SECTION C - DESCRIPTION/SPECIFICATIONS

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END OF SECTION

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SECTION 01 33 00
SUBMITTALS

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

1. Include in prices offered in Price Schedules for other items of work.

1.02 REFERENCE STANDARDS

A. American Society of Mechanical Engineers (ASME)

1.	ASME Y14.1-12	Decimal-inch Drawing Sheet Size and Format

B. National Institute of Building Sciences (NIBS)

1.	NIBS NCS-14	United States National CAD Standards, Version 6

1.03 DEFINITIONS

A. Days: Calendar days.

B. Required Submittal Number (RSN): Identifies items to be submitted together as a complete submittal.

C. Submittal Types, as listed in Table 01 33 00A - List of Submittals:

1. A - Action:
   a. Government will respond as to adequacy of submittal.
   b. Action Submittals: Considered “shop drawings” within terms of the clause at FAR 52.236-21 - Specifications and Drawings for Construction.
2. I - Informational:
   a. Government will acknowledge receipt of Informational submittals.
   b. Government may reject an Informational submittal when submittal does not comply with contract. Contractor shall correct mistakes or deficiencies in rejected Informational submittals and resubmit.
   c. Informational Submittals: Considered “shop drawings” within terms of the clause at FAR 52.236-21 - Specifications and Drawings for Construction, except that approval by Government is not required.

1.04 SUBMITTAL REQUIREMENTS

A. In case of conflict between requirements of this section and requirements included elsewhere in these specifications, requirements included elsewhere take precedence.

B. General:

1. Prepare in English.
2. Label with contract number and title, and RSN.
3. Measurement units: US Customary Units.
    a. Provide a unique transmittal number for each submittal.

C. Drawings:

1. Minimum identification in title block:
    a. Contract number and title.
    b. Contractor's or supplier's title and drawing number.
    c. Date.
2. Reserve 3- by 3-inch space next to title block for review stamps.
3. Print Size: D size (22-inches by 34-inches) as defined by ASME Y14.1.
4. Draw to scale using computer drafting or drafting equipment, unless otherwise specified.
    a. Computer drafted drawings:
        1) In accordance with NIBS NCS.
        2) Electronic file format: Compatible with AutoCAD, Version 2015 or later.
        3) Compile using "eTransmit" utility in AutoCAD.
    b. Drawing prepared with drafting equipment, when allowed: Lettering shall be neat.
5. Drawings designated as "Government Format" in specifications:
    a. Computer drafted.
    b. Government will provide an electronic AutoCAD format template.
    c. Title block and sheet format:
        1) As shown on standard drawing 40-D-7102.
        2) Government will provide template.
        3) Government will provide specific title block information to be used.

6. Final drawings:
    a. Computer drafted.
    b. Government will provide an electronic AutoCAD format template.
    c. Show as-built changes, including revision dates, made during installation. Indicate changes by clouding.
7. Electronic Files: On CD or DVD discs.

D. Product Data:
1. Mark manufacturer's data for commercial products or equipment, such as catalog cut sheets.
    a. Identify manufacturer's name, type, model, size, and characteristics.
    b. Illustrate that product or equipment meets requirements of specifications.
    c. Mark items to be furnished in a manner that will photocopy (no highlighter).
    d. Strike through items that do not apply.

E. Certifications:
1. Certifications by a Registered Professional: Signed and sealed by registered professional.
    a. Not required for non-design work.
2. Manufacturer’s Certifications: Signed by authorized representative of manufacturer.

F. Manuals:
1. Copies:
    a. Printed copies: Bound and indexed.
    b. Electronic copies: Searchable Adobe pdf on CD or DVD discs.
        1) Bookmark longer files to assist in navigating file.
        2) Electronic files may be submitted as separate parts of a manual. After each separate electronic file is approved, compile each approved electronic file to assemble an entire manual which shall be consistent with a single final manual submittal.
2. Contents:
    a. Parts identification lists, lists of special tools, and accessories.
    b. Schematics and wiring diagrams.

c. Detailed instructions for installing, operating, lubricating, and maintaining equipment.

d. As-built drawings, photographs, and test records or reports by specifications.

G. Photographs:

1. Include negatives, or digital files on CD or DVD in .jpeg or similar format.

1.05 SUBMITTALS PROCEDURES

A. Submit only checked submittals. Submittals without evidence of Contractor's approval will be returned for resubmission.

B. Submit complete sets of required materials for each RSN as specified in "Submittals Required" column in Table 01 33 00A - List of Submittals. A complete set includes listed items for RSNs with multiple parts.

C. Submit sets specified in "Sets to be sent:" columns in Table 01 33 00A - List of Submittals.

1. Submittals identified with "CDMS" in "Sets to be sent" column shall be submitted electronically in accordance with Section 01 31 30 - Contract Document Management System.

D. Include the following information in transmittal letters:

1. Contract number and title.

2. RSN for each attached submittal.

3. Responsible code.

4. Number of sets for each RSN.

5. Identify submittal as initial or resubmittal.

E. Resubmittal of submittals not approved:

1. Mark changes such that they are readily identifiable and show revision date.

2. Describe reasons for significant changes in transmittal letter.

3. Resubmit returned submittals within 28 days after receiving comments, unless otherwise directed.

4. Requirements for initial submittals apply to resubmittals.

1.06 REVIEW OF SUBMITTALS

A. Time Required:

1. Submittal review will require 28 days for review of each submittal or resubmittal, unless otherwise specified.

2. Time required for review of each submittal or resubmittal begins when complete sets of materials required for a particular RSN are received and extends through return mailing postmark date.

B. Time in Excess of Specified:

1. CO may extend contract completion date to allow additional time for completing work affected by excess review time.

   a. Time extension will be to extent that excess review time caused delay to contract completion date.

   b. Time extension will not exceed time used in excess of specified number of days for review of submittals or resubmittals.

   c. Concurrent days of excess review time resulting from review of 2 or more separate submittals or resubmittals will be counted only once in extending contract completion date.

2. No time extension will be allowed if Contractor fails to make complete action submittals in sequence and within time periods specified.

3. Adjustment for delay will be made only to extent that:

   a. Approval was required under the contract, and,

   b. Requests for approval were properly and timely submitted and were approved.

4. Adjustment will be subject to terms of paragraphs (b) and (c) of the clause at FAR 52.242-14, Suspension of Work, however, no such delay shall be deemed to be a "suspension order" as the term is used in that clause.

5. Government will review a submittal and the first resubmittal at no charge.

   a. Review of subsequent submittals for the same RSN will be at Contractor's expense.

   b. At the sole discretion of CO, a non-refundable amount equal to the review charges will be deducted from contract price.

   c. Currently, charges vary between $74 and $116 per hour, depending upon complexity of submittal and level of expertise required to perform review.

C. Return of Submittals:

1. Return of submittals will be by CDMS response or hard copy, as applicable.

2. Action Submittals: 1 set of submittals required for action will be returned either approved, partially approved, approved subject to identified changes and resubmit, or not approved.

a. Revise and resubmit submittals not approved.

b. Do not change designs without approval of CO after drawings, documentation, and technical data have been approved.

3. Informational Submittals: Government will acknowledge Informational submittals.

a. Informational submittals will not be returned when they comply with specifications.

b. Informational submittals that do not comply with specifications may be returned for resubmittal or additional information may be requested.

c. Informational submittals that affect the critical path shown on the baseline schedule may be returned for resubmittal or additional information may be requested.

1.07 HARD COPY OF TRANSMITTALS

A. Addresses for codes listed in Table 01 33 00A - List of Submittals:

1. Contracting Officer, Bureau of Reclamation, Attn: UC-840, 125 South State St, Room 6107, Salt Lake City, UT 84138-1147.

2. Construction Engineer, Bureau of Reclamation, 1235 La Plata Hwy, Farmington, New Mexico, 87401.

3. Technical Service Center, Bureau of Reclamation, Attn: 86-68170, PO Box 25007, Denver CO 80225-0007; Express Mail Sixth and Kipling, Building 67, Room 152.

B. Send original transmittal letter with appropriate number of sets to office listed in "Responsible Code" column in Table 01 33 00A - List of Submittals.

1. Responsible codes starting with "86-6" are located in the Technical Service Center. Send these submittals to the TSC address shown above.

C. Send copy of transmittal letter with appropriate number of sets to offices that are not responsible code, but show "Sets to be sent" in Table 01 33 00A - List of Submittals.

D. When "Sets to be sent" is 0, send a copy of transmittal letter to that office.

E. Submittals required by specifications, but not listed in Table 01 33 00A - List of Submittals:

1. Submit in accordance with this section.

2. Submit to CE unless otherwise specified.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

Table 01 33 00A - List of Submittals

* Submittal types A - Action, I - Information

** CO indicates Contracting Officer, CE indicates Construction Engineer, TSC indicates Technical Service Center

RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
I-1	Safety and Health (WBR 1452223-81)	Safety program	Submitted and accepted before commencing onsite work See section 3 of RSHS	A	CE	CDMS		
01 14 10-1	Use of Site	Land Use and Landscape Rehabilitation Plan	At least 28 days before use of Federal land	A	CE	CDMS		
01 31 19-1	Project Management and Coordination	Written Summary	Monthly once on-site construction begins	I	CE	CDMS		
01 31 19-2	Project Management and Coordination	Off ROW Land Use Coordination	At least 6 months prior to use of land	I	CE	CDMS		
01 31 30-1	Contract Document Management System	Approval Data	7 days of after Award	A	TSC 86-68510	0	1	1
01 31 30-2	Contract Document Management System	Final Data	Within 14 days of completion of work	A	CE	0	2	2
01 32 10-1	Construction Program	Representative Information	Within 7 days after receipt of Notice of Award	I	CE	CDMS		
01 32 10-2	Construction Program	Baseline Schedule	Within 21 days after receipt of Notice to Proceed	A	TSC 86-68510	CDMS		
01 32 10-3	Construction Program	Updated Schedule Reports	Monthly or with Progress Payments	A	TSC 86-68510	CDMS		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
01 32 10-4	Construction Program	Time Impact Analysis	Within 28 days after CO directs a contract change, with any proposal for a future modification, with any value engineering proposal, or with any request or claim for an equitable adjustment to the contract	A	TSC 86-68510	CDMS		
01 35 10-1	Safety Data Sheets	Complete LHM and SDS	At least 14 days before jobsite delivery of hazardous material	I	CE	CDMS		
01 35 10-2	Safety Data Sheets	Updated LHM and SDS	At least 14 days before jobsite delivery of hazardous material not previously listed	I	CE	CDMS		
01 35 20-1	Safety and Health	Emergency Action Plans Written Program and Training Records	At least 30 days before beginning onsite work	A	CE	CDMS		
01 35 20-2	Safety and Health	Job Hazard Analyses (JHA)	At least 30 days before beginning onsite work	A	CE	CDMS		
01 35 20-3	Safety and Health	Exposer Assessment Form	At least 30 days before beginning onsite work	A	CE	CDMS		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
01 35 20-4	Safety and Health	Monthly Accident Summary Report	First day of each month. See paragraph 3.8 of RSHS.	A	CE	CDMS		
01 35 20-5	Safety and Health	Respirator User Documentation	At least 30 days before beginning onsite work	A	CE	CDMS		
01 35 20-6	Safety and Health	General Requirements for Hoisting Equipment	At least 30 days before beginning onsite work	A	CE	CDMS		
01 35 20-7	Safety and Health	Other Training Certificates, as applicable	At least 30 days before beginning onsite work	A	CE	CDMS		
01 35 22-1	First-Aid	Medical Facilities Plan	At least 28 days before beginning on-site construction	A	CE	CDMS		
01 35 30-1	Contractor‘s Onsite Safety Personnel	Resume	At least 28 days before beginning on-site construction	A	CE	CDMS		
01 35 30-2	Contractor’s Onsite Safety Personnel	Safety Inspection Reports	Once each week	I	CE	CDMS		
01 46 00-1	Quality Procedures	Contractor Quality control Plan (QC)	At least 28 days before beginning on site work	A	CE	CDMS		
01 46 00-2	Quality Procedures	Contractor’s Daily Report	No later than the end of the following work day	A	CE	CDMS		
01 46 00-3	Quality Procedures	Quality Control Supervisor (QCS) Resume	At least 28 days before beginning on site work	A	CE	CDMS		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
01 46 00-4	Quality Procedures	Contractor's Quality Testing Plan	At least 28 days before beginning on site work.	A	CE	CDMS		
01 46 00-5	Quality Procedures	Summary of Monthly Test Results	Monthly	A	CE	CDMS		
01 46 20-1	Testing Agency Services	Testing Agency Services Plan	At least 42 days before testing is required	A	CE	CDMS		
01 55 00-1	Vehicular Access and Parking	Pre-Construction Digital Recording	At least 21 days before beginning onsite work	A	CE	CDMS		
01 55 00-2	Vehicular Access and Parking	Post Construction and Post Repair Digital Recording	At least 21 days before release of final payment	A	CE	CDMS		
01 55 20-1	Traffic Control	Traffic Control Plan and Permit Applications	At least 70 days before affecting public traffic	A	CE	CDMS		
01 55 20-2	Traffic Control	Permits	At least 14 days before affecting public traffic	I	CE	CDMS		
01 56 10-1	Protection of Existing Installations	Plan for Protecting Existing Installations	At least 28 days before start of onsite construction work	A	CE	CDMS		
01 56 15-1	Protection of Existing Utilities	Utility Owner Acknowledgment	At least 28 days before start of onsite construction work	A	CE	CDMS		
01 56 15-2	Protection of Existing Utilities	Utility Crossing Investigation	At least 28 days prior to submittal 33 11 10-2 Pipe Laying Diagrams	I	CE	CDMS		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
01 56 15-3	Protection of Existing Utilities	Work Plan within Utility Easement	At least 28 days before start of onsite construction work	A	CE	CDMS		
01 57 20-1	Environmental Controls	Copy of Applicable Air Quality Permit	At least 14 days before beginning on-site work	I	CE	CDMS		
01 57 30-1	Water Pollution Control	Updated Stormwater Pollution Prevention Plan (SWPPP)	At least 28 days before start of onsite construction work	A	CE	CDMS		
01 57 30-2	Water Pollution Control	Spill Prevention Control and Countermeasure (SPCC) Plan	At least 28 days before delivery or storage of oil	A	CE	CDMS		
01 57 40-1	Pesticides	Pesticide Use Plan	At least 28 days before start of onsite construction work	A	CE	CDMS		
01 57 50-1	Tree and Plant Protection	Protection Plan	At least 28 days before beginning on-site work	A	CE	CDMS		
01 57 90-1	Preservation of Historical and Archeological Data	Alternate Use Area or Borrow Area	At least 6 months prior to use of land	A	CE	CDMS		
01 71 20-1	Surveying	Surveying Plan	At least 28 days before beginning survey work	A	CE	CDMS		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
01 71 20-2	Surveying	Resume	At least 28 days before beginning survey work; At least 28 days before personnel change	A	CE	CDMS		
01 71 20-3	Surveying	Accuracy Check Results	At least 28 days before beginning survey work	I	CE	CDMS		
01 71 20-4	Surveying	Completed and Reduced Survey Notes	Within 2 days of completing and reducing notes	I	CE	CDMS		
01 71 20-5	Surveying	Original Field Survey Books	Weekly	I	CE	CDMS		
01 71 20-6	Surveying	Quantity Survey Notes and Computations	Accompanying progress payment requests	I	CE	CDMS		
01 71 20-7	Surveying	Workday's Survey Notes	At conclusion of workday if requested by Government	I	CE	CDMS		
01 74 00-1	Cleaning and Waste Management	Waste Production and Disposal Plan	Within 7 days of waste disposal	I	CE	CDMS		
01 74 00-2	Cleaning and Waste Management	Waste Production and Disposal Records	Within 7 days of hazardous waste disposal	I	CE	CDMS		
01 74 00-3	Cleaning and Waste Management	Environmental Consultant Resume	At least 28 days before beginning environmental assessment	I	CE	CDMS		
01 74 00-4	Cleaning and Waste Management	Environmental Site Assessment	Within 14 days of completion of work	I	CE	CDMS		
01 78 30-1				A	CE	CDMS		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
	Project Record Documents	Final As-built Drawings	Within 14 days of completion of work			0	1	1
02 82 20-1	Removal and Disposal of Asbestos Containing Materials	Contractor Qualifications	At least 40 days before asbestos removal starts	I	TSC 86-8540	CDMS		
02 82 20-2	Removal and Disposal of Asbestos Containing Materials	Asbestos Hazard Abatement Plan	At least 40 days before asbestos removal starts	A	TSC 86-8540	CDMS		
02 82 20-3	Removal and Disposal of Asbestos Containing Materials	Emission Monitoring Results	Within 2 days after tests completed	I	TSC 86-8540	CDMS		
02 82 20-4	Removal and Disposal of Asbestos Containing Materials	Hazardous Waste Manifest	Within 15 days after disposal	I	TSC 86-8540	CDMS		
03 30 00-1	Cast-in-Place Concrete	Approval Data	At least 28 days before start of onsite construction work	A	TSC 86-8530	CDMS		
03 30 00-2	Cast-in-Place Concrete	Concrete Placement Schedule	At least 20 days before start of concrete placement	A	CE	CDMS		
03 30 00-3	Cast-in-Place Concrete	Certifications	At least 28 days before start of onsite construction work	A	CE	CDMS		

