KOOTENAI COMMUNITY WATER MAIN LOOP CONSTRUCTION
PO-21-N04

KOOTENAI INDIAN RESERVATION
BOUNDARY COUNTY, IDAHO

MARCH 2024

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Division 34 – Transportation

Section 340513 – Common Work Results for Roadways Award

END

SECTION 01 11 00
SUMMARY OF WORK

PART 1 – GENERAL

1.01 SUMMARY

A. The work to be performed under this contract shall consist of furnishing the following to perform the work outlined in these specifications and as indicated by Project Drawings:

1. Tools
2. Equipment
3. Materials
4. Labor
5. Supplies
6. Manufactured articles
7. All transportation to complete the work
8. Temporary facilities

B. Location of Work: The Kootenai Indian Reservation, Kootenai Tribe of Idaho, Bonners Ferry, Idaho.

C. Incidentals Items: All work, materials, and services not expressly listed as being provided by others or not expressly called for in the contract but are necessary for the completion of the work in good faith, shall be furnished, installed, and performed by the contractor.

1.02 WORK REQUIRED

A. Furnish all labor, materials, equipment, and supervision necessary to construct the following facilities as described by these specifications and drawings. All work, materials, and services not expressly listed as being provided by others or that are called for in the contract or necessary to provide a complete and operational system will be furnished, installed, and performed by the Contractor.

1. Mobilize within 10 days of Notice to Proceed.

2. Install 1,247 feet of 6-inch, C900 PVC, SDR 18 watermain including fittings and all required appurtenances, as indicated on the contract documents.

3. Install 6-inch Gate Valves with Box.

4. Install 55 feet of 1” and 15 feet of 2” water service lines. Provide water service connections including corporation stop and curb stop.

5. Connect the new water main to the existing 4-inch watermain at the locations shown on the contract plans. Relocate existing fire hydrant and install a new one as indicated in the connection detail.

6. Abandon existing PVC watermain and water service lines as shown on the plans and/or instructed by the project engineer, including cutting and capping.

7. Finish site work including driveway and road restoration, seeding, and final site cleanup.

B. Work sites are identified in the attached site plans.

C. The materials and construction methods specified herein are minimum requirements. Where the applicable codes and ordinances require more stringent materials or execution methods, they shall apply.

1.03 SITE CONDITIONS

A. Utilities

1. Known buried utilities are shown on the site plans as indication to what the Contractor may encounter, NOT FOR LOCATION PURPOSES. Locations, material, and sizes of any utilities shown are approximate and not meant as a complete representation. Contractor must obtain exact locations of utilities using state “Utility Locate” hotlines. Contractor should contact all other utility owners not covered by the state “Utility Locate” hotlines.

2. Protect existing utilities during construction.

3. Immediately notify Tribal Point of Contact, Project Engineer, and the utility owner of any damaged utilities.

4. Any and all damage that results from work under this contract shall be promptly repaired at the expense of the Contractor.

B. State of Idaho

1. All applicable state laws and ordinances are required to be followed.

2. The Contractor must, where applicable, have work performed by permitted and/or licensed businesses and employees.

C. Permits

1. All required permits are the responsibility of the Contractor.

1.04 SAFETY

A. OSHA safety guidelines and rules related to construction shall be followed at all times.

B. Examples of required safety practices include, but are not limited to:

1. Personal protective equipment worn on the job site, such as head protection, eye protection, hearing protection, hand protection, protective clothing, high-visibility clothing, foot protection, and fall protection.

2. Trench shoring and/or other practices required to ensure safety to workers in trenches.

3. Barricades, covers, or other adequate methods of preventing passerby access to unattended excavations.

1.05 DISTURBED AREAS

A. All areas that are disturbed by the Contractor are to be returned to their original condition or better. This includes, but it not limited to:

1. Sidewalks
2. Roadways, embankments, and clear zones
3. Grass
4. Vegetation
5. Swales and Ditches

1.06 CLOSEOUT

A. Inform Tribal Point of Contact and Project Engineer of date and time for Final Inspection. Final Inspection should include inspection of all installed facilities. All deficiencies will need to be completed before full payment is made.

B. All submittals and as-built drawings of systems must be received in a correct and complete manner before final payment can be made.

1.07 ADDITIONAL INFORMATION

A. For information regarding the technical aspects of the project, contact the Engineers:

Jullyanne De Pasion
Project Engineer
Indian Health Service
528 E Spokane Falls Blvd, Ste 302

Spokane, Washington 99202
Phone: 509-867-6026
Jullyanne.DePasion@ihs.gov

Benjamin Chadwick, P.E.
Design Engineer
Indian Health Service
528 E Spokane Falls Blvd, Ste 302
Spokane, Washington 99202
Phone: 503-414-7772
Benjamin.Chadwick@ihs.gov

B. For information regarding contracting information, contact the Tribal Coordinator for this project:

Theresa Wheat
Administrative Director
Kootenai Tribe of Idaho
Phone: 208-267-3519
Theresa@kootenai.org

C. All project activities shall comply with all Tribal regulations related to the completion of the work including the acquisition of necessary permits and the payment of Tribal taxes.

END OF SECTION

SECTION 01 22 00
PRICE AND PAYMENT

PART 1 – GENERAL

1.01 SUMMARY

A. Work covered by this section includes method of measurement and basis of payment for all divisions included.

B. Payment for the various items of the Bid Schedules, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, materials, labor, supplies, manufactured articles, transportation, and temporary facilities required to complete the work, including incidentals.

C. Respective prices and payment shall constitute full compensation for all work completed including incidentals.

D. All items not expressly listed as being provided by others that are necessary for the completion of work shall be furnished and installed by the Contractor.

1.02 ESTIMATED QUANTITIES

A. All quantities stipulated in the bid schedule or other contract documents are approximate and are to be used:

1. As a basis for estimating the probable cost of the work, and

2. For the purpose of comparing the bids submitted.

B. The Contractor shall be paid for actual quantities installed based on the quantities measured in the field. The actual amounts of work completed and materials furnished may differ from estimated quantities. The contractor shall make no claim for damages, anticipated profits, or otherwise, on account of differences between the estimated amounts and the actual amount of work performed and materials furnished.

C. At no time shall the Contractor exceed the agreed upon total cost without prior approval from the Contracting Officer.

1.03 SURVEY AND MEASUREMENTS

A. All quantity measurements shall be the responsibility of the Contractor and will be verified by the Project Engineer.

B. All measurements and subsequent payments will be based on completed and accepted work performed in strict accordance with the drawings, specifications, and other contract documents.

PART 2 – PRODUCTS

2.01 GENERAL

A. Payment shall be full compensation to complete the work items in good faith, including incidental work.

B. In addition to those things listed under each item, the unit price bid shall be full compensation for all of the following:

1. General requirements in Division 01, but not limited to the following:

a. Submittals
b. As-built drawings

2. Specific requirements including but not limited to the following (unless otherwise expressly defined as a line item in the bid schedule):

a. Erosion control
b. Clearing and grubbing
c. Removal and replacement of obstructions
d. Associated trenching, excavation and backfill, including the removal of any nuisance water, bedding, haunching, and compaction.
e. Disposal of any excess material
f. Traffic control
g. Rough grading
h. Finish work, where called for, including finish grading, topsoiling, and landscaping

2.02 BID ITEMS

A. Schedule A: Watermain Replacement

1. Mobilization and Demobilization:

a. Measurement: Lump Sum. Progress payments shall be made as follows:
1) 60% for Mobilization
2) 30% for Demobilization
3) 10% for record drawings.

b. Basis for Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to

complete the work as specified, including but not limited to; mobilization and demobilization of all equipment, materials, and personnel; provision of record drawings (as-built); weekly construction schedule due no later than end of the same week; in accordance with the approved plans and specifications.

2. 6-inch PVC Watermain, C900, DR-18

    a. Measurement: Lineal Foot as indicated on the Bid Schedule measured horizontally over the centerline of the pipe.

    b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; excavation; trenching; construction staking; traffic control; potholing and protection of existing utilities; clearing and grubbing; pipe installation; fittings and connections unless otherwise listed in the bid schedule; marker posts; warning tape; tracing wire; thrust restraint; bedding; haunching; backfill; compaction; grading; site restoration including driveways and existing roads; seeding; pressure testing; leak repair; disinfection and all other appurtenances; in accordance with the approved plans and specifications.

3. Fire Hydrant Assembly

    a. Measurement: Each.

    b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; fire hydrant, gate valve and box, joint restraints, fittings, installing tracing wire, and all other appurtenances required to complete the work as specified.

4. 6-inch Gate Valve with Box

    a. Measurement: Each.

    b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; gate valve and box; block; fittings; marker posts; tracing wire; thrust restraints; and all other appurtenances; in accordance with the approved plans and specifications.

5. 1-inch Corporation Stop with Saddle

    a. Measurement: Each.

b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; saddle; corporation stop; main tapping; and all other appurtenances; in accordance with the approved plans and specifications.

6. 1-inch Curb Stop with Box

   a. Measurement: Each.

   b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; curb stop; box; block; and all other appurtenances; in accordance with the approved plans and specifications.

7. 1-inch Water Service Line, HDPE, SDR09

   a. Measurement: Lineal Foot as indicated on the Bid Schedule measured horizontally over the centerline of the pipe.

   b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; obstacle removal and replacement; pipe; fittings; tracing wire; flushing; disinfection; and all other appurtenances; in accordance with the approved plans and specifications.

8. 2-inch Corporation Stop with Saddle

   a. Measurement: Each.

   b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; saddle; corporation stop; main tapping; and all other appurtenances; in accordance with the approved plans and specifications.

9. 2-inch Curb Stop with Box

   a. Measurement: Each.

   b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; curb stop; box; block; and all other appurtenances; in accordance with the approved plans and specifications.

10. 2-inch Water Service Line, HDPE, SDR09

    a. Measurement: Lineal Foot as indicated on the Bid Schedule measured horizontally over the centerline of the pipe.

    b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; obstacle removal and replacement; pipe; fittings; tracing wire; flushing; disinfection; and all other appurtenances; in accordance with the approved plans and specifications.

11. Connections to Existing System

    a. Measurement: Lump Sum.

    b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; coordination of water system shutdown; fittings; pipe re-configuration; existing fire hydrant relocation; disinfection; pressure testing; leak repairs; site restoration; and all other appurtenances; in accordance with the approved plans and specifications.

12. Pipe Abandonment

    a. Measurement: Lump Sum.

    b. Basis of Payment: Full compensation for all work necessary to abandon existing PVC water mains and water service lines including excavation; cutting and capping existing PVC water mains and water service lines, abandoning or removing fittings and valves; backfill; compaction grading, site restoration; and; in accordance with the approved plans and specifications.

