

A. LCU Design Manual Casing Installations - Effective 8/30/11

1. General

The provisions of this section shall represent the minimum standards for the installation of casing pipe for water mains.

For water mains to be placed under all Lee County Department of Transportation (LCDOT) roadways, the casing and procedures shall conform to the requirements of LCDOT as outlined in Administrative Code "AC-11-12" and any supplements thereto. All work and materials shall be subject to inspection by LCDOT.

Specific crossing requirements of the authority having jurisdiction shall be obtained in advance and complied with for all underground water mains crossing Lee County roadways, Florida State Highways, and railroads.

It shall be the responsibility of the engineer to prepare and complete design loading calculations for the water main casing to determine if the proper material requirements are greater than those minimums specified here.

Casings shall be installed in accordance with permit conditions of the authority having jurisdiction.

2. Conditions Requiring Casing

Carrier pipe conditions which will require a casing are as follows:

Location	Carrier Pipe Material		
	PVC DR 18	DI PC 250	HDPE DR 11
All Rights-of-Way, not under traveled way	none	none	none
Local Roadways and Collectors no more than 2 lanes			
Under Primary Travel Lane ¹	steel casing ³	steel casing ³	none
Under Secondary Travel Lane ²	steel casing ³	none	none
Collector More than 2 lanes or Arterial Roadway			
Under Primary Travel Lane ¹	steel casing ³	steel casing ³	HDPE casing ⁴
Under Secondary Travel Lane ²	steel casing ³	none	none
Controlled Access, Expressway, and Freeway			
Under Primary Travel Lane ¹	steel casing ³	steel casing ³	HDPE casing ⁴
Under Secondary Travel Lane ²	steel casing ³	steel casing ³	HDPE casing ⁴
Railroads	steel casing ³	steel casing ³	HDPE casing ⁴
Driveway or Access Drive			
For Institutional sites (schools, hospital, etc)	steel casing ³	none	none
For all others	none	none	none

Notes

- 1 Includes condition where the carrier pipe crosses under both Primary and Secondary Travel Lanes together.
- 2 Condition where the carrier pipe is only under a Secondary Travel Lane.
- 3 Steel casing shall conform to the requirements of the Steel Casing Section of this Chapter
- 4 HDPE casing shall conform to the requirements of the HDPE Casing Section of this Chapter.

3. Casing Pipe Material and Installation

Casing pipes crossing under County roadways shall be located at suitable approved alignments in order to eliminate possible conflict with existing or future utilities and structures with a minimum 36 depth of cover between the top of the casing pipe and the surface of the roadway.

For casing pipe crossings under roadways, railroads, or other installations not within the jurisdiction of Lee County, the Contractor shall comply with the regulations of said authority in regard to design, specifications and construction. State Highway casing installations shall be as specified in the FDOT, "Utility Accommodation Guide", and for railroads, the American Railway Engineering Association, Part 5, Section 5.2, "Specifications for Pipelines Conveying Nonflammable Substances", shall be applicable. However, in no case shall the minimum casing pipe diameter and wall thickness, for a specific carrier pipe size, be less than that specified herein.

Schedule 40 PVC shall be an acceptable casing material for service lines.

Steel Casing

Steel casings shall be prime steel pipe conforming to the requirements of ASTM Designation A-139. Unless otherwise approved by Lee County Utilities, the minimum casing pipe size and wall thickness shall be as shown in the following table, for the water carrier pipe size indicated. For sizes not included therein, or for special design considerations, approval shall be obtained from Lee County Utilities.

Carrier Pipe Normal Size Inches	Casing Pipe Nominal Diameter Inches	Casing Pipe Wall Thickness Inches
4	10	0.250
6	12	0.250
8	16	0.250
10	20	0.250
12	24	0.312
14	28	0.312
16	30	0.312
20	36	0.375
24	42	0.500

HDPE Casing

HDPE casings shall be a minimum DR 11 for carrier pipes less than 16" diameter, and DR 17 for carrier pipes 16" diameter and larger. There shall be a minimum of 4" annular clearance between the interior of the casing pipe and the outside of the carrier pipe, unless otherwise approved by the County. HDPE casing pipe shall be manufactured from PE 3408 polyethylene meeting AWWA C906 standards.

Carrier Pipe Normal Size Inches	Carrier Pipe Wall Thickness Dimension Ratio	Casing Pipe Nominal Diameter Inches	Casing Pipe Wall Thickness Dimension Ratio
4	11	10	11
6	11	14	11
8	11	16	11
10	11	18	11
12	11	20	11
14	11	24	11
16	11	24	17
18	11	30	17
20	11	30	17
24	11	30	17

4. Carrier Pipe

Water main carrier pipes to be installed within steel casings shall be Restrained Joint with casing spacers in accordance with Section 2 and the requirements of the LCU Standard Details located in Section 7. HDPE water main carrier pipes to be installed within HDPE casings shall not require spacers and bell restraints.

Pipe and fittings shall comply with the applicable provisions of these Standards. Special supporting of the carrier pipe within the casing shall be required with a design approved by Lee County Utilities.

Stainless steel carriers with Teflon skids, or The Booster Casing Spacers, being on center and restrained shall be the preferred method for installing the carrier pipe in steel casing. Spacers shall be installed 7 feet, or less, on center. After the carrier pipe has been tested for leakage, the casing shall have the ends blocked with an 8" wall of brick masonry with a weep hole installed near the bottom of each wall.

High-density polyethylene Raci casing spacers or approved equal can be used for all size PVC pipes and on DIP pipe with diameters 12" or less. The spacers shall be of a projection type with a minimum number of projections around the circumference totaling the number of carrier pipe diameter inches. Casing spacers shall be spaced every 7 feet, or less, on center. The casing spacers shall provide a minimum safety factor of 2 to 1 to support the service load.