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
03 30 00-4	Cast-in-Place Concrete	Cementitious Materials Certification and Test Reports	At least 28 days before start of onsite construction work	A	TSC 86-8530	CDMS		
03 30 00-5	Cast-in-Place Concrete	Test Reports	Within 2 hours of test results	A	CE	CDMS		
03 30 20-1	Concrete Reinforcing	Reinforcement Diagrams and Lists	At least 28 days before start of onsite construction work	A	CE	CDMS		
03 48 10-1	Precast Concrete Manholes	Approval Data	At least 28 days before start of onsite construction work	A	TSC 86-8530	CDMS		
03 63 00-1	Epoxy Grout	Approval Data	At least 28 days before start of onsite construction work	A	TSC 86-8530	CDMS		
07 21 20-1	Spray-On Insulation	Approval Data	At least 28 days before start of onsite construction work	A	CE	CDMS		
07 21 60-1	Insulation Jacket	Approval Data	At least 28 days before start of onsite construction work	A	CE	CDMS		
07 21 60-2	Insulation Jacket	Instructions	At least 28 days before start of onsite construction work	A	CE	CDMS		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
09 96 20-1	Coatings	Approval Data	At least 28 days before start of onsite construction work	A	TSC 86-8540	CDMS		
09 96 20-2	Coatings	Final Approval Data	Within 28 days of final testing	A	TSC 86-8540	CDMS		
09 96 20-3	Coatings	Paint Chip Samples	At least 28 days before start of onsite construction work	A	CE	CDMS		
09 96 20-4	Coatings	Qualifications	At least 28 days before start of onsite construction work	A	TSC 86-8540	CDMS		
09 96 20-5	Coatings	Quality Control Plan	At least 28 days before start of onsite construction work	A	TSC 86-8540	CDMS		
09 96 20-6	Coatings	Contractor Quality Testing Report	Within 28 days of all coatings being applied	A	TSC 86-8540	CDMS		
10 14 26-1	Utility Markers	Utility Marker Plan	At least 28 days before start of onsite construction work	A	CE	CDMS		
23 33 13-1	Draft Control Damper	Approval Data	At least 28 days before start of onsite construction work	A	CE	CDMS		
23 33 13-2	Draft Control Damper	Final Data	Within 28 days of final testing	A	CE	CDMS		

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
26 42 10-1	Cathodic Protection and Corrosion Monitoring System	Certification and Data	At least 40 days before procuring materials	A	TSC 86-68540	CDMS		
26 42 10-2	Cathodic Protection and Corrosion Monitoring System	Interference Mitigation Method	At least 28 days before start of onsite construction work	A	TSC 86-68540	CDMS		
26 42 10-3	Cathodic Protection and Corrosion Monitoring System	Final Data	Within 28 days of final testing	A	TSC 86-8540	CDMS		
31 02 10-1	Water for Dust Abatement	Meter Calibration	At least 28 days before start of onsite construction work	A	CE	CDMS		
31 02 30-1	Dust Palliative	Proposed Application Area for Dust Palliative	At least 28 days before start of onsite construction work	A	CE	CDMS		
31 03 33-1	Removal of Water from Excavation	Removal of Water Plan	At least 28 days before start of onsite construction work	A	CE	CDMS		
31 23 02-1	Compacting Earth Materials	Test Results	Within 28 days of testing	A	CE	CDMS		
31 23 22-1	***Pipe Trench Earthwork***	***Cultural Site Trench Box Design***	***At least 28 days before start of onsite construction work***	***A***	***CE***	***CDMS***		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
31 23 70-1	Controlled Low Strength Material (CLSM)	Approval Data for CLSM Produced Without Native Soil	At least 28 days before start of onsite construction work	A	TSC 86-8530	CDMS		
31 23 70-2	Controlled Low Strength Material (CLSM)	Approval Data for CLSM Produced with Native Soil	At least 28 days before start of onsite construction work	A	TSC 86-8530	CDMS		
31 23 70-3	Controlled Low Strength Material (CLSM)	Quality Control Test Results	Within 28 days of testing	A	CE	CDMS		
31 31 30-1	Soil-Supplied Herbicide	Use Plan	At least 28 days before start of onsite construction work	A	CE	CDMS		
31 31 30-2	Soil-Supplied Herbicide	Applier Certification	At least 28 days before start of onsite construction work	A	CE	CDMS		
32 15 10-1	Gravel Surfacing	Gravel Certification	At least 28 days before start of onsite construction work	A	CE	CDMS		
32 15 10-2	Gravel Surfacing	Geofabric Installation	At least 28 days before start of onsite construction work	A	CE	CDMS		
32 15 10-3	Gravel Surfacing	Geofabric Certification	At least 28 days before start of onsite construction work	A	CE	CDMS		

Table 01 33 00A - List of Submittals

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
32 91 60-1	Erosion Control Blanket	Manufacturer's Information	At least 28 days before start of onsite construction work	A	CE	CDMS		
32 91 60-2	Erosion Control Blanket	Installation Plan	At least 28 days before start of onsite construction work	A	CE	CDMS		
32 92 20-1	***Seeding***	***Seeding Plan***	***At least 28 days before seeding***	***A***	***CE***	***CDMS***		
32 92 20-2	***Seeding***	***Certifications***	***At least 28 days before seeding***	***A***	***CE***	***CDMS***		
33 05 21-1	Bored Utility and Road Crossings	Placement Plan	At least 28 days before beginning on-site work	A	CE	CDMS		
33 05 21-2	Bored Utility and Road Crossings	Material Certification	At least 28 days before beginning on-site work	A	CE	CDMS		
33 05 21-3	Bored Utility and Road Crossings	Copy of Application for Utility Permit	At least 28 days before beginning on-site work	A	CE	CDMS		
33 11 10-1	Pipeline General Requirement	Qualifications	At least 28 days before beginning on-site work	A	CE	CDMS		
33 11 10-2	Pipeline General Requirement	Pipelaying Diagrams	At least 28 days before manufacture of pipe	A	TSC 86-68140	CDMS		
33 11 10-3	Pipeline General Requirement	Filling and Testing Plan	At least 28 days before beginning on-site work	A	TSC 86-68140	CDMS		

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RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
33 11 10-4	Pipeline General Requirement	Floatation Prevention Plan	At least 28 days before beginning on-site work	A	TSC 86-68140	CDMS		
33 11 10-5	Pipeline General Requirement	Pipe Deflection Measurements	Within 14 days of completion of backfill	A	TSC 86-68140	CDMS		
33 11 10-6	Pipeline General Requirements	Connection to Reach 12A	At least 28 days before submittal of pipe laying diagram for end of Reach 11 Section	A	TSC 86-68140	CDMS		
33 11 12-1	Steel Line Pipe	Shop Drawings	At least 42 days before manufacture of pipe	A	TSC 86-68140	CDMS		
33 11 12-2	Steel Line Pipe	Ventilation Plan	At least 28 days before beginning on-site work	A	CE	CDMS		
33 11 13-1	Ductile Iron Pipe	Shop Drawings	At least 42 days before manufacture of pipe	A	TSC 86-68140	CDMS		
33 11 13-2	Ductile Iron Pipe	Commercial Products	At least 42 days prior to fabrication or procurement	A	TSC 86-68140	CDMS		
33 11 16-1	PVC Pressure Pipe	Shop Drawings	At least 42 days before manufacture of pipe	A	TSC 86-68140	CDMS		
33 11 16-2	PVC Pressure Pipe	Pipe Manufacture Certification	At least 40 days before procuring materials	A	CE	CDMS		

Table 01 33 00A - List of Submittals

* Submittal types A - Action, I - Information

** CO indicates Contracting Officer, CE indicates Construction Engineer, TSC indicates Technical Service Center

RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
33 11 18-1	HDPE Pressure Pipe	Heat Fusion Joint Operator Qualifications	At least 40 days prior to beginning onsite work	I	CE	CDMS		
33 11 18-2	HDPE Pressure Pipe	Shop Drawings	At least 42 days before manufacture of pipe	A	TSC 86-68140	CDMS		
33 11 18-3	HDPE Pressure Pipe	Certification	At least 40 days before procuring materials	A	CE	CDMS		
33 11 18-4	HDPE Pressure Pipe	Fusion Procedures	At least 28 days prior to beginning on-site work	A	CE	CDMS		
33 11 19-1	Fiberglass Pipe	Qualification Reports	At least 28 days prior to beginning on-site work	A	TSC 86-68140	CDMS		
33 11 19-2	Fiberglass Pipe	Shop Drawings	At least 42 days before manufacture of pipe	A	TSC 86-68140	CDMS		
33 11 19-3	Fiberglass Pipe	Joint Repair Plan	At least 28 days before beginning on-site work	A	TSC 86-68140	CDMS		
33 21 95-1	Metal Piping for Line Pipe Installations	Shop Drawings	At least 28 days before beginning on-site work	A	TSC 86-68140	CDMS		
33 21 95-2	Metal Piping for Line Pipe Installations	Commercial Product Data	At least 28 days before beginning on-site work	A	TSC 86-68140	CDMS		
33 21 95-3	Metal Piping for Line Pipe Installations	Final Drawings	Within 14 days of completion of work	A	TSC 86-68140	CDMS		
						0	1	1

Table 01 33 00A - List of Submittals

* Submittal types A - Action, I - Information

** CO indicates Contracting Officer, CE indicates Construction Engineer, TSC indicates Technical Service Center

RSN	Clause or Section Title	Submittals required	Due date or delivery time	Type *	Respon-sible code	No of sets to be sent to **		
						CO	CE	TSC
33 22 15-1	Valves and Equipment	Commercial Product Data	At least 28 days before beginning on-site work	A	TSC 86-68420	CDMS		
33 22 15-2	Valves and Equipment	Service Manuals	Within 13 days of completion of work	A	CE	CDMS		
						0	5	1
35 42 35-1	Bank Protection	Samples	At least 28 days before beginning on-site work	A	TSC 86-68240	CDMS		
35 42 35-2	Bank Protection	Certifications	At least 28 days before beginning on-site work	A	CE	CDMS		
35 42 35-3	Bank Protection	Field Verification of Wash Crossing Elevations	At least 28 days prior to submittal 33 11 10-2 Pipe Laying Diagrams	A	TSC 86-68240	CDMS		

END OF SECTION

SECTION 01 51 00
TEMPORARY UTILITIES

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

1. Include in prices offered in Price Schedule for other items of work.

a. Except:

1) Water for testing and filling.

2) Water for dust abatement.

1.02 REFERENCE STANDARDS

A. Institute of Electrical and Electronics Engineers (IEEE)

1. IEEE C2-17 National Electrical Safety Code (NESC)

1.03 TEMPORARY ELECTRICITY

A. Provide all electric power required for construction, testing and commissioning through contract completion and acceptance by Government.

B. Provide all generators, transmission lines, distribution circuits, transformers, and other electrical equipment and facilities required for obtaining power and distributing power to points of use.

C. Contractor is responsible for making all arrangements and payments to the Utility Companies for all temporary electricity required for construction, testing and commissioning through contract completion and acceptance by Government.

D. Comply with IEEE C2 clearances and spacing for temporary communications and supply lines.

E. Potential Sources:

1. Depending on availability the following entities may have electricity:

a. Navajo Tribal Utility Authority (NTUA)

1) Contact:

Navajo Tribal Utility Authority
P.O. Box 1749
Shiprock, NM 87420
Telephone: 800-528-5011
www.ntua.com

b. Continental Divide Electric Cooperative, Inc.

