SECTION 01 56 15
PROTECTION OF EXISTING UTILITIES

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Utility Crossing Investigations Reach 2:

1. Payment: Lump-sum price offered in Price Schedule 1.

B. Utility Crossing Investigations Reach 3:

1. Payment: Lump-sum price offered in Price Schedule 2.

C. Cost: Include in prices offered in Price Schedules for other items of work, except for Utility Crossing Investigations.

1.02 REFERENCE STANDARDS

A. Bureau of Reclamation (Reclamation)

1.	RSHS	Reclamation Safety and Health Standards, including revisions, available at https://www.usbr.gov/safety/rshs/index.html

B. Institute of Electrical and Electronics Engineers (IEEE)

1.	IEEE C2-2023	National Electrical Safety Code (NESC)

1.03 SUBMITTALS

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

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

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

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

1. Include the following for each utility line as applicable:
   a. Owner company name, address, and telephone number.
   b. Utility line crossing location.
   c. Utility line or item material.
   d. Elevation.
   e. Diameter.

f. Service restrictions.

g. Powerline voltage.

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

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 jobsite.

B. Unknown existing utility lines may cross pipeline alignment.

C. 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.

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

E. Coordinate work within existing pipeline and transmission line Rights-of-Way with all utility owners. Contractors 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.

1. New Mexico 811
   1021 Eubank Blvd NE
   Albuquerque, NM 87112
   www.nm811.org
   Statewide: Dial 811 or 800-321-ALERT (2537) during regular business hours.
   By Web: Request a Line Spot 24-hours a day.

2. Navajo Tribal Utility Authority (NTUA)

   Shiprock District

   PO Box 1749, Shiprock, NM 87420

   Telephone: 928-729-5721

B. 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 potholing or test pits or as approved by utility owners.
3. Obtain permission from utility owner before performing physical utility investigation (potholing or test pits).
4. Reference notes on drawings.

C. 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.

D. No excavation will be permitted within 10 feet of gas lines when in service without written approval from Gas Company.

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

1. Protect overhead power facilities as required by utility owner if working in their ROW.
2. Protect existing waterlines as required by utility owner when working within 100 feet of their lines.

F. For abandoned electric and water lines near Shumway Arroyo on Reach 2, contact power and water companies to turn off lines prior to work.

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

3.02 CLEARANCE

A. Obtain clearances required for construction operations; provide in accordance with RSHS and IEEE C2.

B. ***Contractor to coordinate de-energizing the power transmission line or provide additional poles with NTUA to meet required clearance for construction.***

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.

C. Do not cross, park or travel along utility ROW without written permission from utility owner:

1. Permission shall be obtained by Contractor.
2. If permit(s) are required, Contractor shall include Government as permittee.

END OF SECTION

SECTION 01 57 60
PROTECTED SPECIES

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 PROJECT CONDITIONS

A. Certain native plant and animal species in the State of New Mexico are protected under Federal, State and Tribal laws. Government has ascertained that protected species and/or their habitats may exist in the areas to be disturbed by construction activities. These species include, but may not be limited to, the following:

1. Migratory Birds.
2. Burrowing Owl.
3. Ferruginous Hawk.
4. Prairie Dog.
5. Kit Fox.
6. Mesa Verde Cactus.
7. Raptors.

B. Federal legislation provides for protection of Threatened and Endangered Species, which might otherwise be lost due to alteration of terrain as a result of any Federal construction projects.

C. Project is designed to comply with Environment Commitments of Navajo-Gallup Water Supply Project Final Environmental Impact Statement, Realignment of the Northern Portion of the San Juan Lateral Environmental Assessment, and Final Biological Opinion for the Navajo-Gallup Water Supply Project reissued by U.S. Fish and Wildlife Service on September 20, 2022.

D. Insert this section in subcontracts.

E. In accordance with Federal, State, and Tribal Law, Government may arrange for removal of protected species.

1. Cooperate with those performing such removal.
2. If these species are not removed, cooperate with and abide by protection plans developed by appropriate Federal, State, and Tribal entities to avoid damage to or disturbance of protected species.

F. Persons who, without permission contribute to the take of threatened and endangered species are subject to arrest and penalty of United States, Navajo Nation, and New Mexico laws.

1. Take: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct.
2. Harm: includes significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.
3. Harass: intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering.
4. Incidental take: take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.
5. Offenders will be subject to United States, Navajo Nation, and New Mexico environmental protection laws and civil penalties.

G. Immediately notify COR if protected species listed above are disturbed. Include written account, map, extent of disturbance, number of impacted species, and circumstances. COR will coordinate notifications to USFWS and Navajo Nation.

1.03 SPECIAL REQUIREMENTS

A. Migratory Birds

1. Nesting may occur in area between March 15th and August 15th.
2. Government will survey for nesting birds in vegetated areas to be disturbed. Evaluation shall be performed no more than 5 days prior to area disturbance.
3. Notify OGR 10 days before disturbing an area.
4. Do not disturb a nesting pair of birds with eggs.
5. Avoid birds and modify construction activities as directed by COR.

B. Mesa Verde Cactus

1. Mesa Verde Cactus is found directly adjacent to construction areas.
   a. Government will monitor work in these areas.
   b. Coordinate work with COR and OGR.
   c. Government will conduct preconstruction surveys for Mesa Verde Cactus. Evaluation shall be performed in blooming season in the year prior to construction.
      1) Blooming may occur from April to May.
   d. Notify OGR before a minimum of 14 days prior to disturbing an area to complete spring surveys.

1) Do not disturb potential Mesa Verde Cactus habitat prior to preconstruction surveys.

2) Modify construction activities as directed by COR.

e. Onsite Contractor personnel shall complete Mesa Verde Cactus awareness training prior to working in project area.

1) Government will provide training to inform onsite personnel of environmental requirements and expectations.

2) Training session will occur during preconstruction meeting or other mutually agreed upon time before initial groundbreaking takes place.

a) Duration: Approximately 1 hour.

b) Training will be recorded, and a digital copy of Mesa Verde Cactus awareness training will be provided to Contractor

3) Require onsite personnel to complete required Mesa Verde Cactus awareness training before being allowed to work in project area.

4) Maintain training records

5) Onsite personnel added after completion of Government-provided training session shall view digital copy of training before being allowed to work in project area.

6) The Contractor shall adhere to all requirements outlined in the Mesa Verde Cactus Education and Awareness training, which will include requirements Reclamation ***~~develops~~ developed*** in coordination with the United States Fish and Wildlife Service (FWS) during preparation of the Mesa Verde Cactus Construction Plan***, including required buffer areas***.

a) Construction Plan is a required Conservation Measure of the FWS's 2022 Final Re-issued Biological Opinion, No, 2-22-01-F-532.

C. Raptors:

1. Raptor nesting may occur in the area from January 15th to July 15th:

a. Minimize disturbance to raptors. Government will conduct raptor surveys prior to construction that is to begin between January 15th and July 15th. Evaluation shall be performed no more than 5 days prior to area disturbance. The survey will include all potential nesting habitat within specified buffer distances (0.25-mile to 0.625-mile, depending on the species) of the construction right- of-way.

2. Notify COR 10 days prior to construction to allow for raptor nest surveys.

3. Do not disturb an active raptor nest:

a. Government will notify Contractor of nest locations.

b. No construction will be allowed within the above months within 0.25-mile to 0.625-mile of active nests, depending on the species.

4. Raptor Safe Utility Poles:

a. All above ground utility poles shall conform to a design standard(s) that comply with the Raptor Electrocution Prevention Regulations RCS-43-08 published September 10, 2008. This is to avoid unintentional electrocution of raptors that may perch on the utility pole.

D. Ferruginous Hawk

1. Nesting may occur in the area from March 1st to July 31st.

a. Government will conduct pre-construction surveys for nesting hawks in areas to be disturbed within 1.0 km (0.62 miles) of suitable nesting habitat during species breeding and chick reading seasons (March 1st to July 31st, of any year). Evaluations shall be performed no more than 5 days before an area is disturbed.

b. Notify COR 10 days before disturbing an area.

c. Do not disturb nesting birds within buffers established by Navajo Nation Department of Fish and Wildlife.

1) Avoid hawks and modify construction activities as directed by COR.

E. Burrowing Owl

1. Nesting may occur in the area from March 1st to August 31st.

a. Government will survey for burrowing owls if any work is proposed during the species' active season (March 1st to August 31st, of any given year). Surveys shall occur within 0.4 km (1/4 mile) of the project location and follow appropriate protocols.

1) If burrowing owl(s) are found during survey, no surface work shall occur within ¼ mile of the active nest until after the nesting period (March 1st -August 15th); additionally, no habitat alteration is allowed year-round within 0.2 km of nest site.

2) If burrowing owls are found that impact the contractor's work, a contract modification may be issued.

b. Notify COR 10 days before disturbing an area.

c. Do not disturb nesting owls within buffers established by Navajo Nation Department of Fish and Wildlife.

F. Kit Fox

1. Active Kit fox den sites may occur in the project area.

a. Government will survey for kit fox den sites in areas disturbed.

b. Notify COR 30 days before disturbing an area.

c. Do not disturb kit fox den sites during breeding and reproduction season (December 1st to August 1st) within buffers established by Navajo Nation Department of Fish and Wildlife (0.2 km or 1/8 mile).

1) Avoid kit fox den site and modify construction activities as directed by COR.

G. Prairie Dogs

1. Active prairie dog colonies may be present in portions of the project area.

a. Government will survey for prairie dogs in these project areas if any work is proposed in the species' breeding and reproduction season (March 1st to June 1st).

b. Notify COR 30 days before disturbing an area.

2. Do not disturb prairie dogs during breeding and reproduction season.

a. Breeding and reproduction may occur from March 1st to June 1st.

b. Avoid breeding prairie dogs and modify construction activities as directed by COR.

1.04 REPLACEMENT PLANTS

A. Protected plant species shall not be removed or damaged by Contractor.

1. If inadvertent effects occur to protected species during construction:

a. Notify COR:

1) Verbal: Within 2 hours.

2) Written: Within 24 hours.

b. Cease work in affected work area until consultation commitments are completed.

2. Government, in consultation with Bureau of Indian Affairs (BIA) and State of New Mexico, will manage required removal/replacement planting in accordance with consultation commitments.

3. Replacement numbers/ratio in accordance with consultation commitments.

1.05 DISCOVERY OF RESOURCES

A. When Contractor or parties operating or associated with Contractor, in performance of this contract discover threatened and endangered species on ROW:

1. Immediately cease work within 50 feet of discovery location.

a. Place temporary safety fence in accordance with 01 56 32 –Temporary Safety fence to prevent disturbance until biologist can investigate to avoid inadvertent disturbance by construction activities.

