specified.
- B. Backfill using Earthfill:
 - 1. Backfill with allowance for topsoil or road surfacing.
 - 2. Leave trench with backfill material neatly mounded across the entire trench width, but not more than 6 inches above the adjacent ground surface.
 - 3. Correct excess or deficiency of backfill material apparent after settlement and within correction period by regrading, and disposing of excess material or adding additional material where deficient.
 - 4. Backfill trench above pipe zone in lifts not exceeding 12 inches. Compact each lift to a minimum of 95 percent relative compaction in accordance with ASTM D698 prior to placing succeeding lifts.
- C. Gravel Surfacing:
 - 1. Install Gravel Surfacing in top of backfilled trench in areas shown on Drawings.
 - 2. Compact as specified in Section 32 11 23, Aggregate Base Course.
- D. Controlled Low Strength Material:
 - 1. Discharge from truck mounted drum type mixer into trench.
 - 2. Place in lifts as necessary to prevent uplift (flotation) of new and existing facilities.
 - 3. In traveled areas beneath haul roads fill entire trench section to bottom of pavement or gravel surfacing for a temporary driving surface.

3.10 QUALITY CONTROL

- A. Perform gradation analysis in accordance with ASTM C117 and ASTM C136 as required in Table 2 for:
 - 1. Earthfill, including specified class.
 - 2. Foundation stabilization material.
 - 3. Imported trench backfill material.
 - 4. Select native backfill material.

TRENCH BACKFILL 31 23 23.15 - 10

- B. Perform density testing at production output or stockpile in accordance with ASTM D698 for each material grading produced as required in Table 2 for:
 - 1. Earthfill.
 - 2. Imported trench backfill material.
 - 3. Select native backfill material.
- C. In-Place Density and Moisture Tests:
 - 1. Show proof that areas meet specified requirements before identifying density test locations.
 - 2. Complete in-place density and moisture testing per ASTM D6938 and ASTM D2216 once per material every 500 linear feet for the first 2,000 linear feet of trench along the pipeline alignment, and once every 1,000 linear feet for the second 2,000 linear feet of trench along the pipeline alignment. Remainder of trench backfill material shall be tested by visual observation and metal probing to detect loose trench backfill material, as determined by Owner's Project Representative.
 - 3. Owner's Project Representative may request additional in-place density tests per ASTM D6938 and ASTM D2216 at up to 10 additional locations per material at the expense of the Contractor to verify compaction requirements are being met per specifications.
- D. Certify Laboratory Performance of Mix Designs: Controlled low strength material.
- E. If test results indicate material does not meet specification requirements, terminate material placement and take corrective action. Re-testing shall be at the expense of the Contractor.

Table 2 Minimum Sampling and Testing Requirements			
Property	Test Method	Frequency	Sampling Point
Gradation	ASTM C117 and ASTM C136	One sample from each 1,000 tons of finished product	Production output or stockpile
Moisture Density (Maximum Density)	ASTM D698	One test for every material grading produced	Production output or stockpile

Table 2 Minimum Sampling and Testing Requirements			
Property	Test Method	Frequency	Sampling Point
In-Place Density and Moisture Content	ASTM D6938 and ASTM D2216 for moisture content	As outlined in Paragraph In-Place Density and Moisture Tests	In-place completed, compacted area

3.11 REPLACEMENT OF TOPSOIL

- A. Replace topsoil in top 6 inches of backfilled trench in non-traffic areas.
- B. Maintain finished grade of topsoil areas shown and grade as necessary to restore drainage.

3.12 MAINTENANCE OF TRENCH BACKFILL

- A. After each section of trench is backfilled, maintain surface of backfilled trench even with adjacent ground surface until final surface restoration is completed.
- B. Gravel Surfacing Rock: Add gravel surfacing rock where applicable and as necessary to keep surface of backfilled trench even with adjacent ground surface, and grade and compact as necessary to keep surface of backfilled trenches smooth, free from ruts and potholes, and suitable for normal traffic flow.
- C. Topsoil: Add topsoil where applicable and as necessary to maintain surface of backfilled trench level with adjacent ground surface.
- D. Asphaltic Pavement: Replace settled areas or fill with asphalt as specified in Section 32 12 16, Asphalt Paving.
- E. Other Areas: Add excavated material where applicable and keep surface of backfilled trench level with adjacent ground surface.

3.13 SETTLEMENT OF BACKFILL

A. With the exception of trenches with surface restoration Type D, settlement of trench backfill, or of fill, or facilities constructed over trench backfill will be considered a result of defective compaction of trench backfill.

END OF SECTION

TRENCH BACKFILL 31 23 23.15 - 12

SECTION 31 32 19.16 GEOTEXTILE

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards that may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. D4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
 - b. D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - c. D4533, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
 - d. D4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - e. D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 - f. D4833, Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

1.02 DEFINITIONS

- A. Fabric: Geotextile, a permeable geosynthetic comprised solely of textiles.
- B. Maximum Average Roll Value (MaxARV): Maximum of series of average roll values representative of geotextile furnished.
- C. Minimum Average Roll Value (MinARV): Minimum of series of average roll values representative of geotextile furnished.
- D. Nondestructive Sample: Sample representative of finished Work, prepared for testing without destruction of Work.
- E. Overlap: Distance measured perpendicular from overlapping edge of one sheet to underlying edge of adjacent sheet.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Manufacturer material specifications and product literature.
 - b. Installation drawings showing geotextile sheet layout, location of seams, direction of overlap, and sewn seams.
 - c. Description of proposed method of geotextile deployment, sewing equipment, sewing methods, and provisions for holding geotextile temporarily in place until permanently secured.
- B. Informational Submittals: Certifications from each geotextile manufacturer that furnished products have specified property values. Certified property values shall be either minimum or maximum average roll values, as appropriate, for geotextiles furnished.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver each roll with sufficient information attached to identify it for inventory and quality control.
- B. Handle products in manner that maintains undamaged condition.
- C. Do not store products directly on ground. Ship and store geotextile with suitable wrapping for protection against moisture and ultraviolet exposure. Store geotextile in way that protects it from elements. If stored outdoors, elevate, and protect geotextile with waterproof cover.

1.05 SCHEDULING AND SEQUENCING

- A. Where geotextile is to be laid directly upon ground surface, prepare subgrade as specified in Section 31 23 13, Subgrade Preparation, first.
- B. Notify Owner's Project Representative whenever geotextiles are to be placed. Do not place geotextile without Owner's Project Representative approval of underlying materials.

PART 2 PRODUCTS

2.01 WOVEN GEOTEXTILE

A. Composed of polymeric yarn interlaced to form planar structure with uniform weave pattern.

GEOTEXTILE 31 32 19.16 - 2

- B. Calendared or finished so yarns will retain their relative position with respect to each other.
- C. Polymeric Yarn: Long-chain synthetic polymers (polyester or polypropylene) with stabilizers or inhibitors added to make filaments resistant to deterioration due to heat and ultraviolet light exposure.
- D. Sheet Edges: Selvaged or finished to prevent outer material from separating from sheet.
- E. Unseamed Sheet Width: Minimum 12 feet.
- F. Type: Mirafi RS380i, "or-equal."
- G. Physical Properties: Conform to requirements in Table No. 1.

Table No. 1Physical Property Requirements for Woven Geotextile			
Property	Requirement	Test Method	
Apparent Opening Size (AOS)	40 U.S. Standard Sieve Size	ASTM D4751	
Water Permittivity	0.9 sec. ⁻¹ , MinARV	ASTM D4491 (Falling Head)	
Vertical Waterflow Rate	75 gpm/sq ft, MinARV	ASTM D4491 (Falling Head)	
Wide Width Strip Tensile Strength at 2% Strain (MD/CD)	600/1,020 lb/ft-width, MinARV	ASTM D4595	
Ultraviolet Radiation Resistance	90 percent strength retention, MinARV after 500 hours	ASTM D4355	

2.02 NONWOVEN GEOTEXTILE

A. Pervious sheet of polyester, polypropylene, or polyethylene fabricated into stable network of fibers that retain their relative position with respect to each other. Nonwoven geotextile shall be composed of continuous or discontinuous (staple) fibers held together through needle-punching, spun-bonding, thermalbonding, or resin-bonding.

- B. Geotextile Edges: Selvaged or otherwise finished to prevent outer material from pulling away from geotextile.
- C. Unseamed Sheet Width: Minimum 12 feet.
- D. Type: Mirafi 140N, "or-equal."
- E. Physical Properties: Conform to requirements in Table No. 2.

Table No. 2Physical Property Requirements for Nonwoven Geotextile			
Property	Requirement	Test Method	
Water Permittivity	1.7 sec. ⁻¹ , MinARV	ASTM D4491 (Falling Head)	
Apparent Opening Size (AOS)	70 U.S. Standard Sieve Size	ASTM D4751	
Grab Tensile Strength, Machine Direction	120 lb/in, MinARV	ASTM D4632	
Grab Elongation, Machine Direction	50 percent, MaxARV	ASTM D4632	
Puncture Strength	310 lb, MinARV	ASTM D4833	
Trapezoid Tear Strength	50 lb, MinARV	ASTM D4533	
Ultraviolet Radiation Resistance	70 percent strength retention, MinARV after 500 hours	ASTM D4355	

PART 3 EXECUTION

3.01 LAYING GEOTEXTILE

A. Lay and maintain geotextile smooth and free of tension, folds, wrinkles, or creases.

3.02 SHEET ORIENTATION ON SLOPES

A. Orient geotextile with long dimension of each sheet parallel to direction of slope.

- 3.03 JOINTS
 - A. Unseamed Joints:
 - 1. Overlapped.
 - 2. Overlap, unless otherwise shown:
 - a. Foundation/Subgrade Stabilization: Minimum 18 inches.
 - b. Riprap: Minimum 18 inches.
 - c. Trenches: Minimum 18 inches, except overlap shall equal trench width if trench width is less than 18 inches.
 - d. Other Applications: Minimum 12 inches.

3.04 PLACING PRODUCTS OVER GEOTEXTILE

- A. Before placing material over geotextile, notify Owner's Project Representative. Do not cover installed geotextile until after Owner's Project Representative provides authorization to proceed.
- B. If tears, punctures, or other geotextile damage occurs during placement of overlying products, remove overlying products as necessary to expose damaged geotextile. Repair damage as specified in Article Repairing Geotextile.

3.05 INSTALLING GEOTEXTILE IN TRENCHES

- A. Place geotextile in a way to completely envelope granular material to be placed in trench or separate granular material from native soil with specified overlap at joints. Place geotextile in a way and with sufficient slack for geotextile to contact trench bottom and sides fully when trench is backfilled.
- B. After granular drain material is placed to required grade, fold geotextile over top of granular drain material, unless otherwise shown. Maintain overlap until overlying fill or backfill is placed.

3.06 RIPRAP APPLICATIONS

- A. Overlap geotextile at each joint with upstream sheet of geotextile overlapping downstream sheet.
- B. Sew joints where wave run-up may occur.
- C. Limit height of riprap fall onto geotextile to prevent damage.
 - 1. Drop Height: 0 foot for greater than 200-pound rock.

3.07 SILT FENCE APPLICATIONS

- A. Install geotextile in one piece, or continuously sewn to make one piece, for full length and height of fence, including portion of geotextile buried in toe trench.
- B. Install bottom edge of sheet in toe trench and backfill in a way that securely anchors geotextile in trench.
- C. Securely fasten geotextile to each support post in a way that will not result in tearing of geotextile when fence is subjected to service loads.
- D. Promptly repair or replace silt fence that becomes damaged.

3.08 REPAIRING GEOTEXTILE

- A. Repair or replace torn, punctured, flawed, deteriorated, or otherwise damaged geotextile.
- B. Repair Procedure:
 - 1. Place patch of undamaged geotextile over damaged area and at least 18 inches in all directions beyond damaged area.
 - 2. Remove interfering material as necessary to expose damaged geotextile for repair.
 - 3. Sew patches or secure them with heat fusion tacking or with pins and washers or by other means approved by Owner's Project Representative.

3.09 REPLACING CONTAMINATED GEOTEXTILE

A. Protect geotextile from contamination that would interfere, in Owner's Project Representative opinion, with its intended function. Remove and replace contaminated geotextile with clean geotextile.

END OF SECTION

SECTION 31 41 00 SHORING

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational Submittals: Trench excavation plan.

PART 2 PRODUCTS (NOT USED)

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 the Work.

3.02 TRENCH EXCAVATION PLAN

- A. Prepare trench excavation plan addressing following topics:
 - 1. Details of shoring, bracing, sloping, or other provisions in words, plans, sections, and details for the Contractor-designed protection of the excavation and for worker protection from hazards of caving ground.
 - 2. Include design assumptions and calculations demonstrating compliance with the design requirements and with safety and other applicable design standards.
 - 3. Methods and sequencing of installing excavation support.
 - 4. Proposed locations of stockpiled excavated material.
 - 5. Minimum lateral distance from the crest of slopes for vehicles and stockpiled excavated materials.
 - 6. 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. For trench excavation exceeding 5 feet in depth, provide adequate safety system meeting requirements of applicable state and local construction safety orders, and federal requirements.

END OF SECTION

SECTION 32 11 23 AGGREGATE BASE COURSE

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. C29, Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate.
 - b. C88, Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
 - c. C117, Standard Method of Test for Materials Finer Than 75μm (No. 200) Sieve in Mineral Aggregates by Washing.
 - d. C131, Standard Specification for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - e. C183, Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates.
 - f. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³)).
 - g. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft³ (2700 kN-m/m³)).
 - h. D1883, Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - i. D2216, Standard Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
 - j. D2419, Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
 - k. D2844, Standard Specification for Resistance R-Value and Expansion Pressure of Compacted Soils.
 - 1. D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
 - m. D4791, Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
 - n. D5195, Standard Test Methods for Density of Soil and Rock In-Place Below Surface by Nuclear Methods.

o. D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.02 DEFINITIONS

- A. Base Course: Crushed aggregate or similar as specified placed and compacted on prepared subgrade or subbase course.
- B. Completed Course: Compacted, unyielding, free from irregularities, with smooth, tight, even surface, true to grade, line, and cross-section.
- C. Completed Lift: Compacted with uniform cross-section thickness.
- D. Gravel Surfacing: Aggregate used for construction of low-volume access and staging area that can be easily graded and compacted.
- E. Leveling Course: Crushed aggregate placed and compacted on base course to be used for finish grading.
- F. Standard Specifications: When referenced in this section, shall mean the Oregon Standard Specifications for Construction, 2021.

1.03 SUBMITTALS

- A. Informational Submittals:
 - 1. Certified Test Results on Source Materials: Submit copies from commercial testing laboratory 20 days prior to delivery of materials to Project showing materials meeting the physical qualities specified.

PART 2 PRODUCTS

2.01 BASE COURSE

- A. As specified for 1-1/2-inch to 0-inch Dense Graded Aggregate in Section 02630 Base Aggregate of the Standard Specifications.
- B. Clean, hard durable pit run gravel or crushed stone graded from coarse to fine containing enough fines to bind material when compacted.