1) Contact:

Continental Divide Electric Cooperative, Inc.
2500 NM Highway 602
Gallup, NM 87305
Telephone: 505-863-3641
Fax: 505-863-2175
www.cdec.coop/

1.04 TEMPORARY WATER

A. Provide water required for construction purposes.

B. Potential Sources:

1. Depending on availability the following entities may have potable water:

2. Contact for access, metering, and billing arrangements.

a. The City of Gallup:

1) Contact:

Gallup Joint Utilities
P.O. Box 1270
Gallup, NM 87305
Telephone: 505-863-1289
www.gallupnm.gov

2) Potable water for cleaning, and filling and testing may only be available from November 30 to March 1.

b. Navajo Nation Water Code Administration (NNWCA) may have non-potable construction water.

1) Contact:

Navajo Nation Water Code Administration
P.O. Box 678
Fort Defiance, AZ 86504
Attn: Melvin Badonie
Telephone: 928-729-4132
Fax: 928-729-4421
www.watercode.navajo-nsn.gov

C. Arrange, pay and transport water for use during construction.

D. Use water which meets specified requirements for water used in concrete, soil-cement, masonry, ***and*** grouting~~***., and other permanent work***~~.

E. Furnish means of conveying water to points of use.

1.05 SANITARY FACILITIES

A. Provide sanitary facilities.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 REMOVAL

A. Remove temporary equipment and facilities upon completion of work under this contract.

END OF SECTION

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SECTION 01 56 15
PROTECTION OF EXISTING UTILITIES

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Utility Crossing Investigation:

1. Payment: Lump sum prices offered in Price Schedules.

B. Cost:

1. Include Utility Owner Acknowledgments offered in Price Schedules for other items of work.

1.02 REFERENCE STANDARDS

A. Bureau of Reclamation (Reclamation)

1.	RSHS	Reclamation Safety and Health Standards, including revisions posted at www.usbr.gov/ssle/safety/RSHS/rshs.html

B. Institute of Electrical and Electronics Engineers (IEEE)

1.	IEEE C2-17	National Electrical Safety Code (NESC)

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 56 15-1, Utility Owner Acknowledgment:

1. Copy of notification acknowledgement showing underground and overhead utility agreements.

C. RSN 01 56 15-2, Utility Crossing Investigation:

1. As listed under “Project Conditions” in this section.

D. RSN 01 56 15-3, Work Plan within Utility Easement:

1. Proposed installation method including construction equipment.
2. Methods for protecting.
3. Approval of work plan from Utility owner.

1.04 PROJECT CONDITIONS

A. Drawings included in these specifications show existing utilities, but may not show all utilities existing at the jobsite.

B. Obtain location of buried conduit, pipe, cable, ground mat, and other buried items before submitting pipe laying diagrams.

C. Unknown existing utility lines may cross pipeline alignment.

D. Government does not represent that location of known existing utilities shown on drawings are exact. It is Contractor's responsibility to determine actual location of and make provision for all known and unknown utilities:

1. Verify locations, depths and clearances of both above and below ground utilities prior to excavation.

E. Ensure that each utility line is in service as required by each utility owner.

F. Coordinate work within existing pipeline and transmission line Right-of-Way with all utility owners. Contractor's shall comply with all Utility owner crossing requirements and shall be responsible for all costs associated with utility crossings. Obtain permission from Utility owners before procuring materials to be installed in Right-of-Way.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 GENERAL

A. Have New Mexico One Call 811 locate utilities before doing underground work.

B. Navajo Tribal Utility Authority (NTUA) is not part of New Mexico One Call:

1. Have NTUA locate utilities before doing underground work. Contact Information:

Navajo Tribal Utility Authority
P.O. Box 170
Fort Defiance, AZ 86504
Telephone: 928-729-5721

C. Utility Crossing Investigation:

1. Determine height and voltage of overhead utility lines. Clearances in accordance with RSHS and OSHA, whichever is more stringent.

2. Determine location, elevations, diameters, and materials of each underground utility line by hydro-excavation or vacuum excavation or as approved by utility owners. Test pits may be used when approved by COR:

   a. Submit to COR before beginning preparation of pipelaying diagrams required by Section 33 11 10 - Pipeline General Requirements and excavation work.

   b. COR will determine if adjustment of pipeline grade and design is required and provide Contractor with revised drawings.

3. Obtain permission from utility or gasline owner before performing physical utility crossing investigation (potholing or test pits).

D. Coordinate with each utility line owner and schedule construction to adhere to each owner's in service, allowable out of service, and crossing requirements during construction. See Section 51 00 00 – Information Available to Offerors for crossing agreements.

E. Notify impacted property owner at least 2 working days before disturbing waterline that serves their property. Water service to property shall not be shut off for more than 8-hours.

F. ***~~No excavation will be permitted within 10-feet of gas lines when in service without written approval from Gas Company~~. No construction activities, including excavation, will be permitted within 25 feet of gas lines unless a Company representative is on-site to monitor all construction activities.***

G. Protect and support existing utilities that intersect work area. Before commencing work, obtain approval and necessary permits from utility owners within project ROW.

H. Repair existing utilities damaged during construction as approved by COR and utility owner.

3.02 CLEARANCE

A. Obtain clearances required for construction operations: Contractor shall provide in accordance with RSHS.

3.03 INTERFERENCE WITH OPERATION OR MAINTENANCE

A. Do not interfere with operation or maintenance service on utilities, existing on date offers are received:

1. Provide for access to utilities in a manner satisfactory to owners and operators and Government.

B. Provide required temporary structures; make necessary repairs, replacements, or similar operations; and furnish indemnity or other bonds.

END OF SECTION

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SECTION 01 57 90

PRESERVATION OF HISTORICAL AND ARCHEOLOGICAL DATA

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

1. Except as provided for an equitable adjustment, include in prices offered in Price Schedules for other items of work.

1.02 DEFINITIONS

A. Cultural resources: Includes prehistoric, historic, architectural, and traditional cultural properties. These include, but are not limited to, human skeletal remains, archaeological artifacts, records, and material remains related to such property.

B. Cultural items: Native American cultural items (i.e., funerary objects, sacred objects, objects of cultural patrimony, or human remains) for which protection is prescribed under the Native American Graves Protection and Repatriation Act (NAGPRA) - Public Law 101-601; 104 Stat. 3042, Section 3(d); and 43 CFR Part 10.4.

C. Human remains: Physical remains of the body of a person.

D. Funerary objects: Native American items that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed intentionally at the time of death or later with or near individual human remains.

E. Native American: Of, or relating to, a tribe, people, or culture that is indigenous to the United States.

F. Sacred Objects: Native American items that are specific ceremonial objects needed by traditional Native American religious leaders for the practice of traditional Native American religions by their present-day adherents. These items are specifically limited to objects that were devoted to a traditional Native American religious ceremony or ritual and which have religious significance or function in continued observance or renewal of such ceremony.

G. Objects of cultural patrimony: Native American items having ongoing historical, traditional, or cultural importance central to the Indian tribe itself, rather than property owned by an individual tribal member. These objects are of such central importance that they may not be alienated, appropriated, or conveyed by any individual tribal member.

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 01 57 90-1, Alternate Use Area or Borrow Area:

1. When use area or borrow area other than those approved is to be used, submit map showing location of unapproved use or borrow areas, for approval.

1.04 PROJECT CONDITIONS

A. Project site has been surveyed for construction within ROW by agencies having jurisdiction: Navajo Nation Historical Preservation Department (NNHPD), State Historical Preservation Office (SHPO) and Bureau of Indian Affairs (BIA).

B. Government will retain an Archeologist to monitor ground disturbing activity work within 100-foot, each side of known cultural sites:

1. Coordinate work with COR and Government Archeologist.

C. On-site Contractor personnel shall undergo cultural resource awareness training:

1. Government will provide training. Training will take approximately 1-hour. Schedule for training will be mutually agreed upon.

2. Inform on-site personnel of cultural resource requirements before initial groundbreaking takes place.

3. On-site personnel added after completion of cultural awareness training shall be informed by their management of cultural resource requirements before being allowed to work in project area.

4. Maintain training records.

D. Federal legislation provides for protection, preservation, and collection of scientific, prehistorical, historical, and archeological data, including relics and specimens, which might otherwise be lost due to alteration of terrain as a result of any Federal construction project.

E. Persons who, without permission, injure, destroy, excavate, appropriate, or remove historical or prehistorical artifact, object of antiquity, or archeological resource on public lands of the United States are subject to arrest and penalty of law.

F. Comply with Federal, State and Tribal laws when operating on non-Federal and non-Indian lands.

G. Attend weekly coordination meetings. Refer to Section 01 31 19 - Project Management and Coordination.

H. Discovery of Resources:

1. When Contractor or parties operating or associated with Contractor, in performance of this contract discover cultural resources on ROW:

a. Immediately cease work at that location.

b. Verbally notify CO and COR within 2-hours, giving location and nature of findings.

c. Verbally notify Reclamation staff archaeologist within 2-hours. Telephone: 970-385-6500, Durango, Colorado.

d. Follow with written confirmation to CO within 12 hours.

2. Do not disturb or damage cultural resources uncovered during construction activities. Provide cooperation and assistance to preserve findings for removal or other disposition by CO.

3. Do not resume work in area of discovery until receipt of written notice to proceed from CO.

I. Where appropriate by reason of discovery, CO may order delays in time of performance or changes in work, or both. When such delays or changes are ordered, an equitable adjustment will be made in contract in accordance with applicable clauses of contract.

J. Mitigate cultural resources as directed by Government on lands outside of Permanent or Construction ROW, including private lands:

1. Coordinate Government cultural resource identifications and inspections:

a. Obtain permission for Government access in arrangements for use of lands outside of ROW including private lands for use areas or borrow sources, access routes and areas of disturbance.

K. Insert this section in subcontracts which involve performance of work on jobsite terrain.

L. Obtain Government clearance before disturbing lands outside of ROW in accordance with Section 01 14 10 - Use of Site.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 EXCLUSION ZONE

A. Fence exclusion zones ***to protect cultural resources discovered during construction*** as directed by COR and in accordance with Section 01 56 32 - Temporary Safety Fence.

END OF SECTION

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SECTION 31 23 22
PIPE TRENCH EARTHWORK

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Price Schedule 1 (Reach 9): Diameter change from 48-inches to 42-inches is assumed at Station 90879+00. Location of diameter change may vary based on pipe material type used and quantities adjusted accordingly.

B. Mobilization of Trench Box:

1. Payment: Applicable lump sum price offered in Price Schedules.

a. For protection of cultural resources.

b. Additional Trench Boxes may be required for areas outside of cultural resources.

c. Box may be needed depending on the cultural resource mitigation work being completed this fall.

C. Use of Trench Box:

1. Measurement: Length of Trench Box.

2. Payment: Applicable linear foot price offered in Price Schedules.

D. Excavation for Pipe Trenches:

1. Measurement: Made to paylines and lengths shown on drawings and trench lengths of common excavated material.

   a. Regardless of actual widths, bottoms, and side slopes excavated, measurement will be made to paylines shown on drawings.

   b. Measurement for payment for additional excavation will be made to trench widths (Wp) shown on drawings and to depth directed by COR.

   c. Measurement for payment will be continuous through pipe fittings.

   d. Measurement for payment for excavation for concrete for pipe fittings that is outside the trench excavation paylines will be made to lines and dimensions shown on the drawings or to the neatlines of the concrete.

2. Payment: Cubic yard prices offered in Price Schedules.

   a. Includes cost of labor and materials for:

      1) Shoring, sheeting, bracing, timbering, safety sloping, and other temporary construction;

      2) Pumping and unwatering;

3) Removing such temporary construction where required;

4) Stockpiling excavated material for backfill;

5) Disposal of unused or wasted excavated materials.

b. No direct payment will be made for excavation of pipe trenches outside paylines shown on drawings.

c. Include cost of excavation for pipe trenches required outside paylines in prices offered in Price Schedules for various sizes and classes of line pipe.

d. Overexcavation performed beyond specified or directed paylines and backfill and compaction of backfill for such overexcavation shall be at expense of Contractor.

e. Where excavation is performed in backfill, no payment will be made for resulting excavation, backfill, and compacting backfill.

E. Rock Excavation for Pipe Trenches:

1. Measurement: Made to paylines shown on drawings and trench lengths of rock material excavated.

a. Regardless of actual widths, bottoms, and side slopes excavated, measurement will be made to paylines shown on drawings and to original ground or rock surface.

b. Measurement for payment for additional excavation will be made to Wp and trench bottom shown on drawings and to depth directed by COR.

c. Measurement for payment will be continuous through pipe fittings.

d. Measurement for payment of excavation for concrete for pipe fittings that is outside trench excavation paylines will be made to lines and dimensions shown on drawings or to neatlines of the concrete.

2. Payment: Cubic yard prices offered in Price Schedules.

a. Includes cost of labor and materials for:

1) Mechanical breaking, shoring, sheeting, bracing, timbering, safety sloping, and other temporary construction;

2) Pumping and unwatering;

3) Removing such temporary construction where required;

4) Stockpiling excavated material for backfill;

5) Disposal of unused or wasted excavated materials.

b. No direct payment will be made for rock excavation of pipe trenches outside Wp, depth and length listed above.

c. Include cost of rock excavation for pipe trenches required outside paylines prices offered in Price Schedules for Rock Excavation of Pipe Trenches.

d. Overexcavation performed beyond specified or directed paylines and backfill and compaction of backfill for such overexcavation shall be at expense of Contractor.

F. Embedment in Pipe Trenches:

1. Measurement:

a. Made to paylines for pipe trenches, to lengths shown on drawings, or as directed based on diameters Dp shown on drawings, regardless of actual diameters of pipe furnished.

b. Measurement for payment for the embedment zone in pipe trenches for additional excavation of pipe trenches will be made to trench widths Wp shown on drawing 1695-D-60314.

1) Embedment zone; between 0.25 Dp to 0.7 Dp.

c. Controlled Low Strength Material is required in embedment zone for road and utility crossings.

2. Payment: Cubic yard prices offered in Price Schedules.

a. Includes cost of work associated with procuring, processing, and hauling of necessary material.

b. Where embedment material is obtained from other sources, payment will be made for embedment only. Include cost of excavating or procuring, hauling, and processing of such material in unit prices offered in Price Schedules for embedment in pipe trenches.

c. Native material when used from required excavation for embedment in pipe trenches will be paid for both as excavation when removed from original position and as embedment when placed.

d. No direct payment will be made for embedment in pipe trenches for pipe outside paylines shown on drawings. Include cost of embedment outside these paylines in prices offered in Price Schedules for various sizes and classes of line pipe.

e. No payment will be made for embedment required to fill overexcavation performed by Contractor.

f. No payment will be made for removal and reconstruction of defective and nonconforming embedment compacted to an insufficient density.

