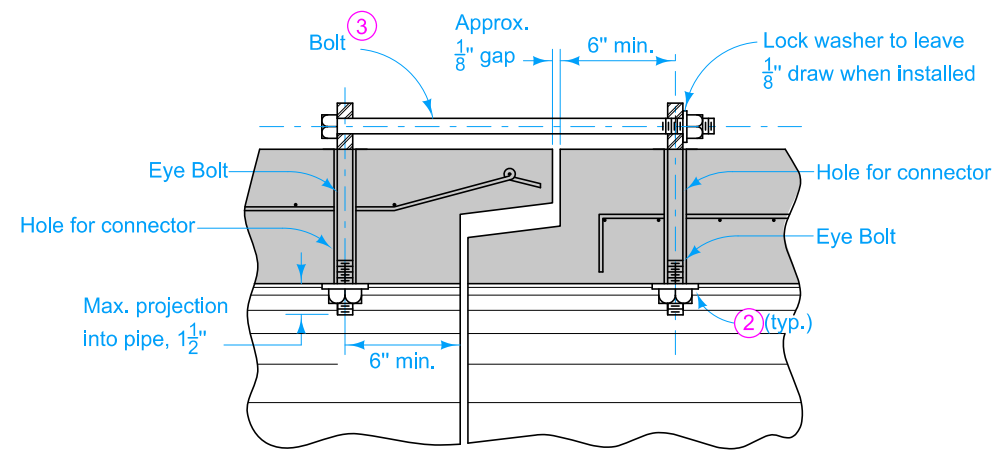
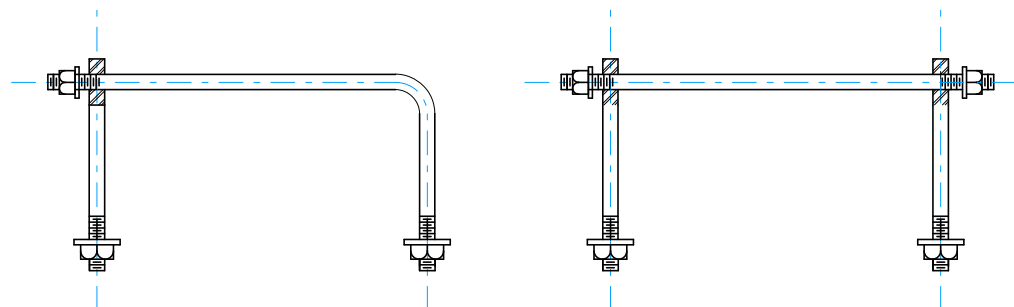


**SECTION OF PIPE CONNECTOR
(Concrete Pipe to Corrugated Pipe)**



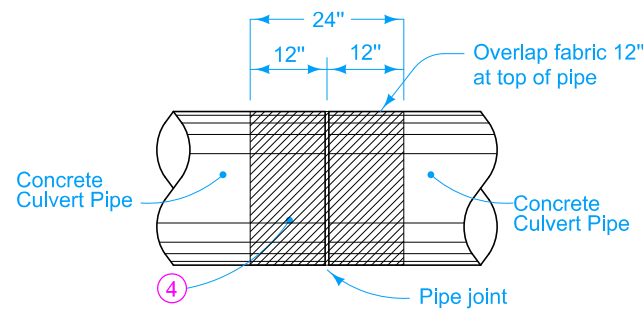
**SECTION OF PIPE CONNECTOR
(Concrete Pipe to Concrete Pipe)**



ONE BEND END

THREADED AT BOTH ENDS

OPTIONAL BOLTS/CONNECTORS



PIPE JOINT WRAPPING

PIPE SIZE (in)	CONNECTOR AND BOLT SIZE (in.)	HOLE FOR CONNECTOR (in.)
12 to 27	5/8	7/8
30 to 60	3/4	1.0
66 to 132	1.0	1 1/4

Wrap all joints on concrete roadway pipe culverts.
 Use Type 3 Connections on all culvert pipes, unless specified otherwise. Refer to Materials I.M. 445.01 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)

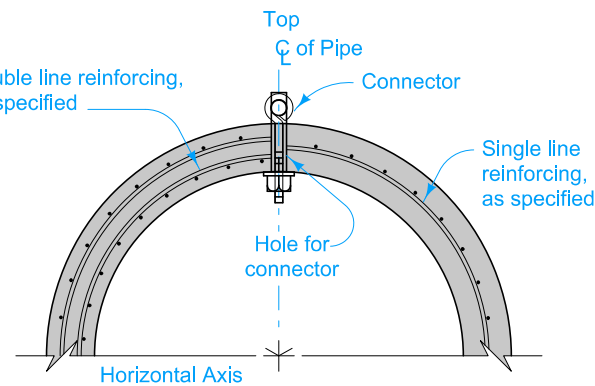
Two connectors near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required. Refer to Materials I.M. 491.09 for seal requirements.

TYPE 3 (Non - Sealed Joint)

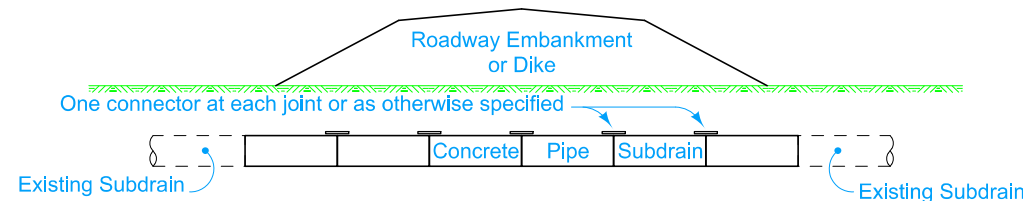
Two connectors near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required.