13. Asphalt Pavement Resurfacing (Driveway)

    a. Measurement: Square Feet.

    b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; saw cutting the perimeter of the pavement removal area; curb removal; pavement removal, excavation, crushed aggregate base; grading; compaction; pavement joint sealant; asphalt placement; curb placement; and site restoration; in accordance with the approved plans and specifications.

14. Tree Removal (if necessary)

    a. Measurement: Each.

    b. Basis of Payment: Full compensation for furnishing all labor, tools, equipment, and materials, and performing all operations required to complete the work as specified, including but not limited to; cutting down trees; removing stumps; clearing vegetation, debris and other obstacles; hauling away debris; in accordance with the approved plans and specifications.

END OF SECTION

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes the pre-construction conference, construction scheduling, days of work, and coordination requirements. The Project Engineer may choose to waive these requirements. If waived, the Project Engineer may reinstitute these requirements at any time during the project as deemed necessary.

B. Costs associated with project management and coordination is incidental to the contract work and is included in the contract unit and lump sum costs.

1.02 PRE-CONSTRUCTION CONFERENCE AND PROGRESS MEETINGS

A. Prior to beginning construction but following contract award, the Contractor, Subcontractors, and other interested parties must participate in a Pre-Construction Conference. This meeting may be conducted by teleconference.

B. Periodically throughout the contract performance period, the Contractor and Subcontractors shall avail themselves to project progress meetings. These meetings shall be held as often as the parties determine is necessary, but will be at least once every week.

C. Representatives from the following shall attend each meeting via in person or virtually:

1. Prime Contractor
2. Subcontractors
3. Contracting Officer (CO)
4. Contracting Officer’s Representative (COR)
5. Project Engineer and Construction Control Inspector
6. Tribal Coordinator

D. The Project Engineer shall arrange a date that is mutually acceptable to all parties planning to attend.

E. Contractor is responsible for notifying Subcontractors of meeting time and date.

F. Meeting Minutes:

1. Meeting Minutes will be recorded, typed up in a memorandum and distributed to all attendees by the Project Engineer.

2. Any attendee may question or challenge the content of the meeting minutes in writing to the Project Engineer prior to the next project meeting. If the meeting minutes are unchallenged, they will be accepted as an accurate representation of the meeting discussions and decisions.

1.03 CONSTRUCTION SCHEDULE

A. The Contractor shall provide the Project Engineer and Tribal Coordinator with a written preliminary construction schedule containing start and completion dates of the major items at the preconstruction meeting.

B. The Contractor shall notify the Project Engineer three full working days in advance of any construction.

C. The Contractor shall communicate major changes to the schedule to the Project Engineer in writing.

1.04 DAYS OF WORK

A. The Contractor shall not work on Saturdays, Sundays, tribal or federal holidays unless written approval from the Contracting Officer is obtained in advance.

B. The Contractor shall request approval a minimum of 48 hours in advance of Saturdays and 96 hours in advance of Sundays or federal holidays.

1.05 HOURS OF WORK

A. The Contractor shall perform work between the hours of 7:00 am and 5:00 pm local time or otherwise established with the Project Engineer and Tribal representative.

1.06 WEEKLY ACTIVITY SCHEDULE

A. The Contractor shall provide the Project Engineer with a written weekly activity schedule (email is acceptable) indicating planned activities, locations, and approximate schedules.

B. The Contractor shall note the planned visits by manufacturer’s representatives, testing firms, or other site visitors that may be of significance to the Project Engineer.

C. The Contractor shall provide the weekly activity schedule to the Project Engineer by noon on the last day of the workweek for activities during the following week.

1.07 COORDINATION WITH OTHER CONTRACTORS/UTILITIES

A. Coordinate work with other Contractors (i.e. roads, buildings, etc) in the area as necessary to complete the work specified.

B. Coordinate work with local utilities (i.e. water and sewer, electrical, cable, telephone, etc.). Note: Not all buried utilities may be shown on the project drawings. The Contractor shall be responsible for marking utilities prior to construction.

1.08 PROGRESS

A. The Contractor shall provide daily progress reports to the Project Engineer.

B. The progress report shall include station locations of completed work, items installed, and quantities of items installed.

END OF SECTION

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SECTION 01 33 00
SUBMITTAL PROCEDURE

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes information on submittal procedures and general submittal requirements. Materials requiring submittal are listed in the appropriate specification section.

1.02 SUBMITTAL PROCEDURES

A. Submit submittals in digital form or by print form (two copies) to the Project Manager.

B. Identify each cut sheet or shop drawing with the following information:

1. Community
2. Community Location
3. Contract number
4. Supplier
5. Specification section, plan sheet, or detail drawing number to which the submittal pertains

C. Submit the following information, as applicable, in accordance with the submittal requirements of each section:

1. Manufacturer's cut sheets indicating compliance with references and standards (e.g., applicable ASTM, AWWA standards)
2. Laboratory results
3. Dimensional drawings or shop drawings
4. Other specific information required by the particular specification

D. Variations from contract documents or products specified:

1. Bring all submitted variations to the attention of the Project Manager
2. Variations not brought to the Project Manager's attention in writing and that

conflict with the contract documents do not relieve the Contractor from the requirements of the contract documents

E. Revisions and Resubmittals

1. Revise and resubmit submittals as required and identify all changes made since previous submittal.

2. Project Manager obligations for resubmittals:

   a. The Project Manager will be obligated to review the original submittal and one resubmittal for each item requiring submittal.

   b. Subsequent resubmittals will be at the Contractor's expense.

3. Incomplete submittals or rejected submittals that result in the need for the Contractor to resubmit cannot be grounds for a contract time extension or equitable adjustment to contract price unless the Project Manager did not meet their obligations.

F. Submittal time requirements:

1. The Contractor shall provide all submittals to the Project Manager within 14 days after receipt of the Notice to Proceed.

2. The Contractor shall allow 10 days from receipt by the Project Manager for review and approval or rejection.

3. For each material re-submittal required, the Contractor shall allow an additional 7 days from date of receipt by the Project Manager for review and approval or rejection.

4. Repeated resubmittals resulting from "Rejected" or "Incomplete" submittals shall not be grounds for a contract time extension.

5. Lack of response by the Project Manager does not constitute approval.

G. The Contractor shall distribute copies of approved submittals to concerned parties (i.e., suppliers, subcontractors, etc.).

H. Approval required before installation:

1. Approval of submittals must be provided by the Project Manager prior to installation of materials.

2. Materials installed without written submittal approval will be at the

Contractor's risk and may require removal at no expense to the Owner.

1.03 DEFINITIONS

A. Approved: Deemed to be acceptable for use in accomplishing the requirements of the plans and specifications, but does not extend to the means, methods, or procedures of construction (except where specific means, methods, or procedures are specifically required by the contract documents) and does not imply approval of the system or construction in which the submitted item is a part.

B. Conditionally Approved: Deemed to be acceptable for use in accomplishing the requirements of the plans and specifications if the conditions noted in the submittal approval letter are met. The approval does not extend to the means, methods, or procedures of construction (except where specific means, methods, or procedures are specifically required by the contract documents) and does not imply approval of the system or construction in which the submitted item is a part.

C. Not Approved: Not approved for the use for which it was submitted.

D. Incomplete: Information is insufficient to ascertain acceptability.

END OF SECTION

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SECTION 01 42 00
REFERENCES

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes a list of organizations, associations or appropriate agencies with jurisdiction that have references, standards, laws or regulations cited in these specifications.

B. Use latest revision of all references, standards, laws or regulations.

1.02 LIST OF ORGANIZATIONS, ASSOCIATIONS & AGENCIES

A. National Standards Organizations & Associations

American Association of State Highway and Transportation Officials (AASHTO)
444 North Capital Street NW, Suite 249
Washington DC, 20001
(202) 624-5800
www.aashto.org

American Concrete Institute (ACI)
ACI International
PO Box 9094
Farmington Hills, Michigan 48333-9094
(810) 848-3700
www.aci-int.org

American Society for Testing and Materials (ASTM)
100 bar Harbor Drive
West Conshohocken, Pa 19428-2959
(610) 832-9585
www.astm.org

American Water Works Association (AWWA)
6666 West Quincy Avenue
Denver, CO 80235
(303) 794-7711
www.awwa.org

National Electric Code (NEC)
National Fire and Protection Association
1 Batterymarch Park
Quincy, MA 02269-9959
1 888 632-2633
www.nec.com

National Electrical Manufacturer's Association (NEMA)
1300 North 17th Street
Rosslyn, VA 22209
(703) 841-3200
www.nema.org

Underwriters' Laboratories, Inc. (UL)
333 Pfingston Road
Northbrook, IL 60062
(847) 272-8800
www.ul.com

B. Federal Agencies

Environmental Protection Agency (EPA)
U.S. EPA Region 10
1200 6th Avenue
Seattle, WA 98101
(206) 553-1200
http://www.epa.gov/region10

Occupational Safety and Health Administration (OSHA)
1111 Third Avenue, Suite 715
Seattle, Washington 98101-3212
(206) 553-5930
(206) 553-6499 FAX
www.osha.gov

Federal Highway Administration (FHWA)
1200 New Jersey Ave., SE
Washington, DC 20590
(202) 366-0660
http://www.fhwa.dot.gov/

C. State Agencies

Idaho Transportation Department
11331 W. Children Blvd.
Boise, ID 83707-1129
https://itd.idaho.gov/

PART 2 – PRODUCTS (N/A)

PART 3 – EXECUTION (N/A)

END OF SECTION

SECTION 01 43 00
QUALITY ASSURANCE

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes prerequisites and procedures to assure the quality of construction.

1.02 CONTRACTORS QUALIFICATIONS

A. Work shall be performed by a registered contractor in the state where the project is proposed and for the type of construction and magnitude of construction being performed.

1.03 INSTALLER QUALIFICATIONS

A. Work shall be performed under the direction of personnel licensed in the state where the project is proposed and where licensing of the trade is regulated by the state including, but not limited to, plumbing, well drilling, septic system installation, HVAC, and electrical work.

1.04 CONTROL OF INSTALLATION

A. Review materials for acceptability when delivered to the site.

B. Store and handle materials to prevent damage, vandalism, and theft.

C. Review materials, services, and workmanship to ensure that work is performed in accordance with the specifications.

D. Comply fully with manufacturers' instructions.

E. Should manufacturers' instructions conflict with contract documents, request clarification from Project Engineer before proceeding with any project activities.

F. Correct defective work to the satisfaction of the Project Engineer.

1.05 SAMPLES

A. When requested by the Project Engineer, supply samples of materials proposed for use.

1.06 START-UP

A. Prior to start-up, ensure that all equipment is ready for its use, as designed.

B. Ensure that all power sources are balanced and ready for use.

C. Provide the services of manufacturers' field representative for start-up, testing, and adjustment of all major equipment items.