2. Verbally notify CO and OGR within 2 hours, giving location***, extent of the disturbance, number of cacti,*** and nature of findings.

a. Follow with written confirmation to CO within 12 hours***, to include a map of the disturbed area***.

3. Verbally notify Reclamation staff biologist within 2 hours.

a. Name of assigned staff biologist and telephone number will be provided at preconstruction meeting.

B. Do not disturb or damage threatened and endangered species discovered during construction activities. Provide cooperation and assistance to preserve findings for removal or other disposition by CO.

C. Government, in consultation with appropriate regulatory agencies upon discovery of threatened and endangered species, will manage required removal/replacement planting in accordance with consultation commitments.

1. When discovery mitigation has been completed, CO will notify Contractor that work can resume in discovery area.

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

D. 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 the contract in accordance with applicable clauses of the contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 MESA VERDE CACTUS MONITORING AREA

A. See Section 01 14 12 – Work Restriction and Limitations for access to north and west sides of Road 6800.

B. Provide 30-day notice to OGR prior to approaching or entering the Mesa Verde Cactus Monitoring Area (Road 6800) for pre-construction activities.

1. Coordinate with the Government for a biological monitor for new ground disturbing construction activities along the Shumway Arroyo HDD or other areas as directed by COR.

C. Install and maintain approximately ***1,555*** ~~***1,355***~~ feet of fence from Station ***2052+45*** to 2068+00 prior to disturbing these areas.

1. Fence shall be installed and remain in place for the duration of the contract.
2. Government Biologist will be on site during fence installation
   a. COR will coordinate Government Biologist attendance.
   b. Notify COR 7 days prior to fence installation.
3. Fence will be built of materials that will not draw attention to the sensitive area and shall be simple t-post and wire. Refer to wire safety fence in Section 01 56 32 – Temporary Safety Fence.
4. Government may direct Contractor to remove fence prior to completion of the project.
   a. Government Biologist will be on site during fence removal.
5. Notify COR 28 days prior to project completion for direction from the government.
6. When construction is complete, temporary access roads and staging areas within the Mesa Verde Cactus Monitoring Area shall be closed and hand-ranked to remove tire tracks.

D. Provide 48-hour notice to OGR prior to approaching or entering the Mesa Verde Cactus Monitoring Area (Road 6800) for construction activities.

1. Coordinate with the Government for a biological monitor for new ground disturbing construction activities along the Shumway Arroyo or other areas as directed by COR.

E. Cleaning Construction Equipment:

1. If within Mesa Verde Cactus Monitoring Area, follow cleaning protocols outlined in the Mesa Verde Cactus Construction Plan.

END OF SECTION

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SECTION 31 31 30
SOIL-APPLIED HERBICIDE

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

1. Include in prices offered in Price Schedules for Gravel Surfacing.

1.02 SUBMITTALS

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

B. RSN 31 31 30-1, Use Plan.

C. RSN 31 31 30-2, Applicator Certification.

1.03 QUALIFICATIONS

A. Applicators: Certified by appropriate Federal, State, Tribal, or local agencies, as required.

1.04 REGULATORY REQUIREMENTS

A. Comply with label directions, and applicable EPA, Federal, State, Tribal, or local laws and regulations.

PART 2 PRODUCTS

2.01 HERBICIDES

A. Label: EPA (Environmental Protection Agency) pesticide registration number.

B. Provide soil-applied herbicide conforming to one of the following:

1. Atrazine:

   a. Composed of a finely divided, wettable powder containing a minimum of 80 percent chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine and related compounds.

   b. Mix: Minimum of 2 gallons of water per pound of dry product.

2. Bromacil:

   a. Composed of a finely divided, wettable powder containing a minimum of 80 percent bromo-3-sec-butyl-6-methyluracil.

b. Mix: Minimum of 2 gallons of water per pound of dry product.

3. Prometon:

a. Composed of a liquid emulsifiable solution containing a minimum of 25 percent 2-methoxy-4, 6-bis isopropylamino-s-triazine.

b. Mix with water:

1) For small areas, add sufficient water to provide thorough and uniform coverage.

2) For large areas, add concentrate to 100 gallons of water per acre.

4. Commercial mixtures meeting requirements may be used.

PART 3 EXECUTION

3.01 PREPARATION

A. Apply herbicide after gravel surfacing has been placed.

3.02 APPLICATION

A. Apply herbicide to gravel surfacing placed under this section as directed by COR.

1. Select one herbicide from those specified.

2. Apply soil-applied herbicide at following rate:

a. Atrazine: Equivalent of 0.035 pound of dry product per 100 square feet (about 15 pounds per acre).

b. Bromacil: Equivalent of 0.035 pound of dry product per 100 square feet (about 15 pounds per acre).

c. Prometone: Equivalent of 0.017 gallon of herbicide concentrate per 100 square feet (about 7 1/2-gallons per acre).

B. Apply herbicide only with approval of COR.

1. ***If herbicide is within Mesa Verde Cactus Monitoring Area (Road 6800), verify application with Government Biologist prior to placement.***

C. Apply uniformly.

D. During application, continuously agitate suspension.

END OF SECTION

SECTION 32 92 20
SEEDING

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Seeding:

1. Measurement: Area of surface disturbance seeded, or as determined by OGR.
2. Payment: Acre price offered in Price Schedules.

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. Method and equipment used for seeding.
2. Date for seeding.
3. Mulch type and application equipment.
4. Qualifying experience of person responsible for supervision of seeding, and approval.
5. Names, addresses, and telephone numbers of references.
6. 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 F without approval of OGR.

B. Do not seed when ground is snow covered or frozen.

C. Do not seed, mulch, or hydroseed 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.
4. Uniform mixture shown in Table 32 92 20B – Secondary Seed Mixture for Mesa Verde Cactus Habitat Area from Station 2163+00 to Station 2052+00 or as directed by COR.
5. Seed in accordance with Section 51 00 35 – Site Specific Revegetation Plan for Navajo-Gallup Water Supply Project and this section.

Table 32 92 20A – Seed Mixture

Common Name	Scientific Name	Cultivar	Seeding Rate (Pounds pure live seed per acre)
Sterile triticale	Triticum aestivum X Secale cereale 'Quickguard'	VNS	2.0
Fourwing saltbush	Atriplex canescens	VNS	3.0

Shadscale			
Winterfat	Krascheninnikovia lanata	VNS	2.0
Indian ricegrass	Achnatherum hymenoides	Paloma or Rimrock	3.0
Western wheatgrass	Pascopyrum smithii	Arriba	2.0
Galleta	Pleuraphis jamesii	Viva or Florets	2.0
Purple threeawn	Aristida purpurea	VNS	2.0
Sand dropseed	Sporobolus cryptandrus	VNS	0.25
Alkali sacaton	Sporobolus airoides	VNS	0.25
Scarlet globemallow	Sphaeralcea coccinea	VNS	0.25
Narrowleaf penstemon	Penstemon angustifolius	VNS	0.25
Rocky Mountain beeplant	Cleome serrulata	VNS	0.25
Hairy false goldenaster	Heterotheca villosa	VNS	0.25
Shadscale	Krascheninnikovia lanata	VNS	2.0

Table 32 92 20B – Secondary Seed Mixture for Mesa Verde Cactus Habitat

Common Name	Scientific Name	Cultivar	Season	Form	Seeding Rate* (Pounds pure live seed per acre)
Mat saltbush	Atriplex corrugata	VNS	-	Shrub	2.0
~~***Winterfat***~~	~~***Krascheninnikovia lanata***~~	~~***VNS***~~	~~***Cool***~~	~~***Subshrub***~~	~~***2.0***~~
Shadscale saltbush	***Atriplex confertifolia***	***VNS***	***Cool***	***Subshrub***	***2.0***
Indian ricegrass	Achnatherum hymenoides	Paloma or Rimrock	Cool	Bunch	2.0
Galleta	Pleuraphis jamesii	Viva or florets	Warm	Bunch/Sod	2.0
Blue grama	***Bouteloua gracilis***	***Alma or Hachita***	***Warm***	***Sod***	***2.0***
Purple threeawn	Aristida purpurea	VNS	Warm	Bunch	2.0
Sand dropseed	Sporobolus cryptandrus	VNS	Warm	Bunch	0.25
Scarlet globemallow	Sphaeralcea coccinea	VNS	Warm	Forb	0.25
Narrowleaf penstemon	Penstemon angustifolius	VNS	Cool	Forb	0.25

~~***Rocky Mountain beeplant***~~	~~***Cleome serrulata***~~	~~***VNS***~~	~~***Warm***~~	~~***Forb***~~	~~***0.25***~~
~~***Sand verbena***~~	~~***Abronia villosa***~~	~~***VNS***~~	~~***Warm***~~	~~***Forb***~~	~~***0.50***~~

* Based on 60 pure live seeds (PLS) per square foot, drill seeded. Double this rate (120 PLS per square foot) if broadcast or hydroseeded.

2.02 STRAW MULCH

A. Wheat or barley straw.

B. Free of mold or other evidence of decomposition.

C. Free from weed seed.

2.03 HYDROMULCH

A. Mat-Fiber Plus, manufactured by Mat Inc.,12402 Hwy 2, Floodwood, MN 55736, 1 888 477-3028; Spray Mulch X-80 manufactured by Pacific Wood Fibers, PO Box 2109, Redmond WA 98052; or equal, having the following essential characteristics:

1. Wood cellulose fiber.
2. No germination or growth inhibiting factors.
3. Dyed appropriate color to allow visual metering of application.
4. Evenly dispersed and suspended when agitated in water.
5. Forms blotter like ground cover that readily absorbs water and allows infiltration to underlying soil.

2.04 TACKIFIER

A. Mixture of at least three specially blended compatible hydrocolloids:

1. One hydrocolloid will act as a slippery agent during suspension.
2. Will form loose, long-chain-like film on drying
3. No growth or germination inhibiting factors.
4. Hydrates and disperses in circulating water to form homogeneous slurry.
5. Equilibrium air dry moisture content at time of manufacture of 8 percent, ±2 percent.
6. Minimum water holding capacity: 6 1/2 times weight of dry material.

