SECTION 03 48 10

PRECAST CONCRETE MANHOLES

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

1. Include in prices offered in Price Schedules for Six-Inch Diameter Air Valve Assemblies, Six-Inch Diameter Air Valve with Manhole Assemblies, and Six-Inch Blowoff with Manhole Assemblies.

1.02 REFERENCE STANDARDS

A. ASTM International (ASTM)

1.	ASTM C478-15a	Precast Reinforced Concrete Manhole Sections
2.	ASTM C923-08(2013)	Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
3.	ASTM C990-09(2014)	Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

1.03 SUBMITTALS

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

B. RSN 03 48 10-1, Approval Data:

1. Manufacturer’s product data for precast reinforced concrete manhole sections, precast lid, and joint sealant.

PART 2 PRODUCTS

2.01 PRECAST CONCRETE MANHOLE

A. Precast Reinforced Concrete Manhole Sections: ASTM C478.

B. Joints and Joint Sealant: ASTM C990.

2.02 MANHOLE COVER AND MANHOLE STEPS

A. Precast Concrete Lid: ASTM C478.

B. Twenty four inch hinged, ~~***lockable***~~, metal lid. ***With metal clasp to accommodate NTUA padlock.***

C. Manhole steps shall be made of 1/2-inch steel rod encapsulated with copolymer polypropylene or approved equal and shall conform to ASTM C478.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install plumb in accordance with manufacturer's recommendations.

B. Seal joints between manhole sections.

C. Place and compact backfill materials uniformly about manhole structure to prevent unequal loading and displacement of structure in accordance with Section 31 23 02 – Compacting Earth Materials.

END OF SECTION

SECTION 33 11 12
STEEL LINE PIPE

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Cost:

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

1.02 PROJECT CONDITIONS

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

1.03 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-13	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 C207-13***	***Steel Pipe Flanges for Waterworks Service – Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm)***
5.	AWWA C208-12	Dimensions for Fabricated Steel Water Pipe Fittings
6.	AWWA C227-11	Bolted, Split-Sleeve Restrained and Non-restrained Couplings for Plain-End Pipe
7.	AWWA C604-11	Installation of Buried Steel Water Pipe 4 Inch (100 mm) and Larger
8.	AWWA M11-***17***	Steel Pipe: A Guide for Design and Installation, ***Fifth*** Edition

1.04 SUBMITTALS

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

B. RSN 33 11 12-1, Shop Drawings:

1. Show pipe and fitting fabrication details.
2. Show exact dimensions of joints, and proposed joint restraint.
3. Show exact dimensions of welding lead holes and repair method.
4. See RSN 33 11 10-2 for further details.

C. RSN 33 11 12-2, Ventilation Plan:

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

1.05 GENERAL

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

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:

~~Except:~~

a. Steel plate: ASTM A283, grade C, D or E.

b. 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.

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.

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 ***products listed in 2.01A: ~~ASTM A283, grade C, D, or E 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: ***~~0.25 inches or thickness required to meet pipe classification shown on plan and profile, whichever is greater.~~ In accordance with AWWA C200, AWWA C208, and M-11.***

C. Welding:

1. AWS D1.1.

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

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

F. Coating and lining in accordance with Section 09 96 20 - Coatings.

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

1. In accordance with AWWA C205.

2. Wire fabric:

a. Self-furring.

b. Secured to inside of pipe sections by tack welding.

3. Lining thickness: 3/4-inch with a tolerance of plus 1/16-inch.

4. Apply lining ~~***pneumatically and steel trowel lining***~~ with a resultant surface finish, including joints, equal to finish of adjacent pipe.

H. Joints between fittings and ductile iron pipe:

1. Rubber gasket joints.

2. Joint dimensions and tolerances: Same as pipe manufacturer's joint design.

I. Miter Bends: Fabricate steel bends in accordance with AWWA C208 and as shown on drawings.

J. 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.

K. 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.

L. Tees:

1. Tees for air valves, blowoffs, manholes, and temporary construction line 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.

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

2.06 FLANGE GASKETS:

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

1. Sized in accordance with AWWA C207, Table 1.
2. For AWWA C207 flanged joints.
3. Compressed, Non-Asbestos (CNA) Gasketing with Aramid Fibers and a NGR Binder.
4. For potable cold water service.

