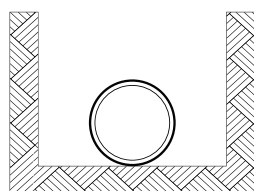


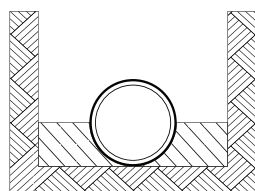


For Generations

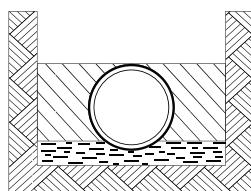
# LAYING CONDITIONS



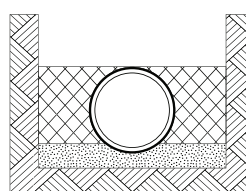
**Type 1\***  
Flat-bottom trench.† Loose backfill.



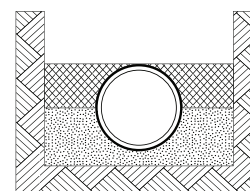
**Type 2**  
Flat-bottom trench.† Backfill lightly consolidated to centerline of pipe.



**Type 3**  
Pipe bedded in 4 in. (100 mm) minimum of loose soil.++ Backfill lightly consolidated to top of pipe.



**Type 4**  
Pipe bedded in sand, gravel, or crushed stone to depth of 1/8 pipe diameter, 4 in. (100 mm) minimum. Backfill compacted to top of pipe. (Approximately 80 percent Standard Proctor, AASHTO T-99.)



**Type 5**  
Pipe bedded in compacted granular material to centerline of pipe. Compacted granular or select material++ to top of pipe. (Approximately 90 percent Standard Proctor, AASHTO T-99.)

\* For 14 in. (355-mm) and larger pipe, consideration should be given to the use of laying conditions other than Type 1.

† "Flat-bottom" is defined as undisturbed earth.

++ "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials, and frozen earth.

**Notes:**

Consideration of the pipe-zone embedment conditions included in this figure may be influenced by factors other than pipe strength. For additional information on pipe bedding and backfill, see ANSI/AWWA C600.

American Association of State Highway and Transportation Officials, 444 N. Capitol St. N.W., Suite 225, Washington, DC 20001.

## STANDARDS APPLICABLE TO DUCTILE IRON PIPE AND FITTINGS

<b>THICKNESS DESIGN OF DUCTILE IRON PIPE</b>	ANSI/AWWA C150/A21.50
<b>DUCTILE IRON PIPE FOR WATER AND OTHER LIQUIDS</b>	ANSI/AWWA C151/A21.51 FEDERAL WWP421D, Grade C
<b>DUCTILE IRON PIPE FOR GRAVITY FLOW SERVICE</b>	ANSI/ASTM A746
<b>DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS</b>	
3 in. through 36 in.	ANSI/AWWA C110/A21.10
<b>DUCTILE IRON COMPACT FITTINGS</b>	
3 in. through 24 in.	ANSI/AWWA C153/A21.53
<b>FLANGED FITTINGS</b>	ANSI/AWWA C110/A21.10 ANSI B16.1
<b>DUCTILE IRON PIPE WITH THREADED FLANGES</b>	ANSI/AWWA C115/21.15
<b>COATINGS AND LININGS</b>	
Asphaltic	ANSI/AWWA C151/A21.51 ANSI/AWWA C110/A21.10 ANSI/AWWA C153/A21.53
Cement Lining	ANSI/AWWA C104/A21.4
Various Epoxy Linings and Coatings	MANUFACTURER'S STANDARD
Exterior Polyethylene Encasement	ANSI/AWWA C105/A21.5
<b>JOINTS – PIPE AND FITTINGS</b>	
Push-On and Mechanical Rubber-Gasket Joints	ANSI/AWWA C111/A21.11 FEDERAL WWP421D
Flanged	ANSI/AWWA C115/A21.15 ANSI B16.1
Grooved and Shouldered	ANSI/AWWA C606
<b>PIPE THREADS</b>	ANSI B2.1
<b>INSTALLATION</b>	ANSI/AWWA C600



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