2.02 GRAVEL SURFACING

A. As specified for 1-inch to 0-inch Shoulder Aggregates in Section 02640 – Shoulder Aggregate of the Standard Specifications.

2.03 SOURCE QUALITY CONTROL

- A. Perform tests necessary to locate acceptable source of materials meeting specified requirements.
- B. Final approval of aggregate material will be based on test results of installed materials.
- C. Should separation of coarse from fine materials occur during processing or stockpiling, immediately change methods of handling materials to correct uniformity in grading.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

- A. As specified in Section 31 23 13, Subgrade Preparation.
- B. Obtain Engineer's acceptance of subgrade before placing base course or surfacing material.
- C. Do not place base course or surfacing materials in snow or on soft, muddy, or frozen subgrade.

3.02 EQUIPMENT

- A. In accordance with Section 00641 of the Standard Specifications.
- B. Compaction Equipment: Adequate in design and number to provide compaction and to obtain specified density for each layer.

3.03 HAULING AND SPREADING

- A. In accordance with Section 00641 of the Standard Specifications.
- B. Hauling Materials:
 - 1. Do not haul over surfacing in process of construction.
 - 2. Loads: Of uniform capacity.
 - 3. Maintain consistent gradation of material delivered; loads of widely varying gradations will be cause for rejection.
- C. Spreading Materials:
 - 1. Distribute material to provide required density, depth, grade, and dimensions with allowance for subsequent lifts.

- 2. Produce even distribution of material upon roadway or prepared surface without segregation.
- 3. Should segregation of coarse from fine materials occur during placing, immediately change methods of handling materials to correct uniformity in grading.

3.04 CONSTRUCTION OF COURSES

- A. Base Course:
 - 1. Maximum Completed Lift Thickness: 6 inches.
 - 2. Completed Course Total Thickness: As shown on Drawings.
 - 3. Spread lift on preceding course to required cross-section.
 - 4. Lightly blade and roll surface until thoroughly compacted.
 - 5. Add keystone to achieve compaction and as required when aggregate does not compact readily because of lack of fines or natural cementing properties, as follows:
 - a. Use leveling course or surfacing material as keystone.
 - b. Spread evenly on top of base course, using spreader boxes or chip spreaders.
 - c. Roll surface until keystone is worked into interstices of base course without excessive displacement.
 - d. Continue operation until course has become thoroughly keyed, compacted, and will not creep or move under roller.
 - 6. Blade or broom surface to maintain true line, grade, and cross-section.
- B. Gravel Surfacing:
 - 1. Maximum Completed Lift Thickness: As shown on Drawings.
 - 2. Completed Course Total Thickness: As shown on Drawings.
 - 3. Spread on preceding course in accordance with cross-section shown.
 - 4. Blade lightly and roll surface until material is thoroughly compacted.
- C. Erosion Control Gravel Surfacing:
 - 1. Completed Course Total Thickness: As shown on Drawings.
 - 2. Spread on preceding course in accordance with cross-section shown.
 - 3. Blade lightly until spread evenly across surface.

3.05 ROLLING AND COMPACTION

A. Commence compaction of each layer of base and gravel surfacing after spreading operations and continue until density of 95 percent of maximum density has been achieved as determined by ASTM D1557.

- B. Commence rolling at outer edges and continue toward center; do not roll center of road first.
- C. Apply water as needed to obtain specified densities.
- D. Place and compact each lift to the required density before succeeding lift is placed.
- E. Surface Defects: Remedy by loosening and rerolling. Reroll entire area, including surrounding surface, until thoroughly compacted.
- F. Finished surface shall be true to grade and crown before proceeding with surfacing.

3.06 SURFACE TOLERANCES

- A. Blade or otherwise work surfacing as necessary to maintain grade and crosssection at all times, and to keep surface smooth and thoroughly compacted.
- B. Finished Surface of Untreated Aggregate Base Course: Within plus or minus 0.04 foot of grade shown at any individual point.
- C. Gravel Surfacing: Within 0.04 foot from lower edge of 10-foot straightedge placed on finished surface, parallel to centerline.

3.07 FIELD QUALITY CONTROL

- A. In-Place Density Tests:
 - 1. Provide testing laboratory at least 48 hours advance notification prior to testing.
 - 2. Show proof that areas meet specified requirements before identifying density test locations.
 - 3. Refer to Table 1 for minimum sampling and testing requirements for aggregate base courses and surfacing.

Table 1 Minimum Sampling and Testing Requirements			
Property	Test Method	Frequency	Sampling Point
Gradation	ASTM C117 and ASTM C183	One Sample every 500 tons but at least every 4 hours of production	Roadbed after processing

Table 1 Minimum Sampling and Testing Requirements			
Property	Test Method	Frequency	Sampling Point
Moisture Density (Maximum Density)	ASTM D1557, Method D	One test for every aggregate grading produced	Production output or stockpile
In-Place Density and Moisture Content	ASTM D5195, ASTM D6938, and ASTM D2216 for moisture content	Base Course: One for each 500 ton but at least every 10,000 sq. ft. of area Surfacing: See Paragraph Density and Moisture Test Frequency for Surfacing below	In-place completed, compacted area

- B. Density and Moisture Test Frequency for Surfacing:
 - 1. Complete in-place density and moisture testing per ASTM D6938 and ASTM D2216 once every 500 linear feet for the first 2,000 linear feet of surfacing along the pipeline alignment, and once every 1,000 linear feet for the second 2,000 linear feet of surfacing along the pipeline alignment. Remainder of surfacing shall be tested by visual observation and metal probing to detect loose surfacing material, as determined by Owner's Project Representative.
 - 2. Owner's Project Representative may request additional in-place density tests per ASTM D6938 and ASTM D2216 at up to 10 additional locations to verify compaction requirements are being met per specifications.

3.08 CLEANING

A. Remove excess material from the Work area. Clean stockpile and staging areas of all excess aggregate.

END OF SECTION

SECTION 32 12 16 ASPHALT PAVING

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. M17, Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
 - b. M81, Standard Specification for Cut-Back Asphalt (Rapid Curing Type).
 - c. M82, Standard Specification for Cut-Back Asphalt (Medium Curing Type).
 - d. M140, Standard Specification for Emulsified Asphalt.
 - e. M156, Standard Specification for Requirements for Mixing Plants for Hot-mixed, Hot-laid Bituminous Paving Mixes.
 - f. M208, Standard Specification for Cationic Emulsified Asphalt.
 - g. R35, Standard Practice for Superpave Volumetric Design for Hot Mix Asphalt.
 - h. T166, Standard Method of Test for Bulk Specific Gravity (Gmb) of Compacted Hot Mix Asphalt (HMA) Mixtures Using Saturated Surface-Dry Specimens.
 - i. T176 Standard Method of Test for Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test.
 - j. T209, Standard Method of Test for Theoretical Maximum Specific Gravity (Gmm) and Density of Hot Mix Asphalt (HMA).
 - k. T245, Standard Method of Test for Resistance to Plastic Flow of Asphalt Mixtures Using Marshall Apparatus.
 - 1. T246, Standard Method of Test for Resistance to Deformation and Cohesion of Hot Mix Asphalt (HMA) by Means of Hveem Apparatus.
 - m. T247, Standard Method of Test for Preparation of Test Specimens of Hot Mix Asphalt (HMA) by Means of California Kneading Compactor.
 - n. T283, Standard Method of Test for Resistance of Compacted Hot Mix Asphalt (HMA) to Moisture-Induced Damage.
 - o. T304, Standard Method of Test for Uncompacted Void Content of Fine Aggregate.

- p. T312, Standard Method of Test for Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of a Superpave Gyratory Compactor.
- 2. Asphalt Institute (AI):
 - a. Manual Series No. 2 (MS-2), Mix Design Methods for Asphalt Concrete.
 - b. Superpave Series No. 2 (SP-2), Superpave Mix Design.
- 3. ASTM International (ASTM):
 - a. D75, Standard Method of Test for Sampling of Aggregates.
 - b. D140, Standard Method of Test for Sampling Bituminous Materials.
 - c. D979, Standard Method of Test for Sampling Bituminous Paving Mixtures.
 - d. D2041, Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
 - e. D2489, Standard Method of Test for Determining Degree of Particle Coating of Asphalt Mixtures.
 - f. D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - g. D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
 - h. D5821, Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.
 - i. E329 REV A, Standard Specification for Agencies Engaged in Construction Inspection Testing, or Special Inspection.

1.02 DEFINITIONS

- A. Combined Aggregate: All mineral constituents of asphalt concrete mix, including mineral filler and separately sized aggregates.
- B. Maximum Aggregate Size: One sieve size larger than the nominal aggregate size.
- C. Nominal Aggregate Size: One sieve size larger than the first sieve that retains more than 10 percent aggregate.
- D. Prime Coat: Low viscosity cutback or emulsified asphalt applied to granular base in preparation of paving to coat and bond loose materials, harden the surface, plug voids, prevent moisture migration, and provide adhesion.
- E. Reclaimed asphalt pavement (RAP): Removed and/or processed pavement materials containing binder and aggregate.

- F. Seal Coat: Term used for various applications of emulsified asphalt, with or without sand or aggregate, to protect the asphalt surface from aging due to wear, degradation from the sun, wind, and water. Also used to improve skid resistance and aesthetics. The term seal coat can be used to define fog seal, slurry seal, chip seal or sand seal, depending on application.
- G. Standard Specifications: Oregon Standard Specifications for Construction, 2021.
- H. Tack Coat: Thin layer of emulsified asphalt applied to hard surfaces, including new pavement lifts, to promote adhesion and bonding.

1.03 DESIGN REQUIREMENTS

A. Prepare asphalt concrete mix design, meeting the following design criteria, tolerances, and other requirements of this specification.

1.04 SUBMITTALS

- A. Informational Submittals:
 - 1. Asphalt Concrete Mix Formula:
 - a. Submit minimum of 15 days prior to start of production.
 - b. Submittal to include the following information:
 - Gradation and portion for each aggregate constituent used in mixture to produce a single gradation of aggregate as specified in Section 00744.12 of the Standard Specifications.
 - 2) Bulk specific gravity for each aggregate constituent.
 - 3) Measured maximum specific gravity of mix at optimum asphalt content determined in accordance with ASTM D2041.
 - 4) Job mix formula properties demonstrating conformance with the mix requirements specified in Section 00744.13 of the Standard Specifications.
 - 5) Properties as stated in Section 00744 of the Standard Specifications, for at least four different asphalt contents other than optimum, two below optimum, and two above optimum.
 - 6) Percent of asphalt lost due to absorption by aggregate.
 - 7) Index of Retained Strength (TSR) at optimum asphalt content as determined by AASHTO T283.
 - 8) Percentage of asphalt cement, to nearest 0.1 percent, to be added to mixture.
 - 9) Optimum mixing temperature.

- 10) Optimum compaction temperature.
- 11) Temperature-viscosity curve of asphalt cement to be used.
- 12) Brand name of any additive to be used and percentage added to mixture.
- 2. Test Report for Asphalt Cement:
 - a. Submit minimum 10 days prior to start of production.
 - b. Show appropriate test method(s) for each material and the test results.
- 3. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common Product Requirements, for the following materials:
 - a. Aggregate: Gradation, source test results as defined in Section 00744.12 of the Standard Specifications.
 - b. Asphalt for Binder: Type, grade, and viscosity-temperature curve.
 - c. Prime Coat: Type and grade of asphalt.
 - d. Tack Coat: Type and grade of asphalt.
 - e. Additives.
 - f. Mix: Conforms to job-mix formula.
- 4. Statement of qualification for independent testing laboratory.
- 5. Test Results:
 - a. Mix design.
 - b. Asphalt concrete core.
 - c. Gradation and asphalt content of uncompacted mix.
 - d. Field density.
 - e. Quality control.

1.05 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Independent Testing Laboratory: In accordance with ASTM E329 REV A.
 - 2. Asphalt concrete mix formula shall be prepared by approved certified independent laboratory under the supervision of a certified asphalt technician.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Temperature: Do not apply asphalt materials or place asphalt mixes when ground temperature is lower than 50 degrees F (10 degrees C) or air temperature is lower than 40 degrees F (4 degrees C). Measure ground and air temperature in shaded areas away from heat sources or wet surfaces.

B. Moisture: Do not apply asphalt materials or place asphalt mixes when application surface is wet.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Tack Coat:
 - 1. Emulsified Asphalt for Tack Coat or Seal Coat: Grade CSS-1, CSS-1h conforming to AASHTO M208. and Section 00730 of the Standard Specifications.
- B. Sand for Blotter Material or Sand Seal: Clean, dry, with 100 percent passing No. 4 (4.75-millimeter) sieve, and a maximum of 10 percent passing No. 200 (75 (m) sieve.

2.02 ASPHALT CONCRETE MIX

- A. General:
 - 1. Mix formula shall not be modified except with written approval of Engineer.
 - 2. Source Changes:
 - a. Should material source(s) change, establish new asphalt concrete mix formula before new material(s) is used.
 - b. Perform check tests of properties of plant-mix bituminous materials on first day of production and as requested by Engineer to confirm that properties are in compliance with design criteria.
 - c. Make adjustments in gradation or asphalt content as necessary to meet design criteria.
- B. Asphalt Concrete: Level 3, 1/2-inch Dense Graded Asphalt Concrete Pavement (ACP) as specified in Section 00744 of the Standard Specifications.
- C. Composition: Hot-plant mix of aggregate, mineral filler if required, and paving grade asphalt cement. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that resulting mixture meets grading requirements of mix formula.
- D. Aggregate:
 - General: As specified in Section 00744.10 of the Standard Specifications; RAP material may be used up to a maximum of 30 percent by total weight as specified in the Standard Specifications.

- E. Mineral Filler: In accordance with AASHTO M17.
- F. Asphalt Cement: Paving Grade PG 64-22, as specified in Section 00744.11 of the Standard Specifications.

2.03 EMULSIFIED ASPHALT CONCRETE

A. Conforming to the requirements of Section 00735 of the Standard Specifications.

PART 3 EXECUTION

3.01 GENERAL

- A. Traffic Control:
 - 1. In accordance with Section 01 50 00, Temporary Facilities and Controls.
 - 2. Minimize inconvenience to traffic, but keep vehicles off freshly treated or paved surfaces to avoid pickup and tracking of asphalt.
- B. Driveways: Repave driveways from which pavement was removed. Leave driveways in as good or better condition than before start of construction.

3.02 LINE AND GRADE

- A. Provide and maintain intermediate control of line and grade, independent of underlying base, to meet finish surface grades and minimum thickness.
- B. Shoulders: Construct to line, grade, and cross-section shown.

3.03 APPLICATION EQUIPMENT

A. In accordance with Section 00744 of the Standard Specifications.

3.04 PREPARATION

- A. Prepare subgrade as specified in Section 31 23 13, Subgrade Preparation.
- B. Existing Roadway:
 - 1. Modify profile by grinding, milling, or overlay methods as approved, to provide meet lines and surfaces and to produce smooth riding connection to existing facility.