- ① If holes are field drilled, place a ribbon of butyl sealant around bolts before placing 3 in. x 3 in. x 1/4 in. plate on bolts through corrugated metal pipe and tightening nuts.
- ② 1 3/4 inch round x 9/64 inch thick washer or 3 in. x 3 in. x 1/4 in. square plate (shaped to pipe radius).
- ③ Connectors with One Bend End and Bell End spacers allowed per Materials I.M. 451. Refer to Optional Bolts detail.
- ④ Engineering fabric for embankment erosion control.

Possible Tabulations:
 104-3
 104-5B



**TYPICAL SECTION
(Non-Sealed Joint)**



TYPICAL INSTALLATION

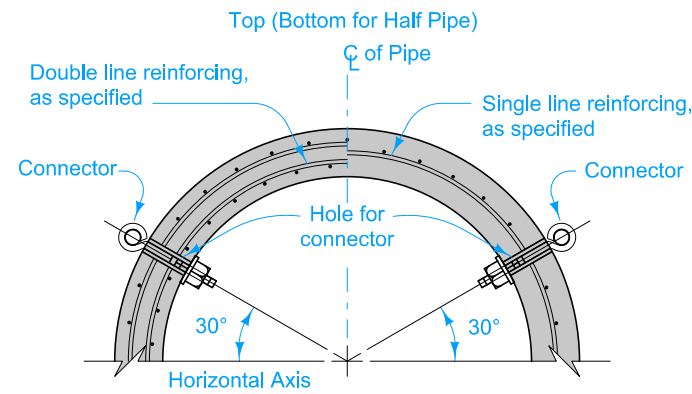
TYPE 1 CONNECTION

IOWA DOT	REVISION	
	3	10-17-17
STANDARD ROAD PLAN		DR-121
SHEET 1 of 2		

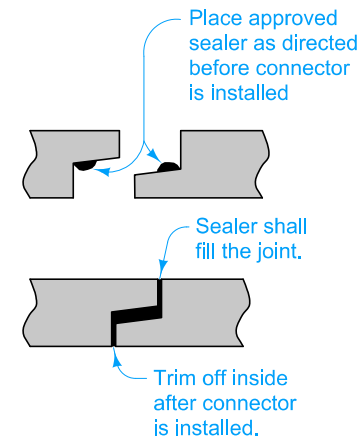
REVISIONS: Added 104-5B to Possible Tabulations. Added Type 3 connection to storm sewer outlet.

Shawn Miller
 APPROVED BY DESIGN METHODS ENGINEER

CONNECTED PIPE JOINTSTITLE

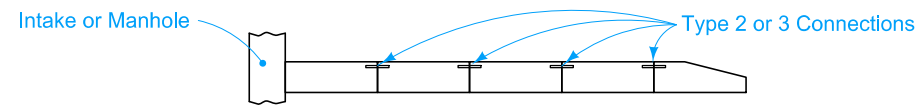


**TYPICAL SECTION
 TYPE 2 CONNECTION
 TYPE 3 CONNECTION**

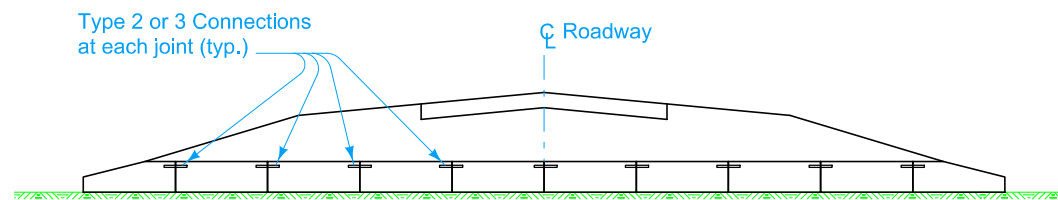


**SEALED JOINT
 TYPE 2 CONNECTION**

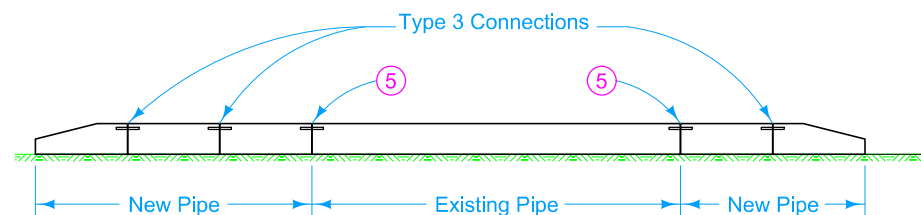
⑤ On culvert extensions, connect all new joints including the joint between the old and new culvert pipe. Holes may need to be drilled into existing pipes.



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



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



**TYPICAL INSTALLATION
 PIPE EXTENSION - TYPE 3 CONNECTION**

TYPE 2 AND TYPE 3 CONNECTIONS

	REVISION	
	3	10-17-17
STANDARD ROAD PLAN		DR-121
		SHEET 2 of 2

REVISIONS: Added 104-5B to Possible Tabulations. Added Type 3 connection to storm sewer outlet.

Shawn Miller
 APPROVED BY DESIGN METHODS ENGINEER

CONNECTED PIPE JOINTSTITLE