2.07 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.
2. Perform dye penetrant test on welds in accordance with ASTM E165.
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.
   c. Required on thrust restrained joints greater than 30 degree bend deflection angles, unless butt welded joints are required.
5. Single Lap Weld Joints:
   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.
6. Joint Thrust Restraint: As shown on drawings.

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 CHANGES IN ALIGNMENT AND GRADE

A. Refer to Section 32 11 10 – Pipeline General Requirements.

B. Make small 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.

C. 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 COR.

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 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

SECTION 35 42 35
BANK PROTECTION

PART 1 GENERAL

1.01 MEASUREMENT AND PAYMENT

A. Wash Crossings:

1. Payment: Lump sum prices offered in Price Schedules for appropriate Wash Crossing Station.

   a. Includes:

      1) Compacting backfill to 85 percent.

      2) Vertical steel member (erosion indicator post).

      3) Toe rock and geotextile fabric, if required.

      4) Costs associated with stormwater discharge permit in accordance with Section 01 57 30 – Water Pollution Control.

   b. Does not include:

      1) Line pipe, joint restraints, or anchor blocks

      2) Erosion control blankets and coir wattles

2. Costs: All wash crossings not listed in the Price Schedule are to be included in applicable Line Pipe and Earthwork Price Schedule items.

1.02 REFERENCE STANDARDS

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

1.	AASHTO M288-15	Geotextile Specification for Highway Applications
2.	AASHTO T104-99	Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
3.	AASHTO T310-13	In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
4.	AASHTO T85-14	Specific Gravity and Absorption of Coarse Aggregate
5.	AASHTO T99	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. American Society for Testing and Materials (ASTM)

1.	ASTM C535-16	Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
2.	ASTM D698-12e2	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 (600 KN-m/m^3)
3.	ASTM D5080-17	Standard Test Method for Rapid Determination of Percent Compaction

1.03 SUBMITTALS

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

B. RSN 35 42 35-1, Samples:

1. Riprap: Contractor shall provide one sample of rock of at least 2 tons, meeting specified gradation.
    a. Sample shall be provided at the quarry.
    b. Sample will be used as reference for judging gradation of riprap supplied.
    c. When determined necessary, conformance of gradation will be verified through additional sampling by dumping and checking gradation of two random truckloads of stone:
        1) Riprap gradation verification can be done visually or through a particle size analysis perform in accordance with ASTM D5519, Test Method A or B.
        2) Analysis can be performed at quarry or worksite on a test pile of representative rock.
        3) Mass of test pile shall be at least 20 times the mass of largest rock in the pile.
        4) Results of test shall be compared to gradation required for project.
        5) Test pile results that do not meet construction specifications shall be cause for rock to be rejected.
        6) Mechanical equipment, a sorting site, and labor needed to assist in checking gradation shall be provided at Contractor's expense.

C. RSN 35 42 35-2, Certifications:

1. Certified test reports made by an independent testing laboratory indicating that all products meet or exceed requirements.

D. RSN 35 42 35-3, Field Verification of Wash Crossing Elevations:

1. As listed under this "Project Conditions" of this Section.

1.04 PROJECT CONDITIONS

A. Drawings included in these specifications show existing wash crossing locations, however, topography shown may not represent current ground surfaces.

1. Survey ground surface and verify depth of cover over line pipe before submitting pipe laying diagrams.

PART 2 PRODUCTS

2.01 RIPRAP

A. Rock from approved sources shall be excavated, selected, and processed to meet specified quality and grading requirements at the time rock is installed.

B. Consist of hard, dense, durable stone, angular in shape and resistant to weathering to ensure permanence in structure and climate in which it is used.

C. Rounded stone or boulders shall not be used as riprap material.

D. Stone shall have a specific gravity of at least 2.5 in accordance with AASHTO T85.

E. Each piece shall have its greatest dimension not greater than three times its least dimension.

F. Be rocks or rough quarry stone with:

1. Percent wear of not more than 60 as determined by ASTM C535.

2. Soundness loss of not more than 21 as determined by AASHTO T104.

3. Using a magnesium sulfate solution with a test duration of 5 cycles.

G. Conform to gradation requirements given in Table 34 42 35A – Riprap Gradation Requirements. Control of gradation will be by visual inspection.