D. Provide reports from the manufacturer, including their observations and documentation of workmanship to the Project Engineer within 30 days of manufacturer's visit, unless a sooner response is required by the applicable specification section.

E. Work will not be considered complete until all systems and subsystems have been tested for proper functionality and proper adjustment.

1.07 MANUFACTURER'S FIELD SERVICES

A. Provide reports on observations and documentation of workmanship to the Project Engineer and Project Manager within 30 days of visit for review where manufacturers' field services are provided.

1.08 WARRANTY

A. Provide a minimum one (1) year warranty for all materials and labor, covering defects in the materials or deficiencies resulting from contractor installation.

B. Provide additional warranties as required by specific sections.

END OF SECTION

SECTION 01 56 00
TEMPORARY BARRIERS AND ENCLOSURES

PART 1 – GENERAL

1.01 SUMMARY

A. The work of this section consists of furnishing, installing, and maintaining barriers to protect existing facilities and the public from construction operations

1.02 SUBMITTAL

A. Barrier Plan

PART 2 – PRODUCTS

2.01 GENERAL

A. Material may be new or used, but shall be suitable for intended purpose. Fences and barriers shall be structurally adequate and neat in appearance.

2.02 FENCING

A. Security Fence: Use around staging area and stock pile area. Chain link, 2-inch mesh, minimum height, 6 feet. Posts shall have portable bases and shall not be installed in the ground.

B. Safety Barrier Fence: Use around all other improvement areas unless otherwise directed by the Project Engineer. Orange plastic fence, minimum height, 4 feet.

2.03 BARRICADES AND SIGNS

A. Refer to Uniform Traffic Control Devices (MUTCD) manual, Part VI, 2009 edition.

2.04 LUMBER

A. Free of nails, large knot holes and splinters.

2.05 BARRIER TAPE

A. Banner Guard, imprinted with "DANGER", manufactured by Reef Industries, Inc., Houston, Texas, or equal.

PART – 3 EXECUTION

3.01 PROTECTION OF PUBLIC

A. Fence, barricade, or otherwise block off the immediate work area to prevent unauthorized entry.

B. Protect pedestrian traffic by barricades or fences.

C. When pedestrian traffic is detoured around construction site, provide temporary walkways with protection as required at ends. For walkways, use lumber running parallel to direction of traffic movement and provide ramps at changes of elevation.

D. Cover pipes, hoses, and power lines crossing sidewalks and walkways with troughs using beveled edge boards.

E. Erect and maintain sufficient detour signs at road closures and along detour routes.

3.02 SECURITY FENCES

A. Before starting work, install all security fence and barriers.

B. Locate vehicular gates to avoid interference with traffic on public thoroughfares.

C. Locate pedestrian entrance gates as required to provide controlled personnel entry.

D. Chain link fence may be installed (Contractors option) in the following locations:

1. Use around staging area and stock pile area.

E. 4-feet Safety Barrier fence shall be installed in the following locations:

1. Areas of the work site as contractor deems necessary for safety and protection of work area.

3.03 BARRIER TAPE

A. Install where directed by Project Engineer. Keep a minimum of two rolls on site at all times.

3.04 REMOVAL

A. Completely remove barriers no longer needed when approved by Project Engineer.

END OF SECTION

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SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This section outlines the contractor's responsibilities for product selection and storage of materials once on site.

1.02 RELATED WORK

A. Section 013300 – Submittal Procedure
B. Section 014300 – Quality Assurance

1.03 BASIC PRODUCT REQUIREMENTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the work. Does not include machinery and equipment used for preparation, fabrication, conveying, and erection of the work. Products may also include existing materials or components required for reuse.

B. Only new products shall be incorporated in the work. Do not use materials and equipment removed from existing premises, except as specifically permitted by the specifications. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Project Engineer and Tribal Representative.

C. Provide interchangeable components of the same manufacturer, for similar components.

D. All products shall be of American manufacture.

E. Standard Products: Where available, provide standard products of types that have been produced and used successfully in other installations

1.04 PRODUCT OPTIONS

A. Products Specified by Reference Standards or Description Only:

1. Provide any product meeting the standards or description.

B. Closed Proprietary Product Specifications:

1. Provide products of manufacturers named, no options or substitutions allowed.

C. Open Proprietary Product Specifications:

1. Substitutions must be approved by the Project Engineer.

2. Request procedures for substitution approval are described in Section 013300 – Submittal Procedure.

3. Products for which substitutions for approval will be considered are as follows:

a. Specified manufacturer's make and model preceded by the words "equal to", or followed by the words "or equal".

D. Performance Specifications:

1. Where specifications require compliance with performance requirements, provide products that meet the described performance and are recommended by the manufacturer for the intended application.

E. No substitutions shall be ordered, installed, or utilized without prior written approval of the Project Engineer.

1.05 SUBSTITUTED PRODUCTS

A. A request for approval of a substituted product constitutes a representation that the Contractor:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.

2. Will provide the same warranty for the substitution as for the specified product.

3. Will coordinate installation and make any and all changes to other work which may be required to facilitate installation of the substitute, with no additional cost to Owner.

4. Waives claims for additional costs or time extension which may subsequently become apparent.

B. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written

request, or when acceptance will require revision to the Contract Documents.

1.06 OWNER FURNISHED PRODUCTS

A. There are no Owner furnished products, unless specifically called out in the specifications or drawings as provided by “others”.

1.07 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.08 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible.

1. Store sensitive products in weather-tight, climate-controlled enclosures.

B. For exterior storage of fabricated products, place on sloped supports, above ground.

C. Provide off-site storage and protection when site does not permit onsite storage or protection.

D. Cover products subject to deterioration with impervious sheet covering.

1. Provide ventilation to avoid condensation.

E. Store loose granular materials on solid flat surfaces in a well-drained area.

1. Prevent mixing with foreign matter.

F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

G. Arrange storage of products to permit access for inspection.

1. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes information on closeout procedures and final cleaning.

1.02 CLOSEOUT PROCEDURES

A. Substantial Completion Process:

1. Provide the Project Engineer certification that preliminary punch list is complete and that facilities are ready for beneficial use by the Owner.

2. If the Project Engineer concurs, the Project Engineer will document a warranty date for substantially complete facilities.

B. Final Inspection:

1. Submit written certification that work is complete in accordance with contract documents and ready for final inspection at least ten (10) calendar days prior to final inspection.

2. Perform and coordinate the final inspection with the engineer, representatives of the owner and other funding partners (i.e. funding agencies) involved in the project.

3. Final Punch List: Remaining deficiencies will be listed, in a written letter, from the Project Engineer.

4. Provide warranties and record documents (e.g. as-built drawings) to Project Engineer within ten (10) days of final inspection.

C. Final Completion: Final completion will be established once the final punch list deficiencies are remedied and applicable General and Contracting Requirements are met.

1.03 FINAL CLEANING

A. Complete final clean-up prior to final inspection.

B. Remove waste and surplus materials, rubbish, and construction facilities from the site.

END OF SECTION

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SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. This section describes the requirements for closeout submittals including, record drawings, warranty information and general operation and maintenance information.

1.02 RELATED WORK

A. Section 01 43 00 – Quality Assurance

1.03 DELIVERY

A. Provide all closeout submittals meeting these requirements and any specific requirements of each section.

B. All closeout submittals must be received in a correct and complete manner before final payment shall be made.

1.04 DEFINITIONS

A. Record Drawing: A drawing showing the actual installation of facilities, showing changes from the plans, and showing detail enough that future persons can readily locate all objects.

B. Ties: Measurements from permanent easily located objects to an installed object.

PART 2 – PRODUCTS (N/A)

PART 3 - EXECUTION

3.01 RECORD DRAWINGS

A. Provide record data in one of the following manners:

1. On a set of project drawings, neatly draw tie measurements and changes.

2. On separate 8½ X 11 sheets, neatly draw site sketches, structure sketches, etc., indicating the necessary information.

B. Provide three (3) swing tie measurements from permanent structures to all buried utility objects installed under the contract that may need to be located in the future, including, but not limited to:

1. Gate valves
2. Corporation stops
3. Curb stops
4. Water main fittings
5. Couplings to existing water systems.
6. Cleanouts
7. Sewer wyes.
8. Utility crossings.
9. Septic tank manholes and access covers.
10. Corners of drainfields

C. Provide offset measurements for buried utilities (e.g. water main) installed parallel to roads.

D. Provide revised elevation data for all items that have elevations shown on the plan drawings, including, but not limited to, the following:

1. Manhole inverts (inlet and outlet)
2. Manhole rims
3. Lift station invert
4. Lift station top
5. Lift station pipe penetrations
6. Float elevations
7. Septic tank elevations
8. Elevations of pipe entering and leaving structures

3.02 WARRANTIES

A. Submit all warranty information regarding the materials installed.

B. Minimum warranty information is listed in Section 01 43 00 – Quality Assurance. Specific warranties may be required for each Section of specifications.

3.03 OPERATION AND MAINTENANCE INFORMATION

A. Submit all operation and maintenance information as included in the packaging from the manufacturer regarding the materials installed.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes provisions for non-structural cast-in-place concrete.

1.02 REFERENCES (as applicable)

A. ASTM C33 – Standard Specification for Concrete Aggregates.
B. ASTM C94 – Standard Specification for Ready Mix Concrete.
C. ASTM C150 – Standard Specification for Portland Cement.
D. ASTM A185 – Welded Steel Wire Fabric, Plain for Concrete Reinforcement
E. ASTM A615 – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

1.03 QUALITY ASSURANCE

A. Obtain cement and aggregate from the same source for all work.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Portland Cement Type – IA, Air Entrained.

B. Aggregates: ASTM C33.

1. Fine Aggregates:

a. Fine aggregates shall be clean, hard, tough, water sound and free of deleterious substances.

b. One hundred percent passing 3/8-inch sieve.

c. At least fifty percent passing No. 16 sieve.

2. Coarse Aggregates

a. Coarse aggregates shall be clean, hard, tough, water sound and free of deleterious substances.

b. Maximum aggregate size for reinforced concrete shall not be larger than 1/5 of the narrowest dimension between forms, nor larger than

3/4 of the minimum clear spacing between reinforcing bars or between bars and forms.

c. Maximum aggregate size for unreinforced slabs shall not be larger than 1/3 the slab thickness or 2 inches, whichever is smaller.

C. Mixing Water

1. Use potable water unless approved by Project Engineer.

D. Material Storage

1. Store materials in such a manner as to prevent deterioration or intrusion of foreign matter.

2.02 METAL REINFORCEMENT

A. Rebar: Conforming to ASTM A615

B. Welded Wire Fabric: Conform to ASTM A185

PART 3 - EXECUTION

3.01 PLACING CONCRETE

A. Concrete shall not be placed when atmospheric temperature is below 40 degrees Fahrenheit unless authorized in writing by the Project Engineer.