- 2. Remove existing material to a minimum depth of 1 inch (25 millimeters).
- 3. Paint edges of meet line with tack coat prior to placing new pavement.
- C. Thoroughly coat edges of contact surfaces (curbs, manhole frames) with emulsified asphalt or asphalt cement prior to laying new pavement. Prevent staining of adjacent surfaces.

3.05 PAVEMENT APPLICATION

- A. General: Place asphalt concrete mixture on approved, prepared base in conformance with Section 00744 of the Standard Specifications.
- B. Tack Coat:
 - 1. Prepare material, as specified in Section 00730 of the Standard Specifications, prior to application.
 - 2. Apply uniformly to clean, dry surfaces avoiding overlapping of applications.
 - 3. Do not apply more tack coat than necessary for the day's paving operation.
 - 4. Touch up missed or lightly coated surfaces and remove excess material.
 - 5. Application Rate: 0.05 gallon per square yard to 0.15 gallon per square yard (0.25 liter per square meter to 0.70 liter per square meter) of asphalt (residual if diluted emulsified asphalt).
- C. Pavement Mix:
 - 1. Prior to Paving:
 - a. Sweep primed surface free of dirt, dust, or other foreign matter.
 - b. Patch holes in primed surface with asphalt concrete pavement mix.
 - 2. Place asphalt concrete pavement mix in two equal lifts.
 - 3. Compacted Lift Thickness:
 - a. Minimum: Twice maximum aggregate size, but in no case less than 2 inch (50 millimeters).
 - b. Maximum: 3 inches (75 millimeters).
 - 4. Total Compacted Thickness: As shown.
 - 5. Sequence placement so that meet lines are straight and edges are vertical.
 - 6. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.

- 7. Joints:
 - a. Offset edge of each layer a minimum of 6 inches (150 millimeters) so joints are not directly over those in underlying layer.
 - b. Offset longitudinal joints in roadway pavements so longitudinal joints in wearing layer coincide with pavement centerlines and lane divider lines.
 - c. Form transverse joints by cutting back on previous day's run to expose full vertical depth of layer.
- 8. Succeeding Lifts: Apply tack coat to pavement surface between each lift.
- 9. After placement of pavement, seal meet line by painting a minimum of 6 inches (150 millimeters) on each side of joint with cutback or emulsified asphalt. Cover immediately with sand.
- D. Compaction:
 - 1. Roll until roller marks are eliminated and density of 92 percent of measured maximum density determined in accordance with ASTM D2041 is obtained.
 - 2. Joint Compaction:
 - a. Place top or wearing layer as continuously as possible.
 - b. Pass roller over unprotected end of freshly laid mixture only when placing of mix is discontinued long enough to permit mixture to become chilled.
 - c. Cut back previously compacted mixture when Work is resumed to produce slightly beveled edge for full thickness of layer.
 - d. Cut away waste material and lay new mix against fresh cut.
- E. Tolerances:
 - 1. General: Conduct measurements for conformity with crown and grade immediately after initial compression. Correct variations immediately by removal or addition of materials and by continuous rolling.
 - 2. Completed Surface or Wearing Layer Smoothness:
 - a. Uniform texture, smooth, and uniform to crown and grade.
 - b. Maximum Deviation: 1/8 inch (3 millimeter) from lower edge of a 12-foot (3.6-meter) straightedge, measured continuously parallel and at right angle to centerline.
 - c. If surface of completed pavement deviates by more than twice specified tolerances, remove and replace wearing surface.
 - 3. Transverse Slope Maximum Deviation: (1/4 inch (6 millimeters) in 12 feet (3.6 meters) from rate of slope shown.

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- 4. Finished Grade:
 - a. Perform field differential level survey on maximum 50-foot (15-meter) grid and along grade breaks.
 - b. Maximum Deviation: 0.02 foot (6 millimeters) from grade shown.

3.06 PATCHING

- A. Temporary:
 - 1. Contractor shall install an Emulsified AC patch on the USFS 4400-000 Dufur Mill Road when Work is complete if temperatures do not allow for Permanent AC Patch to be installed.
 - 2. Temporary patch shall be removed prior to hot mix patch installation.

B. Permanent:

- 1. Preparation:
 - a. Remove damaged, broken, or unsound asphalt concrete adjacent to patches. Trim to straight lines exposing smooth, sound, vertical edges.
 - b. Prepare patch subgrade as specified in Section 31 23 13, Subgrade Preparation.
- 2. Application:
 - a. Patch Thickness: 3 inches (75 millimeters) or thickness of adjacent asphalt concrete, whichever is greater.
 - b. Place asphalt concrete mix across full width of patch in layers of equal thickness.
 - c. Spread and grade asphalt concrete with hand tools or mechanical spreader, depending on size of area to be patched.
- 3. Compaction:
 - Roll patches with power rollers capable of providing compression of 200 pounds per linear inch to 300 pounds per linear inch (350 Newtons per linear centimeter to 525 Newtons per linear centimeter). Use hand tampers where rolling is impractical.
 - b. Begin rolling top course at edges of patches, lapping adjacent asphalt surface at least one-half the roller width. Progress toward center of patch overlapping each preceding track by at least onehalf width of roller.
 - c. Make sufficient passes over entire area to remove roller marks and to produce desired finished surface.
- 4. Tolerances:
 - a. Finished surface shall be flush with and match grade, slope, and crown of adjacent surface.

b. Tolerance: Surface smoothness shall not deviate more than plus 1/4 inch (6 millimeters) or minus 0 inch when straightedge is laid across patched area between edges of new pavement and surface of old surfacing.

3.07 FIELD QUALITY CONTROL

- A. General: Provide services of approved certified independent testing laboratory to conduct tests.
- B. Field Density Tests:
 - 1. Perform tests from cores or sawed samples in accordance with AASHTO T166.
 - 2. Measure with properly operating and calibrated nuclear density gauge in accordance with ASTM D2950.
 - 3. Maximum Density: In accordance with ASTM D2041, using sample of mix taken prior to compaction from same location as density test sample.
- C. Testing Frequency:
 - 1. Quality Control Tests:
 - a. Asphalt Content, Aggregate Gradation: Once at the batch plant.
 - b. Mix Design Properties, Measured Maximum (Rice's) Specific Gravity: Once at the batch plant.
 - 2. Density Tests: Once per lift.

END OF SECTION

SECTION 32 17 23 PAVEMENT MARKINGS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. M237, Standard Specification for Epoxy Resin Adhesives for Bonding Traffic Markers to Hardened Portland Cement and Asphalt Concrete.
 - b. M247, Standard Specification for Glass Beads Used in Traffic Paint.
 - c. M248, Standard Specification for Ready-Mixed White and Yellow Traffic Paints.
 - d. M249, Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form).
 - 2. ASTM International (ASTM): D4280, Standard Specification Extended Life Type, Nonplowable, Prismatic, Raised, Retroreflective Pavement Markers.
 - 3. Federal Specifications (FS):
 - a. A-A-2886A, Paint, Traffic, Solvent Based.
 - b. TT-B-1325C, Beads (Glass Spheres); Retroreflective.

1.02 DEFINITIONS

A. Standard Specifications: When referenced in this section, shall mean Oregon Standard Specifications for Construction, 2021.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Product Data:
 - 1) Paint.
 - 2) Thermoplastic material.
 - 3) Reflective markers.
 - 4) Epoxies, resins, and primers to be used.
 - b. Glass Beads: Proposed gradation.

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- B. Informational Submittals:
 - 1. Description of proposed methods for removal of drips, overspray, improper markings, paint and thermoplastic material tracked by traffic, and existing markings.
 - 2. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common Product Requirements, for products specified in this section.
 - 3. Equipment List: Proposed equipment to be used, including descriptive data.
 - 4. Manufacturer's Instructions:
 - a. Application of preformed tape.
 - b. Application of portland cement concrete primer.
 - c. Application of glass beads.
 - d. Application of epoxy resin.
 - e. Installation of reflective markers.

PART 2 PRODUCTS

- 2.01 GENERAL
 - A. All products shall be in accordance with Section 00850 of the Standard Specifications.
- 2.02 PAINT
 - A. Color: White or yellow.
 - B. Traffic paint in accordance with Section 00860 of the Standard Specifications.
 - C. Homogeneous, easily stirred to smooth consistency, with no hard settlement or other objectionable characteristics during storage period of 6 months.

2.03 GLASS BEADS

A. In accordance with Section 00225 of the Standard Specifications.

PART 3 EXECUTION

- 3.01 GENERAL
 - A. Surface Preparation, Application, and Protection: In accordance with Section 00850, of the Standard Specifications.

3.02 SURFACE PREPARATION

- A. Cleaning:
 - 1. Thoroughly clean surfaces to be marked before application of pavement marking material.
 - 2. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water or a combination of these methods.
 - 3. Completely remove rubber deposits, surface laitance, existing paint markings, and other coatings adhering to pavement with scrapers, wire brushes, sandblasting, approved chemicals, or mechanical abrasion.
 - 4. Scrub areas of old pavement affected with oil or grease with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application.
 - 5. Surfaces shall be completely free of dirt and ice, and dry of water at the time of application of materials specified herein.
 - 6. Oil-Soaked Areas: After cleaning, seal with cut shellac to prevent bleeding through the new paint.
 - 7. Reclean surfaces when the Work has been stopped due to rain.
 - 8. Existing Pavement Markings:
 - a. Remove existing pavement markings that may interfere or conflict with newly applied marking patterns, or that may result in a misleading or confusing traffic pattern.
 - b. Do not apply thermoplastic markings over existing preformed or thermoplastic markings.
 - c. Perform grinding, scraping, sandblasting or other operations so finished pavement surface is not damaged.
- B. New Asphalt Pavement: Allow a minimum pavement cure time of 30 days before applying paint.

3.03 PAINT APPLICATION

- A. General:
 - 1. Thoroughly mix pigment and vehicle together prior to application, and keep thoroughly agitated during application.
 - 2. Do not add thinner.
 - 3. Apply only when air and pavement temperatures are above 40 degrees F and less than 95 degrees F. Maintain paint temperature within these same limits.
 - 4. Apply only when surface is dry.

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- 5. Do not apply when conditions are windy to the point of causing overspray or fuzzy line edges.
- 6. Provide guidelines and templates to control paint application.
- 7. Take special precautions in marking numbers, letters, and symbols.
- 8. Sharply outline edges of markings and apply without running or spattering.
- B. Rate of Application:
 - 1. Reflective Markings: Apply evenly, 105 plus or minus 5 square feet per gallon.
 - 2. Glass Bead Application:
 - a. Apply immediately following application of paint.
 - b. Use evenly distributed drop-on application method.
 - c. Rate: 6 pounds per gallon of paint.
 - 3. Nonreflective Markings: Apply paint evenly to pavement surface at a rate of 105 plus or minus 5 square feet per gallon.
 - 4. On new pavement or new asphalt surface treatments, apply two coats of paint at a uniform rate of 210 square feet per gallon.
- C. Drying:
 - 1. Provide maximum drying time to prevent undue softening of bitumen and pickup, displacement, or discoloration by traffic.
 - 2. If drying is abnormally slow, discontinue painting operations until cause is determined and corrected.
- D. Protection:
 - 1. Protect markings from traffic until paint is thoroughly dry.
 - 2. Protect surfaces from disfiguration by paint spatters, splashes, spills, or drips.
- E. Cleanup: Remove paint spatters, splashes, spills, or drips from the Work and staging areas including areas outside the immediate Work area where spills occur.

END OF SECTION
SECTION 32 91 13 SOIL PREPARATION

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. C33/C33M, Standard Specification for Concrete Aggregates.
 - b. C602, Standard Specification for Agricultural Liming Materials.
 - c. D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
 - d. D5268, Standard Specification for Topsoil Used for Landscaping Purposes.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Certified Topsoil Analysis Reports:
 - a. Indicate quantities of materials necessary to bring onsite topsoil into compliance with textural/gradation requirements.
 - b. Indicate quantity of lime, and quantity and type of soil additive.

1.03 SEQUENCING AND SCHEDULING

A. Perform Work specified in Section 31 10 00, Site Clearing, prior to performing Work specified under this section.

PART 2 PRODUCTS

- 2.01 TOPSOIL
 - A. General: Natural, friable, sandy loam, obtained from well-drained areas, free from objects larger than 1-1/2 inches maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.
 - B. Certified weed-free if imported. Imported Topsoil source to be approved by USFS.

- C. Organic Matter: Minimum 1.5 percent by dry weight as determined in accordance with ASTM D2974.
- D. pH: Range 5.0 to 7.0.
- E. Textural Amendments: Amend as necessary to conform to required composition by incorporating sand, peat, manure, or sawdust.
- F. Source: Stockpile material onsite, in accordance with Section 31 10 00, Site Clearing. Import topsoil if onsite material is insufficient in quantity.
- 2.02 LIME
 - A. Composition: Ground limestone with not less than 85 percent total carbonates, ASTM C602.
 - B. Gradation:
 - 1. Minimum 50 percent passing No. 100 sieve.
 - 2. Minimum 90 percent passing No. 20 sieve.
 - 3. Coarser material acceptable provided rates of application are increased proportionately on basis of quantities passing No. 100 sieve.

2.03 SOIL ADDITIVES

- A. Sawdust or Ground Bark:
 - 1. Nontoxic, of uniform texture, and subject to slow decomposition when mixed with soil.
 - 2. Nitrogen-treated, or if untreated mix with minimum 0.15 pound of ammonium nitrate or 0.25 pound of ammonium sulfate per cubic foot of loose material.
 - 3. Certified weed-free source.
- B. Peat:
 - 1. Composition: Natural residue formed by decomposition of reeds, sedges, or mosses in a freshwater environment, free from lumps, roots, and stones.
 - a. Organic Matter: Not less than 90 percent on a dry weight basis as determined by ASTM D2974.
 - b. Moisture Content: Maximum 65 percent by weight at time of delivery.
 - 2. Certified weed-free source.

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C. Sand: Fine Aggregate: Clean, coarse, well-graded, ASTM C33/C33M. Certified weed-free source.

2.04 SOURCE QUALITY CONTROL

A. Topsoil Analysis/Testing: Performed by county or state soil testing service or approved certified independent testing laboratory.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

- A. Scarify subgrade to minimum depth of 6 inches where topsoil is to be placed.
- B. Remove stones over 2-1/2 inches in any dimension, sticks, roots, rubbish, and other extraneous material.
- C. Limit preparation to areas which will receive topsoil within 2 days after preparation.

3.02 TOPSOIL PLACEMENT

- A. Provide minimum 6-inch-thick topsoil course over all disturbed areas restored with seeding and planting.
- B. Do not place topsoil when subsoil or topsoil is frozen, excessively wet, or otherwise detrimental to the Work.
- C. Mix soil amendments, lime, and other soil additives, identified in analysis reports with topsoil before placement or spread on topsoil surface and mix thoroughly into entire depth of topsoil before planting or seeding.
- D. Place one-half of the total depth of topsoil and work into top 4 inches of subgrade soil to create a transition layer. Place remainder of topsoil to depth of 6 inches where seeding and planting are scheduled.
- E. Uniformly distribute to within 1/2 inch of final grades. Fine grade topsoil eliminating rough or low areas and maintaining levels, profiles, and contours of subgrade.
- F. Remove stones exceeding 1-1/2-inch diameter, roots, sticks, debris, and foreign matter during and after topsoil placement.