Table 35 42 35A – Riprap Gradation Requirements

Stone Size D50 (In)	Percent Material Smaller Than Typical Stone	Typical Stone Dimensions (In.)	Typical Stone Weight (lbs.)
9	70-100	15	160
	50-70	12	85
	35-50	9	35
	2-10	3	1.3

2.02 GEOTEXTILE

A. Provide Class 1 non-woven geotextile (filter fabric) in accordance with AASHTO M288, Table 6 (For *In Situ* Soil which has 15 to 50% passing 0.075mm).

2.03 EROSION CONTROL BLANKET

A. In accordance with Section 32 91 60 – Erosion Control Blanket.

2.04 EROSION CONTROL BLANKET ANCHORS

A. In accordance with Section 32 91 60 – Erosion Control Blanket.

2.05 COIR WATTLES

A. In accordance with Section 32 91 60 – Erosion Control Blanket.

2.06 VERTICAL STEEL MEMBERS

A. Use angle iron, steel pipe, or steel railroad rails.

B. Use steel angles at least 4- by 4- by 0.25-inch.

C. Use standard weight steel pipe with minimum outside diameter of 4-inches, and minimum of 3/16-inch thick.

D. Use railroad rails with unit weight at least 30 pounds per yard.

1. Color: Neon orange.
2. Attach non-destructible label with the following:

NGWSP PIPELINE INDICATOR POST
If exposed, please contact Navajo Tribal Utility Authority with location

PART 3 EXECUTION

3.01 RIPRAP INSTALLATION

A. Site Preparation:

1. Compact channel bed and bank line excavated for pipe trench backfill.
   a. Compact to 85 percent of maximum density obtained using ASTM D698/AASHTO T99 (Standard Proctor) or ASTM D5080 in accordance with AASHTO T310.
2. Remove large, sharp objects including but not limited to rocks, cut trees, roots, shrubs, and glass that may damage geotextile fabric.
3. Grade wash bank slope as shown on drawings.

B. Geotextile Placement:

1. Place geotextile between riprap and supporting soil.
2. Place fabric as smoothly as possible on prepared surface.
3. Fabric may be folded or cut to conform to surface.
4. Folds and Overlaps:
    a. Fold or overlap in direction of construction.
    b. Overlap fabric a minimum of 30-inches.
5. Hold fabric in place with pins or staples.

C. Riprap Placement:

1. Place riprap stones to form continuous blanket of minimum thickness indicated on drawings.
2. Place stones with long axis parallel to toe of slope and have a stable bearing upon underlying soil or stones.
3. Make joints between larger stones as close as practicable and filled with smaller stones.
    a. Place stones with faces and shapes matched to minimize voids and form as smooth a surface as practical.
    b. Dumping backhoe placement alone is not sufficient to ensure a properly interlocked system.
    c. Material may be machine-placed then arranged as necessary by use of excavator with multi-prong grappling device or by hand to interlock and form a substantial bond.
4. Do not tear or otherwise damage geotextile fabric.
5. Ensure a layer of fabric is placed at interface between sloped and stone surfaces as shown on drawings.

D. Backfill and Compaction:

1. Place natural soil material in wash bottom to same grade as prior to pipeline trench excavation burying scour protection portion of riprap.
2. Compact soil material in 12-inch lifts using hand operated or larger compactor.

3.02 EROSION CONTROL BLANKET INSTALLATION

A. In accordance with Section 32 91 60 – Erosion Control Blanket.

3.03 COIR WATTLE INSTALLATION

A. In accordance with Section 32 91 60 – Erosion Control Blanket.

3.04 VERTICAL STEEL MEMBER INSTALLATION

A. Drive or place vertical steel members in bed of wash crossings as shown on drawings to serve as advanced warning of channel bed lowering.

3.05 REPAIR

A. Repair or replace products damaged during installation at Contractor's expense.

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 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 to 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.

