

3. Pipe and Fitting Joints.

a. Specifications Requirements.

- 1) DIP in accordance with the Specifications, and AWWA C110, C111 and C115.
- 2) PVC pipe in accordance with the Specifications and AWWA C900 and C905.
- 3) For joints on Steel Pipe, see requirements in Part One, Section 2 (Pipe Materials and Fittings).

b. Types of Allowable Joints.

- 1) For DIP 54-inch and smaller allowable joints include:
 - a) Mechanical joint bell.
 - b) Plain end (for mechanical joint or push-on).
 - c) Push-on bell joints. Restrain joints, if required, by means of a restrained joint gasket for pipe sizes 4-inch through 24-inch and proprietary restrained joints for pipe sizes 16-inch and larger.
 - d) Flanged joints.
 - (1) Two class of flanges:
 - (a) Class 125 flanges in accordance with AWWA C110.
 - (b) Class 250 flanges in accordance with ANSI B/16.1, full-face gaskets.
 - (2) Buried flanged joints are generally not desirable because of the rigidity of the joint, however, the use of buried insulated flanged joints are allowed, see Insulating Joints, this section.
 - (3) Design all vault and interior building piping and fittings with flanged pipe, except as follows:
 - (a) Tapping sleeve and valve in vaults.
 - (b) Mechanical joint solid sleeves in vaults, if used in lieu of mechanical couplings. See requirements for Solid Sleeves and Mechanical Couplings under Part One, Section 7 (Allowable Fittings).
 - (4) When connecting to Class 250 flanged gate valve, the flanged connecting pipe must have ANSI B16.1, Class 250 flanges, for design limitations see Design Requirements for Gate Valves, Part One, Section 18 (Pipeline Valves).
 - (5) 54-inch diameter, ANSI B16.1, Class 250 flanges may not be available. Verify availability during the design.
- 2) For PVC 12-inch and smaller: Push-on bell joints.
- 3) For Steel Pipe: Continuous butt-welded pipe joints, unless otherwise approved.



c. Joint Requirements for Pipe and Fittings.1) Pipe Joints.

- a) DIP use push-on bell joints for pipe joints, unless otherwise noted on the drawings or Standard Details.
- b) Mechanical joint bell for DIP may be used in the design for pipe sizes 24-inch and smaller diameter. Verify the availability of pipe sizes before specifying in the design.
- c) Flanged joints for DIP requires a minimum class 54 DIP and the flanges are threaded and screwed on the pipe by the manufacturer in accordance with AWWA C115.
- d) For requirements for polyethylene encasement or special coatings, see Part One, Section 2 (Selection of Pipe Material).

2) Fitting Joints.

- a) For DIP, the allowable fitting joints includes:

- (1) Mechanical joint or push-on bell joints for 48-inch and smaller pipe sizes in accordance with AWWA C110. Push-on bell joints for compact fittings in accordance with AWWA C153, unless otherwise noted on the drawings or Standard Details.
- (2) For 54-inch fittings, push-on bell joints in accordance with AWWA C153 and the manufacturer's standards. Special considerations for operating pressure over 150 psi, see Part One, Section 2 (Pipe Material and Fittings) and Part One, Section 4 (Selection of Pipe Material).
- (3) Flanged joints see Type of Joints under this section.

- b) For PVC pipe, the allowable fitting joints includes:

- (1) PVC fittings: Push-on Joints.
- (2) Ductile iron fittings see Part One, Section 2 (Pipe material and Fittings).

- 3) For joint deflection design criteria, see Part One, Section 12 (Allowable Joint Deflections) and Section 14 (Joint Deflections at Fittings).

d. Insulation Joint Requirements.

- 1) Flanged DIP short piece (flanged by plain end) is allowed, however this is the only case in which flanged joints are approved for use in direct buried pipelines, see Standard Details C/3.1, C/3.2 and C/3.3.
- 2) PVC spool piece is allowed as an alternative to insulating flange, see Part One, Section 4 (Selection of Pipe Material), and Standard Details C/3.2a and C/3.3a.
- 3) For the design criteria for insulating joints, see Standard Details and Part Three, Section 28 (Corrosion Control).