DOG RIVER PIPELINE REPLACEMENT (CONTRACT NO. 2022-001)

G. Remove surplus subsoil and topsoil from Site. Grade stockpile area as necessary and place in condition acceptable for planting or seeding.

END OF SECTION

SOIL PREPARATION 32 91 13 - 4

SECTION 32 92 00 TURF AND GRASSES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Maintenance Period: Begin maintenance immediately after each area is planted (seed, sod, or sprig) and continue for a period of 8 weeks after all planting under this section is completed.
- B. Satisfactory Stand:
 - 1. Native seed that has:
 - a. No bare spots larger than 3 square feet.
 - b. Not more than 10 percent of total area with bare spots larger than 1 square foot.
 - c. Not more than 15 percent of total area with bare spots larger than 6 square inches.

1.02 SUBMITTALS

- A. Action Submittals: Product labels/data sheets.
- B. Informational Submittals:
 - 1. Wetland Seed Mix:
 - a. Certification of Seed Analysis, Germination Rate, and Inoculation:
 - 1) Certify that each lot of seed has been tested by a testing laboratory certified in seed testing, within 6 months of date of delivery. Include with certification:
 - a) Name and address of laboratory.
 - b) Date of test.
 - c) Lot number for each seed specified.
 - d) Test Results: (i) name, (ii) percentages of purity and of germination, and (iii) weed content for each kind of seed furnished.
 - 2) Mixtures: Proportions of each kind of seed.
 - 3) Submit seed mix for USFS botanist approval.
 - 2. Wetland Seed Inoculant Certification: Bacteria prepared specifically for legume species to be inoculated.
 - 3. Certification of sprig type and name.
 - 4. Description of required maintenance activities and activity frequency.

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1.03 DELIVERY, STORAGE, AND PROTECTION

- A. Wetland Seed:
 - 1. Furnish in standard containers with seed name, lot number, net weight, percentages of purity, germination, and hard seed and maximum weed seed content, clearly marked for each container of seed.
 - 2. Keep dry during storage.
- B. Hydroseeding Mulch: Mark package of wood fiber mulch to show air dry weight.

1.04 WEATHER RESTRICTIONS

A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.

1.05 SEQUENCING AND SCHEDULING

- A. Complete Work specified in Section 32 91 13, Soil Preparation, before starting Work of this section.
- B. Complete Work under this section within 3 days following completion of soil preparation.
- C. Notify Engineer at least 3 days in advance of:
 - 1. Each material delivery.
 - 2. Start of planting activity.
- D. Planting Season: Those times of year that are normal for such Work as determined by accepted local practice.

1.06 MAINTENANCE SERVICE

- A. Contractor:
 - 1. Perform maintenance operations during maintenance period to include:
 - a. Watering: Keep surface moist.
 - b. Washouts: Repair by filling with topsoil, liming, fertilizing, seeding, and mulching.
 - c. Mulch: Replace wherever and whenever washed or blown away.
 - d. Reseed unsatisfactory areas or portions thereof immediately at the end of the maintenance period if a satisfactory stand has not been produced.

- e. Reseed/replant during next planting season if scheduled end of maintenance period falls after September 15.
- f. Reseed/replant entire area if satisfactory stand does not develop by July 1 of the following year.

PART 2 PRODUCTS

2.01 FERTILIZER

A. As specified in Section 32 91 13, Soil Preparation.

2.02 SEED

A. Fresh, clean new-crop seed that complies with the tolerance for purity and germination established by Official Seed Analysts of North America.

Wetland Seed Mix					
Scientific Name	Common Name	Pounds per Acre(lbs./Ac)			
Elymus Glaucus	Blue Wildrye	6-10			
Festuca Rubra Var Rubra	Native Red Fescue	6-10			
Deschampsia Caespitosa	Tufted Hairgrass	8-10			
Glyceria Occidentalis	Western Mannagrass	6-10			
Beckmannia Syzigachne	American Sloughgrass				
Mimulus Guttatus	Yellow Monkey Flower	8-10			
Juncus Alpinus	Northern Rush	8-10			
Juncus Balticus	Baltic Rush	4-5			
Juncus Tenuis	Slender Rush	8-10			

2.03 STRAW MULCH

A. As specified in Section 01 57 13, Temporary Erosion and Sediment Control.

2.04 HYDROSEEDING MULCH

A. As specified in Section 01 57 13, Temporary Erosion and Sediment Control.

2.05 TACKIFIER

A. As specified in Section 01 57 13, Temporary Erosion and Sediment Control.

2.06 WEED BARRIER

A. 6 mils (0.006 inch) black polyethylene sheet.

PART 3 EXECUTION

3.01 PREPARATION

- A. Grade areas to smooth, even surface with loose, uniformly fine texture.
 - 1. Roll and rake, remove ridges, fill depressions to meet finish grades.
 - 2. Limit such Work to areas to be planted within immediate future.
 - 3. Remove debris, and stones larger than 1-1/2-inch diameter, and other objects that may interfere with planting and maintenance operations.
- B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.
- C. Restore prepared areas to specified condition if eroded or otherwise disturbed after preparation and before planting.

3.02 SEEDING

- A. Start within 2 days of preparation completion.
- B. Hydroseed slopes steeper than 3H:1V. Flatter slopes may be mechanically seeded.
- C. Only wetland seed mix shall be used in wetland areas. Do not seed wetland area with winter protective mix.
- D. Mechanical: Broadcast seed in two different directions, compact seeded area with cultipacter or roller.
 - 1. Sow seed at uniform rate of 5 pounds per 1,000 square feet.
 - 2. Use Brillion type seeder.
 - 3. Broadcasting will be allowed only in areas too small to use Brillion type seeder. Where seed is broadcast, increase seeding rate 20 percent.
 - 4. Roll with ring roller to cover seed, and water with fine spray.

- E. Hydroseeding:
 - 1. Application Rate is dependent on mix type.
 - 2. Apply on moist soil, only after free surface water has drained away.
 - 3. Prevent drift and displacement of mixture into other areas.
 - 4. Upon application, allow absorption and percolation of moisture into ground.
 - 5. Mixtures: Seed and fertilizer may be mixed together, apply within 30 minutes of mixing to prevent fertilizer from burning seed.
- F. Mulching: Apply uniform cover of mulch as specified in Section 01 57 13, Temporary Erosion and Sediment Control.
- G. Tackifier: Apply over mulched areas with slopes steeper than 2:1 as specified in Section 01 57 13, Temporary Erosion and Sediment Control.
- H. Water: Apply with fine spray after mulching to saturate top 4 inches of soil.

3.03 FIELD QUALITY CONTROL

- A. A minimum of 60 percent effective groundcover is required before the first overwintering period.
- B. 8 weeks after seeding is complete and on written notice from Contractor, Engineer will, within 15 days of receipt, determine if a satisfactory stand has been established.
- C. If a satisfactory stand has not been established, Engineer will make another determination after written notice from Contractor following the next growing season.

END OF SECTION

SECTION 32 93 00 PLANTS

PART 1 GENERAL

1.01 WORK INCLUDED

A. This Work consists of furnishing and installing plant materials, including live stakes, container plants, and Salvaged Riparian Vegetation Clumps of the types specified in accordance with Drawings and these Specifications, at the locations shown on Drawings.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Association of Nurserymen (AAN): Z60.1, Nursery Stock.
 - 2. Federal Housing Administration (FHA), Section 1103-103.
 - 3. Hortus Third, Liberty Hyde Bailey, Hortorium, 1976.

1.03 DEFINITIONS

- A. Planting Area: A planting zone delineated on Drawings and described in the Seed and Plant Schedule where live stakes and container plants are specified.
- B. Plants: Planted stock, including live stakes and container plants.
- C. Salvaged Riparian Vegetation Clump: As defined in Section 31 10 00, Site Clearing.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Plant materials source list.
 - 2. Product data on manufactured products specified.
- B. Informational Submittals:
 - 1. Operation and Maintenance Data:
 - a. As specified in Section 01 78 23, Operation and Maintenance Data.
 - b. Instructions for storage, planting, care, and maintenance of each type of plant for 1-year period in climate and location of the Project.

2. Weed Control Plan: Submit to Engineer and USFS. Including methods of weed control; dates of weed control operations; and the name, application rate, and Safety Data Sheets of all proposed herbicides. Herbicides are not allowed unless otherwise approved by USFS. Locations for herbicide use must also be approved by USFS. Use of herbicides may be requested to the USFS if invasive weeds are identified after seeding/planting. In addition, the Contractor shall furnish the Engineer with a copy of the current product label for each pesticide and spray adjuvant to be used. These product labels shall be submitted with the Weed Control Plan for approval.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Cover plants during shipment with a tarpaulin or other suitable covering to minimize drying.
- B. As specified herein for transplanting.

1.06 SCHEDULING AND SEQUENCING

- A. Plant Deliveries: Notify Engineer at least 1 day in advance of each delivery.
- B. Planting Season: Plant only between October 1 and March 1.
- C. Plant after final grades are established and before seeding.
- D. Do not apply herbicides for weed control.

PART 2 PRODUCTS

2.01 PLANT MATERIALS

- A. Provide quantity, size, genus, species, and variety of trees and shrubs indicated; comply with applicable requirements of AAN Z60.1.
- B. Nomenclature (Names of Plants): In accordance with "Hortus Third".
- C. Quality and Size:
 - 1. Nursery-grown, habit of growth normal for species.
 - 2. Sound, healthy, vigorous, and free from insects, diseases, and injuries.
 - 3. Equal to or exceeding measurements specified in plant list. Measure plants before pruning with branches in normal position.
 - 4. Perform necessary pruning at time of planting.
 - 5. Sizes: Dimensional relationship requirements of AAN Z60.1 for kind and type of plants required.

- D. Plant List:
 - 1. The quantities and species for each project location (Dog River and Brooks Meadow Creek) are listed below:
 - a. Plant List Dog River.

Dog River Plant List Stream Riparian Restoration							
Spacing (Feet on Center)	Size	Genus	Species	Common Name	Variety		
4	1G	Lonicera	Involucrata	Black twinberry	Shrub		
4	1G	Acer	Circinatum	Vine maple	Shrub		
4	1G	Vaccinium	Parvifolium	Red huckleberry	Shrub		
10	1G	Alnus	Rhombifolia	Mountain alder	Tree		
10	1G	Picea	Engelmanii	Engelmann spruce	Tree		
	Spacing (Feet on Center) 4 4 4 10 10	Spacing (Feet on Center)Size41G41G41G101G101G	Spacing (Feet on Center)SizeGenus41GLonicera41GAcer41GVaccinium101GAlnus101GPicea	Spacing (Feet on Center)SizeGenusSpecies41GLoniceraInvolucrata41GAcerCircinatum41GVacciniumParvifolium101GAlnusRhombifolia101GPiceaEngelmanii	Spacing (Feet on Center)SizeGenusSpeciesCommon Name41GLoniceraInvolucrataBlack twinberry41GAcerCircinatumVine maple41GVacciniumParvifoliumRed huckleberry101GAlnusRhombifoliaMountain alder101GPiceaEngelmaniiEngelmann spruce		

Assume wetland seed mix for herbaceous cover.

Assume 10 wide on right bank (10x90) and 5 feet wide on left bank (5x90).

Dog River Plant List Stream Bank							
Quantity	Spacing (Feet on Center)	Size	Genus	Species	Common Name		
125	2	Live stake	Salix	Spp TBD	Willow		
125	2	Live stake	Cornus	Stolonifera	Red osier dogwood		
Assume 5 wide on right bank (5x90) and 5 feet wide on left bank (5x90).							

Brooks Meadow Creek Plant List Stream Restoration							
Quantity	Spacing (Feet on Center)	Size	Genus	Species	Common Name	Variety	
13	4	1G	Lonicera	Involucrata	Black twinberry	Shrub	
13	4	1G	Acer	Circinatum	Vine maple	Shrub	
13	4	1G	Vaccinium	Parvifolium	Red Huckleberry	Shrub	
2	10	1G	Alnus	Rhombifolia	mountain Alder	Tree	
2	10	1G	Picea	Engelmanii	Engelmann Spruce	Tree	
Assume wetland seed mix for herbaceous cover.							

b. Plant List – Brooks Meadow Creek.

Brooks Meadow Creek Plant List Wetland Enhancement							
Quantity	Spacing (Feet on Center)	Size	Genus	Species	Common Name	Varie	
34	4	1G	Lonicera	Involucrata	Black twinberry	Shrub	

	-					10 01 0	
34	4	1 G	Cornus	Stolonifera	Red osier dogwood	Shrub	
4	10	1G	Alnus	Rhombifolia	Mt. Alder	Tree	
4	10	1G	Picea	Engelmanii	Engelmann Spruce	Tree	
Assume wetland seed mix for herbaceous cover.							

2.02 HERBICIDE

- Not used. A.
- TOPSOIL 2.03
 - A. Not used.

PLANTS 32 93 00 - 4 Variety

- 2.04 FERTILIZER
 - A. Not used.

PART 3 EXECUTION

3.01 LOCATION OF PLANTS

- A. Locate plants as shown on Drawings, unless obstructions are encountered, in which case notify Owner's Project Representative. Cutting locations shown on Drawings shall be considered approximate.
- B. Request Owner's Project Representative observe locations and adjust as necessary before planting begins.

3.02 PREPARATION

A. Prepare ground surface following disturbance to an uncompacted, relatively smooth surface.

3.03 PLANTING

- A. No plant material shall be planted until it has been inspected and approved for planting by the Owner's Project Representative. Rejected material shall be removed from the Project Site immediately. All plants for the Project shall be received on Site prior to the Owner's Project Representative beginning inspection of the plants.
- B. Under no circumstances will planting be permitted during unsuitable soil or weather conditions as determined by the Owner's Project Representative. Unsuitable conditions may include hot temperatures, dry weather, frozen soil, freezing weather, saturated soil, standing water, high winds, heavy rains, and high water levels.
- C. The plant material shall be handled in such a manner that the stems are kept covered and damp at all times.
- D. Plant salvaged riparian vegetation clumps, live stakes, and container plants before seeding.

3.04 SALVAGED RIPARIAN VEGETATION CLUMPS

A. Sequence the planting so that the Salvaged Riparian Vegetation Clumps are handled only once (picked up from the stockpile area, transported, and placed into the planting hole).