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

1.06 INFORMATION DRAWINGS

A. Drawings marked "For Information Only" in 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 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	1695-529-60145	San Juan Lateral - General Map
2	1695-529-60098	San Juan Lateral – Reach 9 – Line Pipe – Location Map
3	1695-529-60099	San Juan Lateral – Reach 10 – Line Pipe – Location Map
4	1695-529-60100	San Juan Lateral – Reach 11 – Line Pipe – Location Map
5	1695-529-60163	San Juan Lateral – Block 9-11 – Staging Area
Civil:		
San Juan Lateral – Reach 9 – Line Pipe:		
6	1695-D-60281	Plan and Profile – Beginning to Sta. 90005+00 – Sheet 1 of 26
7	1695-D-60282	Plan and Profile – Sta. 90005+00 to Sta. 90050+00 – Sheet 2 of 26
8	1695-D-60283	Plan and Profile – Sta. 90050+00 to Sta. 90099+00 – Sheet 3 of 26
9	1695-D-60284	Plan and Profile – Sta. 90099+00 to Sta. 90150+00 – Sheet 4 of 26
10	1695-D-60285	Plan and Profile – Sta. 90150+00 to Sta. 90200+00 – Sheet 5 of 26
11	1695-D-60286	Plan and Profile – Sta. 90200+00 to Sta. 90250+00 – Sheet 6 of 26
12	1695-D-60287	Plan and Profile – Sta. 90250+00 to Sta. 90300+00 – Sheet 7 of 26
13	1695-D-60288	Plan and Profile – Sta. 90300+00 to Sta. 90350+00 – Sheet 8 of 26
14	1695-D-60289	Plan and Profile – Sta. 90350+00 to Sta. 90400+00 – Sheet 9 of 26
15	1695-D-60290	Plan and Profile – Sta. 90400+00 to Sta. 90450+00 – Sheet 10 of 26
16	1695-D-60291	Plan and Profile – Sta. 90450+00 to Sta. 90500+00 – Sheet 11 of 26

Table 52 00 00A - List of Drawings

Sheet No.	Drawing No.	Title
17	1695-D-60292	Plan and Profile – Sta. 90500+00 to Sta. 90550+00 – Sheet 12 or 26
18	1695-D-60293	Plan and Profile – Sta. 90550+00 to Sta. 90600+00 – Sheet 13 or 26
19	1695-D-60294	Plan and Profile – Sta. 90600+00 to Sta. 90649+00 – Sheet 14 or 26
20	1695-D-60295	Plan and Profile – Sta. 90649+00 to Sta. 90700+00 – Sheet 15 of 26
21	1695-D-60296	Plan and Profile – Sta. 90700+00 to Sta. 90750+00 – Sheet 16 of 26
22	1695-D-60297	Plan and Profile – Sta. 90750+00 to Sta. 90800+00 – Sheet 17 of 26
23	1695-D-60298	Plan and Profile – Sta. 90800+00 to Sta. 90850+00 – Sheet 18 of 26
24	1695-D-60299	Plan and Profile – Sta. 90850+00 to Sta. 90900+00 – Sheet 19 of 26
25	1695-D-60300	Plan and Profile – Sta. 90900+00 to Sta. 90950+00 – Sheet 20 of 26
26	1695-D-60301	Plan and Profile – Sta. 90950+00 to Sta. 91000+00 – Sheet 21 of 26
27	1695-D-60302	Plan and Profile – Sta. 91000+00 to Sta. 91050+00 – Sheet 22 of 26
28	1695-D-60303	Plan and Profile – Sta. 91050+00 to Sta. 91100+00 – Sheet 23 of 26
29	1695-D-60304	Plan and Profile – Sta. 91100+00 to Sta. 91150+00 – Sheet 24 of 26
30	1695-D-60305	Plan and Profile – Sta. 91150+00 to Sta. 91200+00 – Sheet 25 of 26
31	1695-D-60306	Plan and Profile – Sta. 91200+00 to End – Sheet 26 of 26
San Juan Lateral – Reach 10 – Line Pipe:		
32	1695-D-60307	Plan and Profile – Beginning to End (Station 10003+58)