PART 3 EXECUTION

3.01 SEEDBED PREPARATION

A. Complete prior to seeding, and mulching or hydromulching:

1. Rip, till, and disc compacted areas to create suitable medium for reseeding prior to spreading topsoil.
2. Respread topsoil and scarify or harrow and rake topsoil to minimum depth of 3-inches.
3. Remove stiff clods, lumps, roots, litter, stones, and other foreign material greater than 6-inches in size from surface.
4. Dispose of removed materials in accordance with Section 01 74 00 – Cleaning and Waste Management.
5. Fill or smooth topsoil surface to remove rills, gullies, and depressions.
6. Protect prepared topsoil surfaces from erosion and washouts. Repair damaged surfaces as required.

3.02 SEEDING APPLICATION

A. Seeding in Project Areas:

1. Apply seed and mulch by one of the following methods:
   a. Broadcast seeding followed by mulching or hydromulching.
   b. Drilling seed followed by mulching or hydromulching.
   c. Hydroseeding.
2. Apply seed mixture at rate specified in applicable Table 32 92 20A – Seed Mixture. Double rate of seed application if broadcast seeding.
3. Seed between July 15 and November 15.

B. Seeding Under Erosion Control Blanket:

1. Prior to placing erosion control blankets apply seed mixture at rate specified in Table 32 92 20A – Seed Mixture. Double rate of seed application if broadcast seeding.
2. Seed between July 15 and November 15.

3.03 BROADCAST SEEDING

A. Broadcast seed only in areas not accessible for drilling or hydroseeding.

B. Mechanical Broadcasting:

1. Equipment: Centrifugal type.
2. Designed and regulated to apply seed uniformly at proper rate per acre.

C. Hand Broadcasting:

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

D. 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 devices.

3.04 DRILLING SEED

A. Drill:

1. Disc-type seed drill.
2. Space rows 1-foot or less apart.
3. Perform on contour, perpendicular to slopes to minimize runoff, rilling, and erosion.

B. Regulate drill to uniformly distribute seed at rate specified in Table 32 92 20A – Seed Mixture and at proper seed depth:

1. Smaller seed depth: 1/4- to 1/2-inch.
2. Larger seed depth: 1- to 2-inches.

3.05 MULCHING

A. Certified weed-free straw or native grass hay.

B. Spread and crimp within 24-hours of seeding.

C. Rate: 1 to 2 tons/acre uniformly spread

D. Anchor with threader:

1. Operate crosswise to slope.
2. Depth: 3- to 4-inches.
3. Interval: 6- to 12-inches across slope.

3.06 HYDROSEEDING AND HYDROMULCHING

A. Slurry:

1. Mix to keep homogeneous.
2. Ingredients:
   a. Water.

b. Tackifier.

c. Seed.

d. Wood cellulose fiber mulch:

1) Rate: 4,000 pounds per acre at 10 percent moisture content.

2) Add to water slurry after seed.

3. Maximum time between batching slurry and application: 1-hour.

B. Spray apply slurry mix uniformly.

C. Use mulch coloring as metering agent.

END OF SECTION

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SECTION 33 11 12
STEEL LINE PIPE

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

1. Include cost of furnishing and installing steel line pipe in prices offered in Price Schedules for Pipeline General Requirements.

   a. Does not include pipe specified in Section 33 21 95 – Metal Piping for Line Pipe Installations.

1.02 REFERENCE STANDARDS

A. ASTM International (ASTM)

1.	ASTM A139/A139M-16	Electric-Fusion (Arc) - Welded Steel Pipe (NPS 4 and Over)
2.	ASTM A283/A283M-18	Low and Intermediate Tensile Strength Carbon Steel Plates
3.	ASTM A1011/A1011M-15	Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Allow and High-Strength Low-Allow with Improved Formability
4.	ASTM A1018/A1018M-16a5	Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy, Columbium or Vanadium, and High-Strength Low-Alloy with Improved Formability
5.	ASTM E165/E165M-12	Liquid Penetrant Examination for General Industry
6.	ASTM E709/E709M-15	Standard Guide for Magnetic Particle Testing

B. American Welding Society, Inc. (AWS)

1.	AWS D1.1/D1.1M-15	Structural Welding Code – Steel

C. American Water Works Association (AWWA)

1.	AWWA C200-12	Steel Water Pipe - 6 Inch (150mm) and Larger

2.	AWWA C205-12	Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 Inch (100mm) and Larger - Shop Applied
3.	AWWA C206-17	Field Welding of Steel Water Pipe
4.	AWWA C208-12	Dimensions for Fabricated Steel Water Pipe Fittings
5.	AWWA C227-11	Bolted, Split-Sleeve Restrained and Non-restrained Couplings for Plain-End Pipe
6.	AWWA C604-11	Installation of Buried Steel Water Pipe 4 Inch (100 mm) and Larger
7.	AWWA M11-04	Steel Pipe: A Guide for Design and Installation, Fourth Edition

1.03 SUBMITTALS

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

B. RSN 33 11 12-1, Steel Line Pipe Thicknesses:

1. Show straight line pipe fabrication details.
2. Provide steel thickness and yield stress tables for each pipe size, depth, and head class.
3. Show details of factory epoxy lining of joint cement mortar hold back area if alternate epoxy joint recess lining is proposed.

C. RSN 33 11 12-2, Field Welder Qualifications

1. Welder Certifications.

D. RSN 33 11 12-3, -4, -5, -6, Shop Drawings:

1. RSN 33 11 12-2, Reach 2, Start of Reach 2 to Start of San Juan River HDD.
2. RSN 33 11 12-3, Reach 2, End of San Juan River HDD to end of Reach 2.
3. RSN 33 11 12-4, Reach 3, Start of Reach 3 to Start of Chaco River HDD.
4. RSN 33 11 12-5, Reach 3, End of Chaco River HDD to end of Reach 3.
5. Submit concurrently with applicable corresponding Reach section of pipelaying diagrams submitted until Section 33 11 10 – Pipeline General Requirements.
6. Show pipe and fitting fabrication details.
7. Show exact dimensions of joints and proposed joint restraint.
8. Show exact dimensions of welding lead holes and repair method.
9. Show details of factory epoxy lining of joint cement mortar hold back area if alternate epoxy joint recess lining is proposed.

10. See RSN 33 11 10-2 through -5 for further details.

E. RSN 33 11 12-7, Ventilation Plan:

1. Method for ventilating inside of pipe when placing mortar lining for joints.

F. RSN 33 11 12-8, Single Lap Weld Stress Calculations:

1. In accordance with Article 3.01 B. 5.

1.04 GENERAL

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

1.05 QUALIFICATIONS

A. Steel Pipe Welders: Welders and Welding Operators to be qualified in accordance with AWS D1.1.

PART 2 PRODUCTS

2.01 STEEL LINE PIPE

A. Pipe:

1. Electric fusion (arc) welded helical-seam steel pipe: ASTM A139, Grade C, D, or E.
2. Fabricated in accordance with AWWA C200:
   a. Except:
      1) Steel plate: ASTM A283, Grade C or D.
      2) Steel Sheet or coil: ASTM A1011, designation SS, Grade 40, 45, or 50; or ASTM A1018, designation SS, Grade 40 or designation HSLAS-F, Grade 50.
3. Apply heat sheet shrink sleeve as detailed in Section 09 96 20 – Coatings. Install weld seam tape prior to applying sleeve.

B. Inside diameter measured to inside of lining shall not be less than nominal diameter shown on drawings.

C. Minimum Steel Wall Thickness:

1. Greater thickness from the following requirements:
   a. Steel Wall Thickness for Handling:
      1) Equal to inside diameter (inches) of pipe steel shell divided by 240 for mortar lined and flexible coated steel pipe.
      2) In no case shall steel pipe wall thickness be less than 0.135-inches.

b. Steel Wall Thickness for Internal Pressure:

1) Hoop stress of pipe shell. Not to exceed:

a) 50 percent yield strength as defined by steel grade of steel using the Barlow formula. With pressure defined by Hydraulic Grade Line as shown on pipeline plan and profile drawings.

b) 75 percent yield strength as defined by grade of steel using the Barlow formula. With pressure defined by pipe head class as shown on pipeline plan and profile drawings.

2) Barlow formula as defined by AWWA M11 Equation 4-1.

c. Steel Wall Thickness for Steep Pipe ("K"): Minimum 0.25-inches or greater as required for Internal Pressure.

D. Steel shall be fully killed and conform to fine grain practice.

E. Rubber gaskets: In accordance with AWWA C200.

2.02 FITTINGS

A. Steel: ***Materials listed in Section 2.01A.*** ~~***ASTM A283, Grade C or D or ASTM A1011, designation SS, Grade 40, 45, or 50; or ASTM A1018, designation SS, Grade 40 or designation HSLAS-F, Grade 50.***~~

B. Minimum steel wall thickness and fitting dimensions: In accordance with AWWA C200, AWWA C208 and AWWA M-11.

C. Minimum pressure rating of fittings shall match adjacent pipe.

D. Welding:

1. AWS D1.1.

E. Lifting eyes and other handling devices: Made part of fitting before lining and coating are applied.

F. Bolts and Nuts: ASME B18.2.1 and FS FF-N-836.

G. Coating and lining in accordance with Section 09 96 20 – Coatings.

H. Cement-Mortar Lining for Specials and Bends Larger than 24-inches:

1. In accordance with AWWA C205.

2. Apply lining with a resultant surface finish, including joints, equal to finish of adjacent pipe.

I. Joints between fittings and ductile iron pipe:

1. Rubber gasket joints.
2. Joint dimensions and tolerances: Same as pipe manufacturer's joint design.

J. Miter Bends: Fabricate steel bends in accordance with AWWA C208, AWWA M-11 and as shown on drawings. Radius of miter bends for line pipe shall be 2.5 times the pipe outside diameter.

K. Pipe Couplings:
1. Coupling types as shown on drawings.
2. Suitable for line pipe materials used.
3. Suitable for cold water pressures of pipe head classes on drawings.
4. Refer to Section 33 21 95 – Metal Piping for Line Pipe Installations for coupling requirements.

L. Closure Section Joints
1. Restraint requirements shown on drawings.
2. Field welded butt strap joints.
3. Bolted, Split-Sleeve Restrained and Nonrestrained Couplings for Plain – End:
   a. In accordance with AWWA C227.
   b. Refer to Section 33 21 95 – Metal Piping for Line Pipe for coupling requirements.

M. Tees:
1. Tees for air valves, blowoffs, manholes, and turnout as shown on drawings.
2. Tee length, minimum: As shown on drawings, required for blocking, or in accordance with AWWA C208 whichever is greater.