- B. Excavate the hole to a diameter slightly larger than the diameter of the root clump, and large enough to allow the roots to extend to their full length. Excavate the hole to a depth so that the base of the clump root ball will be installed slightly above the saturation zone. Support and protect above-ground stems while backfilling the hole.
- C. Backfill the hole with the material excavated from the hole and fill up to the level of the surrounding ground after being tamped down slightly, taking care to match the final ground elevation to that of the Salvaged Riparian Vegetation Clump root collar prior to it initially being excavated. Tamp soil firmly, taking care not to overly compact the soil, and water to eliminate air pockets and stabilize plant. Fill in with remaining soil and tamp firmly, taking care not to overly compact the soil.
- D. Make a berm of soil extending to the diameter of the remaining branches around plant to catch water and keep plant moist. Water again thoroughly.

3.05 CONTAINER PLANTS

- A. Plant container plants as shown on Drawings and described in these Specifications.
- B. During planting, protect container plants from sun, wind, low humidity, or freezing temperatures and retain moisture to the roots. Do not allow the containers to sit directly in the sun or wind.
- C. Plant one container plant at a time, removing it from the container only after the hole is dug. Place plants upright and backfill the hole with material dug out of the hole. Firmly pack the ground to remove any air pockets, without compacting the stem, leaves, or roots.
- D. Gently remove the plants from the containers without damaging the roots or stem. Do not remove the plants by pulling on the stem.
- E. Representative samples of all container plantings shall be inspected by the Owner's Project Representative upon removal from the container.
- F. All circling roots shall be cut and straightened to ensure correct directional growth after planting. All J-shaped or U-shaped roots shall be straightened to ensure correct directional growth after planting.
- G. In their final position, containerized plants shall have the same relationship to finished grade as when growing in the container.

H. Water each plant with 1 gallon to 2 gallons of water, making sure the roots are not exposed after final watering.

3.06 LIVE STAKES

A. Live Stakes shall be installed in riverbank soil, as shown on Drawings. The total length of each live cutting shall be a minimum of 3 feet in length and 1/2-inch to 1-inch in diameter placed at 2-foot spacing, on center. The exposed ends shall be cut cleanly. Leaving no greater than two viable buds, and no more than 1/3 of the total cutting length, exposed above the soil. Water thoroughly and lightly compact to ensure good soil contact the entire planted length.

3.07 FERTILIZER

A. Not used.

3.08 PROTECTION OF INSTALLED WORK

A. Protect all container plants using nylon (flexible UV inhibited polyethylene and polypropylene) mesh tubes (5 inches in diameter by 36 inches tall) and anchor each tube with two with 48-inch long bamboo stakes 1/2 inch in diameter.

END OF SECTION

SECTION 33 05 01 CONVEYANCE PIPING—GENERAL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Concrete Institute (ACI): 301, Specifications for Structural Concrete.
 - 2. American Water Works Association (AWWA):
 - a. C110/A21.10, Ductile-Iron and Gray-Iron Fittings.
 - b. C115/A21.15, Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
 - c. C207, Steel Pipe Flanges for Waterworks Service Sizes 4 in. Through 144 in. (100 mm Through 3,600 mm).
 - d. C210 Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
 - e. C213, Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
 - f. C217, Petrolatum and Petroleum Wax Tape Coatings for the Exterior of Connections and Fittings for Steel Water Pipelines.
 - g. C219, Bolted, Sleeve-Type Couplings for Plain-End Pipe.
 - h. C221, Fabricated Steel Mechanical Slip-Type Expansion Joints.
 - i. C606, Grooved and Shouldered Joints.
 - 3. ASTM International (ASTM):
 - a. A497/A497M, Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
 - b. A615/A615M, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - c. C94/C94M, Standard Specification for Ready-Mixed Concrete.
 - d. C150/C150M, Standard Specification for Portland Cement.
 - e. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - 4. NSF International (NSF):
 - a. NSF/ANSI 61, Drinking Water System Components Health Effects.
 - b. NSF/ANSI 372, Drinking Water System Components Lead Content.

1.02 AMERICAN IRON AND STEEL REQUIREMENTS

A. Goods and services provided in the performance of the Work are being funded with monies made available by the Drinking Water State Revolving Fund that has statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the Project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to these Contract Documents. See Supplementary Conditions.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Detailed pipe fabrication drawings showing pipe details, special fittings and bends, dimensions, coatings and other pertinent information.
 - 2. Layout drawing showing location of each pipe section and special length.
 - 3. Product Data: Manufacturer's data for couplings, saddles, gaskets, and other pipe accessories. Indicated maximum rated working pressure and test pressure for each item.
- B. Informational Submittals:
 - 1. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common Product Requirements.
 - 2. Certification for compliance with AIS documenting the origin of all domestic iron or steel materials. Refer to Section 01 61 00, Common Product Requirements.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. In accordance with manufacturer's recommendations and as specified in individual Specification(s) following this section.
- B. Marking at Plant: Mark each pipe and fitting at plant. Include date of manufacture, manufacturer's identification, specification standard, diameter of pipe dimension ratio, pipe class, pipe number for laying purposes, and other information required for type of pipe.
- C. Pipe, specials, and fittings received at Project Site in damaged condition will not be accepted.

- D. Gasket Storage: Store rubber gaskets in cool, well ventilated place, and do not expose to direct rays of sun. Do not allow contact with oils, fuels, petroleum, or solvents.
- E. Store and support pipe securely to prevent accidental rolling and to avoid contact with mud, water, or other deleterious materials.
- F. Handling:
 - 1. Pipe shall be handled with proper equipment in a manner to prevent distortion or damage. Use of hooks, chains, wire ropes, or clamps that could damage pipe, damage coating or lining, or kink and bend pipe ends is not permitted.
 - 2. Use heavy canvas, or nylon slings of suitable strength for lifting and supporting materials.
 - 3. Lifting pipe during unloading or lifting into trench shall be done using two slings placed at quarter point of pipe section. Pipe may be lifted using one sling near center of pipe, provided pipe is guided to prevent uncontrolled swinging and no damage will result to pipe or harm to workers. Slings shall bear uniformly against pipe.
 - 4. Pipe and fittings shall not be stored on rocks or gravel, or other hard material that might damage pipe. This includes storage area and along pipe trench.

PART 2 PRODUCTS

2.01 GENERAL

- A. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
 - 1. Use or reuse of components and materials without a traceable certification is prohibited.

2.02 PIPE

A. As specified in the individual specification(s) following this section.

- 2.03 JOINTS
 - A. As specified in the individual specification(s) following this section.

2.04 COUPLINGS

- A. General:
 - 1. Coupling linings for use in potable water systems shall be in conformance with NSF/ANSI 61.
 - 2. Couplings shall be rated for appropriate operating pressure and hydrostatic test pressure.
- B. For Pipe with Flanged Ends:
 - 1. Flanged coupling adapters, in accordance with AWWA C219.
 - a. Pipe Type to be Joined: As shown on Drawings.
 - b. Pipe Ends Tolerance: Conform to Table 4 of AWWA C219.
 - c. Pipe Outside Diameter, Including Coating: As shown on Drawings.
 - d. Service Type: Raw Water.
 - e. Rated Working Pressure: 150 psi.
 - f. Test Pressure: 100 psi.
 - g. Operating Temperature Range: 33 degrees F to 60 degrees F.
 - h. Anticipated Angular Deflection of Pipe: 0 degree.
 - i. Hydrostatic Test Requirements and Reporting: See following specification sections.
 - j. Marking Requirements: Per manufacturer and industry standard.
 - k. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common Product Requirements.
- C. Bolting Materials for Couplings: Stainless steel in accordance with AWWA C219.

2.05 SLAB, FLOOR, WALL, AND ROOF PENETRATIONS

- A. Modular Mechanical Seal:
 - 1. Type: Interconnected synthetic rubber links shaped and sized to continuously fill annular space between pipe and wall sleeve opening.
 - 2. Assemble interconnected rubber links with Type 316 stainless steel bolts, nuts, and pressure plates.
 - 3. Size modular mechanical seals according to manufacturer's instructions for the size of pipes shown to provide a watertight seal between pipe and wall sleeve opening.

- 4. Manufacturers and Products:
 - a. Thunderline/LinkSeal, Div. of PSI, Houston, TX; Link Seal.
 - b. Calpico, Inc., South San Francisco, California; Sealing Linx.
 - c. Advance Products and Systems, Lafayette, Louisiana; Innerlynx.

B. Wall Sleeves:

- 1. Diameter, ends, and length shall be as shown on Drawings.
- 2. Shall include integral seep ring to minimize seepage between metal sleeve and concrete.
- C. Wall Couplings:
 - 1. Diameter, ends, and length shall be as shown on Drawings.
 - 2. Wall couplings shall provide flexible mechanical joint.
 - 3. Body and end rings shall be coated with fusion bonded epoxy.
 - 4. Body shall include integral seep ring.
 - 5. Shall comply with AWWA C219.

2.06 FLANGES, FLANGE GASKETS, AND BOLTING MATERIALS

- A. As specified in individual specifications following this section.
- B. Flanges, bolting materials, and flange gaskets for steel flanges shall conform to AWWA C207.
- C. Flanges, bolting materials, and flange gaskets for ductile iron flanges shall conform to AWWA C110 and AWWA C115.
- D. Stainless steel bolting material shall conform to ASTM F593, Type 304 stainless steel, Group 1, Condition SH1, 2, 3 or 4.
- E. If the flanges are coated, provide two washers for each bolt on each side of the flange to minimize damage to the coating as the nuts are tightened. Provide bolts of the proper length to accommodate the washers.
- F. All flanges shall be wrapped with wax tape that conforms to AWWA C217.

2.07 CONCRETE FOR THRUST BLOCKS

- A. Thrust Block Concrete: As specified in Section 03 30 10, Structural Concrete.
- B. Reinforcing Steel: ASTM A615/A615M, Grade 60 deformed bars.
- C. Welded Wire Fabric: ASTM A497/A497M.

D. Formwork: Plywood; earth cuts may be used as approved by Engineer.

2.08 PIPE LOCATING TAPE

A. As specified in Section 31 23 23.15, Trench Backfill.

2.09 PIPE BEDDING AND PIPE ZONE MATERIAL

A. Granular material or Controlled low strength material as specified in Section 31 23 23.15, Trench Backfill and shown on Drawings.

2.10 TRENCH STABILIZATION MATERIAL

A. As specified in Section 31 23 23.15, Trench Backfill.

2.11 ANTI-GALLING COMPOUND

A. Commercially available anti-galling compound specifically made to prevent stainless steel bolt/nut seizure.

PART 3 EXECUTION

- 3.01 GENERAL
 - A. Notify Engineer at least 2 weeks prior to field fabrication of pipe or fittings.
 - B. Furnish feeler gauges of proper size, type, and shape for use during installation for each type of pipe furnished.
 - C. Distributing Materials: Place materials along trench only as will be used each day, unless otherwise approved by Engineer. Placement of materials shall not be hazardous to traffic or to general public, obstruct access to adjacent property, or obstruct others working in area.

3.02 EXAMINATION

- A. Verify size, material, joint types, elevation, and horizontal location of existing pipeline to be connected to new pipeline or new equipment.
- B. Inspect size and location of structure penetrations to verify adequacy of wall pipes, sleeves, and other openings.
- C. Damaged Coatings and Linings: Repair using coating and lining materials in accordance with manufacturer's instructions.

3.03 PREPARATION OF TRENCH

- A. Prepare trench as specified in Section 31 23 16, Excavation.
- B. Unless otherwise permitted by Engineer, maximum length of open trench shall not exceed 500 feet.

3.04 INSTALLATION

- A. General:
 - 1. Join pipe and fittings in accordance with manufacturer's instructions, unless otherwise shown or specified.
 - 2. Install individual pipe lengths in accordance with approved lay diagram. Misplaced pipe shall be removed and replaced.
 - 3. Inspect pipe and fittings before installation, clean ends thoroughly, remove foreign matter and dirt from inside.
 - 4. Apply anti-galling compound to all stainless steel threaded nut/bolt connections prior to assembly to prevent seizing.
 - 5. Flanged Joints:
 - a. Install perpendicular to pipe centerline.
 - b. Bolt Holes: Straddle vertical centerline, aligned with connecting equipment flanges or as shown on Drawings.
 - c. Use torque-limiting wrenches to provide uniform bearing and proper bolt tightness.
 - d. Flange Type: Use flat-faced flange when joining with flat-faced ductile or cast iron flange.
 - 6. Couplings:
 - a. Install in accordance with manufacturer's written instructions.
 - b. Before coupling, clean pipe holdback area of oil, scale, rust, and dirt.
 - c. Remove pipe coating, if necessary, to obtain smooth surface.
 - d. Clean gaskets before installation.
 - e. If necessary, lubricate with gasket lubricant for installation on pipe ends.
 - f. Tighten coupling bolts progressively, drawing up bolts on opposite sides gradually until bolts have uniform tightness.
- B. Buried Pressure Pipe:
 - 1. Concrete Encased or Embedded Pipe: Do not encase joints in concrete, unless specifically shown on Drawings.

- 2. Placement:
 - a. Keep trench dry until pipe laying and joining is completed.
 - b. Exercise care when lowering pipe into trench to prevent twisting or damage to pipe.
 - c. Measure for grade at pipe invert, not at top of pipe.
 - d. Excavate trench bottom and sides of ample dimensions to permit proper joining, welding, visual inspection, and testing of entire joint.
 - e. Prevent foreign material from entering pipe during placement.
 - f. Close and block open end of last laid pipe section when placement operations are not in progress and at close of day's work.
 - g. In general, lay pipe upgrade with bell ends pointing in direction of laying.
 - h. Deflect pipe at joints for pipelines laid on a curve using unsymmetrical closure of spigot into bell. If joint deflection of standard pipe lengths will not accommodate horizontal or vertical curves in alignment, provide:
 - 1) Shorter pipe lengths.
 - 2) Special mitered joints.
 - 3) Standard or special fabricated bends.
 - i. Check gasket position with feeler gauge to assure proper seating.
 - j. After joint has been made, check pipe alignment and grade.
 - k. Place sufficient pipe zone material to secure pipe from movement before next joint is installed.
 - 1. Prevent uplift and floating of pipe prior to backfilling.
- 3. Tolerances:
 - a. Deflection From Horizontal Line: Maximum 2 inches.
 - b. Deflection From Vertical Line: Maximum 1 inch.
 - c. Joint Deflection: Maximum of 75 percent of manufacturer's recommendation.
 - d. Horizontal position of pipe centerline on alignment around curves maximum variation of 1 foot from position shown.
 - Cover Over Top of Pipe: Minimum 3 feet, unless otherwise shown.
- 5. Disposal of Excess Excavated Material: As specified in Section 31 23 16, Excavation.

3.05 THRUST RESTRAINT

4.

A. Location: At pipeline tees, plugs, caps, bends, and locations where unbalanced forces exist.

- B. Thrust Blocking:
 - 1. Place only where shown on Drawings.
 - 2. Quantity of Concrete: Sufficient to cover bearing area of pipe and provide required soil bearing area as shown on Drawings.
 - 3. Place blocking so pipe and fitting joints are accessible for repairs.
 - 4. Place concrete in accordance with Section 03 30 10, Structural Concrete.

3.06 CORROSION PROTECTION

- A. Buried Pipe: As specified in the individual specifications following this section.
- B. Notify Engineer at least 3 days prior to start of surface preparation, coating application, and corrosion protection work.

