



Designation: C 1504 – 01

Standard Specification for Manufacture of Precast Reinforced Concrete Three-Sided Structures for Culverts, Storm Drains, and Sewers¹

This standard is issued under the fixed designation C 1504; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers single-cell precast conventionally reinforced concrete three-sided structures intended to be used for the construction of culverts and for the conveyance of storm water and sewage.

1.2 A complete metric companion to Specification C 1504 has been developed—C 1504M; therefore, no metric equivalents are presented in this specification.

NOTE 1—This specification is primarily a manufacturing and purchasing specification. The successful performance of this product depends upon the proper selection of the geometric section, bedding, backfill, and care that the installation conforms to the construction specifications. The purchaser of the precast reinforced concrete three-sided structure specified herein is cautioned that he must properly correlate the loading conditions and the field requirements with the geometric section specified and provide for inspection at the construction site.

2. Referenced Documents

2.1 ASTM Standards:

- A 82 Specification for Steel Wire, Plain, for Concrete Reinforcement²
- A 185 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement²
- A 496 Specification for Steel Wire, Deformed, for Concrete Reinforcement²
- A 497 Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement²
- A 615/A 615M Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement²
- A 616/A 616M Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement²
- A 617/A 617M Specification for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement²
- C 31/C 31M Practice for Making and Curing Concrete Test Specimens in the Field³
- C 33 Specification for Concrete Aggregates³
- C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens³

¹ This specification is under the jurisdiction of ASTM Committee C13 on Concrete Pipe and is the direct responsibility of Subcommittee C13.07 on Acceptance Specifications and Precast Concrete Box Sections.

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² *Annual Book of ASTM Standards*, Vol 01.04.

³ *Annual Book of ASTM Standards*, Vol 04.02.

C 150 Specification for Portland Cement⁴

C 309 Specification for Liquid Membrane-Forming Compounds for Curing Concrete³

C 494/C 494M Specification for Chemical Admixtures for Concrete³

C 497 Test Methods for Concrete Pipe, Manhole Sections, or Tile⁵

C 595 Specification for Blended Hydraulic Cements⁴

C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete³

C 822 Terminology Relating to Concrete Pipe and Related Products⁵

2.2 AASHTO Standard:

Standard Specifications for Highway Bridges⁶

3. Terminology

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

4. Types

4.1 Precast reinforced concrete three-sided structures shall be produced by manufacturers that meet the requirements of the purchasers, and shall designate each section by span, rise, and design earth cover.

5. Basis of Acceptance

5.1 Acceptability of the three-sided sections produced in accordance with Section 7 shall be determined by the results of the concrete compressive strength tests described in Section 10, by the material requirements described in Section 6, and by inspection of the finished three-sided sections.

5.2 Three-sided sections shall be considered ready for acceptance when they conform to the requirements of this specification.

6. Materials

6.1 *Reinforced Concrete*—The reinforced concrete shall consist of cementitious materials, mineral aggregates and

⁴ *Annual Book of ASTM Standards*, Vol 04.01.

⁵ *Annual Book of ASTM Standards*, Vol 04.05.

⁶ American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001.