Table 52 00 00A - List of Drawings

Sheet No.	Drawing No.	Title
33	1695-D-60308	Temporary 6-Inch Construction Water Line – Plan and Profile
San Juan Lateral – Reach 11 – Line Pipe:		
34	1695-D-60309	Plan and Profile – Beginning to Sta. 11100+00 – Sheet 1 of 5
35	1695-D-60310	Plan and Profile – Sta. 11100+00 to Sta. 11150+00 – Sheet 2 of 5
36	1695-D-60311	Plan and Profile – Sta. 11150+00 to Sta. 11200+00 – Sheet 3 of 5
37	1695-D-60312	Plan and Profile – Sta. 11200+00 to Sta. 11240+00 – Sheet 4 of 5
38	1695-D-60313	Plan and Profile – Sta. 11240+00 to End (Sta. 11279+60) – Sheet 5 of 5
San Juan Lateral – Block 9-11 – Line Pipe:		
39	1695-D-60314	Pressure Pipe Trench – Installation – Sections and Details
40	1695-D-60315	Concrete Encased – Miter Bends – Sections and Details – Sheet 1 of 2
41	1695-D-60316	Concrete Encased – Miter Bends – Sections and Details – Sheet 2 of 2
42	1695-D-60317	Concrete Encased – Miter Bends – Data Tables
43	1695-D-60318	Air Valve Installation – Sections and Details
44	1695-D-60319	Air Valves with Manholes – Sections and Details
45	1695-D-60320	Air Valves – Data Tables
46	1695-D-60321	Blowoff – Sections and Details
47	1695-D-60322	Manhole with Blowoff – Sections, Details, and Tables
48	1695-D-60323	Typical Buried Manhole – Plan, Sections and Table
49	1695-D-60324	Sectionalizing Valve – Installation – Plan, Sections and Details
50	1695-D-60325	Sectionalizing Valve – Installation – Tapers, Adaptors, and Collars

Table 52 00 00A - List of Drawings

Sheet No.	Drawing No.	Title
51	1695-D-60326	Sectionalizing Valve – Installation – Typical Layout
52	1695-D-60327	Precast Concrete Manholes – Details
53	1695-D-60328	Crownpoint Turnout – Plan, Sections and Details
54	1695-D-60329	Typical Road Crossing – Open Cut - Sections
55	1695-D-60330	Road Crossing – BIA Road 9 – Sta. 11065+20
56	1695-D-60331	Plan and Profile – Gas Line Crossings
57	1695-D-60332	Plan and Profile – Steep Pipe Anchor Blocks
58	1695-D-60333	Steep Pipe Anchor – Blocks – Profile, Sections, and Details
59	1695-D-60334	Reach 10 – Temporary Construction Water Line – Sections and Details – Sheet 1
60	1695-D-60335	Wash Crossing – Erosion Control Details – Sheet 1
61	1695-D-60336	Wash Crossing – Erosion Control Details – Sheet 2
62	1695-D-60337	Wash Crossing – Sta. 90023+26
63	1695-D-60338	Wash Crossing – Sta. 90077+09
64	***1695-D-60339***	***Wash Crossing – Sta. 90095+94 & Sta. 90097+40***
65	1695-D-60340	Wash Crossing – Sta. 90106+05 & Sta. 90124+68
66	1695-D-60342	Wash Crossing – Sta. 90163+39
67	1695-D-60343	Wash Crossing – Sta. 90261+28
68	1695-D-60344	Wash Crossing – Sta. 90283+24
69	1695-D-60345	Wash Crossings – Sta. 90298+16 & Sta. 90628+16
70	1695-D-60346	Wash Crossing – Sta. 90376+25
71	1695-D-60347	Wash Crossing – Sta. 90389+71
72	1695-D-60348	Wash Crossing – Sta. 90401+39
73	1695-D-60349	Wash Crossing – Sta. 90465+63
74	1695-D-60351	Wash Crossing – Sta. 90579+06
75	1695-D-60352	Wash Crossing – Sta. 90609+15
76	1695-D-60355	Wash Crossing – Sta. 90833+35