G. Backfill for Pipe Trenches:

1. Measurement:

a. Made to paylines for pipe trenches, to lengths shown on drawings, or as directed based on diameters Dp shown on drawings, regardless of actual diameters of pipe furnished.

b. Measurement for payment of backfill in pipe trenches for additional excavation of pipe trenches will be made to trench widths Wp shown on drawings and to depth directed by COR.

1) Backfill; Between 0.7 Dp to bottom of stripping or original ground surface in rock.

c. Backfill material mounded or spread over trench above original ground surface will not be measured for payment as backfill in pipe trenches.

d. Controlled Low Strength Material is required in backfill for road and utility crossings.

2. Payment: Cubic yard prices offered in Price Schedules.

a. Includes cost of work associated with excavation or procuring, processing, and hauling of necessary material.

b. Material from required excavation used for backfill in pipe trenches will be paid for both as excavation when removed from original position and as backfill when placed.

c. Where backfill material is obtained from other sources, payment will be made for backfill only. Include cost of excavating or procuring, hauling, and processing of such material in unit prices offered in Price Schedules for backfill in pipe trenches.

d. No direct payment will be made for backfill in pipe trenches for pipe outside paylines shown on drawings. Include cost of backfill outside these paylines in prices offered in Price Schedules for various sizes and classes of line pipe or valve assemblies.

e. No direct payment will be made for furnishing and placing gravel around air valves, and blowoffs. Include cost in prices offered in Price Schedules for backfill in pipe trenches.

f. No payment will be made for backfill required to fill overexcavation performed by Contractor.

g. No payment will be made for removal and reconstruction of defective and nonconforming backfill compacted to an insufficient density.

H. Cost:

1. Include cost of bedding in pipe trenches in Line Pipe.

a. Bedding Zone; bottom of trench to 0.25 Dp.

1.02 DEFINITIONS

A. Additional Excavation: Excavation beyond specified lines as directed by COR to remove unsuitable foundation material.

B. Overexcavation: Excavation performed for convenience, fault, or operation of Contractor beyond specified or directed additional excavation lines.

C. Rock Excavation:

1. Material that cannot be ripped with 400 horsepower or larger crawler tractor equipped with ripper rated for hard rock with a rock tooth.

2. Material that cannot be excavated with 300 horsepower or larger hydraulic excavator, with rock teeth, in areas where it is not feasible for ripping with crawler tractor.

1.03 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO SSHB-02 Standard Specifications for Highway Bridges, 17th Edition

B. Bureau of Reclamation (Reclamation)

1. RSHS ***Reclamation Safety and Health Standards, including revisions posted at: www.usbr.gov/ssle/safety/RSHS/rshs.html***

1.04 *SUBMITTALS*

A. RSN 31 23 22-1, Cultural Site Trench Box Design:

1. Completed by Registered Professional Engineer in accordance with RSHS.

2. Include access and excavation plans for cultural site areas.

1.05 PROJECT CONDITIONS

A. Soil conditions are described in Section 53 10 00 - Geologic Investigations.

B. Tables 31 23 22A - Reach 9, Reach 10 and Reach 11 summarize Government's interpretation of geological investigations to predict native material properties. Conditions in field may vary. Bidders are encouraged to come to their own conclusions relating to excavation characteristics of site materials.

C. Material Types presented in these tables do not reflect potential for encountering bedrock during excavation. If bedrock is encountered, trench excavation should match what is shown on drawing 1695-D-60314 for Material Type 1. Bedrock surface has been inferred from geologic investigations, and is presented on drawings 1695-D-60281 through 1695-D-60313.

Table 31 23 22A – Reach 9

Station	Expected Native Material Properties*
90010+00 to 90019+50	3
90019+50 to 90104+00	2
90104+00 to 90151+00	3
90151+00 to 90187+00	2
90187+00 to 90237+00	3
90237+00 to 90432+00	2
90432+00 to 90483+00	3
90483+00 to 90545+00	2
90545+00 to 90634+00	3
90634+00 to 91100+00	2
91100+00 to 91150+00	3
91150+00 to 91195+00	2
91195+00 to 91226+00	3

Table 31 23 22A – Reach 10

Station	Expected Native Material Properties*
10010+00 to 10050+00	3

Table 31 23 22A – Reach 11

Station	Expected Native Material Properties*
11058+00 to 11100+00	2
11100+00 to 11179+50	3
11179+50 to 11280+00	2

*Refer to Drawing 1695-D-60314 for explanation of Native Material Properties.

PART 2 PRODUCTS

2.01 BEDDING

A. Bedding:

1. Controlled low strength materials in accordance with Section 31 23 70 - Controlled Low Strength Material (CLSM).

2.02 EMBEDMENT

A. Embedment:

1. Select material in accordance with drawings.
2. CLSM in accordance with Section 31 23 70 – Controlled Low Strength Material (CLSM).

3. Select Material from commercial sources meeting requirements of this specification.

4. Native material removed from pipe trench excavation or from other sources arranged for by Contractor.

2.03 MATERIALS FOR BACKFILL

A. Use materials removed in excavating for pipe trenches or from other sources arranged for by Contractor.

1. Government makes no guarantee that specified backfill materials are contained in or can be processed from materials excavated from pipe trenches.

2. All reasonable effort shall be expended to obtain suitable backfill material from required excavation prior to obtaining commercial sources.

B. Do not use unprocessed expansive clays in compacted backfill.

C. Provide processing equipment and perform work necessary to process excavated materials to produce materials meeting requirements of these specifications.

D. Maximum backfill particle size within 1-foot of the outside of pipe: Conform to requirements of Table 31 23 22B - Maximum Backfill Particle Size

Table 31 23 22B - Maximum Backfill Particle Size

Type of Pipe	Maximum Particle Size, inches
PVC, metallic pipe with dielectric coating, or metallic pipe encased in polyethylene	3/4
Polyethylene Pipe: Diameter 10-inch to 16-inch Diameter greater than 16-inch	 1 1 1/2
Fiberglass Pipe	1 1/4
Other pipe	3

E. Maximum backfill particle size beyond 1-foot of outside of pipe: 1/2 lift height.

F. Particle size of material placed in compacted backfill, maximum: 3-inches.

G. Particle size of material placed in uncompacted backfill, maximum: 5-inches.

H. Backfill placed where pipelines cross under open irrigation ditches and other watercourses: Silty or clayey material with a plasticity index of 8 or more.

PART 3 EXECUTION

3.01 GENERAL

A. Perform operations so that land can be restored to original conditions.

3.02 *CULTURAL SITES TRENCH BOX*

A. Applicable linear foot per reach shall be on site prior to excavation.

B. Install in locations as directed by COR.

C. Trench box shall be suitable for installation of line pipe within excavation up to 20 feet in depth.

D. Minimize ground disturbing activities to minimum required to install pipeline and to provide access in the area where trench box is used.

1. No supplemental excavations shall be performed outside the vertical, shored trench excavation.

2. Route traffic either side of the excavation to minimize impacts to sensitive sites as directed by COR.

3. CO will consider adjusting costs for site restrictions in accordance with FAR 52.243-04.

3.03 EXCAVATION

A. Do not excavate or keep pipe trench open more than 300-feet ahead or 100-feet when groundwater is present of pipelaying, backfilling, or compacting backfill operations, unless approved by COR.

1. Backfill and Compacting Operations:

a. Shall not fall behind pipelaying and excavation operations,

b. Allow CLSM to obtain required strength in accordance with Section 31 23 70 - Controlled Low Strength Material (CLSM) prior to placing backfill above 10-feet of cover.

c. At the end of each shift:

1) 100-feet of pipe trench, maximum, is open ahead of pipelaying and,

2) Backfill is within 100-feet of pipelaying.

3) For trenches left open overnight,

a) Install inflatable watertight plug.

b) Fence open trench with temporary safety fence in accordance with Section 01 56 32 - Temporary Safety Fence.

2. If backfilling and compacting fall behind pipelaying operations, stop excavation and pipelaying operations. Do not proceed until directed by COR.

B. Excavate pipe trenches for pipelines, delivery installations, and pipeline accessories to lines, grades, and dimensions shown on drawings.

C. Finish bottom of trench accurately to lines and grades shown on drawings.

D. Perform excavation in the dry.

E. Do not excavate in frozen materials without written approval of COR.

3.04 ADDITIONAL EXCAVATION

A. Perform additional excavation in trench bottom for pipe foundations as shown on drawings and other additional excavation beyond specified lines, as directed by COR.

3.05 OVEREXCAVATION

A. When foundation material is overexcavated beyond specified or directed lines, fill overexcavation with backfill materials and compact in accordance with Section 31 23 02 - Compacting Earth Materials.

B. If foundation material is overexcavated by being disturbed or loosened during excavation, compact material in place or remove and replace with backfill material and compact in accordance with Section 31 23 02 - Compacting Earth Materials.

3.06 STOCKPILING

A. Stockpile excavated materials which meet or will be processed to meet material requirements for backfill in pipe trenches until processed or used as backfill material.

3.07 DISPOSAL

A. Dispose of excess excavated materials in accordance with Section 31 23 39 - Disposal of Excavated Materials.

1. Excess excavated materials: Materials which are not used or processed for use as backfill material and waste materials from such processing.

3.08 PIPE INSTALLATION

A. Install pipe in accordance with Section 33 11 10 – Pipeline General Requirements.

3.09 BEDDING PLACEMENT

A. Place to lines shown on drawings or as directed by COR.

B. Do not drop directly on pipe.

C. Place CLSM in accordance with Section 31 23 70 – Controlled Low Strength Material (CLSM) and as shown on drawings.

D. Place to widths and depths shown on drawings.

E. Place at same elevation on both sides of pipe to prevent unequal loading and displacement of pipe. Elevation difference on sides of pipe shall not exceed 6-inches.

3.10 EMBEDMENT PLACEMENT

A. Place to lines shown on drawings or as directed by COR.

B. Do not drop directly on pipe.

C. Place CLSM, Select or Native Material in accordance with drawings.

D. Place to widths and depths shown on drawings.

E. Place at same elevation on both sides of pipe to prevent unequal loading and displacement of pipe. Elevation difference on sides of pipe shall not exceed 6-inches.

F. Place CLSM, select or native material in accordance with drawing 1695-D-60314.

3.11 BACKFILL PLACEMENT

A. Install warning tape over center of pipe at least 18-inches below ground and at least 18-inches above pipe. See Section 33 11 10 – Pipeline General Requirements, Pipe Accessories; Warning Tape for details.

B. Place backfill in pipe trenches to lines shown on drawings, or as directed by COR.

C. Do not place material in backfill when either material or surfaces on which backfill is to be placed are frozen.

D. Place backfill for overexcavation performed outside specified or directed paylines for excavation for pipe trenches in same manner as specified for adjacent backfill or embedment.

E. Do not drop backfill directly on pipe.

F. Place backfill carefully and spread in uniform layers so that spaces about rocks and clods will be filled.

G. Place backfill in lifts:

1. Backfill to be compacted: In accordance with Section 31 23 02 - Compacting Earth Materials.
2. Maximum lift height of other backfill: 1-foot.

H. Place backfill to the same elevation on both sides of the pipe to prevent unequal loading and displacement of pipe. Elevation difference of backfill on sides of pipe shall not exceed 6-inches.

I. Backfill above compacted backfill may be placed as soon as compacting of backfill is completed.

1. Placing of this backfill shall be delayed at locations designated by COR for the procurement of compacted backfill sample collections for testing.

J. Place backfill over pipe as approved by COR, if backfilling operations are interrupted for more than 24 hours.

K. For Wash Crossing backfill: See Section 35 42 35 – Bank Protection.

3.12 COMPACTING BACKFILL

A. Compact backfill in pipe trenches in layers having about the same top elevation on both sides of pipe to prevent unequal loading and displacement of pipe.

B. Compact backfill as specified in Section 31 23 02 - Compacting Earth Materials.

C. Location of Compacted Backfill:

1. As shown on drawings.
2. Backfill for foundation.
3. Backfill on outside of horizontal curves for a minimum of restrained pipe length.
4. Backfill where pipeline cross under roadways and driveways.
5. Backfill where utility pipelines cross pipeline:
    a. To horizontal centerline of pipeline crossing lateral pipeline and to dimensions and slopes as shown on drawings.
6. Backfill at tees with horizontal outlets, pipe bends, encasements, collars including collar-type blocking, and pipe plugs as shown on drawings.
7. Backfill around valve boxes and manholes as shown on drawings.
8. Where additional excavation for pipe trenches is directed by COR to remove foundation material or other material, compact backfill within paylines for this additional excavation.

D. When tests indicate insufficient density of compacted backfill about pipe:

1. Remove backfill above compacted backfill.
2. Compact backfill until proper density is obtained.
3. Replace backfill above compacted backfill.
4. This work shall be at Contractor's expense.

3.13 PROTECTION

A. Government reserves the right to direct Contractor to place a sufficient amount of backfill material over compacted backfill within 72 hours after compacting of backfill has been completed.

B. Place uncompacted backfill to a minimum depth of 3-feet or compact backfill to a minimum depth of 2-feet above top of pipe before allowing construction equipment to travel over pipe.

1. After these minimum earth covers are in place, maximum live equipment loading allowed over pipe shall be HS-20 loading (16,000-pound wheel load) in accordance with AASHTO SSHB.

2. If construction equipment that exerts a larger wheel load is proposed to be used, submit construction equipment loadings to COR for analysis and determination of required backfill depths or other protective measures.

END OF SECTION

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SECTION 32 91 60
EROSION CONTROL BLANKET

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Erosion Control Blanket:

1. Measurement: Surface area required to be covered, except no allowance will be made for overlaps, repairs, or waste.
2. Payment: Square yard prices offered in Price Schedules:
   a. Includes:
      1) Erosion Control Blanket Anchors.
      2) Coir Wattles.
      3) Seeding under Erosion Control Blankets in accordance with Section 32 92 20 – Seeding.

