Wrap all joints on concrete roadway pipe culverts.

Use Type 3 Connections on all culvert pipes, unless specified otherwise. Refer to Materials I.M. 469.01 for Connector requirements.

Minimum 2 threads showing at all threaded ends.

Connections not required on pipe sections installed by trenchless methods.

For belled concrete pipe joints, connectors may be installed on the inside of the pipe.

**TYPE 1**

One connector at the top of the pipe section.

**TYPE 2** (Sealed Joint)

Two connectors near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required. Refer to Materials I.M. 491.09 for seal requirements.

**TYPE 3** (Non-Sealed Joint)

Two connectors near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required.

If holes are field drilled, place a ribbon of butyl sealant around bolts before placing 3 in. x 3 in. x 1 in. plate on bolts through corrugated metal pipe and tightening nuts.

1/2 inch round x 1/8 inch thick washer or 3 in. x 1/4 in. square plate (shaped to pipe radius).

Connectors with One Bend End and Bell End spacers allowed per Materials I.M. 461. Refer to Optional Bolts/Connectors detail.

Engineering fabric for embankment erosion control.

Possible Tabulations:

- 104-3
- 104-5B

Possible Tabulations:

- 104-3
- 104-5B

**PIPE JOINT WRAPPING**

Concrete Culvert Pipe

- One connector at each joint or as otherwise specified.
- Wrap all joints on concrete roadway pipe culverts.

**TYPICAL SECTION**

(Non-Sealed Joint)

**TYPICAL INSTALLATION**

**ONE BEND END**

**THREADED AT BOTH ENDS**

**OPTIONAL BOLTS/CONNECTORS**

**SOIL/STORMWATER**

Connections not required on pipe sections installed by trenchless methods.

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**TYPE 1**

One connector at the top of the pipe section.

**TYPE 2** (Sealed Joint)

Two connectors near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required. Refer to Materials I.M. 491.09 for seal requirements.

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**ENGINEERING FABRIC**

For embankment erosion control.

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**ENGINEERING FABRIC**

For embankment erosion control.
**TYPICAL INSTALLATION**

**STORM SEWER OUTLET - TYPE 2 OR TYPE 3 CONNECTION**

- Intake or Manhole
- Type 2 or 3 Connections

**NEW CONSTRUCTION - TYPE 2 or 3 CONNECTION**

- Type 2 or 3 Connections at each joint (typ.)
- Roadway

**PIPE EXTENSION - TYPE 3 CONNECTION**

- Type 3 Connections
- New Pipe
- Existing Pipe
- New Pipe

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**NEW CONSTRUCTION - TYPE 2 or 3 CONNECTION**

- Type 2 or 3 Connections at each joint (typ.)
- Roadway

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**CONNECTED PIPE JOINTS**

- DOUBLE LINE REINFORCING, AS SPECIFIED
- SINGLE LINE REINFORCING, AS SPECIFIED
- HOLE FOR CONNECTOR
- CONNECTOR
- TOP (BOTTOM FOR HALF PIPE)

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**SEAL JOINT TYPE 2 CONNECTION**

- Sealer shall be applied before connector is installed.
- Trim off inside after connector is installed.
- Place approved sealer as directed before connector is installed.

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**TYPE 2 AND TYPE 3 CONNECTIONS**

- Double line reinforcing, as specified
- Single line reinforcing, as specified
- Connector
- Hole for connector
- Top (Bottom for Half Pipe)

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**CONNECTED PIPE JOINTS**

- On culvert extensions, connect all new joints including the joint between the old and new culvert pipe. Holes may need to be drilled into existing pipes.