PIPE CULVERTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Pipe Culverts

B. Pipe Aprons and Beveled Ends

C. Footings for Concrete Pipe Aprons

D. Pipe Apron Guards

1.02 DESCRIPTION OF WORK

Construct pipe culverts, beveled ends, pipe aprons, and associated appurtenances.

1.03 SUBMITTALS

Follow the General Provisions (Requirements) and Covenants.

1.04 SUBSTITUTIONS

Follow the General Provisions (Requirements) and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Follow the General Provisions (Requirements) and Covenants.

1.06 SCHEDULING AND CONFLICTS

Follow the General Provisions (Requirements) and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Pipe Culverts:

1. Trenched:

a. Measurement: Each type and size of pipe installed in a trench will be measured in linear feet from end of pipe to end of pipe along the centerline of pipe, exclusive of aprons. Lengths of elbows and tees will be included in length of pipe measured.

b. Payment: Payment will be made at the unit price of each type and size of pipe.

c. Includes: Unit price includes, but is not limited to, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, connectors, testing, and inspection.

2. Trenchless:

a. Measurement: Each type and size of pipe installed by trenchless methods will be measured in linear feet along the centerline of the casing pipe.

b. Payment: Payment will be made at the unit price for each type and size of pipe.

c. Includes: Unit price includes, but is not limited to, furnishing and installing pipe; trenchless installation materials and equipment; pit excavation, dewatering, and placing backfill materials; pipe connections; testing; and inspection.

1.08 MEASUREMENT AND PAYMENT (Continued)

B. Pipe Aprons:

1. **Measurement:** Each type and size of pipe apron will be counted.

2. **Payment:** Payment will be made at the unit price for each type and size of pipe apron.

3. **Includes:** Unit price includes, but is not limited to, trench excavation, furnishing bedding material, placing bedding and backfill material, connectors, and other appurtenances.

C. Footings for Concrete Pipe Aprons:

1. **Measurement:** Each footing installed on a concrete pipe apron will be counted.

2. **Payment:** Payment will be made at the unit price for each footing.

3. **Includes:** Unit price includes, but is not limited to, excavation, reinforcing steel, and concrete.

D. Pipe Apron Guards:

1. **Measurement:** Each pipe apron guard will be counted.

2. **Payment:** Payment will be made at the unit price for each pipe apron guard.

PART 2 - PRODUCTS

2.01 PIPE CULVERTS

A. Roadway Pipe Culverts: All storm sewer pipe materials specified for use in right-of-way in Section 4020 may be used within right-of-way as a roadway pipe culvert.

B. Entrance Pipe Culverts: The following pipe culvert types described in Section 4020 may be used within right-of-way as entrance pipe culverts:

1. Reinforced Concrete Pipe (RCP).
2. Reinforced Concrete Arch Pipe (RCAP).
3. Reinforced Concrete Elliptical Pipe (RCEP).
4. Reinforced Concrete Low Head Pressure Pipe (RCPP).
5. Corrugated Metal Pipe (CMP).
6. Spiral Rib Pipe.
7. Coated Corrugated Metal Pipe.
8. Corrugated Metal Arch Pipe.

C. Structural Plate Culverts: Structural plate culverts may be used in the right-of-way as roadway or entrance pipe culverts.

1. Use a galvanized steel structural plate complying with AASHTO M 167.
2. Use bolts and nuts complying with ASTM A 449 and galvanized per ASTM A 153, Class C.
3. Assemble the structure according to the manufacturer's recommendations. Tighten the bolts using an applied torque of between 100 and 300 foot-pounds.
4. Install the structure according to the contract documents, the manufacturer′s recommendations, and AASHTO Standard Specifications for Highway Bridges, Division II, Section 26.
5. Conform the gage of the structure to Iowa DOT Standard Road Plan RF-32 or as specified in the contract documents.

D. Aluminum Structural Plate Culverts: Aluminum structural plate culverts may be used in the right-of-way as roadway or entrance pipe culverts.

1. Comply with AASHTO M 219.
2. Use a corrugation profile of 9 inches by 2 1/2 inches.
3. Use aluminum complying with ASTM B 209.
4. Use a minimum thickness of 0.100 inch. Gage of structure complying with manufacturer's requirements or as specified in the contract documents.
5. Use bolts and nuts meeting ASTM A 307 or ASTM A 449 and galvanize per ASTM A 153.

2.01 PIPE CULVERTS (Continued)

6. Assemble the structure according to the manufacturer's recommendations. Tighten the bolts using an applied torque of between 100 and 300 foot-pounds.

7. Install the structure according to the contract documents, the manufacturer's recommendations, and AASHTO Standard Specifications for Highway Bridges, Division II, Section 26.

8. Meet or exceed the AASHTO Standard Specifications for Highway Bridges, Division I, Section 12.8 for HS 20 loading.

2.02 PIPE APRONS AND BEVELED ENDS

Comply with the requirements of Section 4020, 2.01 and Section 4030, 2.01 for the pipe material of which the apron is constructed.

2.03 APRON FOOTINGS

Comply with the requirements of Section 6010 for reinforcing steel and structural concrete used in apron footings.

2.04 APRON GUARD

Use smooth or deformed steel bars, ASTM A 615, Grade 40 or merchant quality, in the construction of the apron guard.

PART 3 - EXECUTION

3.01 PIPE CULVERT INSTALLATION

A. Trenched:

1. Install pipe in a trench per Section 4020.

2. For culvert pipe installed in embankment, pipe may be installed at the Contractor's option per the contract documents and the following Iowa DOT Specifications sections:
   a. Reinforced Concrete Pipe (circular, arched, and elliptical): Section 2416.
   b. Corrugated Metal and Corrugated Plastic Pipe: Section 2417.
   c. Structural Plate Culverts: Section 2420.

B. Trenchless: For trenchless installations, comply with Section 3020.

3.02 APRONS

A. Install pipe aprons where specified in the contract documents. Use the same installation methods as used on the pipe to which the apron is being attached.

B. Install apron footings where specified. Construct per Section 6010 and the contract documents.

C. Anchor the last three concrete pipe sections and the apron together with two pipe connections per joint.

D. Install apron guard where specified. Construct as shown on Iowa DOT Standard Road Plan RF-26.

3.03 CLEANING, INSPECTION, AND TESTING

Clean, inspect, and test culverts per Section 4060.

END OF SECTION