3.07 PLACEMENT OF PIPE LOCATING TAPE

A. Place pipe locating tape in accordance with Section 31 23 23.15, Trench Backfill.

3.08 PIPE BEDDING AND ZONE MATERIAL

- A. Place pipe bedding and pipe zone material in accordance with Section 31 23 23.15, Trench Backfill.
- 3.09 FIELD QUALITY CONTROL
 - A. Pressure Leakage Testing: As specified in the individual specification(s) following this section.

3.10 CLEANING

A. Following assembly and testing, and prior to final acceptance, flush pipelines with water until foreign matter is removed. Coordinate diversion of flushing water and disposal with Owner.

END OF SECTION

SECTION 33 05 01.10 HIGH-DENSITY POLYETHYLENE (HDPE) PRESSURE PIPE AND FITTINGS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards that may be referenced in this section:
 - 1. American Society of Mechanical Engineers (ASME):
 - a. Boiler and Pressure Vessel Code, Section IX, Article XXI-XXIV.
 - b. B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
 - c. B18.2.1, Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
 - d. B18.2.2, Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series).
 - 2. American Water Works Association (AWWA):
 - a. C906, Polyethylene (PE) Pressure Piping and Fittings, 4 in. through 65 in. for Waterworks.
 - b. Manual M55, PE Pipe Design and Installation.
 - 3. ASTM International (ASTM):
 - a. A193/A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - b. A194/A194M, Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
 - c. A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - d. A307, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
 - e. A536, Standard Specification for Ductile Iron Castings.
 - f. A563, Standard Specification for Carbon and Alloy Steel Nuts.
 - g. D3035, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
 - h. D3261, Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
 - i. D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

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- j. F714, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.
- k. F2620, Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.
- 4. Code of Federal Regulations (CFR): Title 49 Part 192.285, Plastic Pipe: Qualifying Persons to Make Joints.
- 5. NSF International (NSF): 61, Drinking Water System Components Health Effects.
- 6. Plastics Pipe Institute (PPI):
 - a. Handbook of PE Pipe.
 - b. Technical Note 38, Bolt Torque for Polyethylene Flanged Joints.
 - c. TR-33, Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe.

1.02 OWNER FURNISHED MATERIALS

- A. See materials listed in Section 01 64 00, Owner-Furnished Products.
- B. Contractor is responsible for providing all materials not furnished by Owner.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Catalog information confirming pipe, fittings, and other materials conform to requirements of this section.
 - b. Drawings of specific connection details.
- B. Informational Submittals:
 - 1. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common Product Requirements.
 - 2. Infrared temperature gun product data.
 - 3. Experience, training record, and certificates of persons to be fusing HDPE pipe.
 - 4. Information on manufacturer and model of machine to be used for fusion of HDPE pipe.
 - 5. Testing Plan:
 - a. Submit at least 15 days prior to testing and include the following as a minimum:
 - 1) Testing dates.
 - 2) Piping systems and section(s) to be tested.

- 3) Method of isolation.
- 4) Method of conveying water from source to system being tested.
- 6. Certifications of Calibration: Approved testing laboratory certificate if pressure gauge for hydrostatic test has been previously used. If pressure gauge is new, no certificate is required.
- 7. Test report documentation.
- 8. Installation Plan following the Plastic Pipe Institute, ASTM F2620, and manufacturer's recommendations. Plan shall include, but not be limited to the following major components:
 - a. Pipe and fitting storage.
 - b. Pipe and fitting handling equipment.
 - c. Proposed means to maintain required temperatures for fusing.
 - d. Proposed means to shield fusing area from wind, snow, blowing dust, and rain.
 - e. Proposed means to maintain uniform pipe wall temperature prior to fusing.
 - f. Temperature Control Plan: Plan shall include means to reduce temperature of pipe to limit stated in Part 3 of this specification.
- 9. Fusion parameters including recommended limits of criteria recorded by data logger.
- 10. Fusion report for each joint, including information listed under Article Field Quality Control. Submit joint reports within 24 hours after fusion.
- 11. Gasket manufacturer's table for recommended bolt torque and tightening pattern.
- 12. American Iron and Steel (AIS) certification documentation.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Pipe Manufacturer: Listed with Plastic Pipe Institute.
 - 2. Experienced in fabricating pipe of similar diameters and wall thickness required for the Work.
 - 3. Successful fabrication of at least 1,000 linear feet of 24-inch diameter or larger pipe within past 5-year period.
 - 4. Persons fusing HDPE pipe shall have a current operator qualification training certificate and wallet card showing operator is qualified to operate machine to be used on the Project and have minimum of 1 year of experience with fusing HDPE pipe and have received minimum of 20 hours training for fusing HDPE pipe from pipe supplier or fusing equipment supplier.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Shipping: Do not cut, kink, or otherwise damage pipe during transportation.
- B. Storage and Handling:
 - 1. Pipe interiors are to be inspected and all debris removed prior to storage.
 - 2. Limit stacking of pipe to a height that will not cause excessive deformation of bottom layers of pipes under anticipated temperature conditions.
 - 3. Do not exceed the stacking heights stated in AWWA Manual M55.
 - 4. Where necessary, because of ground conditions, store pipe on wooden sleepers, spaced suitably and of such widths as not to allow deformation of pipe at point of contact with sleeper or between supports.
 - 5. Comply with the requirements of the approved Installation Plan.
 - 6. Keep pipe shaded from direct sunlight prior to fusion and installation in trench.

1.06 CONNECTIONS TO EXISTING HDPE PIPE

A. Fusing to Existing Pipe: Comply with manufacturer's or distributor's recommendations based on Site conditions and PPI TR-33.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Pipe and Fittings:
 - 1. New, unused pipe.
 - 2. Conform to requirements of AWWA C906.
 - 3. In compliance with NSF 61.
 - 4. Resin:
 - Potable Water Transmission and Distribution Systems: Polyethylene resin shall meet or exceed requirements of ASTM D3350 for PE 4710 material with cell classification of 445474C, or better. PE 4710 HDPE pipe and fittings shall be manufactured from bimodal resins. Pressure rating shall be based on hydrostatic design stress of 1,000 psi at 73.4 degrees F.
 - b. Resin shall contain a minimum of 2 percent carbon black for UV stability.
 - 5. Pressure Rating: As shown on Drawings.
 - 6. Outside Diameter Basis: DIPS (Ductile Iron Pipe Size).
 - 7. Pipe Size: 30-inch diameter.
 - 8. Pipe Segment Length: 50 feet.

HIGH-DENSITY POLYETHYLENE (HDPE) PRESSURE PIPE AND FITTINGS 33 05 01.10 - 4 PW\DEN003\D3504800\01 MARCH 2022 ©COPYRIGHT 2022 JACOBS

- 9. Pipe lengths, fittings, and flanged connections to be joined by thermal butt-fusion shall be of a compatible resin mix for the fusion process.
- 10. Fittings:
 - a. Owner will furnish fittings as described in Section 01 64 00, Owner-Furnished Products. Any additional fittings shall meet requirements of this section.
 - b. Polyethylene fittings shall have same or higher pressure rating as pipe.
 - c. Sizes Larger than 12 Inches: Thermal butt-fused fabricated.
 - d. Unless noted otherwise, provide fittings with a factory fused 4-foot-long spool on each end to facilitate onsite fusion. Fitting with fused spool shall be a minimum of 66 inches long from miter on each end.
 - e. Mark each fitting with durable marker and machined stamp or grooved marking, identifying station location, and degree angle of elbow fitting specified.
- B. Backup Rings:
 - 1. Convoluted for Flanged Connections:
 - a. ASTM A240/A240M, Type 316 stainless steel.
 - b. Complete with one-piece, molded polyethylene flange adapters.
 - c. Flanged Connections: Same or greater pressure rating as pipe.
 - 2. Gaskets: Material, size, and thickness shall be as recommended by gasket manufacturer and in accordance with PPI Technical Note 38. Gasket manufacturer shall provide a table with recommended bolt torque and tightening pattern.
- C. Joints: Thermal butt-fusion or electrofusion, except where connecting to unions, valves, and equipment with flanged or threaded connections that may require future disassembly, or where shown otherwise on Drawings. Use appropriate transition fitting or adapter for all joints that are not thermal butt-fused or electro-fused.
- D. Bolts, Nuts, and Washers:
 - 1. Bolt Materials: Type 316 stainless steel, ASTM A193/A193M, Grade B8M hex-head, carbide solution treated and strained hardened.
 - 2. Bolt Fabrication: In accordance with ASME B18.2.1.
 - 3. Nut Materials: Type 316 stainless steel, ASTM A194/A194M, Grade 8 hex-head.
 - 4. Nut Fabrication: In accordance with ASME B18.2.2.
 - 5. Washers: Type 316 stainless steel. Same material as bolts in accordance with ASME B18.21.1.

- 6. Thread Lubricant: Provide bolt manufacturer's recommended lubricant on bolt threads, nuts, nut face, and around bolt hole.
- 7. Corrosion Resistance: When used in submerged brine water applications, bolts, nuts, and washers shall be coated in polytetrafluoroethylene (PTFE) applied by fastener manufacturer.
- E. Wall Anchor:
 - 1. Material: Same as HDPE pipe.
 - 2. Internal Diameter: Equal to adjacent pipe.
 - 3. Shear Strength: Equal to or greater than tensile strength of adjacent pipe.
 - 4. Fabrication: Butt fusion. Extrusion bead welding is not allowed.
- F. Electrofusion Flex Restraint: Not allowed.
- G. Electrofusion Couplings:
 - 1. Material: HDPE.
 - 2. Method of Attachment: Electrofusion.
 - 3. Designed for coupling HDPE pipe.
 - 4. Manufacturers:
 - a. Central Plastics Company.
 - b. ISCO Industries.
- H. Electrofusion Branch Saddles:
 - 1. Material: HDPE.
 - 2. Method of Attachment: Electrofusion.
 - 3. Temporary Method of Attachment: Integrated straps or bands.
 - 4. Designed for HDPE pipe.
 - 5. Manufacturers:
 - a. Central Plastics Company.
 - b. ISCO Industries.
 - c. HDPE Supply.
 - d. Chevron Phillips Pipe.
- I. Concrete Thrust Blocks: See Section 33 05 01, Conveyance Piping—General.
- J. Products that restrain HDPE pipe with wedges or clamps are not acceptable.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General:
 - 1. Install polyethylene pipe and appurtenances in conformance with AWWA M55, PPI TR-33, ASTM F2620, and pipe manufacturer's recommendations.
 - 2. Follow all requirements of approved Installation Plan where HDPE is to be installed in ambient temperatures less than 50 degrees F, in hot conditions or in windy conditions.
 - 3. Protect and install pipe in accordance with the Temperature Control Plan when contraction of pipe length may cause damage to or pull out from structures.
- B. Joining: Butt-fuse pipes and fittings in accordance with pipe manufacturer's recommendations. Depending on Site conditions, perform butt-fusion joining in or outside of excavated trench.
 - 1. If HDPE pipe surface temperature is above 90 degrees F as measured with infrared temperature gun, allow pipe to cool prior to making any connections to flanges, existing pipeline systems, or structures.
 - 2. Connect HDPE pipe to auxiliary equipment, such as valves, pumps, tanks, and other piping systems with flanged connections as follows:
 - a. Polyethylene flange adapter, thermally butt-fused to end of pipe. Flange "stub ends" are not allowed.
 - b. Convoluted backing flange, as specified.
 - c. Bolt and nut of sufficient length to show a minimum of three complete threads when joint is made and tightened to manufacturer's standard.
 - d. Follow requirements of PPI Technical Note 38 including mandatory 4-hour bolt retorquing.
 - 3. Special Precautions at Flanges: Support polyethylene pipe connected to heavy fittings, manholes, and rigid structures in such a manner that no subsequent relative movement between polyethylene pipe at flanged joint and rigid structures is possible.
 - 4. Minimum Long-Term Field Bending Radius: Unless otherwise noted, restricted to limits recommended by AWWA M55, Table 8-2.
- C. Placement in Trench:
 - 1. Control water in trench per Section 31 23 19.01, Dewatering, and Section 31 23 23.15, Trench Backfill.

- 2. Handle joined pipeline in such a manner that pipe is not damaged by dragging it over sharp and cutting objects.
- 3. Position slings for handling pipeline away from butt-fused joints.
- 4. Remove sections of damaged pipe and replace it with undamaged pipe. Damaged pipe is defined as pipe with kinks or gouges exceeding 10 percent of pipe wall thickness.
- 5. Exercise care when lowering pipe into trench to prevent damage or twisting of pipe.
- 6. At flanges, valves, and connections, excavate out trench bottom sufficiently to ensure clearance between undisturbed trench bottom and flange, valve, or connection.

3.02 FIELD QUALITY CONTROL

- A. Joint Butt Fusion:
 - 1. Measure and log each joint fusion by an electronic monitoring device (data logger) affixed to fusion machine. Data to be logged shall include the following and shall be capable of being retrieved electronically:
 - a. Pipe size, dimensions, and wall thickness.
 - b. Machine model and size.
 - c. Operator identification.
 - d. Job identification number.
 - e. Weld number.
 - f. Fusion, heating, and drag pressure settings.
 - g. Heater plate temperature.
 - h. Time stamp showing when weld was performed.
 - i. Heating and curing time of weld.
 - j. Curing temperature readings and time stamps of readings.
 - k. Error messages and warnings for out of range temperature or pressure settings.
 - 2. In addition to logged items above, the following shall be logged or annotated on report:
 - a. Location of joint being fused by pipeline station or by reference to pipe Shop Drawing.
 - b. Ambient temperature, wind speed, precipitation, and humidity.
 - c. Environmental actions taken (such as, use of tarps, enclosures, and blankets).
 - d. Type of HDPE and manufacturer.
- B. Joint Weld Inspection:
 - 1. Contractor shall provide required tools and labor to remove joints and send to lab for testing.
- 2. Visually examine each joint in accordance with the guidelines in ASTM F2620. Remove and replace any joints not meeting the standard.
- 3. Mechanical Joint Testing:
 - a. Pipe Wall Thickness 1-Inch or Less: Test joints in accordance with bend back testing provided in Appendix X4 of ASTM F2620.
 - b. Pipe Wall Thickness Greater than 1-Inch: Test joints in accordance with the guided side bend testing in accordance with ASME BPVC, Section IX, Article XXI-XXIV.
 - c. Specimens: Cut pipe 12 inches on each side of field made joint. Rejoin ends and proceed with Work.
 - d. Test Frequency:
 - 1) First 1,000 Linear Feet: The third and tenth joint and up to one additional joint selected at random by Engineer.
 - 2) Each Additional 5,000 Linear Feet: Up to one joint selected at random by Engineer.
 - 3) Each Test Failure: Up to two additional joints selected at random by Engineer.
- C. Pipeline Hydrostatic Test:
 - 1. General:
 - a. Notify Engineer in writing 5 days in advance of testing. Perform testing in presence of Engineer.
 - b. Furnish testing equipment and perform tests in manner satisfactory to Engineer. Testing equipment shall provide observable and accurate measurements of initial service leak and allowable make-up water volume under specified conditions.
 - c. Test Newly Installed Pipelines: Install temporary test head at upstream and downstream end of pipeline segment being tested.
 - d. Isolate new pipelines that are connected to existing pipelines.
 - e. Using water as test medium, pipes shall successfully pass a hydrostatic test prior to acceptance.
 - f. Maximum length allowable in any given test is 3,000 linear feet.
 - g. Conduct field hydrostatic test on buried piping after trench has been completely backfilled. Testing may, as approved by Engineer, be done prior to placement of asphaltic concrete or roadway structural section.
 - h. Final field hydrostatic test shall not be conducted until backfilling has been completed as specified.
 - i. Supply of temporary water shall be as stated in Section 01 50 00, Temporary Facilities and Controls.
 - j. Dispose of water used in testing in accordance with federal, state, and local requirements.