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO))

1.	AASHTO T310-13	Standard Method of Test for In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
2.	AASHTO T99-15	Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop

B. ASTM International (ASTM)

3.	ASTM D698-12e2	Standard Test Methods for Laboratory compaction Characteristics of Soil Using Standard Effort (12 400 ft-.bf/ft^3)

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 32 91 60-1, Manufacturer's Information:

1. Literature listing specified essential characteristics.
2. Installation instructions.

3. Excelsior color sample.

C. RSN 32 91 60-2, Installation Plan:

1. Describe sequence of placing blanket.

PART 2 PRODUCTS

2.01 *SEEDING*

A. In accordance with Section 32 92 20 – Seeding.

2.02 EROSION CONTROL BLANKET

A. AEC Premier Coconut erosion control blanket, as manufactured by American Excelsior Company, 850 Avenue H East, Arlington TX, telephone: 800-777-7645; or equal, having the following essential characteristics:

1. Machine-assembled mat with 100 percent aspen or coconut excelsior within 2 layers of netting stitched to form a 3 dimensional matrix:

a. Netting: Jute or other natural biodegradable fiber.

2. Consistent thickness with aspen or coconut excelsior curled, interlocked, and evenly distributed over entire area of mat.

3. Excelsior Color: Sand.

4. Unit Weight: 8 ounces per square yard.

5. Thickness, Minimum: 1/2-inch.

6. Thread Pattern: 4-inch wide by 4-inch long.

B. Supply blanket in protected, rolled mat form.

2.03 EROSION CONTROL BLANKET ANCHORS

A. Biodegradable staples, 6-inch minimum length, as recommended by manufacturer.

2.04 COIR WATTLES

A. BioD-Watl 9, as manufactured by Rolanka International, 155 Andrew Drive, Stockbridge, GA 30281, telephone: 770-506-8211; or equal, having the following characteristics:

1. 100% coconut fiber filler material in cylindrical shaped rolls with 2-inch by 2-inch high strength outer netting made of 60-lbs. strength machine spun bristle coir twines.

2. Unit Weight: 1.5 lb/ft.

3. Density: 3.4 lb/cu ft.

4. Diameter: 9-inch.

5. Length: 15- and 20-feet.

PART 3 EXECUTION

3.01 EROSION CONTROL BLANKET INSTALLATION

A. Site Preparation:

1. Compact bank line excavated for pipe trench backfill beneath erosion control blanket bank protection:

   a. Compact to 85 percent of maximum density obtained using AASHTO T99 (Standard Proctor) in accordance with AASHTO T310.

   b. Compact to 85 percent of maximum density obtained using ASTM D698 (Standard Effort).

2. Remove large, sharp objects which include but are not limited to rocks, cut trees, roots, shrubs, glass that may damage erosion control blanket.

3. Grade wash crossing bank slope to the natural topography prior to pipe installation.

4. Seed in accordance with Section 32 92 20 – Seeding just prior to placing erosion control blanket. Seed only under erosion control blanket.

B. Erosion Control Blanket:

1. Install erosion control blanket on slopes steeper than 2.5:1, at locations shown on drawings or as directed by COR and in accordance with manufacturer's recommended installation procedures and approved installation plan.

2. At overlaps, shingle upstream matting over downstream matting.

3. Secure topsoil erosion control matting in a 6- by 6-inch anchor trench at top and bottom of berms and at upstream and downstream ends of mats.

4. Before backfilling anchor trenches, pin or staple erosion control blanket into anchor trench with no more than 12-inch spacing as recommended by manufacturer.

5. Outside anchor trench, anchor topsoil erosion control matting with 3 to 4 staples per square yard as recommended by manufacturer.

3.02 COIR WATTLE INSTALLATION

A. Anchoring system must be adequate to seat coir wattle securely in contact with adjacent ground:

1. Place coir wattle at bank toe and at subsequent 12-foot intervals up compacted backfill bank on top of erosion control blanket extending 5-feet beyond disturbed area.

2. Minimum 2-foot overlap between adjoining wattles.

3. A pair of 2-inch by 4-inch wood construction stakes should be placed every 4-feet along coir wattle, one on each side.

4. Piercing coir wattle with stakes should be avoided. Stakes should be driven alongside coir wattle. Coir wattle is secured by tightly sandwiching coir wattle between stakes.

B. To form a continuous unit, coir wattles must be tied together end-to-end:

1. Use strong synthetic rope to stitch ends together, with knots tied at frequent intervals to ensure reliable connection.

3.03 REPAIR

A. Repair or replace damaged during installation topsoil erosion control matting at Contractor's expense.

END OF SECTION

SECTION 32 92 20

SEEDING

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost: Include in Square Yard Cost offered in Price Schedules for Erosion Control Blanket.

1.02 DEFINITIONS

A. Pure live seed content: Weight of seed times percent purity times percent germination.

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 32 92 20-1, Seeding Plan:

1. Equipment.
2. Name and address of seed suppliers.

C. RSN 32 92 20-2, Certifications:

1. Origin of seed.
2. Percent purity and germination.
3. Prohibited and restricted weed seed content.

1.04 DELIVERY STORAGE AND HANDLING

A. Seed Containers:

1. Sealed.
2. Labeled:
    a. Identify seed origin on label.
        1) Intrastate shipping: In accordance with New Mexico State Seed Laws and Regulations.
        2) Interstate shipping: In accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act.

1.05 AMBIENT CONDITIONS

A. Do not seed when ambient temperature is below 38 degrees Fahrenheit without approval of the COR.

B. Do not seed when ground is snow covered.

C. Do not seed when wind velocities prevent uniform application of materials or would drift materials.

PART 2 PRODUCTS

2.01 SEED

A. Weed seeds classified by State Seed Department:

1. Prohibited noxious weeds: None allowed.
2. Restricted noxious weeds: 0.5 percent maximum, by weight.

B. Seed Mixture:

1. Purity, minimum: 85 percent.
2. Germination, minimum: 85 percent.
   a. Germination test: Less than 1-year old at time of seeding.
3. Uniform mixture shown in Table 32 92 20A - Seed Mixture.

Table 32 92 20A - Seed Mixture

Common Name	Cultivar	Seeding Rate (Pounds pure live seed per acre)
Western Wheatgrass	Arriba	3
Streambank Wheatgrass		2
Intermediate Wheatgrass	Oahe	3
Indian Rice Grass	Paloma	2
Blue Grama		2
Sideoats Grama		2
Little Bluestem		2
Rock Mountain Penstemon		1

PART 3 EXECUTION

3.01 SEEDBED PREPARATION

A. Complete prior to seeding.

B. Scarify or harrow and rake topsoil to minimum depth of 3 inches.

C. Remove stiff clods, lumps, roots, litter, stones, and other foreign material greater than 6 inches in size from the surface.

D. Fill or smooth topsoil surface to remove rills, gullies and depressions.

E. Protect prepared topsoil surfaces from erosion and washouts. Repair damaged surfaces as required.

3.02 SEEDING

A. Seed between June 1 to July 31 or October 15 to November 15.

3.03 BROADCAST SEEDING

A. Mechanical Broadcasting:

1. Equipment:
    a. Centrifugal type.
    b. Pull type similar to fertilizer spreader.
2. Designed and regulated to apply seed uniformly at proper rate per acre.

B. Hand Broadcasting:

1. By hand broadcaster.
2. By hand.
3. Uniformly applied.

C. Cover seed with soil to depth of 1/4-inch to 1/2-inch immediately after broadcasting.

1. Use hand rake or float.
2. Do not use log chain or similar device.

END OF SECTION

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SECTION 33 05 21

BORED UTILITY AND ROAD CROSSINGS

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Bored Utility Crossings:

1. Measurement: Linear foot of casing pipe.
2. Payment: Include in prices offered in Price Schedules for Bored Utility and Road Crossings.
    a. Includes:
        1) Casing pipe
        2) Installation of casing and carrier pipe.
        3) Endcaps, spacers, runners and end seals.
        4) Additional earthwork outside line pipe paylines.
    b. Does not include:
        1) Carrier pipe (line pipe).

B. Bored Road Crossing, BIA Road 9 and Gas Plant Road:

1. Measurement: Linear foot of casing pipe.
2. Payment: Include in prices offered in Price Schedules for Bored Utility and Road Crossings.
    a. Includes:
        1) Casing pipe
        2) Installation of casing and carrier pipe.
        3) Endcaps, spacers, runners and end seals.
        4) Additional earthwork outside line pipe paylines.
    b. Does not include:
        1) Carrier pipe (line pipe).

1.02 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 33 05 21-1, Placement Plan:

1. Detail work including boring, casing materials and equipment used.

a. Assembly.

b. Casing geometry.

c. Cross section of installation including soil/bedrock profile.

C. RSN 33 05 21-2, Material Certification:

1. Certification, signed by material producer and Contractor that material complies specified requirements.

D. RSN 33 05 21-3, Copy of Application for Utility Permit.

1.03 SITE CONDITIONS

A. Bedrock may be encountered during boring operations. Refer to Section 53 10 00 – Geologic Investigations.

1.04 PERMITS

A. Obtain permits from appropriate authorities to install bored utility crossings.

PART 2 PRODUCTS

2.01 CASING PIPE

A. Smooth Steel Pipe:

1. In accordance with Section 33 21 95 – Metal Piping for Line Pipe or 33 11 12 – Steel Line Pipe, except:

a. Hydrostatic test not required.

b. Thickness: 0.25-inch~~es~~ ***minimum***.

c. Diameter: 60- and 54-inch.

~~***Epoxy lined.***~~

d. Welded joints.

e. Reach 11, casing pipe under BIA Road 9 will require a minimum yield stress of 50 ksi steel.

2.02 CARRIER PIPE

A. See Section 33 11 10 - Pipeline General Requirements.

B. Use restrained or welded joints.

C. Gas line crossing: Petroleum resistant gaskets inside casing pipe and within 100 feet of gas line crossing.

2.03 SPACERS AND RUNNERS

A. Insulated casing spacers and runners, per manufacturer's recommendations.

2.04 END SEAL

A. Model AW Wrap Around End Seal, Manufactured by Advance Products & Systems, Incorporated, www.apsonline.com or equal with the following essential characteristics:

1. Rubber end seal with stainless steel clamps.
2. Rubber seal manufactured with butyl mastic strips.

PART 3 EXECUTION

3.01 GENERAL

A. Verify utility locations prior to excavation in accordance with Section 01 56 15 - Protection of Existing Utilities.

B. Remove and replace fence in accordance with 01 56 20 - Existing Fences.

C. Excavate suitable pits or trenches for boring operations.

1. Strip in accordance with Section 31 14 10 – Stripping, Stockpiling, and Placement.
2. Earthwork in accordance with Section 31 23 22 – Pipe Trench Earthwork.

D. Where excavation extends below ground water levels, dewater portion below water line in advance of excavation in accordance with Section 31 03 33 - Removal of Water from Excavation.

1. Conduct work in the dry.

E. Do not interfere with normal operations of highway, street, or other facilities.

1. Exception: Public safety in accordance with approved traffic plan.

F. Do not weaken or damage highway, street or facility. Repair at Contractor's expense, as determined by COR.

G. Remove and replace, without additional cost, pipe damaged during boring operations.

H. Install casing pipes to lines and grades shown on drawings.

1. Final position of pipe:
   a. Less than 1-inch in 40-feet laterally or vertically.
   b. Variation: Regular and only 1 direction.
2. Grout bored annulus, outside of casing pipe, if annulus exceeds 1-inch.

I. No pit or trench, excavated to install pipe, shall remain open longer than 5 days after installation, unless otherwise approved by COR.

J. Install safety fencing around pit or trenches in accordance with Section 01 56 32 - Temporary Safety Fence. Remove as required for construction.

3.02 BORING

A. Pilot Hole Method:

1. Bore pilot hole entire length of crossing.
2. Check line and grade of bore from exit hole, and correct.
3. Use pilot hole as centerline for larger diameter hole to be bored.

B. Auger Method:

1. Proper diameter steel pipe equipped with a cutter head to mechanically perform excavation.
2. Augers shall be of sufficient diameter to convey excavated material to work pit.

C. Gel-forming Colloidal Drilling Fluid:

1. Minimum 10 percent of high grade processed Bentonite.
    a. Consolidate cuttings of bit, seal holes in boring wall, and furnish lubrication for cuttings removal and immediate installation of line pipe.
2. Use water or other fluids in boring only to lubricate cuttings for removal.
3. Jetting not permitted.

D. Dispose of drilling fluid in accordance with Section 01 74 00 - Cleaning and Waste Management.

3.03 CARRIER PIPE

A. Install carrier pipe, spacers, runners and end seal per manufacturer’s recommendations.

3.04 BACKFILL

A. If pit or trench is backfilled prior to installation of carrier pipe, install a wooden bulk head at ends of casing to keep backfill material out of casing pipe. Mark ends with of casing pipe with utility markers to allow for relocation.

B. Backfill in accordance with accordance with Section 31 23 22 – Pipe Trench Earthwork.

C. Reconstruct highway slopes and embankments with same materials excavated and to existing dimensions.

D. Dispose of excavated material in accordance with Section 31 23 39 - Disposal of Excavated Materials.

END OF SECTION

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SECTION 33 11 10
PIPELINE GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Line Pipe (Reach 9):

1. Measurement: Horizontally along pipe centerline, without allowance for slope, between ends of pipe in place. Continuous through fittings, outlets, wash crossings, casing pipes, end collars, thrust restraints, and road crossings with no allowance for lap at joints.

    a. Diameter change from 48-inches to 42-inches is assumed to be at Station 90879+00. Location of diameter change may vary based on pipe material type used.

2. Payment: Applicable linear foot prices offered in Price Schedule 1 for various size and class of line pipe.

    a. Includes cost of furnishing materials; furnishing and laying pipe; fittings, furnishing and placing bedding and embedment; providing utility markers; furnishing and placing concrete, cement, and reinforcement steel in encasements, blocking, and collars not included elsewhere.

B. Line Pipe (Reach 10):

1. Measurement: Horizontally along pipe centerline, without allowance for slope, between ends of pipe in place. Continuous through fittings, outlets, end collars, thrust restraints, and road crossings with no allowance for lap at joints.

    a. Measurement for line pipe from pipe outlets will begin at downstream face of valve or flange.

2. Payment: Applicable linear foot prices offered in Price Schedule 2 for various size and class of line pipe.

    a. Includes cost of furnishing materials; furnishing and laying pipe; fittings, furnishing and placing bedding and embedment; providing utility markers; furnishing and placing concrete, cement, and reinforcement steel in encasements, blocking, and collars not included elsewhere.

