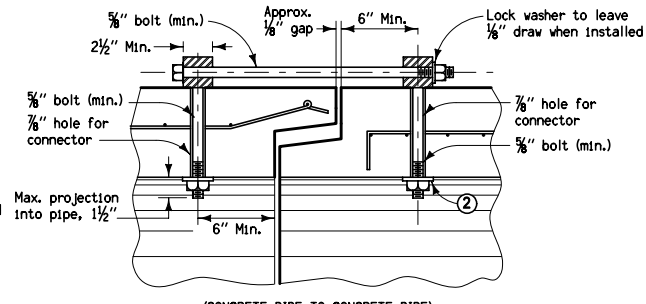
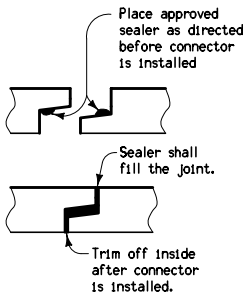


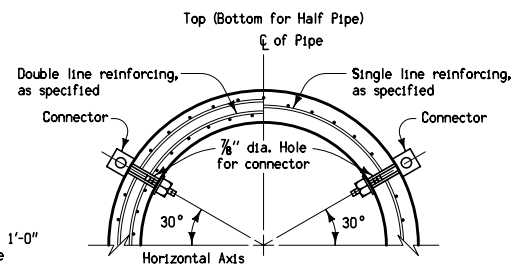
**SECTION OF TYPICAL PIPE CONNECTOR**  
(CONCRETE PIPE TO CORRUGATED PIPE)



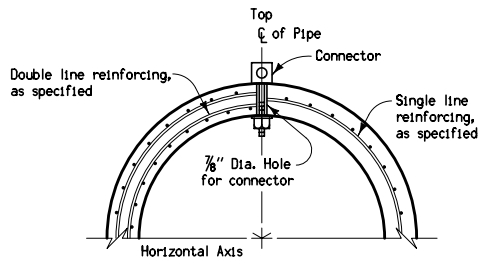
**SECTION OF TYPICAL PIPE CONNECTOR**  
(CONCRETE PIPE TO CONCRETE PIPE)



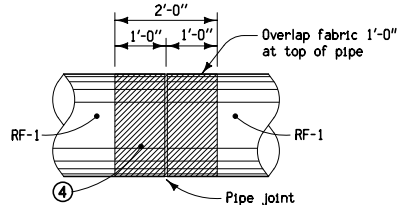
**DETAILS OF SEALED JOINT**  
(Type 2 Connection Only)



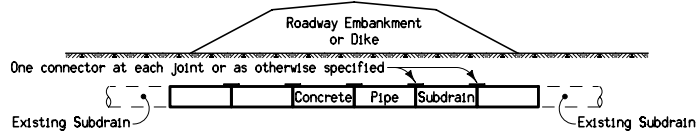
**TYPICAL SECTION**  
**TYPE 2 CONNECTION (Sealed Joint)**  
**TYPE 3 CONNECTION (Non-Sealed Joint)**



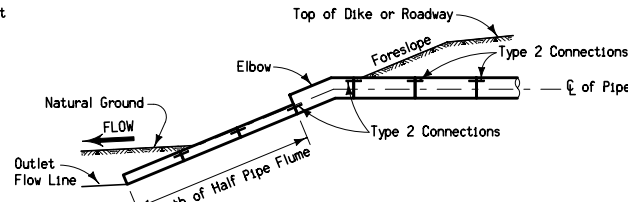
**TYPICAL SECTION**  
**TYPE 1 CONNECTION**  
**(Non-Sealed Joint)**



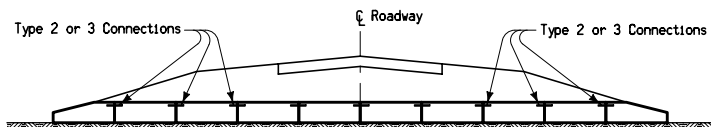
**PIPE JOINT WRAPPING**



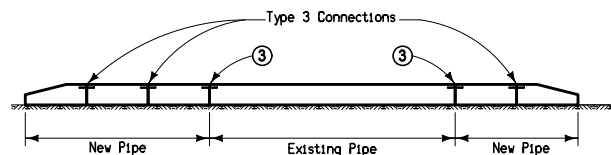
**TYPICAL INSTALLATION**  
**TYPE 1 CONNECTIONS**



**TYPICAL INSTALLATION**  
**TYPE 2 CONNECTIONS**



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



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

Unless otherwise specified, Type 3 Connections shall be used on all culvert pipes.

All joints on concrete roadway pipe culverts shall be wrapped.

**TYPE 1**

One (1) connector at the top of the pipe section. May be used with pipe class 100D or greater.

**TYPE 2**

Two (2) connectors near the top of the pipe section. For details of reinforcement refer to RF-1 for the class of pipe required. The seal used shall meet the requirements of Article 4149.08 of the Standard Specifications. See Materials I.M. 491.09.

**TYPE 3**

Two (2) connectors near the top of the pipe section. For details of reinforcement, refer to RF-1 for the class of pipe required.

- ① If holes are field drilled, place a ribbon of butyl sealant around bolts before placing 3" x 3" x 1/4" plate on bolts through corrugated metal pipe and tightening nuts.
- ② 1 3/4" round x 9/64" thick washer or 3" x 3" x 1/4" square plate (shaped to pipe radius).
- ③ On culvert extensions, all new joints shall be connected including the joint between the old and new culvert pipe. Holes may need to be drilled into existing pipes.
- ④ Engineering fabric for embankment erosion control.

Tabulation:  
104-3

	<small>REVISION</small> 12 04-21-09
	<b>RF-14</b> SHEET 1 of 1
<small>REVISIONS: Modify note 3 to take out the phrase 'except when collars are poured.'</small>	
<i>Deanna Mieland</i> <small>APPROVED BY DESIGN METHODS ENGINEER</small>	

**CONNECTED PIPE JOINTS**