B. Forms shall conform to shapes, lines and dimensions of members as called for on the plans and shall be sufficiently tight to prevent leakage of mortar.

1. Properly brace and tie forms together to maintain position and shape and prevent leakage.

C. Remove water from place of deposit before concrete is placed.

D. Moisten subgrade at the time the concrete is deposited.

E. For job mixed concrete, rotate the mix at the speed recommended by the manufacturer in a clean batch machine. Mix the materials until they are uniformly distributed.

F. Deliver and mix Ready-Mixed Concrete in accordance with ASTM C94.

G. Access to the mixing plant shall be provided to the Project Engineer.

H. Tickets indicating time of adding initial mixing water may be required by the Project Engineer.

I. Place concrete in one continuous operation, once placing is started.

J. Remove supporting forms and shoring after members have acquired sufficient strength to support their weight and imposed loads safely.

K. If concrete placement is authorized for atmospheric temperatures at or below 40 degrees Fahrenheit, concrete temperature shall not be less than 45 degrees Fahrenheit at the time of placement.

1. Heating procedures that alter or prevent the entrainment of the required amount of air in the concrete will not be permitted.

2. Do not heat aggregates and water used for mixing to a temperature exceeding 120 degrees Fahrenheit.

L. Air temperatures surrounding concrete shall be maintained at a temperature of not less than 45 degrees Fahrenheit, nor more than 70 degrees Fahrenheit, for a period of four days.

1. Following the four-day period, the concrete shall be protected from air temperatures below 35 degrees Fahrenheit, for an additional four-day period.

M. Chemical or other foreign material shall not be added to the concrete.

3.02 FIELD QUALITY CONTROL

A. Concrete shall have a compressive strength of 3,000 psi at 28 days.

B. The Project Engineer may require slump and compression tests.

END OF SECTION

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SECTION 31 11 00
CLEARING AND GRUBBING

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers clearing and grubbing within the proposed areas of construction.

PART 2 – PRODUCTS (N/A)

PART 3 – EXECUTION

3.01 CLEARING AND GRUBBING

A. Obtain necessary permit from Tribe prior to cutting any trees or brush (if applicable.)

B. Remove and dispose of all trees, stumps, brush, debris, and all other obstructions as needed to complete construction as specified.

   1. A tree is defined as a large, tall, woody, perennial plant with a single, unbranched, erect, self-supporting stem holding an elevated and distinct crown of branches, which can grow greater than 10 feet in height and greater than 3 inches in diameter.

C. If possible, within right-of-way and property lines, extend clearing and grubbing a minimum of 10 feet beyond all proposed structures unless otherwise directed by the project engineer.

D. The contractor shall haul the grubbed material away from the site.

   1. The contractor shall not burn, bury, and/or leave materials in construction areas unless approved by the Tribe.

E. Grub deep enough to remove all stumps, roots, buried logs, and other vegetative material.

F. Old growth stumps may be encountered within clearing and grubbing area. No additional payment will be made for clearing, grubbing, and removal of old growth stumps.

3.02 DISPOSAL METHODS

A. Disposal Method #2: The Contractor may elect to haul woody vegetative material to a waste site obtained by the Contractor or at a site explicitly identified by the Contract Documents.

B. Disposal Method #3: Chipping

1. Chip into pieces no larger than 6-square inches and ½" thickness.

2. Spread chipped wood evenly across the site.

END OF SECTION

SECTION 31 22 00
GRADING

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes rough and finished site grading of all areas disturbed during construction.

1.02 RELATED WORK

A. Section 32 92 19 – Seeding

PART 2 – PRODUCTS (N/A)

PART 3 – EXECUTION

3.01 ROUGH GRADING

A. Grade the area in the vicinity of the excavation to prevent surface water from flowing into the excavation.

B. Maintain existing drainage.

3.02 FINISH GRADING

A. Grade site to true grades as specified on the plans after all structures and piping have been installed.

B. Grade sites for effective drainage away from structures.

C. Dress and trim all slopes.

D. Round off the tops of slopes and toes of slopes.

E. Place topsoil on all disturbed areas and reseed or sod as soon as possible in accordance with Section 32 92 19 – Seeding.

END OF SECTION

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SECTION 31 23 00
EXCAVATION AND FILL

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes excavation, trenching and backfill necessary for the construction of the facilities as indicated on the plans including, but not limited to: water mains and service lines, sewer mains and service lines, concrete manholes, septic tanks, and other structures.

1.02 RELATED WORK (as applicable)

A. Section 01 78 00 – Closeout Submittals
B. Section 31 22 00 – Grading
C. Section 31 23 16 – Rock Excavation
D. Section 34 05 13 – Common Work Results for Roadways

1.03 REFERENCES

A. Manual on Uniform Traffic Control Devices.

B. ASTM D2321 – Underground installation of Flexible Thermoplastic Sewer Pipe.

C. ASTM D2487 – Classification of Soils for Engineering Purposes [Unified Soil Classification System].

D. Idaho Transportation Department Roadway Design Manual

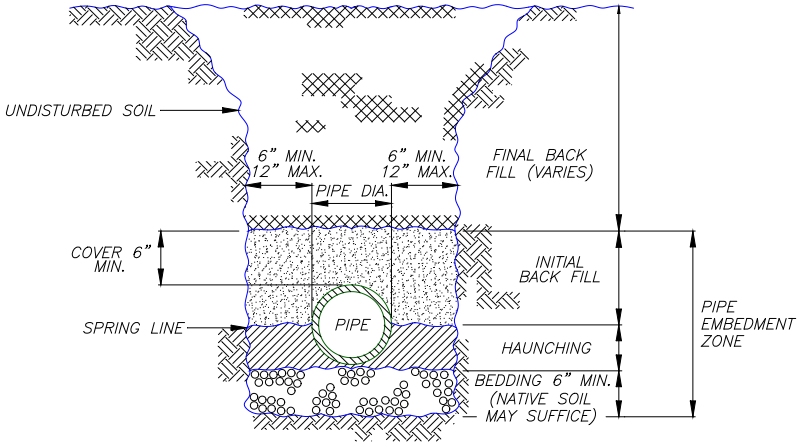
1.04 SUBMITTALS

A. When requested by the Project Engineer, submit the result of standard proctors, including proctor curve, for each soil type encountered and used on the job.

B. Polystyrene Insulation

1.05 DEFINITIONS

A. Bedding, Haunching, and Initial Backfill zones as defined herein and on the standard thermoplastic pipe trench detailed drawing below.



THERMOPLASTIC PIPE TRENCH DETAIL

B. Soil Materials as summarized in the table below and defined in ASTM D2321 and ASTM D2487

Description and Comparison of Soil Material Classifications

ASTM D2321		*ASTM D2487*	
Class	*Type*	*USCS Group Symbol*	*Description*
IA	Manufactured aggregates: ¼ to 1 ½ inch open graded, clean.	* *None*	Closest to "Poorly graded gravel (GP)"
IB	Manufactured aggregates: ¼ to 1 ½ inch dense graded, clean.	* *None*	Closest to "Poorly graded gravel with sand (GP)"
II	Coarse sands and gravels with maximum particle size of 1 ½ inch, clean.	GW	Well-graded gravels and gravel-sand mixtures; little or no fines.
		GP	Poorly graded gravels and gravel sand mixtures; little or no fines.
		SW	Well-graded sands and gravelly sands; little or no fines.
		SP	Poorly graded sands and gravelly sands; little or no fines
	Coarse sands and gravels with maximum particle size of 1 ½ inch, borderline clean.	GW-GC SP-SM Etc.	Sands and gravels which are borderline between clean and with fines
III	Fine sand and clayey gravels.	GM	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravels, gravel-sand-clay mixtures
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
IV	Fine grained soils (inorganic)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity.

		CL	Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays.
		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
V	Organic soils	OL	Organic silts and organic silty clays of low plasticity.
		OH	Organic clays of medium to high plasticity, organic silts.
		PT	Peat and other high organic soils.

* USCS system is limited to naturally occurring soils. Manufactured aggregates not covered.

1.06 QUALITY ASSURANCE

A. Compaction testing qualifications: Tests must be performed by a firm or professional regularly engaged in soil testing for engineering purposes. The individual on site shall be certified to operate nuclear density equipment.

B. Locations: Provide compaction test results to Project Engineer.

PART 2 – PRODUCTS

2.01 BEDDING, HAUNCHING AND INITIAL BACKFILL MATERIAL

A. Class I, Class II or Class III, utilized in accordance with restrictions described in Part 3 – Execution.

2.02 FINAL BACKFILL MATERIAL

A. General:

1. Free from soil chunks larger than 4-inches in dimension

2. Free from stones or rocks larger than 4-inches in dimension

3. Free from organic materials

4. Free from frost chunks

B. Imported final backfill for wet conditions:

1. Types GW, GP, SW, SP (coarse grained soils with less than 5% fines) or GW-GC/GM, GP-GC/GM, SW-SC/SM, SP-SC/SM (coarse grained soils with 5-12% fines)

2. Otherwise meeting the general requirements of Article 2.02, Paragraph A.

PART 3 - EXECUTION

3.01 GENERAL

A. Trenching and excavation work shall be done in accordance with proper emphasis on safety as determined by the contractor to conform to recommended safety standards such as OSHA 1910 and 1926.

B. Obtain all permits from appropriate road agency for construction within road right of way.

C. Repair damage resulting from settlement, slides, cave-ins, water pressure, and other causes.

D. Provide adequate signs, barricades, fences and amber lights and take all necessary precautions to protect the work and the safety of the public in all construction areas.

1. Placement of construction signs and barricades shall conform to the “Manual on Uniform Traffic Control Devices.”

2. Protect barricades and obstructions at night by amber signal lights that burn from sunset to sunrise. Barriers shall also be of substantial construction, painted white or with reflective paint to increase their visibility at night.

3. Perform work without obstruction to traffic or inconvenience to the general public and the residents in the vicinity of the work.

E. Road Crossing

1. Comply with all construction and material requirements of roadway authorities having jurisdiction.

2. Maintain one lane of traffic open at all times.

3. Refer to Section 34 0513 – Common Work Results for Roadways for backfill and restoration requirements.

3.02 EXCAVATION

A. Remove trees and stumps from excavation and site.

B. Remove and stockpile existing topsoil.

C. Install facilities as staked unless otherwise approved by Project Engineer.

D. Maintain surface drainage away from trenching or excavation.

E. Remove unsuitable foundation materials from excavation as shown on the plans or as authorized by the Project Engineer.

F. Maintain a minimum 1-foot clearance between outer surface of structure being installed and wall of excavation.

G. Rock encountered shall be classified, excavated and measured as shown on the plans or as authorized by the Project Engineer.