C. Temporary Construction Water Line (Reach 10):

1. Payment: Lump sum price offered in Price Schedule 2 (Reach 10).

2. Includes all items shown on drawing 1695-D-60308 unless otherwise noted.

D. Line Pipe (Reach 11):

1. Measurement: Horizontally along pipe centerline, without allowance for slope, between ends of pipe in place. Continuous through fittings, outlets, wash crossings, casing pipes, end collars, thrust restraints, and road crossings with no allowance for lap at joints.

   a. Measurement for line pipe from pipe outlets will begin at downstream face of valve or flange.

2. Payment: Applicable linear foot prices offered in Price Schedule 3 (Reach 11) for various size and class of line pipe.

   a. Includes cost of furnishing materials; furnishing and laying pipe; fittings, furnishing and placing bedding and embedment; providing utility markers; furnishing and placing concrete, cement, and reinforcement steel in encasements, blocking, and collars not included elsewhere.

E. Filling and Testing Pipe:

1. Measurement: Includes one pipe volume of water. More water is required for flushing and testing.

2. Payment: Lump sum prices offered in Price Schedules.

   a. Includes water used for filling and testing as approved by COR.

F. Repair Kits:

1. Payment: Lump sum prices offered in Price Schedules.

1.02 DEFINITIONS

A. Line Pipe:

1. Water transmission pipe and 6-inch temporary construction water pipe.

2. Unless otherwise specified, does not include piping in vaults or piping for appurtenances such as blowoffs, bypasses, air valves or manholes.

B. Pipe sizes and classes: Designated on plan and profile drawings by an alphanumeric symbol.

   a. Symbol identifies pipe diameter, cover class and hydraulic transient head as follows:

      1) First number in symbol indicates nominal diameter in inches.

      2) Alphabetic character represents cover class of pipe where; B < 10 feet, C < 15 feet, and D < 20 feet. Pipe with “K” designation represents pipe that has a special design.

      3) Second number in symbol is maximum hydraulic transient head measured to centerline of pipe.

4) A symbol of 42C600 means pipe is 42-inches in diameter with a cover between 10- and 15-feet and a hydraulic transient head of 600-feet at centerline of pipe.

2. Unless specific reference is made to outside or inside diameter of pipe, pipe diameters shown on drawings and used in this section are nominal pipe diameters.

1.03 REFERENCE STANDARDS

A. ASTM International (ASTM)

1.	ASTM C150/C150M-17	Portland Cement
2.	ASTM F2164-13	Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems using Hydrostatic Pressure.

B. American Water Works Association (AWWA)

1.	AWWA C205-12	Cement-Mortar Protective Lining and Coating for Steel Water Pipe – 4 In. (100mm) and Larger - Shop Applied
2.	AWWA C600-10	Installation of Ductile Iron Water Mains and Their Appurtenances
3.	AWWA C604-11	Installation of Steel Water Pipe 4 In. (100mm) and Larger
4.	AWWA C605-13	Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings
5.	AWWA M45	Fiberglass Pipe Design, Third Edition

C. International Organization for Standardization (ISO)

1.	ISO 9001-15	Quality Management

D. National Sanitation Foundation (NSF)

1.	NSF Standard 61-16	Drinking Water System Components - Health Effects

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals:

B. RSN 33 11 10-1, Qualifications:

1. Certification of line pipe layers (Foreman).
2. Certification of line pipe and fitting manufacturers.

C. RSN 33 11 10-2, Pipelaying Diagrams:

1. Submit in sections, not to exceed 5-miles, after utility crossing investigation and wash crossing field information has been submitted for that section.
2. For each type of pipe furnished.
3. Show position and marking of pipe sections.
4. Include centerline and invert stationing and elevations at horizontal and vertical changes in alignment, and subgrade elevation for each pipe segment and fitting.
5. Include pipe thickness, Dimension Ratio (DR) or pressure class of pipe segment or fitting.
6. For alignment changes not using a miter bend (pulling joints) provide station at point of curvature and point of tangent, and deflection angle at each pulled joint.

D. RSN 33 11 10-3, Filling and Testing Plan:

1. Proposed rate, time, and procedure for:
   a. Cleaning.
   b. Filling.
   c. Field and pressure testing.
   d. Draining pipeline.
2. Method for disposing of water drained from pipeline to enable repair of leaks.

E. RSN 33 11 10-4, Flotation Prevention Plan:

1. Show location and describe method of preventing pipe from floating.
2. Provide supporting calculations.

F. RSN 33 11 10-5, Pipe Deflection Measurements.

G. RSN 33 11 10-6, Connection to Reach 12A:

1. Provide details of communications with Tohlakai Pumping Plant Operators.
2. Provide connection schedule.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Ship pipe after receiving COR approval as per Section 2.03 – Source Quality Assurance.

B. Prevent damage to pipe and fittings during loading, transporting, unloading, storing, and laying.

C. Transport metallic pipe and fittings on padded bolsters curved to fit outside of pipes. Use heavy padding under ties.

D. Tightly close open ends of shop-applied, cement-mortar-lined pipe with plastic wrap for protection of cement-mortar lining during shipment.

1. Plastic Wrap:

a. At least 2 thicknesses of 6-mil sheet polyethylene plastic.

b. Remain on pipe until installation.

E. Support and store pipe above ground surface. Do not allow bells and spigots to contact each other or the ground.

F. Government will inspect pipe once it is delivered.

G. Replace or repair, as approved by COR, any pipe that is damaged during shipment, storage, or installation at Contractor's expense. Include linings and coatings.

1.06 QUALIFICATIONS

A. Pipe manufacturers shall be certified in accordance with ISO:9001 or similar nationally certified program approved by COR.

B. Line pipe and specials manufacturers:

1. 10 years successful experience producing products as specified.

2. Provide references for at least 3 completed projects with similar pipe diameters and pressures.

C. Pipe Layers: Skilled and experienced in laying pipe with joints as needed for each material type of pipe used. Minimum 2-years installing pipe with similar pipe diameters, pipe material, and pressures:

1. In the absence of specific pipe material experience, substitution of onsite pipe manufacturer training and quality control is allowed:

a. Provide manufacturer's representative certified in pipeline installation, including all applicable joints, for training pipe layers and pipe foreman prior to installation.

b. In lieu of specific pipe material installation experience, pipe layers and pipe foreman shall still have experience with installing similar pipe diameters and pressures.

D. Qualify welding procedures and welders in accordance with code under which welding is specified.

1.07 REPAIR KITS

A. Furnish 1 repair kit for each material type and size of pipe used.

B. Repair kit:

1. One standard length of pipe and 2 restrained couplings.
2. At highest loading and pressure rating for each material type and nominal size of pipe provided.

C. Place repair kits in storage within 150-miles from site, as designated by COR.

PART 2 PRODUCTS

2.01 PIPE OPTIONS

A. In accordance with the following Sections:

1. 33 11 12 – Steel Line Pipe,
2. 33 11 13 – Ductile Iron Pipe,
3. 33 11 16 – PVC Pressure Pipe,
4. 33 11 18 – HDPE Pressure Pipe.
5. 33 11 19 – Fiberglass Pipe.

B. Locations:

1. Reach 9; pipe material types and diameters allowed are shown on drawing 1695-D-60306.
2. Reach 10; pipe material and types listed in 2.01 – Pipe Options.
    a. 42-inch nominal diameter.
    b. 6-inch nominal diameter: PVC only
3. Reach 11; pipe material and types listed in 2.01 – Pipe Options:
    a. PVC and HDPE not allowed.
    b. 42-inch nominal diameter.

C. No more than one metallic line pipe type and one non-metallic line pipe type may be used, except as shown on drawings.

D. Materials and chemicals that may come into contact with drinking water shall be certified by NSF 61.

E. Rubber Gaskets:

1. Manufactured and tested in accordance with applicable AWWA standard for pipe type.
2. Petroleum-Resistant Gaskets: Use in pipe joints in accordance with Section 33 05 21 – Bored Utility and Road Crossings.
3. Lubricant: Approved for potable water use.

2.02 FITTINGS

A. Fittings should resist same loading conditions as adjacent pipe.

B. Refer to applicable line pipe section for allowed fittings.

2.03 SOURCE QUALITY ASSURANCE

A. Approval for Shipment:

1. Pipe and fitting approval will be determined by inspection, during and after manufacture.
2. Notify Technical Service Center, Attn: 86-68140, and COR at least 14 days before manufacturing pipe and fittings and 3 days before shipping pipe and fittings.
3. Government will inspect pipe units and fittings and will approve for shipment those which have been manufactured and tested in accordance with these specifications, unless Contractor is notified in writing.
4. Further inspection of pipe units and fittings will be in accordance with clause at FAR 52.246-12 Inspection of Construction.

2.04 PIPE ACCESSORIES

A. Sectionalizing Valve, Air Valve, Blowoff, and Manhole Assemblies: In accordance with Section 33 22 15 – Valves and Equipment.

B. Temporary Construction Line: In accordance with Section 33 22 15 – Valves and Equipment.

C. Manholes:

1. Cement-mortar lining: AWWA C205, in accordance with shop applied mortar for lining of specials, except:
   a. Reinforcement required for pipe larger than 24-inch diameter.
   b. Cement: ASTM C150, Type V.
2. Required at locations shown on drawings 1695-D-60320, 1695-D-60322, and 1695-D-60323.

D. Warning Tape:

1. Polyethylene tape.
2. Thickness: 4 mils.
3. Magnetically detectable.
4. Width, minimum: 6-inches.
5. Color: Blue with silver lettering.

6. Legend repeated at least every 3-feet: "CAUTION: WATERLINE BURIED BELOW - FOR MORE INFORMATION CONTACT THE NAVAJO TRIBAL UTILITY AUTHORITY".

E. Tracer Wire for Non-Metallic Pipe:

1. Type: High strength copper clad steel.
2. Size: 10 AWG, minimum.
3. Insulation:
   a. High density, high molecular weight, polyethylene (HDPE).
   b. Jacket Color: Blue.
   c. Rated for direct burial.

F. Tracer Wire Terminal Post:

1. Designed and manufactured for specific application.
2. Temperature and ultraviolet light stable.
3. Color: Blue.
4. Terminals: Two, minimum, per post.
5. Provide terminal jumpers to interconnect lengths of trace wire as needed.
6. Space as recommended by manufacturer.

PART 3 EXECUTION

3.01 GENERAL

A. Perform cleaning, filling, and testing after backfill has been placed to finished grade or as approved by COR.

B. ***Responsible*** Surveyor licensed in State of New Mexico ***or a certified Construction Surveyor, as defined in Section 01 71 20 - Surveying*** shall be on site during excavation and pipelaying.

C. Protect pipe from contamination, damage, and elements during storage on-site by covering with tarp as directed by COR.

D. Install pipe based on these specifications or pipe manufacturer's recommendation, whichever is more stringent.

3.02 INSTALLATION

A. Install pipe in accordance with appropriate Section for pipe option installed.

B. Keep openings to installed pipe closed with watertight inflatable plugs during work stoppage, including end of work day, breaks, and work delays.

C. If pipe is flooded during construction, clear floodwater by draining and flushing with water, or other approved method, until pipe is clean.

D. Lubricant:

1. Keep clean.
2. Apply with dedicated, clean applicator brushes.
3. Apply lubricant as specified by pipe manufacturer:
    a. Use only lubricant supplied by pipe manufacturer.
    b. Lubricate spigot end of pipe as recommended by manufacturer.
    c. Do not lubricate either gasket or gasket groove in bells where gaskets are field installed.
    d. Lubricate factory-installed, non-removable-type gaskets as recommended by pipe manufacturer.

E. Coat buried manholes with cement mortar as shown on drawings.

F. Install tracer wire for non-metallic pipe.

G. Install warning tape over center of pipe at least 18-inches below ground and at least 18-inches above pipe.

3.03 LAYING PIPE

A. Excavate pipe trench in accordance with Section 31 23 22 - Pipe Trench Earthwork.

1. Grade pipe trenches to provide uniform slope along bottom of pipe.
2. At joints involving bells or collars, provide holes at joint of ample size to prevent bells or collars from coming in contact with subgrade and to allow for bedding placement.

B. Keep pipe trenches free of water during pipelaying operations.

C. Lower pipe into trench and place pipe in position such that no soil gets inside pipe and pipe is not damaged.

D. Install pipe to line and grade as shown on drawings.

E. On grades exceeding 10 percent, lay pipe uphill.

F. When pipelaying is not in progress, keep ends of pipelines closed.

G. Joining Pipe:

1. Assemble push-on or mechanical joints in accordance with applicable AWWA standard for pipe type and manufacturer’s recommendations.
2. If adjustment of the position of length of pipe is required after installation, remove and relay length of pipe as new pipe.
3. Maintain pipe firmly in final position.

4. Placing Elastomeric Gasket:
    a. Clean gasket, bell, especially the groove, and spigot with rag, brush, or paper towel to remove any dirt or foreign material.
    b. Use only gaskets which are designed for and supplied with pipe.
    c. Lubricate spigot end of pipe as recommended by manufacturer.
    d. Spigot Groove Method:
        1) Follow manufacturer's recommended practices for gasket installation.
        2) After placing elastomeric gasket in spigot groove, equalize elastomeric gasket cross section by inserting tool such as a large screwdriver under elastomeric gasket and moving it around periphery of pipe spigot.
    e. Coupling Groove Method: Follow manufacturer's recommended practices for gasket installation. Typically factory installed.
5. Fit pipe unit's together, spigot to bell or coupling, and draw joints together so that bells or couplings and spigots are fully engaged with uniform contact to gasket.
6. Do not swing or "stab" joint and do not suspend pipe and swing into bell or coupling.
7. Fit pipe units together in a manner to avoid twisting or otherwise displacing or damaging elastomeric gasket.
8. After joining pipe units, insert feeler gauge between pipe bell and pipe spigot, move it around periphery of pipe to determine that position of elastomeric gasket is correct and there are no fish-mouth problems. If adjustment of position of a length of pipe is required after installation, remove and relay length of pipe as new pipe.

H. Changes in Alignment and Grade:
1. Make changes in alignment and grade with miter bends as shown on drawings.
2. Make other changes in alignment and grade by providing small deflections between adjacent pipe. Do not exceed manufacturer's deflection tolerances.
3. Provide restrained joint lengths upstream and downstream of bends or thrust blocks as shown on drawings. Ductile iron fittings with restrained joint lengths as limited by drawings may be used if Contractor submits revised plan and profile drawings for approval.
4. Do not encase rubber gasket joints in concrete.
5. Refer to individual pipe Sections for additional requirements. If requirements conflict use most stringent requirement.