2. Preparation:

- a. Install temporary thrust blocking or other restraint as necessary to prevent movement of pipe and protect adjacent piping or equipment. Make necessary taps in piping prior to testing.
- b. Wait until concrete test cylinder breaks have reached 3,000 psi minimum after concrete thrust blocking or designed thrust collars are installed to perform pressure tests.
- c. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.
- d. New Piping Connected to Existing Piping: Isolate new piping with grooved-end pipe caps, blind flanges, or other means as acceptable to Engineer.
- 3. Procedure:
 - a. Test pressure shall be 50 psi at upstream end or a max of 120 psi at downstream end of segment being tested.
 - b. Maximum filling velocity shall not exceed 0.25 feet per second, calculated based on full area of the pipe.
 - c. Expel air from pipe system during filling.
 - d. Test procedure shall be in accordance with ASTM F2164.
 - 1) Initial Expansion Phase: Add water as required to maintain test pressure for 4 hours.
 - 2) Test Phase: Reduce pressure by 10 psi and start pressure test.
 - 3) Test is successful if pressure says within 5 percent of initial value for 1 hour.
 - e. If test is not completed because of leakage, equipment failure, or other reasons, depressurize test section and allow it to relax for at least 8 hours before retesting.
 - f. If there is leakage, repair defective pipe section and repeat hydrostatic test.

SECTION 33 05 16.13 PRECAST CONCRETE UTILITY STRUCTURE

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards that may be referenced in this section:
 - American Association of State Highway and Transportation Officials (AASHTO): HB-17, Standard Specifications for Highway Bridges, Division 1 Section 3, Division I Design-Loads (Part A, Part B, Part C).
 - 2. ASTM International (ASTM):
 - a. A497/A497M, Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
 - b. A615/A615M, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - c. C387/C387M, Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
 - d. C478, Standard Specification for Precast Reinforced Concrete Manhole Sections.
 - e. C857, Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
 - f. C858, Standard Specification for Underground Precast Concrete Utility Structures.
 - g. D4101, Standard Specification for Propylene Injection and Extrusion Materials.
 - 3. Occupational Safety and Health Administration (OSHA):
 - a. 29 CFR 1910.27, Fixed Ladders.
 - b. 29 CFR 1926.502, Fall Protection Systems Criteria and Practices.

1.02 LOCATIONS TO PROVIDE

- A. With ARV, as shown on Drawings.
- B. With blow-offs, as shown on Drawings
- C. Brooks Meadow Creek Box Culvert, as shown on Drawings.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Detailed drawings showing complete information for fabrication including, but not limited to:
 - 1) Member dimensions and cross-sections; location, size, and type of reinforcement, including additional reinforcement.
 - 2) Layout dimensions and identification of each precast unit.
 - 3) Welded connections indicated by AWS standard symbols.
 - 4) Details of connections, joints, accessories, and openings or inserts.
 - 5) Watertight joint details.
 - 6) Location and details of anchorage devices.
 - 7) Access door details.
 - b. Product Data:
 - 1) Precast concrete items; show materials of construction by ASTM reference and grade.
 - 2) Joint sealants.
- B. Informational Submittals:
 - 1. Manufacturer's data for lifting devices for handling and erection.
 - 2. Manufacturer's certification that vault design and manufacture comply with referenced ASTMs (for example, ASTM C857 and ASTM C858).
 - 3. Vault design calculation shall be signed by a civil or structural engineer registered in the State of Oregon.
 - 4. Manufacturer's certification that box culvert design and manufacture comply with referenced ASTMs (for example, ASTM C857 and ASTM C858).
 - 5. Box culvert design calculation shall be signed by a civil or structural engineer registered in the State of Oregon.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store each unit in a manner that will prevent cracking, distortion, warping, straining and other physical damage, and in a manner to keep marking visible.
- B. Lift and support each unit only at designated lifting points and supporting points as shown on Shop Drawings.

PART 2 PRODUCTS

2.01 VAULT MANUFACTURERS

- A. Materials, equipment, and accessories specified in this section shall be products of:
 - 1. Oldcastle Precast.
 - 2. Jensen Precast.
 - 3. Hanson Pipe and Precast.

2.02 PRECAST CONCRETE VAULTS

- A. Design Requirements:
 - 1. In the event of a conflict between or among standards, the more stringent standard shall govern.
 - 2. Comply with ASTM C858, except as modified herein.
 - 3. Reinforcing Steel:
 - a. Deformed Bars: ASTM A615/A615M, Grade 60.
 - b. Welded Wire Fabric: ASTM A497/A497M.
 - 4. Nominal Dimensions: As shown on Drawings.
 - 5. Construction: Rigid type and behave monolithically. Do not use panel-type vaults.
 - 6. Design Loads: As determined by ASTM C857, and by using Sitespecific values below.
 - a. Unit Weight of Soil: 120 pounds pe cubic foot.
 - b. Active Earth Pressure Coefficient: 0.28.
 - c. Groundwater Level: ground surface.
 - 7. Design shall accommodate additional stresses or loads that may be imposed during factory precasting, transporting, erection, and placement.
 - 8. Blockouts for penetrations shall be as shown on Drawings.
 - 9. Sealant:
 - a. Nonswelling preformed joint sealants to provide a lasting, watertight bond.
 - b. Manufacturer and Product: Henry Company; RAM-NEK.
 - 10. Mortar: Comply with ASTM C387/C387M, Type S.
- B. Mark each member or element to indicate location in the structure, top surface, and date of fabrication.

2.03 BOX CULVERT MANUFACTURERS

- A. Materials, equipment, and accessories specified in this section shall be products of:
 - 1. Oldcastle Precast.
 - 2. Columbia Precast.
 - 3. Or similar provided they meet the requirements in this specification.
- B. Materials, equipment, and accessories specified in this section shall meet the following:
 - 1. Oregon Department of Transportation Section 00595.11 Reinforced Concrete Box Culverts - Precast Materials.

2.04 ACCESSORIES

- A. Sidewalk Doors and Hatches: Spring-assisted, lockable, galvanized steel access door, size as indicated on Drawings. Doors and hatches shall be provided with antislip coating.
- B. Pipe Connections to Vault: As shown on Drawings.

2.05 BOX CULVERT

- Meet Oregon Department of Transportation Section 00595.41 Reinforced Concrete Box Culverts - Precast Construction and Section 00595.42 -Reinforced Concrete Box Culverts - Precast Fabrication Tolerances.
- B. Design Requirements:
 - 1. All exposed edges of concrete shall be chamfered 3/4 inch unless noted otherwise.
 - 2. All dimensions to reinforcing steel are to centerline of bar unless noted otherwise.
 - 3. Concrete cover measured from the face of the concrete to the face of any reinforcing bar shall be 2 inches unless shown otherwise on Drawings. Cover shall be increased to include relief depth at locations with formliner.
 - 4. Reinforcing steel splice lengths shall be in accordance with AASHTO specifications.
 - 5. Contractor shall verify all dimensions and elevations prior to placing concrete.
 - 6. Fabricator shall determine required dimensions of culvert and all walls to meet strength and service requirements.

- 7. Contractor shall verify dimensions and make adjustments as needed. Minimum box opening shall not be changed.
- C. Design Loads:
 - 1. Culvert shall be designed to accommodate HL-93 loading and all dead loads on the top slab.
 - 2. The manufacturer of the culvert shall provide the design analysis.

Allowable bearing pressure:	5000 PSF
Active pressure:	
At-rest pressure:	57 PCF

PART 3 EXECUTION

3.01 GENERAL

- A. Possible Settlement: If subgrade is encountered that may require removal to prevent structure settlement, notify Engineer. Engineer will determine depth of over excavation and means of stabilizing subgrade prior to structure installation.
- B. Place 12-inch minimum thickness of imported crushed aggregate material on undisturbed earth or modified subgrade; thoroughly compact with a mechanical vibrating or power tamper. Meet requirements of Article Excavation and Backfill.

3.02 EXCAVATION AND BACKFILL

- A. Remove and keep water clear from excavation during construction.
- B. Excavation: As specified in Section 31 23 16, Excavation.
- C. Backfill: As specified in Section 31 23 23, Fill and Backfill, and Section 31 23 23.15, Trench Backfill.

3.03 INSTALLATION

- A. Vault:
 - 1. Concrete Base:
 - a. Place on prepared subgrade.
 - b. Properly locate, ensure firm bearing throughout, and plumb first section.

- 2. Sections:
 - a. Carefully inspect precast sections to be joined.
 - b. Thoroughly clean ends of sections to be joined.
 - c. Do not use sections with chips or cracks.
- 3. Joints:
 - a. Fill joints between precast sections per manufacturer's recommendation.
 - b. Joints shall be watertight to prevent entrance of groundwater.
- 4. Setting Precast Vault: Finish grade of structure top shall be even with surrounding finish grade surface, unless noted otherwise on Drawings.
- B. Pipe Connection to Vault: Install products in accordance with manufacturer's instructions.
- C. Brooks Meadow Creek Box Culvert:
 - 1. Meet Oregon Department of Transportation Section 00595.44 -Reinforced Concrete Box Culverts - Precast Installation.
 - 2. Concrete Base:
 - a. Place on prepared subgrade and granular backfill as shown on Drawings.
 - b. Properly locate, ensure firm bearing throughout, and plumb first section.
 - 3. Sections:
 - a. Carefully inspect precast sections to be joined.
 - b. Thoroughly clean ends of sections to be joined.
 - c. Do not use sections with chips or cracks.
 - 4. Joints:
 - a. Fill joints between precast sections per manufacturer's recommendation.
 - b. Joints shall be watertight to prevent entrance of groundwater.
 - 5. Fill:
 - a. As described in Section 31 23 23, Fill and Backfill, place and compact granular fill and earthfill in continuous horizontal lifts having maximum uncompacted thickness of 8 inches.
 - b. Place granular fill and earthfill concurrently in each lift, then compact granular fill first, followed by earthfill, followed by additional compaction over both materials at the transition. Bring fill up on both sides of box culvert concurrently.

SECTION 33 12 16 WATER UTILITY DISTRIBUTION VALVES

PART 1 GENERAL

1.01 GENERAL

A. American Iron and Steel Requirements apply for this Project. See Section 00 73 00, Supplementary Conditions and Section 01 61 00, Common Product Requirements.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Water Works Association (AWWA):
 - a. C500, Metal-Seated Gate Valves for Water Supply Service.
 - b. C504, Rubber-Seated Butterfly Valves.
 - c. C509, Resilient-Seated Gate Valves for Water Supply Service.
 - d. C515, Reduced-Wall Resilient-Seated Gate Valves for Water Supply Service.
 - e. C517, Resilient-Seated Cast-Iron Eccentric Plug Valves.
 - f. C550, Protective Interior Coatings for Valves and Hydrants.
 - 2. NSF International (NSF):
 - a. NSF/ANSI 61, Drinking Water System Components—Health Effects.
 - b. NSF/ANSI 372, Drinking Water System Components—Lead Content.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Product data sheets for each make and model. Indicate service where used.
 - b. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
 - c. Product data sheets for coating and lining products.
 - d. Certification for compliance to NSF/ANSI 61 for valves used for drinking water service.

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- B. Informational Submittals:
 - 1. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common Product Requirements.
 - a. Metal seated gate valves, full compliance with AWWA C500.
 - b. Butterfly valves, full compliance with AWWA C504.
 - c. Resilient-seated gate valves, full compliance with AWWA C509.
 - d. Reduced-wall, resilient-seated gate valves, full compliance with AWWA C515.
 - e. Resilient-seated cast-iron eccentric plug valves, full compliance with AWWA C517.
 - 2. Method for hydrostatic testing.
 - 3. Tests and inspection results.
 - 4. Operation and Maintenance Data: As specified in Section 01 78 23, Operation and Maintenance Data.
 - 5. Certification for compliance with AIS documenting the origin of all domestic iron or steel materials. Refer to Section 01 61 00, Common Product Requirements.

PART 2 PRODUCTS

- 2.01 GENERAL
 - A. Valve same size as adjoining pipe, unless otherwise indicated.
 - B. Valve ends to suit adjacent piping.
 - C. Valves shall have no leakage (drip tight) in either direction at valve rated design pressure, unless otherwise allowed for in this section or in referenced valve standard.
 - D. Valve to open by turning counterclockwise, unless otherwise specified.
 - E. Valve materials in contact with or intended for drinking water service shall comply with requirements of NSF/ANSI 61 and other applicable federal, state, and local requirements.

- F. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
 - 1. Use or reuse of components and materials without a traceable certification is prohibited.

2.02 GATE VALVES

- A. General:
 - 1. AWWA gate valves to be in compliance with referenced AWWA standard.
 - 2. Provide 2-inch operating nut for buried valves.
 - 3. Provide totally enclosed spur or bevel gear operator with indicator for AWWA gate valves 14 inches and larger.
 - 4. Mark AWWA gate valves with manufacturer's name or mark, year of valve casting, valve size, and working water pressure.
 - 5. Repaired AWWA gate valves will not be allowed.
- B. Resilient-Seated Ductile Iron Gate Valve 3 Inches to 36 Inches:
 - 1. Ductile-iron body, resilient seat, bronze stem, and stem nut, ends as shown on Drawings, nonrising stem, full port in accordance with AWWA C509.
 - 2. Minimum Design Working Water Pressure: 200 psig.
 - 3. Manufacturers:
 - a. M&H Valve; AWWA C509.
 - b. U.S. Pipe.
- C. Factory Finishing of Gate Valve:
 - 1. In accordance with Section 09 90 00, Painting and Coating.
 - 2. Lining and Coating:
 - a. Interior Lining:
 - 1) Manufacturer's standard.
 - 2) In accordance with AWWA C550.
 - 3) Formulated from materials deemed acceptable to NSF/ANSI 61.

- b. Exterior Coating:
 - 1) If valve and operator will not be subsequently field-coated, factory-applied coating shall be either two-part liquid material or heat-activated (fusion) material.
 - 2) In accordance with AWWA C550.
 - 3) Dry Film Thickness: Minimum 10 mils.