3.03 TRENCHING

A. Bottom width: No less than 12 inches or more than 24 inches wider than the outside diameter of the pipe.

B. Depth: Provide minimum cover as specified, or depths shown on plans.

C. Length of open trench:

1. Unless authorized by the Project Engineer in writing, the length of trench excavation in advance of pipe being laid shall not exceed 200-feet during active construction

2. All trenches must be backfilled during non-work hours, or alternately, up to 20-feet of trench can be left open during non-work hours if the trench is completely barricaded and fenced and approved by the Project Engineer.

3. If open trenches in excess of this specification result in the wetting of moisture-sensitive stockpiled materials, such that the moisture content makes it impossible to meet compaction requirements, the Contractor shall provide imported material that complies with these specifications and haul away the wet materials at no expense to the project.

3.04 BEDDING

A. If existing soil cannot provide uniform, stable bearing support, over-excavate 6 inches below bottom of pipe or structure and provide bedding material.

C. Utilize Class I, II or III materials as appropriate for bedding as listed in Table below.

Use of Soils and Aggregate for Bedding

	Class IA	*Class IB*	*Class II*	*Class III*
General	Excellent pipe support. Excellent drainage.	Excellent pipe support. Good drainage. Minimizes migration of adjacent material.	Good pipe support. Fair drainage.	Reasonable pipe support. Poor drainage
Compaction	Not required	Not required	Required 90% of Standard Proctor.	Required 90% of Standard Proctor.
Wet Conditions (below current or future water table). Rock Cuts	Acceptable. Must use same material for Haunching.	Acceptable. Must use same material for Haunching.	Acceptable. Clean groups only suitable for drainage blanket.	Not- Acceptable
Dry Conditions	Acceptable	Acceptable	Acceptable	Acceptable

3.05 HAUNCHING AND INITIAL BACKFILL

A. General

1. Provide complete and uniform bearing and support for the pipe, including allowance for bell holes, or structure.

2. Work material under and around the pipe to ensure full pipe support.

3. Prevent movement of the pipe during placement of material.

4. Avoid contact between the pipe and mechanical compaction equipment.

B. Utilize Class I, II or III materials as appropriate for haunching and initial backfill as listed in Table below. No frozen materials or frozen clods.

Use of Soils and Aggregate for Haunching and Initial Backfill

	Class IA	*Class IB*	*Class II*	*Class III*
General	Excellent pipe support. Excellent drainage. Install to a minimum of 6" above the pipe crown.	Excellent pipe support. Good drainage. Minimizes migration of adjacent material. Install to a minimum of 6" above the pipe crown.	Good pipe support. Fair drainage. Install and compact to a minimum of 6" above the pipe crown.	Reasonable pipe support. Poor drainage. Install and compact to a minimum of 6" above the pipe crown.
Compaction	Not required	Not required	Required 85% of Standard Proctor. 6 inch maximum lifts.	Required 90% of Standard Proctor. 6 inch maximum lifts.
Wet Conditions (below current or future water table). Rock Cuts	Acceptable. Must use same material for Bedding. Extend Haunching to the top crown of the pipe.	Acceptable. Must use same material for Bedding. Extend Haunching to the top crown of the pipe.	Acceptable. Clean groups only suitable for drainage.	Not- Acceptable
Dry Conditions	Acceptable	Acceptable	Acceptable	Acceptable

3.06 FINAL BACKFILL

A. Backfill remainder of excavation with native material, free from large clods, large stones, organic material or frost chunks.

B. Compact in 12-inch lifts to a density not less than the density of the surrounding undisturbed soil.

   1. Compact with a mechanical tamper to a density not less than 90% of the maximum dry density, determined by ASTM D 698.

   2. Provide 4 feet minimum cover over the top of the pipe before utilization of hydro-hammer compaction equipment.

   3. Provide 3 feet minimum of backfill over the pipe before wheel loading the trench.

C. Conform to Section 34 05 13 – Common Work results for Roadways for backfill requirements under roadways.

D. Backfill and compact around manholes, valve boxes, and other appurtenances in 12-inch lifts.

   1. Compact with a mechanical tamper to a density not less than 90% of the maximum dry density, determined by ASTM D 698.

E. Backfill around septic tanks in 18-inch lifts.

   1. Compact in a manner that will not produce undue strain on the tank.

   2. Compaction may be accomplished with the use of water, provided the material is thoroughly wetted from the bottom up, and the tank is filled with water to prevent floating.

F. Repair any trenches improperly backfilled or where settlement occurs, then refill and compact.

G. Restore surface to the required grade and compaction. Conform to Section 31 22 00 – Grading for rough grading, finish grading and site surface drainage.

H. Remove all surplus backfill materials to a location approved by the Engineer.

I. Place insulation in areas where water main, water service lines, or sewer service lines cross a road, driveway, or traveled path, as indicated on the plans or as directed by the Project Engineer.

J. Center insulation over the pipe with no more than 6 inches of compacted fill between the pipe and the insulation. Grade fill so insulation lays flat.

K. Maintain a straight alignment of insulation.

L. Extend insulation a minimum of 5 feet on each side of the crossing.

M. Lap insulation by 6 inches or stagger by 6 inches if composed of two layers.

N. Minimum thickness for the first lift of backfill over the insulation is 8 inches.

1. Do not operate construction equipment directly on insulation. Do not compact first lift with backhoe-mounted compactor, or any other large compaction equipment.

2. Compact remaining backfill using normal construction practices.

3.07 REMOVAL OF NUISANCE WATER

A. Remove nuisance water entering the trenches. Nuisance water that can be removed through the use of sump or trash pumps is not considered dewatering.

B. Keep trenches free from water until the facilities are in place, sealed against the entrance of water, and backfill has been placed and compacted above the water level.

3.08 LOCATE EXISTING UTILITIES

A. Field locate all existing underground utilities.

1. Utilize state “dig-safe” or “one-call” or 811 hotlines.

2. Contact all other utility owners not covered by the state “dig safe” hotlines.

3.09 UTILITY CONFLICTS

A. Protect existing utilities from damage during excavation and backfilling operations.

B. Provide temporary support for existing water, gas, telephone, power, or other utility services that cross the trench until backfilling of trench is complete

1. Compact backfill to 95% of Standard Proctor Density under disturbed utilities.

2. Repair or replace any damaged existing utilities, at no additional cost to the project.

C. Water and sewer main crossing and parallel installation

1. Maintain a 10 foot horizontal separation (O.D. to O.D.) for parallel mains.

2. Upon approval by the Engineer, water and sewer mains may be installed closer than 10 feet, provided all of the following conditions;

   a. Vertical separation is 18 inches (O.D. to O.D.)

   b. Water main is above the sewer main.

   c. Separate trenches are maintained.

3. Maintain a minimum 18-inch vertical separation (O.D. to O.D.) for crossing mains.

   a. Lay pipe with joints equidistant from the point of crossing.

4. If it is impossible to meet any of the above separation distances and deviations, one of the following methods shall be adhered to.

   a. Sewer main shall be constructed to water main pressure pipe standards, and successfully pass a 150-psi pressure test prior to backfilling.

   b. Either the water main or the sewer main may be encased in a watertight carrier pipe that extends 10 feet on both sides of the crossing. The carrier pipe shall be of materials approved by the regulatory agency for use in water main construction.

D. Water and sewer service crossing and parallel installation.

1. Maintain a 30-inch horizontal separation from water and sewer services.

2. Maintain a 12-inch vertical separation for crossing water and sewer services.

3. Water service line splices or joints will not be permitted within 10 feet of a sewer line crossing.

3.10 MOVING FENCES AND MINOR STRUCTURES

A. Remove and reset culverts, drainage pipes or other minor structures that fall within the alignment of the new construction, to their original location and grade.

A. Visit the project site and determine actual conditions with regard to the existence of old car bodies, abandoned houses, fences, driveways, trees, stumps, brush, sidewalks, approaches, and other miscellaneous obstacles to construction.

1. Unless specifically referenced in a bid item, no separate payment will be made for the removal or replacement of these items.

3.11 RECORDS

A. Conform to as-built requirements in Section 01 78 00 – Closeout Submittals.

END OF SECTION

SECTION 31 25 00
EROSION AND SEDIMENTATION CONTROLS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Requirements for prevention of environmental pollution and damage as the result of construction operations under this Contract.

1.02 REFERENCES

A. Environmental Protection Agency - 1987 Congressional Amendments, Clean Water Act, Section 402.

B. Idaho Transportation Department Standard Specifications for Highway Construction – most recent edition

1.03 QUALITY ASSURANCE

A. Erosion control materials, methods, and practices shall conform to the applicable state agency handbooks of Best Management Practices, and Tribal laws established for the purpose of erosion control on construction sites.

1.04 SUBMITTALS

A. Silt fence material, (or alternate erosion control material proposed).

B. Erosion Control Plan (If requested by the Project Engineer or required by law).

PART 2 – PRODUCTS

2.01 POSTS

A. Refer most recent edition of the Idaho Transportation Department Standard Specifications for Highway Construction.

2.02 SILT FENCING

A. Refer most recent edition of the Idaho Transportation Department Standard Specifications for Highway Construction.

2.03 EROSION FIBER LOGS

A. Refer most recent edition of the Idaho Transportation Department Standard Specifications for Highway Construction.

2.04 GEOTEXTILE FABRIC

A. Refer most recent edition of the Idaho Transportation Department Standard Specifications for Highway Construction.

2.05 AGGREGATE FOR STABILIZATION

A. Refer most recent edition of the Idaho Transportation Department Standard Specifications for Highway Construction.

2.06 QUARRY SPALLS

A. Refer most recent edition of the Idaho Transportation Department Standard Specifications for Highway Construction.

PART 3 – EXECUTION

3.01 GENERAL

A. Coordinate temporary and permanent erosion control measures to ensure economical, effective, and continuous erosion control.

B. Keep construction areas small.

C. Divert drainage away from construction areas.

D. Prevent discharge or deposition of soil materials into surface waters.

E. Inspect and maintain temporary erosion control materials to ensure its continued effectiveness.

1. Remove sediment material captured by erosion control systems before the systems fail.

2. Inspect and repair erosion control systems following rain events.

F. Remove erosion control only after the area has stabilized and vegetation has developed to the extent that further erosion is unlikely.

G. Submit an erosion control plan in accordance with local requirements, State BMP's, and Federal EPA requirements, if the area to be disturbed is greater than 5 acres total.

3.02 TEMPORARY EROSION CONTROL

A. Refer most recent edition of the Idaho Transportation Department Standard Specifications for Highway Construction.

3.03 PERMANENT EROSION CONTROL

A. Refer most recent edition of the Idaho Transportation Department Standard Specifications for Highway Construction.

END OF SECTION

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SECTION 32 92 19
SEEDING

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes topsoiling, seeding, fertilizing, and mulching areas disturbed by construction activities.