I. After pipelaying and joining operations are completed, clean inside of pipe and remove debris. When pipelaying is not in progress, keep ends of pipelines closed with watertight inflatable plugs.

J. Schedule work so that at no time pipe remains in trench more than 7 days before backfill is placed to original ground surface or to other specified backfill limits shown on drawings.

K. Joints under Wash Crossing banks and waterway shall be restrained for length shown on drawings. Joints shall have hoop stress and longitudinal stress capacity equal to or greater than adjacent pipe.

3.04 THRUST RESTRAINT

A. Restrained joint couplings or concrete blocking and collars as shown on drawings. Refer to Section 03 30 00 - Cast-in-Place Concrete.

B. Plan, profile and restraint system shown on drawings require modification if alternate methods are used.

C. Alternate methods of restraint may not be used unless submitted and approved by COR.

3.05 TRACER WIRE

A. Install continuous length of tracer wire for full length of each run of non-metallic pipe,

B. Attach wire to top of pipe using suitable methods to ensure tracer wire will not be displaced during construction operations.

C. Locate tracer wire terminal posts at suitable locations to provide testing and/or jumper points for entire length of non-metallic pipe.

D. Verify tracer wire continuity prior to performing backfill operations.

3.06 BACKFILL

A. Backfill pipe in accordance with Section 31 23 22 - Pipe Trench Earthwork.

1. Place backfill about pipe carefully to avoid lateral displacement of pipe and damage to joints.
2. In certain pipeline reaches, where determined necessary by COR to prevent possibility of flotation, do not lay more than 300 linear feet of pipe ahead of backfilling operations.
3. If pipelaying operations are interrupted for more than 24 hours, cover pipe laid in trench with backfill.

3.07 PIPE DEFLECTION

A. For pipe greater than 24-inch.

1. Measure short term deflection of internal diameter:

a. Within 2 weeks after completion of backfill.

b. When interior bracing required, remove before making measurements.

2. Measurement Frequency:

a. One pipe unit out of 3 for first 30 units laid. 1 pipe unit out of 10 thereafter.

b. In deep burial or problem areas, frequency of measurements may be increased at discretion of COR.

3. Measurements:

a. Measure vertical and horizontal diameter at approximate midpoint of pipe unit.

b. Record pipe deflections and station where measurements were taken.

c. Mark inside of pipe so that future comparisons can be made.

B. Deflection limitations apply per individual pipe sections.

C. Take corrective action if required limits are not meet, including removing and replacing pipe that exceeds allowable deflection tolerance.

3.08 FIELD EXAMINATION

A. Flush pipe before filling.

1. Flush foreign material from pipeline prior to testing.

2. Flush using a minimum velocity of 3 feet per second toward low points in reach.

3. Flush at least 3 pipe volumes until water is ***~~clean~~ similar to source water*** as approved by COR.

4. Dispose of flush water in accordance with permits in Section 01 57 30 - Water Pollution Control.

5. Operate valves several times during flushing period.

3.09 FILLING AND DRAINING PIPELINE

A. Notify COR 4 days before filling and testing.

B. Water for filling and testing pipeline in accordance with Section 01 51 00 - Temporary Utilities.

C. Pipeline fill rate, maximum: 18 cubic feet per second.

1. Temporary Water Line fill rate: 2 cubic feet per second

D. Maintain pipeline completely filled for at least 72 hours before testing.

E. Blowoff pipeline after testing is completed and pump pipeline dry.

F. Dispose of testing water by approved method.

3.10 CONTRACTOR FIELD QUALITY TESTING

A. Leak testing pipeline:

1. Notify COR at least 7 days before applying pressure to pipeline.
2. Do not start leak testing when snow or standing water is on the ground. Suspend testing as directed by COR if precipitation accumulates on the ground.
3. Furnish pumps, power, pressure gages, and air valves at each end of pipeline and calibrated flow meters for testing.
4. Comply with applicable test standard except as noted below:
    a. AWWA C605 for PVC.
    b. AWWA C600 for Ductile Iron.
    c. AWWA C604 for Steel.
    d. AWWA M45 for Fiberglass.
    e. ASTM F2164 for HDPE.
5. Test pipeline with hydrostatic pressure equal to elevations listed for each Reach.
    a. Reach 9 and 10; Elevation 6,245 ft.
    b. Reach 11; Elevation 6,725 ft.
    c. Test Segment: Each pipe segment between sectionalizing valves.
    d. First test segment: Between start of pipeline and first sectionalizing valve.
    e. Last test segment: From last sectionalizing valve and end of pipeline.
6. Prior to starting test, maintain pressure in pipe for 24 hours.
7. Test for 96 hours or as approved by COR.
8. Measure volume of water required to maintain pressure during test.
    a. Acceptance criteria:
        1) Measured leakage shall not be greater than test allowance prescribed by the following test method:
            a) AWWA C600 for Ductile Iron Pipe.
            b) AWWA C604 for Steel Pipe.
            c) AWWA C605 for PVC.

d) For Fiberglass Pipe and HDPE Pipe:

$$\text{Leakage Rate: } Q = \frac{LD(P)^{1/2}}{148{,}000}$$

Q = Quantity of makeup water (gph)
L = Length of pipe being tested (ft.)
D = Nominal diameter of pipe (in.)
P = Average test pressure (psi gage). If leakage rate is exceeded, halt test, identify and repair leaks in an approved manner.

b. If criteria is not met, repair or replace pipe or fitting and repeat test until acceptance criteria is achieved.

9. Drain pipe using both gravity flow and sump pump at blowoffs or as approved by COR.

10. Seal openings to pipe as approved by COR.

B. Locate tracer system testing:

1. Perform test of tracer wire system using applicable equipment along entire length of pipe to ensure proper performance.

2. Repair any identified breaks or separations and retest applicable section of system.

END OF SECTION

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SECTION 33 11 19
FIBERGLASS PIPE

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

1. In accordance with Section 33 11 10 - Pipeline General Requirements.

1.02 REFERENCE STANDARDS

A. ASTM International (ASTM)

1.	ASTM F477-14	Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

B. American Water Works Association (AWWA)

1.	AWWA C950-13	Fiberglass Pressure Pipe

C. International Organization for Standardization

1.	ISO 14692-02	Petroleum and natural gas industries – Glass-reinforced plastics (GRP) Piping

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals.

B. RSN 33 11 19-1, Qualification Reports

1. Pipe: AWWA C950 Section 5.1.2 Quality Control Tests and Records.
2. Fittings: ISO 14692 with English units listed.
    a. Section 11.3 Qualification documentation.
    b. Section 11.4.1 Product quality control documentation.
    c. Section 11.5 Installation documentation.
    d. Section 11.6.1 Published values for fittings and flanges.

C. RSN 33 11 19-1, Shop Drawings:

1. Show pipe and fitting fabrication details.
2. Show exact dimensions of joints, and diameter of rubber gasket including tolerances, and other major dimensions.
3. Include minimum ultimate axial strength of pipe.

4. See RSN 33 11 10-2 for further details.

D. RSN 33 11 19-2, Joint Repair Plan:

1. Proposed equipment, materials, and procedures for repairing leaks in pipe joints.

1.04 GENERAL

A. In accordance with applicable portions of Section 33 11 10 – Pipeline General Requirements.

1.05 DELIVERY, STORAGE AND HANDLING

A. Transport pipe and fittings on padded bolsters either curved to fit outside of pipe or using triangular chocks. Use heavy padding under ties.

PART 2 PRODUCTS

2.01 PIPE

A. In accordance with AWWA C950.

B. Pressure pipe utilizing a continuous filament wound process with:

1. Type 1: Filament wound
2. Liner C: Reinforced thermoset polyester liner.
3. Grade 4: Glass-fiber-reinforced polyester mortar.
4. Pipe Stiffness: As required for internal and external pressures – 18 psi minimum.
5. Inside diameters: Equal to ***or larger than the*** nominal diameter called out on drawings with tolerances indicated in AWWA C950 for "Dimensions for inside diameter series pipe".

6. Minimum Pressure Rating of Pipe: Higher pressure rating from the following requirements:

a. Pressure defined by steady state Hydraulic Grade Line as shown on pipeline plan and profile drawings.

b. Transient pressure defined by pipe head class as shown on pipeline plan and profile drawings shall not be greater than 10 percent of continuous pressure rating of pipe.

~~***C. Design normal working pressure for pipe to meet head classes shown on pipeline plan and profile drawings.***~~

D. Elastomeric Sealing Gaskets: Manufactured and tested in accordance with ASTM F477.

2.02 FITTINGS

A. Allowable:

1. Steel: In accordance with Section 33 11 12 – Steel Line Pipe.
2. Ductile Iron: In accordance with Section 33 11 13 – Ductile Iron Pipe.

B. Joint Restraint

1. Not allowed for thrust restraint.
2. Allowed for road and wash crossings where thrust restraint is not required.

C. Joints Between Metallic Fittings and Fiberglass Pipe:

1. Fiberglass line pipe to metallic fitting: flange to flange.

2.03 CONTRACTOR SOURCE QUALITY TESTING

A. Test in accordance with AWWA C950:

1. Tests may be witnessed by Government. Notify COR 30-days prior to testing.

B. Restrained Joint and Flange Fittings:

1. Test in accordance with ISO 14692, except as follows:
   a. Design lifetime: 50 years.

PART 3 EXECUTION

3.01 CHANGES IN ALIGNMENT AND GRADE

A. In accordance with Section 33 11 10 – Pipeline General.

B. Make changes in alignment with miter bends.

C. Make minor changes in alignment and grade by pulling pipe joints.

1. Pulling rubber gasket coupling or bell and spigot joint.
2. Maximum deflection:
   a. 1 degree of deflection as recommended by pipe manufacturer, whichever is less, for pipe head class less than or equal to 450-feet.
   b. 0.75 degree of deflection as recommended by pipe manufacturer, whichever is less, for pipe head class equal to or greater than 475-feet.

D. Lay ends of each section of pipe on theoretical centerline of curve and to grade shown on drawings within laying tolerances prescribed above.

3.02 THRUST RESTRAINT

A. Restrain coupling joint with rubber gaskets and locking rods, where allowed.

B. Alternate methods of restraint may not be used unless approved by COR.

3.03 CLOSURE SECTIONS

A. Use closure sections where necessary, subject to approval of COR.

B. Follow manufacturer's recommendations.

3.04 TOLERANCES

A. Lay pipe to lines and grades shown on drawings or established by COR. With a total maximum departure from established alignment and grade of 1-inch.

3.05 PIPE DEFLECTION

A. Allowable short term vertical pipe diameter deflection after backfilling is complete.

1. Decrease, maximum: 2 percent of nominal pipe diameter.
2. Elongation, maximum: 3 percent of nominal pipe diameter as measured when backfill reaches pipe crown.

B. Allowable long term vertical pipe diameter deflection, at end of warranty period:

1. Decrease, maximum: 5 percent of nominal pipe diameter.

END OF SECTION

SECTION 33 22 15
VALVES AND EQUIPMENT

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Includes the following valves and equipment for air valve, blowoff, manholes, and sectionalizing valve installations as listed below.

B. Assemblies do not include:

1. Line Pipe.
2. Earthwork inside Line Pipe earthwork paylines.

C. Sectionalizing Valve Assemblies

1. Measurement: Number of Sectionalizing Valve Assemblies of each size installed.
2. Payment: Assembly prices offered Price Schedules:
    a. All items associated with valves as shown on drawing 1695-D-60324.

D. Air Valve Assemblies:

1. Measurement: Number of Air Valve Assemblies installed.
2. Payment: Assembly prices offered in Price Schedules.
    a. All items associated with air valve as shown on drawing 1695-D-60318.

E. Air Valve with Manhole Assemblies

1. Measurement: Number of Air Valve with Manhole Assemblies installed.
2. Payment: Assembly prices offered in Price Schedules.
    a. All items associated with air valve with manhole assemblies as shown on drawing 1695-D-60319.

F. Blowoff Assemblies:

1. Measurement: Number of Blowoff Assemblies installed.
2. Payment: Assembly prices offered in Price Schedules.
    a. All items associated with blowoff as shown on drawing 1695-D-60321.

G. Blowoff with Manhole Assemblies:

1. Measurement: Number of Blowoff with Manhole Assemblies installed.

2. Payment: Assembly prices offered in Price Schedules.

a. All items associated with blowoff with manhole as shown on drawing 1695-D-60322.

H. Buried Manhole Assemblies:

1. Measurement: Number of Buried Manhole Assemblies installed.

2. Payment: Assembly prices offered in Price Schedules.

a. All items associated with buried manhole as shown on drawing 1695-D-60323.

I. Cost:

1. Include all equipment associated with Temporary Construction Line in price offered in Temporary Construction Line (Reach 10).

1.02 REFERENCE STANDARDS

A. American Society of Mechanical Engineers

1.	ASME B16.1-2015	Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250
2.	ASME B16.5-2017	Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch
3.	ASME B40.100-2013	Pressure Gauges and Gauge Attachments

B. American Water Works Association (AWWA)

1.	AWWA C207-13	Steel Pipe Flanges for Waterworks Service, Sizes 4 In Through 144 In. (100 mm Through 3,600 mm)
2.	AWWA C504-15	Rubber-Seated Butterfly Valves, 3 In. (75 mm) Through 72 In. (1,800 mm)
3.	AWWA C507-11	Ball Valves, 6 In. Through 48 In. (150 mm through 1,200 mm)
4.	AWWA C512-15	Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service

C. Manufacturers Standardization Society (MSS)

1.	MSS SP-110-10	Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends

1.03 SUBMITTALS

A. Submit in accordance with Section 01 33 00 - Submittals.

1. General:

a. Submit data that demonstrates equipment provided meets requirements.

b. Submit data giving manufacturer's name, type, model, size, and construction and performance characteristics of equipment.

c. Mark proposed catalog sheet item which allows data to be legibly reproduced.

B. RSN 33 22 15-1, Commercial Product Data.

1. Butterfly valves:

a. Submit hydrostatic pressure testing certification under RSN 33 22 15-2, Service Manuals.

2. Valve boxes for buried valves.

3. Air valves.

4. Ball valves.

a. Submit hydrostatic pressure testing certification, including pressures used in testing valves, under RSN 33 22 15-2, Service Manuals.