2.03 LININGS AND COATINGS

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

B. Do not field apply mortar lining without COR approval.

C. Fill inside joint recess of cement mortar lined pipe with cement mortar per AWWA C205.

2.04 CONCRETE

A. Concrete in Thrust Blocks and Collars: Section 03 30 00 – Cast-in-Place Concrete.

2.05 FLANGES:

A. In accordance with AWWA C207.

B. Class: Working pressure meets or exceeds head class of attached pipe

C. Flange bolt pattern shall match bolt pattern of mating flange.

2.06 INSULATED FLANGE

A. Full face gasket insulating kit as manufactured by Pipeline Seal and Insulator, Inc., 6525 Goforth Street, Houston, TX 77021, complete with Linebacker type gasket, Advanced Products and Systems, Inc., P.O. Box 60399, Lafayette, LA 70596-0399, complete with Trojan type gasket, or equal with the following essential characteristics:

1. Gasket:
   a. Full face, Type E.
   b. Outside diameter same as outside diameter of flange.
   c. Retainer:
      1) Phenolic or other material suitable for water service as recommend by the manufacturer.
      2) Thickness, minimum: 1/8-inch.
      3) Dielectric strength, minimum: 500-volts per mil.
   d. Sealing ring: Nitrile.
2. Bolt isolating sleeves:
   a. Full length. Extends halfway into both steel washers when installed.
   b. Tube thickness: 1/32-inch.
   c. Mylar or other suitable material recommended by the manufacturer.
3. Washers:
   a. Isolating washers:
      1) Phenolic or other material suitable for water service as recommend by the manufacturer.
      2) Thickness, minimum: 1/8-inch.
      3) Dielectric strength, minimum: 500-volts per mil.
      4) Inside diameter: Fit over isolating sleeve.
   b. Steel washers:
      1) Thickness: 1/8-inch.
      2) Inside and outside diameters: Same as isolating washers.
4. No asbestos.

2.07 FLANGE GASKETS

A. Multi-Swell Style 3760-U as manufactured by Garlock, www.garlock.com or equal with the following essential characteristics:

1. AWWA C207 or ASME B16.21.
2. Flat, full face or ring type.
3. NSF 61 Certified.
4. Suitable for cold water service.
5. Provide flanges suitable for line pipe pressure locations.

2.08 CONTRACTOR SOURCE QUALITY TESTING

A. Pipe and Fittings:

1. Hydrostatic Test:
   a. Perform shop hydrostatic test on pipe which stresses steel to 75 percent of minimum yield point of the steel.
   b. Hold pressure long enough to allow thorough inspection of welded joints.
   c. Repair leaks by rewelding and retesting joints.
   d. Test sections prior to forming bell and spigot joints.
   e. Repair defects and retest section before applying lining and coating.
   f. Government may witness hydrostatic testing and calibration of pressure gauges. Notify Government 30 days prior to performing hydrostatic test.
2. Fittings fabricated from tested steel pipe do not require hydrostatic testing if welds are tested.
   a. Weld test: Dye penetrant test in accordance with ASTM E165 or Magnetic Particle in accordance with ASTM E709.
   b. Weld defect repair. Chip, flame gouge, or grind to sound metal; reweld; and test repaired weld.

B. Joint Testing: Assemble one joint for each pipe diameter to check bell and spigot to check fit prior to coating or lining.

PART 3 EXECUTION

3.01 INSTALLATION

A. Joining Pipe:

1. In accordance with AWWA C604.
2. Verify inside joint gap meets manufacturer's tolerances as work progresses.

B. Joints for Pipe with Welded Joints:

1. In accordance with AWWA C206. Welded joints after backfill not allowed.
2. Perform dye penetrant test on welds in accordance with ASTM E165 and repair any defects.
3. Welded Butt Joints:
   a. As required for pipe on steep slopes as shown on drawings.
4. Double Lap Weld Joints:
   a. Provide joint with full fillet welds.
   b. Air test double lap welds in accordance with AWWA C206 and repair any defects.
   c. Required on thrust restrained joints greater than 30 degree bend deflection angles, unless butt welded joints are required, and within steel casing pipe.
5. Single Lap Weld Joints: : May be used if calculations sealed by professional engineer in the State of New Mexico show allowable stresses of weld and pipe materials shall not be exceeded for each head class:
   a. May be used on thrust restrained joints with 30 degree bend deflection angles or less.
   b. Road and wash crossings unless butt or double-lap welded joints are required.
   c. Perform Vacuum Box Test and repair any defects in accordance with AWWA C206.
6. Joint Thrust Restraint: As shown on drawings.
7. Joints within casings: Double lap or full penetration butt welded.

C. Connections at Thrust Blocks and Structures: As shown on drawings

D. Closure Sections:
   1. Where necessary as determined by Contractor, subject to approval of COR.
   2. Ambient temperature when closure section is welded, maximum: 60 degrees F.

3.02 TOLERANCES

A. Lay pipe to lines and grades shown on drawings or established by COR to following tolerances:
   1. Departure from and return to established alignment and grade, maximum: 1/16-inch per foot of pipe.
   2. Total departure from established alignment and grade, maximum: 1-inch.

3.03 ADJUSTMENTS IN ALIGNMENT AND GRADE FOR PULLED JOINTS

A. Per approved pipe laying diagrams.

B. Refer to Section 33 11 10 – Pipeline General Requirements.

C. Make small minor changes in alignment and grade by providing small deflections between adjacent pipe sections as follows:

1. Pulling rubber gasket bell-and-spigot joint:

a. A total 1-inch joint deflection may be permitted by reducing normal 1/2-inch inside mortar space to 1/4-inch and pulling opposite side of pipe 3/4-inch from normal closure.

b. Provide unsymmetrical closure at welded lap joint up to maximum pullout of 1-inch.

2. Maximum deflection angle between adjacent pipe sections: Manufacture's recommendations but shall not exceed 5 degrees.

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

3.04 JOINT LINING AND COATING

A. Field joints for pipe with shop applied cement-mortar lining.

1. Line field joints with cement-mortar in accordance with AWWA C205.
2. Coat exterior joints as specified in Section 09 96 20 – Coatings.
3. Do not backfill field joints until coating is approved by OGR.
4. Welding after backfill not allowed.

B. Apply shrink sleeves to field joints in accordance with Section 09 96 20 – Coatings.

3.05 BACKFILL

A. Keep internal supports in place until embedment has been placed and compacted above bottom of pipe to minimum height of 0.7 times diameter.

3.06 PIPE DIAMETER 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.
3. Short term is within 2 weeks after backfilling is complete.

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

1. Decrease, maximum: 3 percent of nominal pipe diameter.

END OF SECTION

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SECTION 33 11 17

PVC GRAVITY DRAIN FOR SAN JUAN LATERAL WATER TREATMENT PLANT REGULATING TANKS

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

1. Include in price offered Price Schedule 2 for San Juan Lateral Water Treatment Plant Regulating Tanks:

   a. Includes:

      1) Pipe bedding and backfill for gravity drain.

      2) Solid and Slotted PVC pipe for gravity drain.

      3) Fittings for gravity drain.

      4) Flexible coupling for gravity drain.

      5) Metallic warning tape for gravity drain.

      6) Outfall screen for gravity drain.

1.02 REFERENCE STANDARDS

A. ASTM International (ASTM)

1.	ASTM A240/A240M-17	Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
2.	ASTM C33/C33M-16e1	Concrete Aggregates
3.	ASTM C1173-18	Flexible Transition Couplings for Underground Piping Systems
4.	ASTM D882-12	Tensile Properties of thin Plastic Sheeting
5.	ASTM D1785-15	Rigid Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80 and 120
6.	ASTM D2103-15	Polyethylene Film and Sheeting
7.	ASTM D2466-15	Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
8.	ASTM D2564-12	Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
9.	ASTM D2672-96a(2009)	Joints for IPS PVC Pipe Using Solvent Cement

10.	ASTM D5926-15	Poly (Vinyl Chloride) (PVC) Gaskets for Drain, Waste, and Vent (DWV), Sewer, Sanitary, and Storm Plumbing Systems
11.	ASTM F480-14	Thermoplastic Well Casing Pipe and Couplings made in Standard Dimension Ratios (SDR), SCH 40 and SCH 80
12.	ASTM F656-10	Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings

1.03 SYSTEM DESCRIPTION

A. This specification section covers the gravity drain around perimeter of the San Juan Lateral Water Treatment Plant Regulating Tanks and continuing to a daylight termination point at the site riprap lined drainage channel.

B. Gravity drain conveys water collected from the concrete tank gravel drain system to site riprap lined drainage channel through 6-inch PVC pipeline.

C. General routing of the gravity drain is shown on drawing ***1695-D-624731~~695-D-60160~~***.

D. Pipe connection locations are shown on drawing ***1695-D-624731~~695-D-60162~~***.

1.04 SUBMITTALS

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

B. RSN 33 11 17-1, Certification:

1. Submit manufacturer's certification that pipe meets specified requirements.

C. RSN 33 11 17-2, Pipe Layout Drawings:

1. Contractor's drawings of piping covered by this specification.
2. Plan view drawing showing dimensions and distances of all system components.
3. Profile view drawing showing elevations, centerlines and depth of cover.

D. RSN 33 11 17-3, Product Approval Data:

1. Shipping, handling and installation procedures.
2. Manufacturers name, commercial products data and drawings, illustrations and dimensions for all pipe, fittings, and components.

E. RSN 33 11 17-4, Final Data:

1. As-built drawings.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle equipment and components in accordance with manufacturer's recommendations to prevent damage.

B. Do not use rope, cable, or chain slings to handle drain pipe. Fabric slings not less than 12-inches in width may be used to handle drain pipe.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

A. Solid Polyvinyl Chloride (PVC) Pipe, Schedule 40, 6-inch:

1. ASTM D1785.
2. End Style: Socket solvent cement.

B. Slotted PVC Underdrain Pipe, SDR17:

1. ASTM F480.
2. Slot Requirements:
   a. Width: 0.085-inch.
   b. Spacing: 0.25-inch.
   c. Open Area: 43.0 square inches, minimum, per foot of pipe.
3. End Style: Socket solvent cement.

C. PVC Extruded or Injection-Molded Pressure Fittings:

1. ASTM D2466.
2. Pressure rating equal to pipe.

D. Solvent cement ASTM D2564.

E. Primer ASTM F656.

F. Metallic Warning Tape:

1. Compliant with ASTM D882 and ASTM D2103.
2. Standard 6-inch wide, commercial quality, detectable underground warning tape.
3. Continuous tape with message "Caution Buried Waterline Below."
4. Color: Blue.

