



Standard Specification for Concrete Pipe for Irrigation or Drainage¹

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1. Scope

1.1 This specification covers nonreinforced concrete pipe to be used for the conveyance of irrigation water with working pressures, including hydraulic transients, as shown in Table 1 and for use in drainage.

1.2 A complete SI companion to Specification C 118 has been developed—C 118M; therefore, no SI equivalents are presented in this specification.

NOTE 1—This specification is for manufacturing and purchase only and does not include requirements for bedding, backfill, installation, or field repairs. The owner is cautioned that he must correlate field conditions with the characteristics of the pipe specified and provide inspection during installation.

2. Referenced Documents

2.1 ASTM Standards:

- C 33 Specification for Concrete Aggregates²
- C 150 Specification for Portland Cement³
- C 497 Test Methods for Concrete Pipe, Manhole Sections, or Tile⁴
- C 595 Specification for Blended Hydraulic Cements³
- C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete²
- C 822 Terminology Relating to Concrete Pipe and Related Products⁴
- C 1116 Specification for Fiber-Reinforced Concrete and Shotcrete²

3. Terminology

3.1 *Definitions*—For definitions of terms relating to concrete pipe, see Terminology C 822.

4. Classification

4.1 Pipe manufactured according to this specification shall be known as “ASTM Standard Concrete Irrigation Pipe,” “ASTM Standard Concrete Drainage Pipe,” or “ASTM Heavy-Duty Concrete Drainage Pipe.”

¹ This specification is under the jurisdiction of ASTM Committee C-13 on Concrete Pipe and is the direct responsibility of Subcommittee C13.01 on Reinforced Concrete Sewer, Drain, and Irrigation Pipe.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.01.

⁴ *Annual Book of ASTM Standards*, Vol 04.05.

TABLE 1 Standard Dimensions, Working Pressure, and Test Requirements for Standard Concrete Irrigation Pipe^A

Internal Designated Diameter, in.	Thickness of Wall, T , in.	Working Pressure, ^B ft	Minimum Internal Hydrostatic Test Pressure, psi	Minimum Three-Edge-Bearing Load, lbf/linear ft
6	7/8	30	50	1300
8	1	30	50	1350
10	1 1/8	30	50	1400
12	1 1/4	25	45	1500
14	1 3/8	25	45	1600
15	1 1/2	25	45	1650
16	1 1/2	25	45	1700
18	1 3/4	25	45	1800
20	2	25	40	1850
21	2 1/8	25	40	1900
24	2 1/4	25	40	2000

^A For hydrostatic test requirements, refer to 10.5.

^B Higher pressures may be used up to a maximum of 40 ft for 6 through 8-in. diameters, 35 ft for 10 through 24-in. diameters. In these cases, the strength of the pipe shall be increased to give a minimum of at least four times the design working pressure when tested as specified in 10.5.

5. Basis of Acceptance

5.1 The acceptability of the pipe shall be determined by the results of the tests prescribed in this specification, if and when required and by inspection to determine whether the pipe conforms to this specification as to design and freedom from defects.

6. Materials

6.1 *Concrete*—The concrete shall consist of cementitious materials, mineral, aggregates, and water.

6.2 Cementitious Materials:

6.2.1 *Cement*—Cement shall conform to the requirements for portland cement of Specification C 150 or shall be portland blast-furnace slag cement or portland-pozzolan cement conforming to the requirements of Specification C 595, except that the pozzolan constituent in the Type IP portland-pozzolan cement shall be fly ash.

6.2.2 *Fly Ash*—Fly ash shall conform to the requirements of Specification C 618, Class F or Class C.

6.2.3 *Allowable Combinations of Cementitious Materials*—The combination of cementitious materials used in the concrete shall be one of the following:

6.2.3.1 Portland cement only,

6.2.3.2 Portland blast furnace slag cement only;

6.2.3.3 Portland pozzolan cement only, or

6.2.3.4 A combination of portland cement and fly ash.