Table 52 00 00A - List of Drawings

Sheet No.	Drawing No.	Title
77	1695-D-60356	Wash Crossing – Sta. 91186+26
78	1695-D-60357	Wash Crossing – Sta. 11167+00
79	1695-D-60360	Corrosion Protection – Impressed Current – Deep Well Anode Bed – Sheet 1
80	1695-D-60361	Corrosion Protection – Test Station Details 1 of 2 – Sheet 2
81	1695-D-60362	Corrosion Protection – Test Station Details 2 of 2 – Sheet 3
82	1695-D-60363	Corrosion Protection – Bond Details – Sheet 4
83	1695-D-60364	Corrosion Protection – Galvanic Anode – Cathodic Protection – Anode Bed – Sheet 5
Information Drawings:		
84	1695-D-1	San Juan Lateral – Reach 12A – Twin Lakes to Tohlakai Hill – Sta. 12011+00 to 12060+00 – Plan and Profile
Standard Drawings:		
85	40-D-6136	Manholes – Class 125 LB. – Plate Steel
86	40-D-6137	Manholes – Class 150 LB. and 300 LB. – Plate Steel
87	40-D-7102	Standard and Typical Designs - Government Drawing Format - Drawing Border, Sample Title Block, and Signature Lines
88	40-D-60002	Miscellaneous Metalwork – Typical Guard Posts – Non-Security Application
89	40-D-60003	Concrete Outline and Reinforcement – General Notes for Concrete Outline and Reinforcement – Sheet 1 of 2
90	40-D-60004	Concrete Outline and Reinforcement – Minimum Requirements for Detailing Reinforcement – Sheet 2 of 2
91	104-D-254	Box Terminations

Table 52 00 00B - Drawings in Numerical Order

Drawing No.	Sheet No.
1695-D-	

Table 52 00 00B - Drawings in Numerical Order

Drawing No.	Sheet No.
1695-D-1	84
1695-D-60281	6
1695-D-60282	7
1695-D-60283	8
1695-D-60284	9
1695-D-60285	10
1695-D-60286	11
1695-D-60287	12
1695-D-60288	13
1695-D-60289	14
1695-D-60290	15
1695-D-60291	16
1695-D-60292	17
1695-D-60293	18
1695-D-60294	19
1695-D-60295	20
1695-D-60296	21
1695-D-60297	22
1695-D-60298	23
1695-D-60299	24
1695-D-60300	25
1695-D-60301	26
1695-D-60302	27
1695-D-60303	28
1695-D-60304	29
1695-D-60305	30
1695-D-60306	31

Table 52 00 00B - Drawings in Numerical Order

Drawing No.	Sheet No.
1695-D-60307	32
1695-D-60308	33
1695-D-60309	34
1695-D-60310	35
1695-D-60311	36
1695-D-60312	37
1695-D-60313	38
1695-D-60314	39
1695-D-60315	40
1695-D-60316	41
1695-D-60317	42
1695-D-60318	43
1695-D-60319	44
1695-D-60320	45
1695-D-60321	46
1695-D-60322	47
1695-D-60323	48
1695-D-60324	49
1695-D-60325	50
1695-D-60326	51
1695-D-60327	52
1695-D-60328	53
1695-D-60329	54
1695-D-60330	55
1695-D-60331	56
1695-D-60332	57
1695-D-60333	58

Table 52 00 00B - Drawings in Numerical Order

Drawing No.	Sheet No.
1695-D-60334	59
1695-D-60335	60
1695-D-60336	61
1695-D-60337	62
1695-D-60338	63
1695-D-60339	64
1695-D-60340	65
1695-D-60342	66
1695-D-60343	67
1695-D-60344	68
1695-D-60345	69
1695-D-60346	70
1695-D-60347	71
1695-D-60348	72
1695-D-60349	73
1695-D-60351	74
1695-D-60352	75
1695-D-60355	76
1695-D-60356	77
1695-D-60357	78
1695-D-60360	79
1695-D-60361	80
1695-D-60362	81
1695-D-60363	82
1695-D-60364	83
1695-529-	
1695-529-401	1

Table 52 00 00B - Drawings in Numerical Order

Drawing No.	Sheet No.
1695-529-60098	2
1695-529-60099	3
1695-529-60100	4
1695-529-60163	5
40-D-	
40-D-6136	85
40-D-6137	86
40-D-7102	87
40-D-60002	88
40-D-60003	89
40-D-60004	90
104-D-	
104-D-254	91

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