2.02 COMPONENTS

A. Flexible Coupling:

1. Fernco 1056 Series manufactured by Fernco, Incorporated, 300 S. Dayton Street, Davison, MI, 48423; or equal, having the following essential characteristics:
    a. Compatible with the pipe material and fittings.
    b. Positive seal against infiltration and exfiltration.
    c. Leakproof and resistant to chemicals and fungus growth.
    d. Conforms to ASTM D5926 and C1173.
    e. Connects pipes of same or different sizes and materials quickly and easily.
    f. Stainless steel clamps are corrosion resistant and rustproof.

2.03 OUTFALL SCREEN

A. Stainless Steel Wire Cloth:

1. Stainless steel, ASTM A240, Type 304 or 316.
2. Mesh openings per linear inch: 4 by 4.
3. Wire diameter, minimum: 0.080-inch.

B. Bands for Screen:

1. Stainless steel: ASTM A240, Type 304 or 316.
2. Thickness, minimum: 10 gauge.
3. Width, minimum: 1/2-inch.

2.04 PIPE BEDDING

A. ASTM C33, coarse sand 100 percent passing 3/8-inch screen and 95 percent passing No. 4 screen.

2.05 PIPE TRENCH BACKFILL

A. Per Section 31 23 02 – Compacting Earth Materials.

PART 3 EXECUTION

3.01 INSTALLATION

A. Laying of slotted wall pipe:

1. In accordance with 31 24 18 – Gravel Drain for Water Storage Tanks.

B. Laying of solid wall pipe:

1. Install water pipes in conformity to the approved design plan and in coordination with OGR.
2. Clean each section of pipe and each fitting before installation.
3. Lower pipe and fittings into the trench preventing damage to pipe. Use approved slings when required.
4. Lay pipe true and uniform to line and grade, with no visible change in alignment at any joint unless curved alignment is called for on the drawings:
   a. If deflection is required, maximum deflection must not exceed the manufacturer's recommendation for the type of pipe and joint being used.
5. Whenever pipe laying is discontinued for an hour or more, close open ends of pipe with water-tight plugs.
6. Pipe shall not be laid when condition of trench or weather is unsuitable or when there is the possibility of foreign material entering the pipe.
7. Keep pipe interior free of dirt, filter material, and foreign material. Provide temporary closure at open pipe ends during work shutdown.

C. Flexible coupling:

1. ***Install on the gravity drain polyvinyl chloride pipe, beyond the tank foundation liner, as shown on drawing 1695-D-62473.***

D. Joining Methods:

1. Solvent cement pipe sections in accordance with ASTM D2467, and ASTM D2672.

E. Slope gravity drain lines to daylight above riprap lined drainage channel. Slope shall be 0.01 minimum.

F. Install stainless steel metal cloth on open ends of pipes at site drainage channel.

3.02 EARTHWORK AND TRENCHES

A. Pipe Bedding and Backfill:

1. Minimum 4-inches below pipe and 6-inches above.
2. Place initial fill in even layers not exceeding 4-inches in depth and hand tamped to the spring line of the pipe, before proceeding to next layer.
3. Place backfill in even layers not exceeding 6-inches in depth and compacted, before proceeding to next layer.

B. Gravel Drain Material: In accordance with Section 31 24 18 – Gravel Drain for Water Storage Tanks.

C. Metallic Detectable Warning Tape:

1. Lay continuous metallic warning tape above runs of nonmetallic pipe to facilitate locating pipe later.
2. Warning tape shall be laid directly above the underground pipe, approximately 1-foot below finished yard elevation.

3.03 CLEANING

A. Clean or replace gravity drains that become clogged, damaged, or obstructed from any cause before acceptance of work. Use methods approved by COR to clean or replace pipe.

3.04 PROTECTION

A. Protect gravity drain pipe from vehicular and equipment traffic during installation.

B. Protect installed gravity drain pipes from equipment, wheel loads, and other concentrated loads until gravity drain is protected by permanent construction.

END OF SECTION

SECTION 35 21 95
STEEL MANIFOLD PIPING

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Steel Manifold Piping:

1. Payment: Lump sum prices offered in Price Schedule 2.

1.02 DEFINITIONS

A. Steel Manifold Piping:

1. Details of steel manifolds are shown on drawings 1695-D-62475 through 1695-D-62483, and 1695-D-60804.

1.03 REFERENCE STANDARDS

1.	ANSI/NSF 372-2022	Drinking Water System Components – Lead Content

B. American Society of Mechanical Engineers (ASME)

1.	ASME B1.20.1-2013(R2018)	Pipe Threads, General Purpose (Inch)
2.	ASME B16.47-2020	Large Diameter Steel Flanges: NPS 26 through NPS 60
3.	ASME B16.5-2020	Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24
4.	ASME B16.9-2018	Factory Made Wrought Buttwelding Fittings
5.	ASME B16.11-2021	Forged Fittings, Socket-Welding and Threaded
6.	ASME B18.22.1-1965(R2017)	Plain Washers
7.	ASME PCC-1-2022	Guidelines for Pressure Boundary Bolted Flange Joint Assembly

C. ASTM International (ASTM)

1.	ASTM A36/A36M-19	Carbon Structural Steel
2.	ASTM A53/A53M-22	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
3.	ASTM A105/A105M-23	Carbon Steel Forgings for Piping Applications

4.	ASTM A139/A139M-22	Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)
5.	ASTM A193/A193M-23	Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
6.	ASTM A194/A194M-22a	Carbon Steel, Alloy Steel, and Stainless-Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
7.	ASTM A234/A234M-23a	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
8.	ASTM A240/A240M-23	Chromium and Chromium-Nickel Stainless-Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
9.	ASTM A420/A420M-22	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low Temperature Service
10.	ASTM F436/F436M-19	Standard Specification for Hardened Steel Washers Inch and Metric Dimensions
11.	ASTM A1011/A1011M-23	Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
12.	ASTM A1018/A1018M-23	Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Commercial, Drawing, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
13.	ASTM E165/E165M-18	Liquid Penetrant Examination for General Industry
14.	ASTM E709-21	Magnetic Particle Testing

D. American Welding Society (AWS)

1.	AWS D1.1/D1.1M:2020	Structural Welding Code - Steel

E. American Water Works Association (AWWA)

1.	AWWA C200-17	Steel Water Pipe - 6 In (150 mm) and Larger
2.	AWWA C206-17	Field Welding of Steel Water Pipe
3.	AWWA C207-18	Steel Pipe Flanges for Waterworks Service, Sizes 4 In. through 144 In. (100 mm Through 3,600 mm)

4.	AWWA C208-22	Dimensions for Fabricated Steel Water Pipe Fittings
5.	AWWA C227-22	Bolted, Split-Sleeve Couplings
6.	AWWA C604-17	Installation of Buried Steel Water Pipe – 4 In. (100 mm) and Larger

F. Commercial Item Descriptions (CID)

1.	CID A-A-1923A-01	Shield Expansion (Lag, Machine and Externally Threaded Wedge Bolt Anchors)

1.04 SUBMITTALS

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

B. RSN 35 21 95-1, Shop Drawings:

1. Checked, detailed shop drawings including dimensions and tolerances, material data, joint details, and welding requirements:
   a. Provide checked box on each drawing indicating date drawing was checked and by whom.
   b. When revised drawings and data are resubmitted, clearly identify changes from previous submittals.

C. RSN 35 21 95-2, Field Welder Qualifications

1. Welder certifications

D. RSN 35 21 95-3, Commercial Products Data:

1. Manufacturer's engineering data sheets demonstrating the applicable size, standards, material, and pressure rating for components in Part 2, Products, of this specification.

E. RSN 35 21 95-4, Pipe Installation Procedure and Calculations:

1. Structural calculations and details of supports and tiedowns for the steel manifold piping stamped and signed by a registered professional engineer in State of New Mexico:
   a. Calculations must demonstrate that the tiedown system is adequate to resist uplift forces resulting from floatation of the steel manifold piping in freshly placed concrete and that the tiedown system will not cause stresses in excess of the allowable in the steel manifold piping.
2. Methods for maintaining circularity and preventing damage to steel pipe, fittings, lining and coating during loading, transporting, unloading, storing, and laying.
3. Type and location of pipe supports and tie downs to be used.
4. Methods for ensuring pipe alignment.

5. Type, locations, and details of field welds.
6. Installation procedure.

F. RSN 35 21 95-5, Source Quality Test Reports:

1. Provide hydrostatic test procedure, including time-pressure record.
2. Report detailing results of hydrostatic testing including time pressure record of each hydrostatic test.

G. RSN 35 21 95-6, Final Drawings and Data:

1. Field Weld Test Results: Results of air and soap tests on field welded double lap and butt strap joints.
2. Complete set of As-Built drawings
   a. Clearly mark drawings ***1695-D-62475 through 1695-D-62483, and 1695-D-60804*** to show all field modifications of the final installation.
   b. Submit drawings in accordance with Section 01 33 00 – Submittals article 1.04 paragraph C.6 and Section 01 78 30 – Project Record Documents.

1.05 QUALIFICATIONS

A. Steel Pipe Welders: Welders and Welding Operators to be qualified in accordance with AWS D1.1.

1.06 DELIVERY, STORAGE, AND HANDLING

A. In accordance with Section 01 60 00 – Product Requirements.

B. During loading, transporting, unloading, storing, and laying, prevent damage to steel manifold piping linings and coating. Transport and handle in accordance with fabricator's instructions:

1. Provide padded bolsters curved to fit under outside of pipe.
2. Provide heavy padding under ties during transportation and storage.

C. Maintain circularity of pipe sections during coating, lining, transporting, and installing operations:

1. Provide stulls or adjustable spiders.
2. Measured deviation between maximum and minimum diameters at stulls or spiders shall not exceed 0.5 percent of nominal pipe diameter.

D. Do not store directly on the ground.

E. Store so that lifting straps can be passed beneath pipe sections.

F. Provide space to allow personnel to move between pipe sections.

G. Cover with tarps and tie down securely.

H. Repair damage to lining and coating as directed if, in the opinion of COR, a satisfactory repair can be made; otherwise, replace damaged section at expense of Contractor and in accordance with Section 09 96 20 – Coatings.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Piping and equipment materials:

1. ANSI/NSF 372 compliant lead-free.

B. Steel plate:

1. ASTM A36, ASTM A1011, SS, Grade 36, 40, or 45; or ASTM A1018, SS, Grade 36 or 40.

C. Stainless Steel Orifice Plate: ASTM A240, Type 304/304L or 316/316L

2.02 PIPE

A. Standard and Schedule Steel Pipe:

1. ASTM A53, Type E or S, Grade B.

B. Electric–Fusion– (arc–) Welded, Spiral–Seam Steel Pipe:

1. ASTM A139, Grade C, D, or E.

C. Threaded Steel Fittings:

1. ASME B16.11 and ASTM A105.
2. Threaded NPT: ASME B1.20.1.

D. Butt-Welding Steel Fittings:

1. ASME B16.9 and ASTM A234 or ASTM A420 - WPL6.

E. Steel Pipe Miter Bend Elbows: Designed, fabricated, and dimensioned in accordance with AWWA C208.

2.03 FITTINGS

A. Flanges:

1. Slip-on: AWWA C207, ASME B16.47, or ASME B16.5.
2. Flat face with finish suitable for gasket:

a. Provide spiral or concentric serrated grooved flange face gasket surface finishes that are suitable for flat gasket material provided and for operating pressures.

b. Contractor shall confirm flange facing matches mating flange at all attachments.