1.02 REFERENCES

A. Idaho Transportation Department Roadway Design Manual.

1.03 SUBMITTALS

A. Topsoil

B. Seed Mixture and Application Rate Data

C. Fertilizer and Application Rate

D. Mulching Material and Application Rate

E. Hydro-seeding Equipment (if used)

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Natural loam, sandy loam, silt loam, silty clay loam, or clay loam humus-bearing soils adapted to the sustenance of plant life.

B. Neither excessively acid nor excessively alkaline.

2.02 FERTILIZER

A. Use State approved fertilizer or other as approved by the Project Engineer.

2.03 SEED MIXTURE

A. Use State approved seed mixture or other as approved by the Project Engineer.

2.04 MULCHING MATERIAL

A. Straw or hay

PART 3 - EXECUTION

3.01 TOPSOIL

A. After grading is completed, spread stockpiled topsoil over all disturbed areas, excluding those where another type of finished surface is being provided.

3.02 FERTILIZING

A. Work soil to be seeded until soil is reasonably even and loose.

B. Fertilize all topsoiled areas using appropriate fertilizer and application rates.

3.03 SEEDING

A. Sow seed using either equipment suited to that purpose or scatter seed uniformly over area with hand seeders when the weather is sufficiently quiet to prevent seeds from blowing away.

B. Lightly rake soil to cover the seed with approximately ¼ inch of soil.

3.04 MULCHING

A. Place hay or straw mulching on seeded area loose enough to allow some sunlight to penetrate and air to circulate but thick enough to shade the ground, conserve soil moisture, and prevent/reduce erosion.

B. Do not perform mulching activities during periods of excessively high winds, which would preclude the proper placing of the mulch.

C. Apply straw or hay uniformly over the disturbed area to a loose depth of ½ to 1½ inches using 1½ to 3 tons of mulch per acre.

D. Immediately after spreading, anchor mulch using a mulch tiller consisting of a series of dull flat discs with notched edges or other approved equipment.

E. Anchor mulch to a depth of approximately 1½ to 2½ inches in the soil.

3.05 HYDROSEEDING

A. Apply seed, fertilizer, and mulch on disturbed areas as soon as construction is complete.

B. Apply using equipment suited for hydro-seed application.

END OF SECTION

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SECTION 33 14 00
WATER UTILITY TRANSMISSION AND DISTRIBUTION

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes the installation of water mains, valves, hydrants, and other appurtenant structures for community water systems.

1.02 RELATED WORK

A. Section 31 23 00 – Excavation and Fill

1.03 REFERENCES

A. ANSI/AWWA C104/A21.4 – Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water
B. ANSI/AWWA C110/A21.10 – Ductile Iron and Gray Iron Fittings, 3 Inch Through 48 Inch, for Water and Other Liquids
C. ANSI/AWWA C111/A21.11 – Rubber-Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
D. ANSI/AWWA C150/A21.50 – Thickness Design of Ductile Iron Pipe
E. ANSI/AWWA C151/A21.51 – Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids
F. ANSI/AWWA C153/A21.53 – Ductile Iron Compact Fittings, 3 Inch Through 16 Inch, for Water and Other Liquids
G. ANSI/AWWA C502 – Dry Barrel Fire Hydrants
H. ANSI/AWWA C509 – Resilient Seat Gate Valves for Water and Sewerage Systems
I. ANSI/AWWA C515 – Reduced Wall, Resilient Seated Gate Valve for Water Supply Service
J. ANSI/AWWA C600 – Installation of Ductile Iron Water Main and Their Appurtenances
K. ANSI/AWWA C605 – Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
L. ANSI/AWWA C651 – Disinfecting Water Mains
M. ANSI/AWWA C900 – Polyvinyl Chloride (PVC) Pressure Pipe, 4 Inch Through 12 Inch, for Water Distribution
N. ASTM D 3139 – Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
O. ASTM F 477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
P. Plastics Pipe Institute, Incorporated – Handbook of Polyethylene Pipe
Q. Standard Methods for Examination of Water and Wastewater
R. Idaho Transportation Department Standard Specifications for Highway Construction, most recent edition

1.04 SUBMITTALS

A. Water Main and Fittings

B. PE Pipe: Pipe Butt Fusing Equipment

C. PE Pipe: Transmission Main Couplings

D. Special Anchoring Retainer Glands

E. Gate Valves and Boxes

F. Fire Hydrant, Flush Hydrant, and Yard Hydrant

G. Warning Tape

H. Marker Post and Tracing Wire Station, Box, and Splice Materials

I. Method of Disinfection

J. Water Testing Lab

K. Method of Connection to Existing Distribution System

1.05 DEFINITIONS

A. Fully Restrained: A fully restrained joint shall have the same working pressure rating as the pipe itself; furthermore, the pipe is as likely to fail as the joint is under extreme conditions.

1.06 ACCEPTANCE

A. Work covered by this section will not be accepted until the backfilling and testing connected with the work has been completed satisfactorily.

B. Any section of water main that is found defective in material, alignment, or joints before acceptance shall be corrected to the satisfaction of the Project Engineer.

PART 2 – PRODUCTS

2.01 WATER DISTRIBUTION PIPE AND FITTINGS

A. Pipe size, material, and pressure rating as indicated on the bid schedule.

B. Ductile Iron Pipe

1. Conform to AWWA C151 with a thickness design in accordance with AWWA C150. Cement mortar lining in accordance with AWWA C104.

2. Pipe ends to have welded copper straps or other approved method to maintain electrical continuity throughout the length of the installed sections.

C. Polyvinyl Chloride Pipe - C900

1. Pipe: Conform to AWWA C900 (pressure class)

2. Joints: Conform to ASTM D 3139 with elastomeric seals (gaskets) conforming to ASTM F477.

D. High Density Polyethylene

1. Pipe: AWWA C906, DIPS dimensions or per bid schedule.

2. Joints:

a. Butt Fused

b. Heat fusion conforming to ASTM D2657

c. Flanged with back-up rings and SAE Grade 3 bolts

d. Equal to Victaulic Style 995 with internal stainless-steel stiffener

e. Mechanical coupling with internal stainless-steel stiffener.

E. Fittings

1. Ductile Iron or C900 PVC pipe.

a. Conform to AWWA C110 and AWWA C111 for ductile and gray iron fittings.

b. Conform to AWWA C153 for ductile iron compact fittings.

c. Conform to AWWA C104 for cement mortar lining.

F. Thrust Restraint

1. Special Anchoring Retainer Glands:

a. Ductile iron: Equal to Megalugs, EBAA Iron, Inc.

b. PVC: Equal to 2000PV, EBAA Iron, Inc.

3. Joint Restraint Rodding:

a. 3/4-inch mild steel threaded rods

b. Tie bolts

c. Duc lugs

G. Joint Restraints for Push-On Joints

1. Ductile Iron: Equal to U.S. Pipe Field Lok Gasket or EBAA Iron, Series 1700

2. PVC: Equal to EBAA Iron, Series 1600

2.02 GATE VALVES

A. Meet or exceed AWWA C509 or C515.

B. Supply valves with mechanical joints unless otherwise indicated.

C. Constructed with a non-rising stem (NRS) and a 2-inch square stem-operating nut, opening counter-clockwise.

D. Provide valves equal to: Mueller A–2360–20 or Waterous (American Flow Control) Series 2500.

2.03 VALVE BOXES

A. Provide 2 piece, slip style, adjustable cast iron valve boxes equal to Tyler model 6850.

1. 5 ¼ - inch nominal diameter

2. sufficient length for depth of bury at valve

B. Provide cover with plainly marked “WATER”

C. Valve box shall be for a minimum of 3 feet of pipe cover.

2.04 VALVE MARKERS

A. Blue UV resistant resin reinforced fiberglass

1. Minimum 3.75 inches wide

2. Minimum 4 feet showing above grade

B. Reflective blue and white decal

1. Decal shall have “Caution Water Valve” on it

C. Equal to Carsonite Utility Marker CUM-375

2.05 FIRE HYDRANTS

A. Conform to AWWA C502.

B. Supply fire hydrants equipped with the following:

1. An arrow cast on the hydrant showing the direction of opening as counter clockwise.

2. Two National Standard 2 ½-inch hose nozzles and one 4 ½-inch pumper nozzle.

3. Traffic flange

4. Weep holes to allow the hydrant to drain, unless directed otherwise in Section 01 11 19 – Revisions to Standard Specifications.

5. Minimum 5 ¼-inch hydrant valve opening capable of opening against water pressure.

6. Fabricated for a standard 5 - foot pipe bury unless otherwise noted on the plans.

C. When a hydrant manufacturer and model is specified in the bid schedule or the plans, that exact unit must be supplied in order to maintain compatibility with the existing hydrants on the Owner’s system.

D. Provide hydrants as specified in the bid schedule and engineered drawings.

2.06 FLUSH HYDRANTS

A. Provide flush hydrants as specified in the bid schedule or the plans.

2.07 YARD HYDRANTS

A. Provide yard hydrants as specified in the bid schedule or the plans.

2.08 WARNING TAPE

A. Supply detectable warning tape that is a minimum of 2 inches thick, blue or striped blue, and have printing that warns of a water line below.

2.09 MARKER POST AND TRACER WIRE STATION, WIRE, AND SPLICE

A. Wire: Provide #10 AWG jacketed solid copper wire, type THHN/THWN.

B. Marker Post and Tracer Wire Station:

1. Dimensions: Min. 66-inches high by 3-1/2 inches wide

2. Equal to Rhino TriView Flex Tracing Wire Station

3. Color: Blue

4. Label: “Warning Water Pipeline”

5. External wire terminals

C. Box: Provide 4-inch Schedule 40 PVC pipe and a 4-inch PVC threaded watertight plug for each box.

1. Alternative: Engineer may request using gate valve box as tracer wire box.

D. Splice Kit: Provide underground waterproof splice materials.

2.10 WATER TESTING LAB

A. Use a state certified lab.

2.11 ACCESSORIES

A. Supply gate valve keys, valve box cover keys and hydrant wrenches only if required.

PART 3 – EXECUTION

3.01 GENERAL

A. Perform trench excavation, bedding of main and appurtenances and backfilling activities in accordance with Section 31 23 00 – Excavation and Fill.

B. Maintain separations from existing utilities in accordance with Section 31 23 00 – Excavation and Fill.

3.02 DELIVERY, STORAGE AND HANDLING

A. Ensure that pipe is free from defects and damage at time of delivery and prior to installation in the trench.

B. Remove all defective pipe from the site within 24-hours of discovery.

C. Handle pipe with padding between metal machinery and pipe.

E. Keep dirt and foreign matter away from pipe interiors and sealing surfaces.

F. Lower pipe carefully into the trench without dropping, rolling, or dumping.

3.03 WATER MAIN INSTALLATION

A. Project Engineer to provide stakes along proposed alignment.

B. Install water mains and appurtenances in the locations and of the sizes and materials shown on the drawings and bid schedule.