2.03 PLUG VALVES

- A. General:
 - 1. Mark AWWA plug valves with manufacturer's name or mark, year of valve casting, valve size, and working water pressure.
 - 2. Repaired AWWA plug valves will not be allowed.
- B. Eccentric Plug Valve 24 Inches to 48 Inches:
 - 1. Nonlubricated type rated 150 psig CWP, drip tight shutoff with pressure from either direction, cast iron body, buried service mechanical joints ends unless otherwise shown, plug cast iron port opening of no less than 70 percent of connecting pipe area and coated with Buna N, seats welded nickel, stem bearings lubricated stainless steel or bronze, stem seal multiple V-rings or U-cubs with O-rings of nitrile rubber, grit seals on both upper and lower bearings.
 - 2. Totally enclosed, geared, manual operator with 2-inch nut. Size operator for 20 psig operating shutoff pressure. For buried service, provide completely sealed operator filled with heavy lubricant.
 - 3. For buried service, provide external epoxy coating.
 - 4. Manufacturers and Products:
 - a. Pratt; Ballcentric.
 - b. DeZurik; Style PEC.
 - c. Milliken; Millcentric Series 600.
- C. Operators and Actuators:
 - 1. Manual Operators:
 - a. General:
 - 1) For AWWA valves, operator force not to exceed requirements of applicable valve standard. Provide gear reduction operator when force exceeds requirements.
 - For non-AWWA valves, operator force not to exceed applicable industry standard or 80 pounds, whichever is less, under operating condition, including initial breakaway. Provide gear reduction operator when force exceeds requirements.

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- 3) Operator self-locking type or equipped with self-locking device.
- 4) Position indicator on quarter-turn valves.
- 5) Traveling nut type operator's threaded steel reach rod with internally threaded bronze or ductile iron nut.
- b. Buried Operator:
 - 1) Buried service operators on valves shall have a 2-inch AWWA operating nut. Enclose moving parts of valve and operator in housing to prevent contact with the soil.
 - 2) Buried service operators to be grease packed and gasketed to withstand submersion in water to 20 feet minimum.
 - 3) Buried valves shall have extension stems, bonnets, and valve boxes.

2.04 ACCESSORIES

- A. Cast-Iron Valve Box: Designed for traffic loads, sliding type, with minimum of 5-1/4-inch ID shaft.
 - 1. Box: Cast iron with minimum depth of 9 inches.
 - 2. Lid: Cast Iron, minimum depth 3 inches, locking type, marked WATER.
 - 3. Extensions: Cast iron pipe.
 - 4. Three-piece box and lid for valves larger than 12 inches with base sized for valve.
 - 5. Valve extension stem for valves with operating nuts 3 feet or greater below finish grade.
 - 6. Manufacturers and Products:
 - a. East Jordan Iron Works; Cast-Iron Valve Boxes.
 - b. Bingham & Taylor; Cast-Iron Valve Boxes.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Mount buried valves such that operating nut is accessible and operable from above.
- B. Install valves so handles will operate from fully open to fully closed without encountering obstructions.
- C. Install in accordance with manufacturer's written instructions.
- D. Extension Stem for Operator: Where depth of valve operating nut is 3 feet or greater below finish grade, furnish operating extension stem with 2-inch operating nut to bring operating nut to a point within 6 inches of finish grade.

- E. Eccentric Plug Valves:
 - 1. Unless otherwise restricted or shown on Drawings, install valve as follows:
 - a. Install valve with stem in horizontal position with plug up when valve is open. Install valve with seat end upstream (flow to produce unseating pressure).

3.02 FUNCTIONAL AND HYDROSTATIC TESTING

- A. Functional Test:
 - 1. Test that valves open and close smoothly under operating pressure conditions.
 - 2. Test that two-way valves open and close smoothly under operating pressure conditions from both directions.
 - 3. Count and record number of turns to open and close valve; account for discrepancies with manufacturer's data.
- B. Hydrostatic Testing:
 - 1. Valve may be tested while testing pipeline or as a separate step after pipeline has been tested.
 - 2. Apply test pressure to upstream side of the plug valve and measure the pressure on the opposite side to determine if there is an increase in pressure caused by leakage.
 - 3. For gate valves used on pump out blowoff piping and combination air release valve assembly piping, close the gate valve and verify visually that it is not leaking on the downstream end.

SECTION 33 12 16.29 AIR AND VACUUM RELEASE VALVE ASSEMBLIES

PART 1 GENERAL

1.01 REFERENCES

- A. American Iron and Steel Requirements apply for this Project. See Section 00 73 00, Supplementary Conditions and Section 01 61 00 Common Product Requirements.
- B. The following is a list of standards which may be referenced in this section:
 - 1. American Society of Mechanical Engineers (ASME):
 - a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings (Classes 25, 125, and 250).
 - b. B36.10M, Welded and Seamless Wrought Steel Pipe.
 - c. B36.19M, Stainless Steel Pipe.
 - d. Boiler and Pressure Vessel Code.
 - 2. American Water Works Association (AWWA):
 - a. C209, Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.
 - b. C214, Tape Coating Systems for the Exterior of Steel Water Pipelines.
 - c. C220, Stainless Steel Pipe, 4 In. (100 mm) and Larger.
 - d. C500, Metal-Seated Gate Valves for Water Supply Service.
 - e. C504, Rubber-Seated Butterfly Valves.
 - f. C507, Ball Valves, 6 In. Through 48 In. (150 mm Through 1200 mm).
 - g. C509, Resilient-Seated Gate Valves for Water Supply Service.
 - h. C512, Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.
 - i. C550, Protective Interior Coatings for Valves and Hydrants.
 - j. C800, Underground Service Line Valves and Fittings.
 - 3. ASTM International (ASTM):
 - a. A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - b. B43, Standard Specification for Seamless Red Brass Pipe, Standard Sizes.
 - c. C478, Standard Specification for Precast Reinforced Concrete Manhole Sections.
 - d. D1785, Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

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- 4. Environmental Protection Agency (EPA): Safe Drinking Water Act.
- 5. NSF International (NSF):
 - a. NSF/ANSI 61, Drinking Water System Components Health Effects.
 - b. NSF/ANSI 372, Drinking Water System Components Lead Content.

1.02 SUBMITTALS

- A. Action Submittals:
 - 1. Product data sheets for make and model.
 - 2. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
 - 3. Maximum recommended test pressure; maximum and minimum recommended working pressures of air valves, isolation valves, flanges, connecting piping, and fittings.
 - 4. Recommended seating materials for specified operating pressures.
- B. Informational Submittals:
 - 1. Manufacturers' Instructions:
 - a. Installation and testing of products specified.
 - b. Pipeline tapping and service saddle installation.
 - 2. Operation and maintenance data.
 - 3. American Iron and Steel (AIS) certification documentation.

PART 2 PRODUCTS

- 2.01 GENERAL
 - A. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
 - 1. Use or reuse of components and materials without a traceable certification is prohibited.

- 2.02 AIR VALVES
 - A. General:
 - 1. Combination air valves shall conform to AWWA C512.
 - 2. Exterior of air valves shall be coated in accordance with Section 09 90 00, Painting and Coating.
 - 3. Interior of air valves shall be coated in accordance with AWWA C550.
 - 4. Air valves shall be factory tested in accordance with AWWA C512.
 - 5. Suitable for operating pressures between 0 psi and 25 psi.
 - B. Combination Air Valve, Water Service, 1 Inch to 16 Inches:
 - 1. Suitable for water service, combines operating features of air and vacuum valve and air release valve. Air and vacuum portion to automatically exhaust air during filling of system and allow air to reenter during draining or when vacuum occurs. Air release portion to automatically exhaust entrained air that accumulates in system.
 - 2. Valve single body or dual body, air release valve mounted on air and vacuum valve, isolation valve mounted between the dual valves. 1-inch through 3-inch valves with NPT threaded inlet and outlet, 4-inch and larger valves with ASME B16.1 Class 125 flanged inlet and cover outlet.
 - 3. Rated 150 psi working pressure, cast-iron or ductile iron body and cover, stainless steel float and trim, built and tested to AWWA C512.
 - 4. Manufacturer and Product: APCO Valve and Primer Corp.; Model 154; "or-equal."
- 2.03 CONNECTION TO MAINLINE
 - A. As shown on Drawings.
- 2.04 ISOLATION VALVES
 - A. Gate Valve 3 Inches and Larger: See Section 33 12 16, Water Utility Distribution Valves.

2.05 PIPING BETWEEN MAINLINE AND AIR VALVE AND PIPING FOR AIR VENT

- A. General: As shown on Drawings.
- B. Steel pipe conforming to ASME B36.10M. Coating shall conform to Section 09 90 00, Painting and Coating. Lining shall conform to Section 09 90 00, Painting and Coating.

- C. HDPE pipe conforming to Section 33 05 01.10, High-Density Polyethylene (HDPE) Pressure Pipe and Fittings.
- 2.06 VALVE VAULT
 - A. As shown on Drawings and specified in Section 33 05 16.13, Precast Concrete Utility Structure.
- 2.07 ACCESSORIES
 - A. Insulation:
 - 1. Cellular polystyrene, 4 inches thick.
 - 2. Manufacturer and Product: Dow Chemical Co.; Dow XPS 150 Blue Board.
 - B. Removable Insulation Jacket:
 - 1. Pyrogel; 15 mm thick.
 - 2. Manufacturer and Product: ThermaXX, LLC; ThermaXX Jacket (Anti-Freeze).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Valves:
 - 1. In accordance with manufacturer's printed instructions.
 - 2. Orient valve in vault with easy access to operator.
 - 3. Replace valves that drip or do not function properly.
- B. Service Saddle:
 - 1. Tap and install in accordance with manufacturer's printed instructions.
 - 2. Use adapters for size of line being tapped.
- C. Valve Vault:
 - 1. Place off center as shown on Drawings for access to operators.
 - 2. Install so finished grade of top of vault is above adjacent ground as shown on Drawings.

- D. Insulation:
 - 1. Install within vault, above and around designated valve assemblies as required to protect valve from freezing.
 - 2. Provide space for air passage to allow proper functioning of air valves.
 - 3. Support insulation with clips anchored to manhole or vault wall.
- E. Removable Insulation Jacket:
 - 1. Install on combination air release valve to protect valve from freezing.
 - 2. Installation per manufacturers recommendations.

3.02 TESTING AND INSPECTION

- A. Air Valve:
 - 1. Confirm functionality prior to filling pipeline with water.
 - 2. Isolation valves shall be in open position during pipeline test.
- B. Isolation Valves: Test that valves open and close smoothly with operating pressure on one side and atmospheric pressure on the other.
- C. Air and Vacuum Valves: Inspect valves as pipe is being filled to verify venting and seating is fully functional.
- D. Verify leak-free performance during testing.

SECTION 33 12 19 WATER UTILITY DISTRIBUTION FIRE HYDRANTS

PART 1 GENERAL

- 1.01 GENERAL
 - A. American Iron and Steel Requirements apply for this Project. See Section 00 73 00, Supplementary Conditions and Section 01 61 00, Common Product Requirements.
- 1.02 RELATED SECTIONS
 - A. Related sections include, but not limited to, the following:
 - 1. Division 01, General Requirements.

1.03 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. American Water Works Association (AWWA):
 - a. C502, Dry-Barrel Fire Hydrants.
 - b. C600, Installation of Ductile-Iron Mains and Their Appurtenances.
 - 2. ASTM International (ASTM): C94, Standard Specification for Ready-Mixed Concrete.
 - 3. FM Global Approved.
 - 4. NSF International (NSF):
 - a. NSF/ANSI 61, Drinking Water System Components Health Effects.
 - b. NSF/ANSI 372, Drinking Water System Components Lead Content.
 - 5. UL: 246, Standard for Hydrants for Fire-Protection Service.

1.04 SUBMITTALS

- A. Action Submittals: Catalog cuts of system components.
- B. Informational Submittal:
 - 1. Certificate of Compliance: Upon completion of the system installation, verify all fire department hose connections, and check all fire safety devices to ensure their readiness for emergency connection and operation.

2. Certification for compliance with AIS documenting the origin of all domestic iron or steel materials. Refer to Section 01 61 00, Common Product Requirements.

PART 2 PRODUCTS

2.01 GENERAL

- A. Components and Materials in Contact with Water for Human Consumption: Comply with the requirements of the Safe Drinking Water Act and other applicable federal, state, and local requirements. Provide certification by manufacturer or an accredited certification organization recognized by the Authority Having Jurisdiction that components and materials comply with the maximum lead content standard in accordance with NSF/ANSI 61 and NSF/ANSI 372.
 - 1. Use or reuse of components and materials without a traceable certification is prohibited.

2.02 HYDRANTS

- A. Hydrant:
 - 1. Break flange type.
 - 2. Nominal 4-1/2-inch main valve opening with 8-inch bottom connections.
 - 3. Conform to AWWA C502.
 - 4. Two 2-1/2-inch hose nozzles.
 - 5. One 4-1/2-inch pumper nozzle.
 - 6. Operating Nuts: 1-1/2-inch National Standard pentagon nut.
 - 7. See Drawings for inlet connection.
 - 8. Red aboveground line.
 - 9. Manufacturers and Product:
 - a. Mueller Co.
 - b. American; Kennedy Valve.
- B. Main Valve:
 - 1. Depth of Bury: 3-1/2 feet.
 - 2. Equip with O-ring seals.
 - 3. Valve opens on counterclockwise rotation.

2.03 PRECAST CONCRETE PIER BLOCK

- A. Nominal dimensions of 8-inch thickness by 16-inch square base.
- B. Compressive Strength: 3,000 psi at 28 days.

2.04 GRAVEL FOR DRAINAGE

A. Washed 3/4-inch crushed rock. Free of organic matter, sand, loam, clay, and other small particles that will restrict water flow through gravel.

2.05 FOUNDATION STABILIZATION MATERIAL

- A. Furnish when existing trench material or imported pipe base material will not support soft or flooded spots in excavated trench.
- B. Maximum 3-inch hard rock free from excessive clay material, but enough fines to bind larger fragments.

PART 3 EXECUTION

3.01 GENERAL

A. Install hydrants in accordance with Section 4.3.6 and Section 4.3.7 of AWWA C600, unless specified otherwise.

3.02 EXCAVATION

A. Excavate to subgrade. Fill over excavated areas with foundation stabilization material. Tamp to provide firm foundation.

3.03 BASE BLOCK

A. Place on firm, level subgrade to ensure uniform support.

3.04 INSTALLATION OF HYDRANTS

- A. Locate hydrants to provide accessibility and to minimize potential damage from vehicles.
 - 1. Relocate improperly set hydrants.
 - 2. Set hydrants so safety flange is a minimum of 2 inches above finished ground or sidewalk level.
- B. Place hydrant on base block carefully to prevent the base block from breaking.

- C. Joints shall conform to Section 4.3.4 of AWWA C600 when cast or ductile iron pipe is used.
- D. Maintain hydrant in a plumb position during subsequent Work.

3.05 GRAVEL FOR DRAINAGE

A. Place gravel around base block and hydrant bottom in accordance with Section 4.3.7 of AWWA C600.