B. Flange Bolts, Studs, Nuts, and Washers:

1. AWWA C207 for AWWA flanges.

2. ASME B16.47 or ASME B16.5 for ASME flanges.

3. Bolts: ASTM A193/A193M, Grade B7.

4. Nuts:

a. Greater than 1-inch diameter: ASTM A194/A194M, Grade 2H

b. 1-inch diameter or less: ASTM A563

5. Washers: ASTM F436.

C. Pipe couplings:

1. Minimum cold water working pressure ratings: 150 psig.

2. Gaskets: Suitable for cold-water service.

3. Grooved-end: Style 77 or Style W77/W77B manufactured by Victaulic, www.victaulic.com; or equal, having the following essential characteristics:

a. Ductile iron conforming to ASTM A536, Grade 65-45-12.

b. Flexible joint type with rolled or cut grooves.

c. Minimum allowable pipe end separation:

1) Couplings 4-inches in diameter and greater: 0.125-inch.

4. Restrained flexible split sleeve type couplings: Style 232 manufactured by Victaulic, www.victaulic.com,; or equal, having the following essential characteristics:

a. Conforms to AWWA C227.

b. Coupling housing: Arched, 2 or more segmented, split sleeve-type which when closed compresses elastomeric O-ring gaskets beneath arches of sleeve to create radial seal around pipe ends joined inside of coupling.

c. Minimum misalignment tolerance (lateral offset between pipe ends): 0.125-inch.

d. Minimum allowable angular deflection:

1) 42-inch: 1°0’.

5. Restrained couplings for dynamic joint deflection:

a. Suitable for buried service.

b. Spaced to accommodate 2-inches of differential settlement.

1) Contractor to submit data or calculations under RSN 35 21 95-1 that demonstrate differential settlement is accommodated within allowable space.

c. Conforms to the following options:

1) Restrained flexible type for dynamic joint deflection Style 233, manufactured by Victaulic, www.victaulic.com; or equal, having the following essential characteristics:

a) Conforms to AWWA C227.

b) Coupling housing: Arched, 2 or more segmented, split sleeve-type which when closed compresses elastomeric O-ring gaskets beneath arches of sleeve to create radial seal around pipe ends joined inside of coupling.

c) Minimum misalignment tolerance (lateral offset between pipe ends): 0.125-inch.

d) Minimum allowable angular deflection:

i. 42-inch: 1°15'.

2) Grooved-end with welding ring: Style W77 with Vic-Ring manufactured by Victaulic, www.victaulic.com; Style 7022 manufactured by ASC Engineered Solutions, www.asc-es.com; or equal, having the following essential characteristics:

a) Uses welding rings to form flexible grooved end on plain end pipe.

b) Ring material: carbon steel that meets or exceeds the requirements of ASTM A105.

c) Housing: ASTM A536 Gr. 65-45-12

d) Minimum allowable pipe end separation:

i. Couplings 4-inches in diameter and greater: 0.19-inch.

e) Minimum allowable angular deflection per coupling:

i. 42-inch: 0°29'.

ii. Installed in multiples to accommodate required differential settlement amount.

3) Dynamic movement joint Style W257B, manufactured by Victaulic, www.victaulic.com; or equal, having the following essential characteristics:

a) Pipe spools meet requirements of ASTM A53, Type E or S, Grade B.

b) Assembly accommodates a minimum of X" of differential settlement.

2.04 APPURTENANCES

A. Anchor bolts:

1. Expansion anchors or epoxy type anchor bolts with studs and epoxy as shown on drawings:

   a. Expansion anchors:

      1) CID A-A-1923A, Type 4.

   b. Adhesive Anchors: Drilled type, installed with a chemical adhesive system:

      1) Adhesive: HIT-HY 200 epoxy adhesive manufactured by Hilti Corporation, www.hilti.com; or equal, having the following essential characteristics:

         a) Injectable two-component epoxy adhesive.

         b) Stud and epoxy combination by same manufacturer.

         c) End of stud: Double cut chisel point.

         d) Studs (threaded rods): ASTM A193, Grade B7.

         e) Nuts: ASTM A194, Grade 2H.

         f) Washers: ASTM F436 Type 1 and ANSI B18.22.1 Type A Plain

B. Gaskets:

1. Multi-Swell Style 3760 manufactured by Garlock, www.garlock.com; or equal, having the following essential characteristics:

   a. Dimensional requirements of AWWA C207, ASME B16.47, or ASME B16.5 as shown on drawings.

   b. Flat, full face or ring type.

   c. Minimum 150 psig cold water pressure rating.

   d. Minimum 1/16-inch thick.

   e. Suitable for cold water service.

C. Flange insulation:

1. Flange isolating gasket kit complete with the "Trojan" type of gasket manufactured by Advanced Products and Systems, Inc., www.apsonline.com, or equal with the following essential characteristics:

   a. Provide full-faced gaskets as shown on drawings. Outside diameter of gasket is same as outside diameter of flange.

b. Provide retainer with integral Nitrile sealing element ("Trojan" type).

c. Retainer material to be suitable for cold water service as recommended by gasket manufacturer.

d. One insulating sleeve and 2 insulating washers for each bolt. Material suitable for cold water service as recommended by gasket manufacturer.

e. Asbestos gaskets are not acceptable.

f. Prevent damage to gasket, gasket supplier to provide required bolt torques, recommended bolt tightening sequence, and flange face finish for insulating flanged joints.

g. Suitable for 150 psig cold water service.

2.05 FABRICATION

A. Fabricate steel manifold piping in accordance with these specifications, as indicated on drawings, and in accordance with AWWA C200.

B. Longitudinal, girth, and spiral joints, other than field welds:

1. Double-welded butt joints with complete penetration.
2. Stagger longitudinal joints.
3. Longitudinal, girth, and spiral joints shall not intersect at outlet connections.

C. Cut plates accurately to size and shape.

D. Bend or roll plates to true circular with curvature continuous from edges of plates.

E. Properly form edges to be joined by welding to suit type of welding and to allow complete penetration.

F. Perform welding with a process that protects molten metal from atmosphere:

1. Where practicable, use automatic machines.
2. Where weld metal is deposited in successive layers, clean each layer thoroughly before subsequent layer is deposited.
3. Take particular care in aligning and separating edges of plates to be joined by butt welding so that complete penetration and fusion of welds will be ensured.
4. After welding is complete, remove weld spatter.

G. Protect work and operator from wind, rain, and snow during welding operations:

1. Welding is not permitted on wet surfaces or when temperature of steel is lower than 0 degrees F.

2. Apply heat to welding areas as needed during field installation. At pipe surface temperatures between 0 and 32 degrees F, heat surface of areas within 3-inches of the point where a weld is to be started to at least 60 degrees F.

H. Ends to be joined by a pipe coupling:

1. Exterior surface of pipe end to be connected with sleeve-type coupling shall be free from weld reinforcement (bead), seams, scars, dents, flats, or other defects likely to interfere with joint-sealing process in accordance with coupling manufacturer instructions.

I. Flanges and flanged connections:

1. During attachment of flanges to associated steel manifold pipe, take adequate steps to ensure that face of flanges remains flat and perpendicular to centerline of attached piping.
2. Remove by machining, initial, residual, or latent irregularities or warping that remains in face of flange after its attachment to steel manifold piping.
3. After machining, flange thickness shall not be reduced below minimum thickness specified in AWWA C207, ASME B16.47, ASME B16.5, or as shown on drawings.
4. Weld pipe flanges to the piping so that bolt holes straddle vertical centerline when in the installed position.
5. Provide pipe flanges that connect to valve body flanges with same number of bolt holes, bolt pattern, bolt circle diameter, and face type, flat or raised, as valves to which they are connected.

J. Continuously weld joints of flange supports and pipe supports.

2.06 CONTRACTOR SOURCE QUALITY TESTING

A. Flange Weld Testing:

1. Test flange welds by magnetic particle or liquid penetrant method in accordance with AWS D1.1.
2. Repair defects and retest weld.

B. Coupling Restraint Ring Weld Testing:

1. Test welds of restraint rings welded to pipe for split-sleeve restrained couplings by magnetic particle or liquid penetrant method in accordance with AWS D1.1.
2. Repair defects and retest weld.

C. Hydrostatic Pressure Testing:

1. Straight sections of steel piping manufactured and hydrostatically tested in accordance with ASTM A53 or ASTM A139 need not be retested.

2. Notify Government a minimum of 30-days before test.
3. Government may witness hydrostatic test and calibration of pressure gauges.
4. Use 2 or more pressure gauges with one being a recording type:
   a. Upper limit of pressure gauges shall be between 1.5 and 3 times required test pressure. Calibrate pressure gauges with a deadweight tester.
   b. Calibrate at least 1 gauge, which is used for acceptance of test, within 30-days prior to use.
   c. Make a time-pressure record of hydrostatic pressure test.
5. Furnish temporary supports, bulkheads, air vents, dead weight tester, and other equipment necessary to perform hydrostatic tests.
6. If flange is attached to piping section after piping section has been hydrostatically tested, piping section will not require retesting.
7. Water temperature for tests: Greater than 45 degrees F.
8. Vent air from test sections.
9. Fill each section with water and uniformly increase pressure until required test pressure is reached:
   a. Hold test pressure for a minimum of 15-minutes.
   b. Apply and release test pressure 3 successive times.
   c. After each application, hold pressure to 2/3 of required pressure until welded joints and seams can be examined.
   d. Repair defects. After defects are repaired repeat complete test procedure.
10. After hydrostatic testing is completed, cut sections for handling purposes on planes normal to pipe axis.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install steel manifold piping to line and grade as shown on drawings and in accordance with AWWA C604:
   1. Install steel manifold pipe in accordance with the approved Pipe Installation Procedure.