C. Install pipe with a minimum bury depth of 5 feet, measured from finished grade, unless otherwise noted on the plans.

D. PE Pipe Installation

1. HDPE Pipe Cold Bending:

    a. 50-feet if not near a fitting or joint.

    b. 100-feet if near a fitting or joint.

    c. Make necessary provisions to ensure that localized curvature is within the tolerances over the length of curve.

    d. For tighter curve requirements, use prefabricated HDPE fittings of the same DR and OD as the pipe.

2. Butt Fused Joints: Butt-fuse all HDPE joints, except as otherwise indicated.

    a. Strictly follow manufacturer’s recommendations.

    b. Ensure that HDPE pipes are of the same grade and dimensions.

    c. Do not remove bead unless determined necessary. If bead is removed do not remove below pipe outside diameter.

3. Victaulic Style 995 Joints:

    a. Install no more frequently than once per 500-feet unless otherwise indicated on the plans or approved by Project Engineer.

    b. Install stainless steel stiffeners inside pipe at joint.

    c. Follow manufacturer's recommendations for installation.

4. Flanged Joints:

    a. Install no more frequently than once per 500-feet unless otherwise indicated on the plans or approved by the Project Engineer.

    b. Strictly follow manufacturer's recommendations.

    c. Install flanges with gaskets.

    d. Ensure flanges are aligned properly before tightening.

    e. Torque bolts to manufacturer's recommendations.

E. Install thrust restraint on all fittings and appurtenances including in-line valves and hydrant tees. Contractors option:

1. Thrust Blocks:

    a. Pour thrust blocks against the fitting and undisturbed earth.

    b. Place concrete thrust blocks so that the pipe and joints will be accessible for repair.

    c. Install rebar around the fitting and embed rebar in concrete thrust block.

    d. Restrain joints within 20 feet of fitting or valve.

2. Special Anchoring Retainer Glands:

    a. Install in accordance with manufacturer's recommendations.

    b. All pipe joints less than 20 feet from fittings with special retainer glands shall be restrained.

    c. Project Engineer may specify additional restraint be used for pipe sections near critical fittings.

3. Joint Restraint Rodding (“Shackle rods”):

    a. Rod from hydrant tees to ears on the hydrant base elbow.

    b. Rod from fitting to fitting.

    c. Install tie bolts to connect tie rods, if required.

    d. Install duc lugs where required to increase the width of the rodding.

    e. Paint rods and hardware with two coats of bituminous coating

F. Horizontal Pipe Deflections shall meet applicable AWWA standards and manufacturer’s recommendations.

3.04 TRACING WIRE INSTALLATION

A. Install with all PVC, DI, and PE pipe.

B. Wrap tracing wire a minimum of three times around each pipe length or attach to pipe a minimum of three times per pipe length.

C. Make all splices with an underground, waterproof splice kit.

D. For installations using PVC pipe as tracing wire boxes: Provide riser boxes at maximum intervals of 1000 feet at hydrant locations.

1. Install tracing wire between each tracing wire box in each direction of pipe.

2. Bring tracing wire a minimum of 18 inches above ground surface directly behind each hydrant using Schedule 40 pipe.

3. Install box to elevation that will not interfere with operation and maintenance of the hydrant.

E. For installations using gate valve boxes as tracing wire boxes:

1. Install tracing wire between each mainline gate valve box.

2. Bring tracing wire up from the pipe along the exterior of the gate valve box.

3. Drill a hole in the gate valve box 4-6-inches below grade.

4. Insert tracing wire into the gate valve box and coil a minimum of 18 inches of tracing wire neatly in the box.

3.05 WARNING TAPE INSTALLATION

A. Install warning tape in water main trench 1 foot below grade maintaining the same depth throughout, centered over the pipe.

3.06 GATE VALVE INSTALLATION

A. Install valves at locations indicated on the plans.

B. Install suitable thrust restraints on all valves.

C. Support gate valves on a solid concrete block.

D. Set valves plumb and provide with a valve box.

E. Provide adequate support for valve box base; the base should not be resting on the gate valve or water distribution piping.

F. Center the valve box over the valve with the box cover:

1. Flush with finished grade elevation.

2. Flush with the surfaced street

3. 2-inches below the level of an unimproved street.

G. Marker Post Installation:

1. Install marker 3 feet behind valve

3.07 FIRE HYDRANT INSTALLATION

A. Install hydrant and auxiliary gate valve at the location indicated on the plans.

B. Connect auxiliary gate valve to tee using a 3-foot section of 6-inch C900 water main pipe unless otherwise indicated on the plans or approved by the Project Engineer.

C. Connect hydrant to auxiliary gate valve using a 3-foot section of 6-inch C900 water main pipe unless otherwise indicated on the plans or approved by the Project Engineer.

D. Install suitable thrust restraint on tee, valve, and hydrant.

E. Set hydrant on a solid concrete block and restrain.

F. Set hydrant with the traffic flange at an elevation of 1 to 3 inches above finished grade.

G. Stand hydrant plumb with the pumper nozzle toward the street.

H. Install suitable thrust restraint at the base of each hydrant.

    1. Do not obstruct proper operation of weep hole(s).

I. Place gravel, a minimum of 18 cubic feet per hydrant, from 18 inches below to 6 inches above the weep hole opening.

    1. Wrap gravel in geotextile per engineered drawings.

3.08 FLUSH HYDRANT INSTALLATION

A. Install hydrant and auxiliary gate valve at the location indicated on the plans, per the manufacturer's recommendations.

B. Connect auxiliary valve to tee using a 3-foot section of 4-inch C900 water main pipe unless otherwise indicated on the plans or approved by the Project Engineer.

C. Connect hydrant to auxiliary gate valve using a 3-foot section of 4-inch C900 water main pipe unless otherwise indicated on the plans or approved by the Project Engineer.

D. Install suitable thrust restraint on tee, valve, and hydrant.

E. Set hydrant on a solid concrete block and restrain.

F. Set hydrant with the traffic flange at an elevation of 1 to 3 inches above finished grade.

G. Stand hydrant plumb.

H. Install suitable thrust restraint at the base of each hydrant.

    1. Do not obstruct proper operation of weep hole(s).

3.09 YARD HYDRANT INSTALLATION

A. Install hydrant at the location indicated on the plans, per the manufacturer's instructions.

3.10 TESTING OF TRACING WIRE

A. Test tracing wire for proper functioning using a conductive/inductive type locator in the presence of the Project Engineer or their representative.

B. Repair and retest, at no extra cost to the owner, any section of tracing wire that does not function properly.

3.11 PIPELINE MARKER POST INSTALLATION

A. If the pipeline is not in a roadway or sidewalk and is in an unimproved area, install Carsonite, or equal, maker posts at 500-foot intervals along the pipeline, centered over the pipe.

B. If the pipeline is under a traveled roadway, install marker posts offset from the pipe at a consistent distance.

C. Allow 36-inches of the post to be exposed above grade.

D. Drill a 1-inch hole in the bottom of the post to embed the base of the post in 0.5-cubic feet of concrete.

E. Stencil in 1-inch black letters the water main information, including offset distance, diameter of pipe, and pipe material neatly on the post.

3.12 PRESSURE AND LEAKAGE TESTING – PVC and DI

A. Whenever practical, before backfill is fully placed or joints fully covered, test pipe for leaks.

B. Perform test in the presence of the Project Engineer or their representative.

C. Furnish necessary material, equipment, and labor for testing including, but not limited to: water, pump, water storage vessel, piping, pressure gauge, valve, hydrant, and corporation stop.

1. Pressure gauge shall be liquid filled with 5 psi or less increments.

2. Pump shall be of a design that limits introduction of air, defective equipment shall be replaced.

D. Test duration: 2 hours minimum.

E. Maximum length of test section: 1,000 feet, longer lengths may be tested up to ½ mile, but the allowable leakage shall be limited to the 1,000 feet length.

F. Testing Procedure – Test in accordance with the Hydrostatic Testing Method outlined in ANSI/AWWA C605.

1. Slowly fill test section with water having a free chlorine residual of 50 mg/L and expel air from mains.

2. Install corporation stops at high points to facilitate removal of air, if necessary.

    a. Remove corporation stops and plug prior to pressure testing.

3. Verify all hydrant lead valves and main valves within the test section are open.

4. Place test section under constant pressure.

    a. 1.5 times working pressure or 150 psi, whichever is greater.

    b. Do not exceed 115% of pipe pressure rating at the lowest point in the test section.

5. If pressure drops more than 5 psi during the test, immediately re-pressurize the line to the original test pressure and continue test.

    a. Record amount of water required to re-pressurize the line.

6. At the end of the test, re-pressurize the line to the original test pressure.

    a. Record amount of water required to re-pressurize the line.

7. Method of Water Measurement shall be provided by contractor and shall be accurate for the amount of water being measured.

8. Add total amount of water required to re-pressurize the line during and at the end of the test and compare with the allowable leakage as calculated below.

    a. If leakage is greater than allowable leakage, test fails.

G. Allowable Leakage Determination

$$L = (N*D*P^{1/2})/7400$$

L = Allowable Leakage (gph)
N = Total Length Tested Divided by
The Standard Pipe Length
D = Nominal Diameter of Pipe (inches)
P = Test Pressure (psi)

Example Allowable Leakage Chart Using Formula Above
PVC Pipe with 20-foot sections

	Allowable Leakage/ 1000 feet (gph)			
Pipe Diameter, D	P = 100 psi	P = 150 psi	P = 200 psi	P = 250 psi
4 inch	0.27	0.33	0.38	0.43
6 inch	0.41	0.50	0.57	0.64
8 inch	0.54	0.66	0.76	0.85
10 inch	0.68	0.83	0.96	1.07
12 inch	0.81	0.99	1.15	1.28

H. Repair, at no cost to owner, any section of the line that fails this test.

1. Retest all repaired sections of line, at no cost to owner, until pressure test is successfully completed.

3.13 DISINFECTION OF WATER MAIN AND FITTINGS

A. Disinfection shall conform to AWWA C651.

B. Obtain water at the site for disinfection.

C. Flushing chlorinated water in accordance with AWWA C651.

1. Waste flushed disinfection water in an environmentally safe manner. The method used is subject to the approval of the Project Engineer.

D. After disinfecting and flushing but before the water main is placed in service, collect and test water samples for bacteriological quality.

1. Sample in accordance with the Standard Methods for Examination of Water and Wastewater.
2. Take two consecutive tests, 24 hours apart.

3. Collect one sample from the new water main and one from each branch line near the end.

a. Additional samples may be required on extremely long mains.

4. Take samples to a state certified testing lab.

5. Permanent sampling taps may be required at the direction of the Project Engineer.

E. If initial disinfection fails to produce satisfactory bacteriological results, rechlorinate the mains and branch lines, flush and take new samples until satisfactory results are obtained.

