**GENERAL NOTES**

Details of construction materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable special provisions.

Concrete endwalls may not be used with galvanized steel or aluminum culvert pipe or vice versa, galvanized steel or aluminum culvert pipe shall normally be installed on culvert pipes of the same metal.

All three-piece steel apron endwalls for 60" diameter pipe and larger shall have stud eyes and stud center panel. All three-piece aluminum apron endwalls for 60" diameter pipe and larger shall have stud eyes and stud center panel. The width of center panels shall be greater than 20 percent of the pipe diameter.

Lap seams shall be firmly joined by galvanized rivets or bolts for steel units and aluminum rivets and bolts for aluminum units. For the 60" through 120" diameter endwall sizes, the two reinforced edges and center panel seams shall be further reinforced with galvanized steel or aluminum expanded angles, the angles shall be attached by galvanized nuts and bolts for steel units and aluminum rivets and bolts for aluminum units.

Where two or more pipes with apron endwalls are laid adjacent to each other, they shall be separated by a distance sufficient to provide a minimum clearance of 6 inches between apron endwalls.

1. For pipe sizes up to 60" diameter, a spot rolled edge may be used instead of steel rod reinforcement, see Section A-A.

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**SECTION A-A**

**ALTERNATE FOR TYPE 1 CONNECTION END SECTION CONNECTOR STRAP**

**TYPE 1**

Threaded 5/8"-11 Rod around Culvert A Through Tank Type Connector Strap or Alternate Connector Strap (see detail)

- Measured Length of Culvert
- Connector Plate
- Rod Holder
- Rod Washer
- Measured Length of Culvert

**TYPE 2**

For 30" thru 60" Corr. Pipe

- Connector Section
- Connector Section
- Measured Length of Culvert
- Connector Section
- Measured Length of Culvert

**TYPE 3**

For 30" thru 60" Corr. Pipe

- Connector Section
- Connector Section
- Measured Length of Culvert
- Connector Section
- Measured Length of Culvert

**TYPE 5**

Alternate for all sizes corrugated circular pipe

- Connector Section
- Connector Section
- Measured Length of Culvert
- Connector Section
- Measured Length of Culvert

**CONNECTION DETAILS**

- For helically corrugated circular pipe use weld connection details 2.5, 3.5 or 5 as applicable.
- For helically corrugated pipe use weld connection details 2.5, 3.5 or 5.
References:

- FDM 13-1-15
- FDM 13-1-17
- FDM 13-1-30
- FDM 13-15-5

Bid items associated with this drawing:

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<tr>
<td>521.1000 - 1199</td>
<td>Apron Endwalls for Culvert Pipe Steel (size)</td>
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<td>522.1000 - 1199</td>
<td>Apron Endwalls for Culvert Pipe Reinforced Concrete (size)</td>
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<td>525.0300 - 0399</td>
<td>Apron Endwalls for Culvert Pipe Aluminum (size)</td>
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Standardized Special Provisions associated with this drawing:

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Other SDDs associated with this drawing:

- SDD 8F4 Joint Ties for Concrete Pipe

Design Notes:

Joint ties are required for the apron endwall and the last 2 sections of culvert and storm sewer pipe installations. See Standard Specifications.

Contact Person:

Ed Lilla (608) 266-2312