B. Prevent steel pipe from being displaced or overstressed during concrete and backfill placement.

C. Furnish and install supports and bracing as may be required to hold steel manifold piping in place, prevent distortion, and prevent flotation during erection and placing of concrete. Supports and bracing shall bear against the exterior pipe surface a minimum of 120-degrees of the pipe circumference and not create a point load on the pipe:
   1. Embedment of timber supports will not be permitted.

2. If used for the support system, cables or chains may not bear directly against the steel pipe or concrete reinforcement.

D. Contact between pipe and rebar will not be allowed.

E. Install pipe spools with flanged connections so that bolt holes straddle vertical centerline when in installed position.

F. Dielectrically insulate between dissimilar metals:

1. Provide insulating type unions at threaded valve, pipe or fitting connections between dissimilar metals.

2. Provide insulating flange kits for flanges of dissimilar metals.

3. Provide insulating hardware kits, including sleeves and washers, for bolts of dissimilar metals to the adjacent metal (e.g., flange, coupling body, etc.).

G. Install pipe couplings, gaskets, and other appurtenances in accordance with manufacturer instructions:

1. Maximum allowable misalignment (lateral offset) between pipe ends at split sleeve type couplings: 0.125-inch:

a. Government may witness installation of pipe couplings.

b. If misalignment exceeds 0.125-inch, piping shall be repaired at the expense of the Contractor to correct misalignment. Piping repair method subject to COR approval.

c. Do not deflect pipe between coupling pairs at couplings for dynamic joint deflection to correct misalignment.

H. Install flange isolation kits in accordance with manufacturer instructions:

1. Use dielectric anti seize sparingly for installation of bolts.

I. Install anchor bolts in accordance with manufacturer instructions.

J. Field joints:

1. Field joints shown on drawings are required to facilitate lining or installation of steel manifold piping.

2. Allowable field joints for steel manifold piping:

a. AWWA C207, ASME B16.47, and ASME B16.5 flanged joints per ASME PCC-1 respectively:

1) Flanges shall be suitable for working pressure of adjacent pipe.

2) Flanges shall not be permitted underneath buildings, water storage tanks, or in concrete encasements.

b. Full-penetration butt welds.

c. Double welded lap joints, or double welded butt strap joints.

d. Threaded couplings for pipe less than 4-inches in diameter.

3. Welded field joints shall be in accordance with AWWA C206.

4. Prepare field welded surfaces and recoat in accordance with Section 09 96 20 – Coatings.

K. Steel manifold piping earthwork:

1. In accordance with Section 31 23 22 – Pipe Trench Earthwork.

3.02 CONTRACTOR FIELD QUALITY TESTING

A. Nondestructive Testing of Field Welds of Steel Pipe:

1. Test all welds in accordance with AWWA C206 and this specification.

2. Complete inspections and tests as work progresses in presence of COR and in accordance with AWS D1.1.

3. When welds are found to be defective by the standards of AWS, repair welds in accordance with AWS D1.1 and reexamine welds to ensure the adequacy of repairs.

4. Visual Inspection: Visually inspect all welds following procedures, techniques, and standards of AWS D1.1.

5. Testing of full penetration joints:

a. Ultrasonic methods in accordance with AWS D1.1.

6. Testing of partial penetration joint field welds and fillet field welds:

a. Magnetic particle testing: ASTM E709.

b. Dye penetrant: ASTM E165.

c. Standards of acceptance for both types: AWS D1.1.

d. Caulking or peening of defective welds is not permitted.

e. Repair and retest unsatisfactory welds.

7. Inspect all double lap welded and butt strap joints by air test:

a. AWWA C206.

b. Test the joints by shop drilling and tapping for a 1/8-inch or 1/4-inch national pipe thread in the lap end of the pipe.

c. Apply 40 psig of air into the connection between the two fillet welds and maintain for a period of 5-minutes.

d. Paint the welds with a soap solution.

e. Mark any leaks indicated by the escaping air bubbles.

f. Repair welds at leak locations in accordance with AWS D1.1 and AWWA C206 and retest.

g. Close the threaded openings with pipe plugs.

h. Seal weld the pipe plugs and grind the weld smooth.

i. Submit test results to COR within one week after testing.

j. Prepare field welded surfaces and recoat in accordance with Section 09 96 20 – Coatings.

3.03 LINING AND COATING

A. Refer to Section 09 96 20 – Coatings.

END OF SECTION

SECTION 52 00 00
DRAWINGS

PART 1 GENERAL

1.01 DISCREPANCIES, ERRORS, OR OMISSIONS

A. Inform CO of discrepancies discovered on drawings in accordance with clause at FAR 52.236-21, Specifications and Drawings for Construction.

B. In accordance with clause at FAR 52.236-21, Specifications and Drawings for Construction, in case of discrepancies, written specifications take precedence over drawings unless otherwise specified.

1.02 PROJECT CONDITIONS

A. Where there are differences as determined by CO between details and dimensions shown on drawings and details and dimensions of existing features at jobsite, use details and dimensions of existing features at jobsite.

1.03 SPECIFICATION DRAWINGS

A. Some drawings show details of fabrication or other details and specifications which are not a part of work under this contract. Disregard specifications and details shown on these drawings which are not applicable to work under this contract.

B. Reference drawings referred to on specification drawings and not considered necessary for contract purposes are not included in specifications.

C. Parts of work for which dimensions are not shown have been drawn to scale as nearly too final dimensions as possible before purchase of machinery or equipment and development of final general and detailed designs.

1.04 TYPICAL DRAWINGS

A. Typical drawings show installations and details of construction which are similar to or approximate to those that are part of work under these specifications. Dimensions and details shown on typical drawings may vary from those shown on construction drawings to be furnished after award of contract.

B. Use typical drawings for bidding purposes only.

1.05 ADDITIONAL OR REVISED DRAWINGS

A. Except as provided in these specifications for drawings to be furnished by Contractor, specifications drawings will be supplemented by additional or revised general and detail drawings as necessary or desirable as work progresses.

B. Do not perform work without proper drawings and instructions.

C. Additional or revised general and detail drawings will show dimensions and details necessary for construction purposes more completely than are shown on these specifications drawings for features of work and for equipment or metalwork not yet purchased.

D. Perform work in accordance with additional general and detail drawings or revisions at applicable prices offered in Price Schedule for such work.

1.06 INFORMATION DRAWINGS

A. Drawings marked "For Information Only" in the drawing list are included to show existing features about which knowledge is required to perform work under this contract. These drawings do not show work to be performed under this contract.

B. If there are differences as determined by the CO between details and dimensions shown on these drawings and those of existing features at jobsite, use details and dimensions of existing features at jobsite.

1.07 STANDARD DRAWINGS

A. Standard drawings may show details which are not a part of work under this contract. Disregard details shown on these drawings which are not applicable to work under this contract.

1.08 LIST OF DRAWINGS

A. Drawings listed in Table 52 00 00A – List of Drawings, are made a part of Section C – Description/Specifications.

1.09 DRAWING NUMBERS IN NUMERICAL ORDER

A. Specification drawings are listed in numerical order in Table 52 00 00B – Drawings in Numerical Order.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

Table 52 00 00A – List of Drawings		
Sheet No.	Drawing No.	Title
General:		
1	1695-D-60249	San Juan Lateral – Block 2-3 – Line Pipe – Sheet Key – Notes and Symbols
Civil:		
2	1695-D-60776	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Plan and Profile – Beginning to Sta. 2050+00
3	1695-D-60777	San Juan Lateral – Block 2 - 3 –Reach 2 – Line Pipe – Plan and Profile – Sta. 2050+00 to Sta. 2100+00
4	1695-D-60778	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Plan and Profile – Sta. 2100+00 to Sta. 2150+00
5	1695-D-60779	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Plan and Profile – Sta. 2150+00 to Sta. 2200+00
6	1695-D-60780	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Plan and Profile – Sta. 2200+00 to Sta. 2250+00
7	1695-D-60782	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Plan and Profile – Sta. 2250+00 to END
8	1695-D-60783	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Beginning to Sta. 3350+00
9	1695-D-60784	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Sta. 3350+00 to Sta. 3400+00
10	1695-D-60785	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Sta. 3400+00 to Sta. 3450+00
11	1695-D-60786	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Sta. 3450+00 to Sta. 3500+00
12	1695-D-60787	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Sta. 3500+00 to Sta. 3550+00
13	1695-D-60788	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Sta. 3550+00 to Sta. 3600+00
14	1695-D-60789	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Sta. 3600+00 to Sta. 3650+00

Table 52 00 00A – List of Drawings		
Sheet No.	Drawing No.	Title
15	1695-D-60792	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Sta. 3650+00 to Sta. 3700+00
16	1695-D-60794	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Plan and Profile – Sta. 3700+00 to End
17	1695-D-60795	San Juan Lateral – Block 2 - 3 – Line Pipe – Pressure Pipe Trench Installation – Sections and Details
18	1695-D-60796	San Juan Lateral – Block 2 - 3 – Line Pipe – Concrete Blocked Miter Bends – Sections and Details
19	1695-D-60797	San Juan Lateral – Block 2 - 3 – Line Pipe – Concrete Encased Miter Bends – Sections and Details
20	1695-D-60798	San Juan Lateral – Block 2 - 3 – Line Pipe – Air Valve Installation – Sections and Details
21	1695-D-60799	San Juan Lateral – Block 2 - 3 – Line Pipe – Air Valves with Manholes – Sections and Details
22	1695-D-60800	San Juan Lateral – Block 2 - 3 – Line Pipe – Manhole with Blowoff – Sections, Details, and Tables
23	1695-D-60801	San Juan Lateral – Block 2 - 3 – Line Pipe – Sectionalizing Valve Installation – Plan, Sections and Tables
24	1695-D-60802	San Juan Lateral – Block 2 - 3 – Line Pipe – Sectionalizing Valve Installation – Plan, Sections and Details
25	1695-D-60803	San Juan Lateral – Block 2 - 3 – Line Pipe – Collars – Details, Sections and Data Tables
26	1695-D-60804	N.A.P.I. Turnout – Plans, Sections, and Details
27	1695-D-60805	San Juan Lateral – Block 2 - 3 – Line Pipe – Typical Buried Manhole – Plans, Sections and Tables
28	1695-D-60806	San Juan Lateral – Block 2 - 3 – Line Pipe – Precast Concrete Manholes – Plans, Sections, and Details
29	1695-D-60807	San Juan Lateral – Block 2 - 3 – Line Pipe – Typical Road Crossing – Open Cut and Bored Sections
30	1695-D-60808	San Juan Lateral – Block 2 - 3 — San Juan Lateral Water Treatment Plant Regulating Tanks -Access Road – Plan and Profile