1. Do not place main in service until the Project Engineer has received safe bacteriological results.

3.14 CONNECTIONS TO EXISTING DISTRIBUTION SYSTEMS

A. Shutoff of mains will not be permitted overnight, over weekends, or on federal holidays.

B. Coordinate system tie-in with the owner and/or operator of the existing utility a minimum of three working days before any connection is made.

C. Notify residents affected by the water shutoff of the time and day of shutoff a minimum of two working days in advance.

D. Start work when all the materials, equipment and labor are on site.

E. Clean all connection components with a chlorine solution prior to installation.

F. Once work on the connection has commenced, it shall proceed continuously without interruption, and as rapidly as possible until completed.

G. Visually inspect any joints not pressure tested for leakage.

1. Test under system pressure prior to backfilling

2. Test in the presence of the IHS representative.

3. Repair and retest any joint with leakage until no leakage is visible at no cost to the owner.

END OF SECTION

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SECTION 33 14 13
WATER SERVICE LINES

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes the installation of water service lines complete with corporation stops, curb stops, curb boxes, and other appurtenances for community water systems.

1.02 RELATED WORK

A. Section 01 78 00 – Closeout Submittals
B. Section 31 23 00 – Excavation and Fill
C. Section 33 14 00 – Water Utility Transmission and Distribution

1.03 REFERENCES

A. AWWA C700 – Cold-Water Meters – Displacement Type, Bronze Main Case
B. AWWA C800 – Underground Service Line Valves and Fittings
C. AWWA C901 – Polyethylene (PE) Pressure Pipe and Tubing, 1/2 Inch through 3 Inch, For Water Service.
D. ASTM B 88 – Standard Specification for Seamless Copper Water Tube.

1.04 SUBMITTALS

A. Water Service Line

B. Fittings

C. Corporation Stops

D. Curb Stops

E. Saddles, Tees or Tapped Couplings

F. Yoke Assembly

G. Meter Boxes

H. Water Meter

I. Pressure Reducing Valve

J. Tracing Wire and Splice Materials

1.05 ACCEPTANCE

A. Work covered by this section will not be accepted until satisfactory backfilling and testing is complete.

PART 2 – PRODUCTS

2.01 WATER SERVICE LINE AND APPURTENANCES

A. Polyethylene Pipe

1. CTS size pipe with a minimum pressure rating of 200 psi. Pipe shall conform to AWWA C901.

2. CTS size pipe: DR 9 or DR 7.

3. High density, ultra high molecular weight polyethylene pipe compound PE-3408 or 3406.

4. Stainless steel stiffeners on compression couplings made for pipe.

5. Equal to Performance Pipe Driscoplex 5100 Ultra-Line water service pipe or Excel.

B. PVC – SCH 40 Pipe

1. Pipe shall be solid core, conform to ASTM D1785 and must be rated NSF-61 (NSF-PW must be on pipe).

C. Copper Pipe

1. Type “K” soft annealed seamless copper tubing conforming to ASTM B 88, and suitable for installation in public water systems.

D. Saddles

1. DI Pipe: Stainless steel single bolt saddle equal to Ford Style FS101.

2. PVC Pipe: Stainless steel single bolt saddle equal to Ford Style FS101.

3. PE Pipe: Stainless steel service saddles for PE AWWA C906 pipe, DIPS dimensions equal to ROMAC style 305-H, or equal.

E. Corporation Stops

1. Brass, meeting NSF-61, with pack joint connection, unless otherwise specified.

2. Connections shall be nonflare for all pipe types.

3. CTS plastic pipe and copper service line: A.Y. McDonald 4704 – 22, Ford FB1000-4, or Mueller P-15028.

4. PE Service line: A.Y. McDonald 4704 – 22, Ford FB1001-4, Mueller P–15028, or equal.

F. Fittings

1. Material: Bronze Alloy

2. Acceptable PE Tubing Fittings:

   a. Compression type

G. Yoke Assembly

1. Iron Yoke with support prongs, Ford Yoke 503P series or equal.

2. Inlet Valve

   a. Valves shall be brass, meeting NSF-61 and have padlock wings.
   b. Pack joint connection for copper and PE, FIP connection for PVC.
   c. Equal to Ford BA94-323 or BA91-323W.

3. Outlet Valve

   a. Valves shall be brass, meeting NSF-61.
   b. Pack joint connection for copper and PE, FIP connection for PVC.
   c. Equal to Ford HHCA91-323D.

4. Expansion Connection shall be equal to Ford EC-23W.

H. Meter Boxes

1. Plastic box with drop-in locking solid plastic, single bottom mount AMR Bracket Cover.

2. Equal to NDS 14x19 D12-BAMR box and cover.

I. Water Meter

1. Conform to AWWA C700 – AWWA Standard for cold-water meters – displacement type.

2. Provide gallon readout register.

J. Pressure Reducing Valves

1. Watts U5-Z3 Series or equal with ¾" x ¾" connection or larger as approved by the Project Engineer.

2.02 TRACER WIRE AND BOX

A. Wire: Provide #10 AWG jacketed solid copper wire, type THHN/THWN.

B. Box: Provide adjustable tracer wire access box manufactured by C.P. Test Services - Valvco, Inc or Rhino TriView.

C. Splice Kit: Provide underground waterproof splice materials.

PART 3 – EXECUTION

3.01 WATER SERVICE LINE AND APPURTENANCES

A. Install water service line of the size and material indicated on the Bid Schedule.

B. Install at the locations shown on the drawings or as directed by the Project Engineer.

C. Refer to Section 31 23 00 for excavation, trenching, backfilling, compaction, separation distance, and insulation requirements.

D. Connection of water service line to the home shall not be completed until the water main has been disinfected and flushed in accordance with Section 33 14 00 – Water Utility Transmission and Distribution.

E. Install service line:

1. From the main to a location into or near each home.

a. Connect to existing water line 5 feet outside the home or as shown on the plans.

b. If a service line is not connected to the home, leave curb stop in the closed position and cap the end of each service line prior to backfilling.

2. With a minimum bury depth of 4 feet.

3. Splices are not allowed in the service line without the written permission of the Project Engineer (unless PVC pipe).

4. Use compression couplings for all connections (unless PVC pipe).

F. Install saddle at each corporation stop tapping location.

1. All connections shall be live tapped through the corporation stop with an approved tapping machine, unless specified below.

2. Dry taps are allowed only during new water main installation, before main disinfection.

G. Yoke Assembly, Meter and Meter Box

1. Connect inlet valve, yoke, and outlet valve together.

a. Support yoke using minimum 36-inch iron pipe driven into ground.

2. Using SCH 40 PVC pipe as risers, connect inlet and outlet valves to service line.

a. Risers shall be plumb
b. Water meter is to be approximately 4 feet below grade.

3. Set the top of meter box flush with finished grade elevation.

4. Install meter in yoke using expansion connector.

H. Install tracing wire with all pipe.

1. Wrap or tape tracing wire to pipe a minimum of every 20 feet.

2. Make all splices with an underground, waterproof splice kit.

3. Bring tracing wire up inside meter box.

a. Secure wire to yoke assembly.
b. Leave approximately 12” of extra wire.

4. Terminate the tracing wire at home.

3.02 UTILITY CONFLICTS

A. Refer to Section 31 23 00 – Excavation and Fill.

3.03 TESTING

A. Turn on each corporation stop and apply main pressure to the service line in the presence of the IHS representative before backfilling.

1. Option: If a new water main is pressure tested, test the water service lines at the same time and pressure as the water main.

B. Repair all visible leaks and retest the line until test is successfully completed at no cost to the owner.

3.04 INTERRUPTION OF SERVICE

A. Coordinate with utility owner

B. Notify all homeowners 24-hours in advance of interrupting water service.

C. Do not leave water shut off overnight.

3.05 AS-BUILTS

A. Provide as-built information on each system in accordance with Section 01 78 00 – Closeout Submittals. Use standard forms (if supplied) by the Engineer.

END OF SECTION

SECTION 34 05 13
COMMON WORK RESULTS FOR ROADWAYS

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes road restoration required when existing roadways or driveways are disturbed during the normal course of construction.

1.02 RELATED WORK

A. Section 31 23 00– Excavation and Fill

1.03 REFERENCES

A. ASTM D698 – Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb Rammer and 12-in. Drop [Standard Proctor Test].
B. Idaho Transportation Department Roadway Design Manual.

1.04 SUBMITTALS

A. Road cut permit if applicable

B. Furnish bonds if applicable

1.05 DEFINITIONS

A. Roadways: Driveways, paved parking lots, unimproved roads, paved streets, and highways.

B. Roadway Limits: To be established by Project Engineer and may include highway shoulders and drainage ditches.

1.06 RESPONSIBILITIES

A. Comply with the standards and construction requirements of the applicable local, municipal, county, state, tribal, and federal authorities.

PART 2 – PRODUCTS

2.01 BITUMINOUS OR CONCRETE PATCH

A. Comply with the standards and construction requirements of the applicable local, county, state, tribal, or federal authorities.

2.02 GRAVEL

A. Comply with the standards and construction requirements of the applicable local, municipal, county, state, tribal, or federal authorities.

PART 3 - EXECUTION

3.01 ROAD CROSSING

A. Cut pavement prior to excavation with pavement saw, backhoe wheel, or other approved method in writing by the Project Engineer.

B. Replace or repair damages to roadway at own expense if the road cut extends beyond the approved road cut width.

3.02 BACKFILL

A. Stockpile material for backfilling.

B. Compact backfill in 1-foot lifts using a mechanical compactor unless otherwise approved by the Project Engineer.

C. Compact backfill to a density no less than 90% of the maximum density determined by the Standard Proctor Test ASTM D 698 to within 3-feet of the surface.

D. Within 3-feet of the surface, compact backfill to a density no less than 95% of the maximum density determined by the Standard Proctor Test ASTM D 698.

E. No special compaction required if a well graded gravel ranging in size from 3/8-inch to 1 ½ - inch with not more than 10% of the material less than 3/8-inch size is used as backfill.

F. See Section 31 23 00 for backfill requirements around manholes, hydrants, valve boxes, and other appurtenances. Maintain density requirements defined in parts C and D of this Section.

G. Do not use heavy compaction within 2-feet of pipelines. Refer to Section 31 23 00 for more detail.

3.03 REGRAVELING ROADWAYS

A. Remove existing gravel surfacing and stockpile material.

B. Restore road to original conditions as approved by Project Engineer or local authority.

3.04 BITUMINOUS OR CONCRETE RESTORATION

A. Restore asphalt driveways and road to original conditions.

B. Match existing surfacing with respect to depth, material, and surface finish, including pavement markings and appurtenances.

C. Comply with the standards and construction requirements of the applicable local, municipal, county, state, tribal, and federal authorities.

END OF SECTION

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