5. Meter boxes.

6. Draft Control Damper.

a. Checked shop drawings showing damper design, dimensions and tolerances, material data, welding requirements; and basic coating requirements.

b. Adjusting weight details.

C. RSN 33 22 15-2, Service Manuals.

1. For items in RSN 33 22 15-1, Commercial Product Data.

2. Operation and Maintenance manuals:

a. Catalog cut sheets identifying model numbers, major components and materials.

b. Detailed start up and operating instructions.

c. Maintenance and lubrication schedules.

d. Troubleshooting.

e. Recommended spare parts with part numbers.

3. Hydrostatic pressure testing certifications for butterfly valves and ball valves as well as pressures used in testing valves.

1.04 HANDLING AND TRANSPORTATION

A. Take every precaution during loading, transportation, unloading, storage, and laying, to prevent damage to valves and equipment.

B. Repair damage to valves and equipment as directed if, in opinion of COR, a satisfactory repair can be made; otherwise replace damaged valves and equipment.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Butterfly Valves:

1. Cold water pressures up to 150 psig: AWWA C504, Class 150B.
2. Cold water pressures from 151 psig up to 250 psig: AWWA C504, Class 250B.
3. Cold water pressures from 251 psig to ***300*** psig: Model HP350 as manufactured by Henry Pratt, ***www.henrypratt.com***, ***Series 2000HP as manufactured by Val-Matic Valve and Manufacturing Corp., www.valmatic.com***; or equal, having the following essential characteristics:
   a. Designed for a cold water pressure of ***300*** psig.
   b. Body: Ductile iron, A536 grade 65-45-12, grade 70-50-05 or 80-55-06.
   c. Shaft: Stainless steel.
   d. On center or eccentric shaft.
   e. Flanged end connections, flat faced.
   f. Rubber seated.
   g. Rubber Seat Materials: AWWA C504.
   h. Tested in accordance with AWWA C504 including performance, leakage and hydrostatic testing.
4. Bubble tight at rated pressure in either direction and suitable for operation after long periods of inactivity.
5. Axis of valve leaf: Horizontal when valve is in installed position except where shown on drawings.
6. Flanged ends:
   a. Class 150B valves: Body flanges suitable for connection to AWWA Class D flanges.
   b. Class 250B valves: Body flanges suitable for connection to AWWA Class E flange or AWWA Class F flanges.
   c. Valves suitable for pressures between 250-***300*** psig: Body flanges suitable for connection to AWWA Class F flanges.

7. Valve seat:
    a. Rubber.
    b. Located either in valve body, mating with a stainless steel seating surface, located on valve disc or in valve disc, mating with a stainless steel seating surface, located in valve body.
    c. Fully rubber lined bonded seat in body type seats are unacceptable.
8. Manual operators:
    a. Manually-operated butterfly valves with worm-gear or traveling nut type manual operator in accordance with AWWA C504.
    b. Ensure rim pull and component strength meets AWWA C504.
    c. Operators that open and close valves at full unbalanced pressure rating of valve.
    d. Gears of self-locking type, holds valve in all positions without fluttering or creeping.
    e. Handwheel where shown on drawings.
9. Buried butterfly valves:
    a. Valve boxes.
    b. 2-inch square-nut operator.
    c. Eight Steel tee-handle wrenches, tee-handle with a length of 8-feet.

B. 6-inch Ball Valves for Blowoffs:
1. Flanged connection to AWWA Class D, E or F flanges to match head classes shown on drawings.
2. AWWA C507.
3. Carbon steel body.
4. Stainless steel ball.
5. Full-ported.
6. Cold-water pressure rating to match “Blowoff Data Tables” on drawing 1695-D-60322.
7. Manual operators:
    a. Manually-operated butterfly valves with worm-gear or traveling nut type manual operator in accordance with AWWA C507.
    b. Ensure rim pull and component strength meets AWWA C507.
    c. Operators that open and close valves at full unbalanced pressure rating of valve.

d. Gears of self-locking type, holds valve in all positions without fluttering or creeping.

8. Buried ball valves:

a. Valve boxes.

b. 2-inch square-nut operator.

c. Two Steel tee-handle wrenches, each tee-handle with a length of 8-feet.

C. 1-inch and 2-inch Ball Valves:

1. 1-inch ball valves:

a. Integral with 6-inch air valves as shown on drawings 1695-D-60318 and 1695-D-60319.

b. Cold-water pressure rating of not less than pressure rating listed on "Air Valve Data Tables" on drawing 1695-D-60320.

2. 2-inch ball valve:

a. To isolate 2-inch air valve for Temporary Construction Water Line as shown on drawing 1695-D-60308.

b. Cold-water pressure rating of not less than 250 psi.

3. Threaded ends.

4. MSS SP-110, brass, bronze ***or stainless steel*** valve body, stainless steel ball, full-ported, female screwed ends

5. Bubble tight at rated pressure in either direction and suitable for operation after long periods of inactivity.

D. 2-inch Air Valves:

1. For Temporary Construction Water Line shown on drawing 1695-D-60308.

a. Val-Matic model (102S/**22.7**) manufactured by Val-Matic Valve and Manufacturing Corporation, ***905 Riverside Drive, Elmhurst, IL 60126;***

b. DeZurik Model 145C manufactured by Valve and Primer Corporation, 1420 South Wright Boulevard, Schaumburg, IL 60193-4599;

c. Crispin Model AL20/M5 or UL20 Air and Vacuum Valve manufactured by Multiplex Manufacturing Company, 600 Fowler Avenue, Berwick, PA 18603;

d. or equal, having the following essential characteristics:

1) Manufactured in accordance with AWWA C512.

2) Combination air/vacuum and air-release type actuated by a float or floats.

3) Dual or single body.

4) Remains open for filling line until water has displaced air at point of attachment of valve assembly after which it closes.

5) Opens when pressure in pipeline drops sufficiently to create a vacuum.

6) Releases trapped air when pipeline is under pressure.

7) Furnish with ball valves in accordance with Article 2.01, C:

a) One on top, permits checking effectiveness of air valve,

b) One at bottom, allows valve to be drained.

8) Stainless steel internal parts such as guides, bushings, and screws.

9) Stainless steel floats.

10) Float-pivot supports: Brass, bronze, stainless steel, or cast iron.

11) Cold-water pressure rating for body not less than pressure 250 psi.

12) Operating pressure for seat materials: Not less than 250 psi.

13) NPT inlets.

E. 6-inch Air Valves:

1. For air valve installations shown on drawings 1695-D-60318 and 1695-D-60319.

a. Val-Matic model (106S /***38*** or 156S/***38.5***) manufactured by Val-Matic Valve and Manufacturing Corporation, ***905 Riverside Drive, Elmhurst, IL 60126;***

b. DeZurik Model 150C manufactured by Valve and Primer Corporation, 1420 South Wright Boulevard, Schaumburg, IL 60193-4599;

c. Crispin Model AL61/PL10 Air and Vacuum Valve manufactured by Multiplex Manufacturing Company, 600 Fowler Avenue, Berwick, PA 18603;

d. or equal, having the following essential characteristics:

1) Manufactured in accordance with AWWA C512.

2) Combination air/vacuum and air-release type actuated by a float or floats.

3) Dual body.

4) Remains open for filling line until water has displaced air at point of attachment of valve assembly after which it closes.

5) Opens when pressure in pipeline drops sufficiently to create a vacuum.

6) Releases trapped air when the pipeline is under pressure.

7) Furnish with ball valves in accordance with Article 2.01, C:

a) One on top, permits checking effectiveness of air valve,

b) One at bottom, allows valve to be drained.

8) Stainless steel internal parts such as guides, bushings, and screws.

9) Stainless steel floats.

10) Float-pivot supports: Brass, bronze, stainless steel, or cast iron.

11) Cold-water pressure rating for the body not less than pressure rating listed on "Air Valve Data Tables" on drawing 1695-D-60320.

12) Operating pressure for seat materials: Provide soft seats suitable for 0 to rated pressure listed on "Air Valve Data Tables" on drawing 1695-D-60320.

13) Covered by steel hood to prevent debris from entering pipe.

14) Flanged inlets:

a) Flange cold-water pressure rating not less than pressure rating listed on "Air Valve Data Tables" on drawing 1695-D-60320.

i. ANSI B16.1 for Class 125 or Class 250 iron flanges.

ii. ANSI B16.5 for Class 300 steel flanges.

2. Spare parts:

a. 7 complete sets of air valve spare parts including:

1) Seats, lever, and gasket.

2) Additional parts recommended by manufacturer.

3) Box and clearly label box.

a) Include detailed list of spare parts inside box.

4) Store in location as directed by COR.

F. Automatic Ball Drip Valve:

1. Threaded end.

2. Automatic draining, ball check.

3. Minimum 250 psig.

4. Provide dielectric insulating union as necessary to prevent galvanic corrosion between dissimilar metals.

G. Valve Boxes:

1. Steel, cast iron, composite or polyvinyl chloride (PVC).

2. 5 1/4-inch minimum inside diameter for valves 4-inches in diameter and larger.
3. 2-piece or 3-piece and slip type.
4. Locking lid with pentagon shaped bolt head.
    a. 2 special tools to unlock lid with pentagon shaped bolt head.
5. Collar with lid marked "WATER".
6. Cast iron:
    a. Model 6855 series, manufactured by Tyler Union, www.tylerunion.com; or equal, having the following essential characteristic:
        1) Cast iron locking lid with pentagon shaped bolt head.
        2) Cast iron extension from valve nut operator to ground surface
        3) Cast iron collar with lid marked "WATER".
7. Base and adequate extension items to extend from valve nut operator to ground surface. Extension items may be PVC or metal:
    a. Refer to Detail A on drawing 1695-D-60324.

H. Pressure Gauges:

1. Refer to drawing 1695-D-60319.
2. One gauge required for beginning of Reach 9.
3. One gauge required for beginning of Reach 10.
    a. Model 213.40 as manufactured by Wika Instrument Corporation, 1000 Wiegand Boulevard, Lawrenceville GA 30043,
    b. Ashcroft Duragauge 1279 as manufactured by Dresser Industries Instrument Division, 250 East Main Street, Stratford CT 06614;
    c. or equal, having the following essential characteristics:
        1) Range displayed on pressure gauges:
            a) Beginning of Reach 9: 0 to 150 psig.
            b) Beginning of Reach 10: 0 to 100 psig.
            c) Figures in intervals of 2 psi, and graduations in intervals of 0.5 or 1 psi.
        2) Bronze bourdon-tube, adjustable-movement type.
        3) Movement made of phosphor bronze, nylon, nickel, silver, stainless steel, Monel steel, nitride steel, or any combination thereof:
            a) Bushings of above-mentioned material but different composition or hardness than shafts.
        4) Case of brass or aluminum alloy.

5) Dust-proof and moisture-proof case.

6) Glycerin liquid filled.

7) 2.5-inch diameter or larger dial.

8) Dial: White with black markings.

9) Black indicating pointer.

10) Red maximum reading pointer indicating highest pressure attained.

11) Shatter resistant window.

12) Conform to ASME B40.100, Grade A accuracy or better.

13) Bottom connected with 0.25-inch diameter male pipe connection.

I. Flange Gaskets:

1. BLUE-GARD Style 3000 manufactured by Garlock Sealing Technologies, 1666 Division Street, Palmyra NY 14522; or equal, having the following essential characteristics:

a. For AWWA C207 flanged joints.

b. Compressed, Non-Asbestos (CNA) Gasketing with Aramid Fibers and a NBR Binder.

c. Full face or ring type.

d. For potable cold water.

J. Meter Boxes:

1. Manufactured by Oldcastle Precast, 7921 Southpark Plaza, Suite 200, Littleton, CO 80120, www.oldcastleprecast.com; or equal, having the following essential characteristics:

a. Pre-cast concrete box.

b. Pre-cast lockable lid.

K. Draft Control Damper:

1. Fabricated galvanized steel.

a. Galvanize in accordance with Section 09 96 20 – Coatings.

2. Adjusting weights.

L. Insulation:

1. For air valve insulation, see Section 07 21 60 – Insulation.

2. For blowoff valve insulation, see Section 07 21 60 – Insulation.

2.02 CONTRACTOR SOURCE QUALITY TESTING

A. Shop test butterfly valves in accordance with AWWA C504 for butterfly valves and AWWA ball valves in accordance with AWWA C507 for ball valves.

1. Leak test and hydrostatic test valves at manufacturer's facility or an alternate facility approved by COR.

2. Tests may be Government witnessed. Notify COR 30 days prior to valve testing.

3. Minimize the number of Government trips by testing all valves from the same manufacturer during the same Government trip.

4. Prior to shop leakage test and in presence of Government, Contractor shall verify that when valve is fully closed, valve position indicator indicates, "CLOSED".

5. If indicator is not in closed position (exactly at closed), remove operator from valve, fully close valve, reinstall operator so that it indicates, "CLOSED".

6. Butterfly valves shop leakage test:

   a. Pressure test valves and their seats for leaks with water in 100 percent closed position for a timed period of 5 minutes with pressure equal to rated design pressure. Valves shall be drip tight with no leakage.

   b. Downstream position of valve shall be visible to Government inspector. Downstream shall be visible and dry prior to and during test so that the seat can be visually inspected.

   c. Test Acceptance:

      1) Spray or high velocity leakage will not be acceptable.

      2) If valve leaks, adjustments shall be made until valve is drip tight with no leakage. Adjustments may include adjusting valve stops, seats, actuators, etc.

      3) If valve is not drip tight (any leakage) in either direction, valve is unacceptable.

   d. After any adjustments are made, valve position indicator shall be inspected again and corrected if necessary.

7. Butterfly valve hydrostatic test: In accordance with AWWA C504.

8. Ball valve shop leakage test: In accordance with AWWA C507.

   a. Downstream position of valve shall be visible to Government inspector.

9. Ball valve hydrostatic test: In accordance with AWWA C507.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install Valves and equipment to lines and grades as shown on drawings.

B. Install valves complete and lubricated in accordance with manufacturer's instructions.

C. Valves with flanged connections: Bolt holes straddle vertical centerline when installed on horizontal pipe.

3.02 CONTRACTOR FIELD QUALITY TESTING

A. After each valve has been completely installed, test valve in pipeline by opening and closing valve through full range of operation 3 times.

B. Make changes or adjustments until operation is approved by COR, and valves are bubble tight and do not leak water past seats.

C. Provide means for inspecting area downstream of valve during testing if required by Government.

3.03 COATING

A. In accordance with Section 09 96 20 - Coatings.

END OF SECTION

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