Table 52 00 00A – List of Drawings		
Sheet No.	Drawing No.	Title
31	1695-D-60809	San Juan Lateral – Block 2 - 3– San Juan Lateral Water Treatment Plant Regulating Tanks Site Plan
32	1695-D- 60810	San Juan Lateral – Block 2 - 3 – Concrete Blocked Miter Bends – Sections and Details
33	1695-D-60811	San Juan Lateral – Block 2 - 3 – Air Valves and Blowoffs – Data Tables
34	1695-D-60812	San Juan Lateral – Block 2 - 3 – Blowoff – Section and Details
35	1695-D-60813	San Juan Lateral – Block 2 - 3 – Wash Crossing - Erosion Control Details
36	1695-D-60814	San Juan Lateral – Block 2 - 3 – Wash Crossing - Erosion Control Details
37	1695-D-62461	San Juan Lateral – Block 2 - 3 – Reach 2 – Lin++e Pipe – Auger Bore - Powerline Crossing Sta. 2016+95
38	1695-D-62463	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Auger Bore - State Hwy 64 Crossing Sta. 2108+22
39	1695-D-62464	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Auger Bore - Road 6700 Crossing Sta. 2134+23
40	1695-D-62465	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Auger Bore - Powerline Crossing Sta. 2184+59
41	1695-D-62466	San Juan Lateral – Block 2 - 3 – Reach 2 – Line Pipe – Auger Bore – ISR N 362 Crossing Sta. 2189+73
~~42~~	~~1695-D-62467~~	~~San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Auger Bore - Powerline Crossing Sta. 3331+13~~
43	1695-D-62468	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Auger Bore – Powerline Crossing Sta. 3340+33
44	1695-D-62469	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Auger Bore - ISR 36
~~45~~	~~1695-D-62470~~	~~San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Auger Bore - Powerline Crossing Sta. 3633+18~~
~~46~~	~~1695-D-62471~~	~~San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Auger Bore - Powerline Crossing Sta. 3707+02~~

Table 52 00 00A – List of Drawings		
Sheet No.	Drawing No.	Title
47	1695-D-62503	San Juan Lateral – Block 2 - 3 – Reach 3 – Line Pipe – Auger Bore - Powerline Crossing Sta. 3478+93
48	1695-D-62472	San Juan Lateral – Block 2 - 3 – Concrete Water Tank - Plan and Sections
49	1695-D-62473	San Juan Lateral – Block 2 - 3 – Concrete Water Tank - Details and Section
50	1695-D-62474	San Juan Lateral – Block 2 - 3 – Tank Overflow and Drain Apron – Plan and Sections
Mechanical:		
51	1695-D-62475	San Juan Lateral – Block 2 - 3 – Steel Manifold Piping - Plan
52	1695-D-62476	San Juan Lateral – Block 2 - 3 – Steel Manifold Piping - Sections
53	1695-D-62477	San Juan Lateral – Block 2 - 3 – Steel Manifold Piping – Details and Schedules
54	1695-D-62478	San Juan Lateral – Block 2 - 3 – Steel Manifold Piping - Details
55	1695-D-62479	San Juan Lateral – Block 2 - 3 – Tank 2 – Plan, Section and Details
56	1695-D-62480	San Juan Lateral – Block 2 - 3 – Tank 1 - Plan, Section and Details
57	1695-D-62481	San Juan Lateral – Block 2 - 3 – Welded Steel Tank – Sections and Details
58	1695-D-62482	San Juan Lateral – Block 2 - 3 – Welded Steel Tank – Sections and Details
59	1695-D-62483	San Juan Lateral – Block 2 - 3 – Overflow - Sections and Details

Table 52 00 00A – List of Drawings		
Sheet No.	Drawing No.	Title
Electrical:		
60	1695-D-62484	San Juan Lateral – Block 2 - 3 – Electrical – SCADA – Network Diagram
61	1695-D-62485	San Juan Lateral – Block 2 - 3 – Electrical Installation – Electrical Plan
62	1695-D-62486	San Juan Lateral – Block 2 - 3 – Grounding Plan
63	1695-D-62487	San Juan Lateral – Block 2 - 3 – Electrical Installation -Site Panelboard Schedule
64	1695-D-62488	San Juan Lateral – Block 2 - 3 – Electrical Installation – Single Line Diagram
65	1695-D-62489	San Juan Lateral – Block 2 - 3 – Electrical Installation – Conduit Plan
66	1695-D-62490	San Juan Lateral – Block 2 - 3 – Electrical Installation - Cable and Conduit Schedule
67	1695-D-62491	San Juan Lateral – Block 2 - 3 – Electrical Installation - Panel Elevation Views
68	1695-D-62492	San Juan Lateral – Block 2 - 3 – Electrical Installation - Equipment Connection Schedule
Cathodic Protection:		
69	1695-D-62493	San Juan Lateral – Block 2 - 3 – Corrosion Protection – Test Station and Cable Trench Details
70	1695-D-62494	San Juan Lateral – Block 2 - 3 – Corrosion Protection – Galvanic Anode Cathodic Protection Anode Bed
71	1695-D-62495	San Juan Lateral – Block 2 - 3 – Corrosion Protection – Impressed Current Deep Well Anode Bed
72	1695-D-62496	San Juan Lateral – Block 2 - 3 – Corrosion Protection – Joint Bond Details and Cable Identification

Table 52 00 00A – List of Drawings		
Sheet No.	Drawing No.	Title
73	1695-D-62497	San Juan Lateral – Block 2 - 3 – Corrosion Protection – Welded Water Storage Tank Plan and Profile
P&ID:		
74	1695-D-62498	P&ID - Legend
75	1695-D-62499	P&ID – Symbols & Abbreviations
76	1695-D-62500	P&ID – Symbols & Abbreviations
77	1695-D-62501	P&ID – Tank Yard
Information Drawings:		
78	1695-D-61852	San Juan Lateral – Block 2 - 3 – Shumway Arroyo – Plan and Profile (Plastic)
79	1695-D-62450	San Juan Lateral – Block 2 - 3 – Shumway Arroyo – Plan and Profile (Metallic)
80	1695-D-62452	San Juan Lateral – Block 2 - 3 – San Juan River – Plan and Profile
81	1695-D-62454	San Juan Lateral – Block 2 - 3 – Nenahnezad Bluff – Plan and Profile
82	1695-D-62456	San Juan Lateral – Block 2 - 3 – Chaco River – Plan and Profile
83	1695-D-61865	San Juan Lateral – Pumping Plant No. 1 – Manifold Piping – Plan and Profile
84	085-N-1100	SJLWTP Regulating Tank NIP Layout
85	085-D-1101	SJLWTP Regulating Tank NIP Power Distribution
Standard Drawings:		
86	40-D-60001	Electrical Equipment Support, Type 1 – Sections and Detail
87	40-D-60002	Typical Guard Posts – Non Security Application
88	40-D-60003	General Notes for Concrete Outline and Reinforcement
89	40-D-60004	Minimum Requirements for Detailing Reinforcement
90	40-D-6137	Manholes – Class 150 LB. and 300 LB.

Table 52 00 00A – List of Drawings		
Sheet No.	Drawing No.	Title
91	40-D-6234	Standard Nameplates
92	40-D-7016	Chain Link Fencing Requirements Soil Installation
93	40-D-7102	Government Drawing Format - Drawing Border, Sample Title Block, and Signature Lines
94	40-D-4334	Electrical Standards – Typical Grounding Details
95	40-D-4335	Electrical Standards – Typical Grounding Details
96	40-D-4753	Electrical Installation - Typical Grounding Details - For Switchyards and Substations
97	40-D-6463	PVC Waterstops - 12-Inch Type, 9-Inch Type, and 6-Inch Type - Cross-Sections

Table 52 00 00B – Drawings in Numerical Order

Drawing No.	Sheet No.
1695-D-	
085-N-1100	3
085-D-1101	2
1695-D-60249	1
1695-D-60776	5
1695-D-60777	6
1695-D-60778	7
1695-D-60779	8
1695-D-60780	9
1695-D-60782	10
1695-D-60783	11
1695-D-60784	12
1695-D-60785	13

Table 52 00 00B – Drawings in Numerical Order

Drawing No.	Sheet No.
1695-D-60786	14
1695-D-60787	15
1695-D-60788	16
1695-D-60789	17
1695-D-60792	18
1695-D-60794	19
1695-D-60795	20
1695-D-60796	21
1695-D-60797	22
1695-D-60798	23
1695-D-60799	24
1695-D-60800	25
1695-D-60801	26
1695-D-60802	27
1695-D-60803	28
1695-D-60804	29
1695-D-60805	30
1695-D-60806	31
1695-D-60807	32
1695-D-60808	33
1695-D-60809	34
1695-D- 60810	4
1695-D-60811	35
1695-D-60812	36
1695-D-60813	37
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Table 52 00 00B – Drawings in Numerical Order

Drawing No.	Sheet No.
1695-D-61865	40
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1695-D-62452	42
1695-D-62454	43
1695-D-62456	44
1695-D-62461	45
1695-D-62463	46
1695-D-62464	47
1695-D-62465	48
1695-D-62466	49
1695-D-62467	50
1695-D-62468	51
1695-D-62469	52
1695-D-62470	53
1695-D-62471	54
1695-D-62472	55
1695-D-62473	56
1695-D-62474	57
1695-D-62475	58
1695-D-62476	59
1695-D-62477	60
1695-D-62478	61
1695-D-62479	62
1695-D-62480	63
1695-D-62481	64
1695-D-62482	65
1695-D-62483	66

Table 52 00 00B – Drawings in Numerical Order

Drawing No.	Sheet No.
1695-D-62484	67
1695-D-62485	68
1695-D-62486	69
1695-D-62487	70
1695-D-62488	71
1695-D-62489	72
1695-D-62490	73
1695-D-62491	74
1695-D-62492	75
1695-D-62493	76
1695-D-62494	77
1695-D-62495	78
1695-D-62496	79
1695-D-62497	80
1695-D-62498	81
1695-D-62499	82
1695-D-62500	83
1695-D-62501	84
1695-D-62503	85
40-D	
40-D-4334	94
40-D-4335	95
40-D-4753	96
40-D-6137	90
40-D-6234	91
40-D-6463	97
40-D-7016	92

Table 52 00 00B – Drawings in Numerical Order

Drawing No.	Sheet No.
40-D-7102	93
40-D-60001	86
40-D-60002	87
40-D-60003	88
40-D-60004	89

END OF SECTION

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