

American Water Works Association

ANSI/AWWA C300-97

(Revision of ANSI/AWWA C300-89)



AWWA STANDARD
FOR
**REINFORCED CONCRETE PRESSURE PIPE,
STEEL-CYLINDER TYPE**



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AMERICAN WATER WORKS ASSOCIATION

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Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

SEC.	PAGE	SEC.	PAGE
Foreword			
I	Introduction.....	vii	
I.A	Background.....	vii	
I.B	History	vii	
I.C	Acceptance	vii	
II	Special Issues.....	viii	
III	Use of This Standard.....	viii	
III.A	Purchaser Options and Alternatives.....	viii	
III.B	Modification to Standard.....	ix	
IV	Major Revisions.....	ix	
V	Comments	x	
Standard			
1	General		
1.1	Scope	1	
1.2	Purpose	1	
1.3	Application.....	1	
2	References	2	
3	Definitions	4	
4	Requirements		
4.1	Permeation	5	
4.2	Drawings and Data to Be Furnished by the Purchaser.....	5	
4.3	Data to Be Submitted by the Manufacturer.....	5	
4.4	Materials	6	
4.5	Design.....	9	
4.6	Fabrication	11	
4.7	Fittings and Special Pipe.....	17	
5	Verification		
5.1	Inspection and Testing by the Purchaser.....	18	
5.2	Tests	19	
6	Delivery		
6.1	Marking.....	20	
6.2	Transportation	20	
6.3	Affidavit of Compliance.....	20	
Tables			
1	Requirements for Pipe of Various Sizes	10	
2	Minimum Thickness of Steel for Fittings of Various Diameters.....	17	

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Foreword

This foreword is for information only and is not a part of AWWA C300.

I. Introduction.

I.A. *Background.* Reinforced concrete pipe of the cylinder type, first manufactured in 1919, consists of a welded steel cylinder with a steel joint ring welded at each end; a cage or cages of steel reinforcing bars or wire; an encasing wall of concrete; and a preformed gasket of rubber to provide the joint seal between adjacent pipes. The pipe is manufactured in sizes ranging from 30 in. (760 mm) to more than 144 in. (3,660 mm) in diameter and is generally made in 16-ft through 24-ft (4.8-m through 7.5-m) laying lengths.

Reinforced concrete pipe, steel-cylinder type, is designed for the specific combination of internal pressure and external load required for the project in accordance with the procedures outlined in AWWA Manual M9, *Concrete Pressure Pipe*. This pipe is normally limited in working pressures to a maximum of 260 psi (1,790 kPa).

This type of pipe is used for transmission lines in irrigation, industrial, and domestic water supply systems, as well as for distribution feeder mains and other uses (see Sec. III of the foreword).

I.B. *History.* In April 1943, the AWWA Board of Directors authorized the preparation of "Tentative Emergency Specifications for Concrete Pressure Pipe." These tentative specifications, which covered several types of pipe in a single document, served a useful purpose during World War II, but are now obsolete and have been withdrawn.

The first standard prepared by AWWA Water Works Practice Committee 8320D—Reinforced Concrete Pipe, which was formed in 1946, covered the manufacture of reinforced concrete pipe, steel-cylinder type, not prestressed. The standard is now designated AWWA C300.

The first edition of this standard was approved as tentative on Dec. 11, 1947. It was revised and approved as a standard on Jan. 13, 1952. The second edition was approved as tentative on July 19, 1957, and made a standard on Jan. 27, 1964. Subsequent editions of AWWA C300 were approved by the AWWA Board of Directors on Jan. 28, 1974, May 16, 1982, and July 26, 1989. This edition was approved on Feb. 2, 1997.

Installation, design, and other data pertaining to this type of pipe are covered by AWWA Manual M9, *Concrete Pressure Pipe*.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for all direct and indirect drinking water additives. Other members of the original consortium included the American Water Works Association Research Foundation (AWWARF) and the Conference of State Health and Environmental Managers (COSHEM). The American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.* Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state and local agencies may use various references, including

1. An advisory program formerly administered by USEPA, Office of Drinking Water, discontinued on Apr. 7, 1990.
2. Specific policies of the state or local agency.
3. Two standards developed under the direction of NSF, ANSI[†]/NSF[‡] 60, Drinking Water Treatment Chemicals—Health Effects, and ANSI/NSF 61, Drinking Water System Components—Health Effects.
4. Other references, including AWWA standards, *Food Chemicals Codex*, *Water Chemicals Codex*,[§] and other standards considered appropriate by the state or local agency.

Various certification organizations may be involved in certifying products in accordance with ANSI/NSF 60 (61). Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdiction. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Appendix A, “Toxicology Review and Evaluation Procedures,” to ANSI/NSF 60 (61) does not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of “unregulated contaminants” are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Appendix A procedures may not always be identical, depending on the certifier.

AWWA C300-97 does not address additives requirements. Thus, users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.
2. Determine the status of certifications by all parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

II. Special Issues. Other special issues are addressed in AWWA Manual M9, *Concrete Pressure Pipe*.

III. Use of This Standard. AWWA has no responsibility for the suitability or compatibility of the provisions of this standard to any intended application by any user. Accordingly, each user of this standard is responsible for determining that the standard’s provisions are suitable for and compatible with that user’s intended application.

III.A. Purchaser Options and Alternatives. Purchasers are advised that, while this standard presents information on materials and procedures of manufacture of

*Persons in Canada, Mexico, and non-North American countries should contact the appropriate authority having jurisdiction.

[†]American National Standards Institute, 11 W. 42nd St., New York, NY 10036.

[‡]NSF International, 3475 Plymouth Rd., Ann Arbor, MI 48106.

[§]Both publications available from National Academy of Sciences, 2102 Constitution Ave. N.W., Washington, DC 20418.

the pipe, it does not contain all of the engineering information needed to prepare a complete specification for a particular pipeline installation. A specific installation may require more restrictive provisions than those in the standards and most certainly will require additional design and installation features.

AWWA Manual M9, *Concrete Pressure Pipe*, should be considered a supplement to this standard. Material in the manual should not be regarded as superseding any portion of this standard. The purpose of AWWA Manual M9, *Concrete Pressure Pipe*, is to provide information concerning some of the various subjects to be considered in, and the minimum standard of practice for, the design and installation of concrete pressure pipelines.

The following items should be covered in the purchaser's specifications:

1. Standard used—that is, ANSI/AWWA C300, Standard for Reinforced Concrete Pressure Pipe, Steel-Cylinder Type, of latest revision.
2. Manner of storage and delivery, if required of the manufacturer.
3. Working pressure, surge pressure, field-test pressure, external loading conditions, and method of bedding and backfilling (Sec. 4.2.2).
4. If detailed drawings are to be submitted for review (Sec. 4.3.1).
5. If the manufacturer is not permitted to supply pipe from inventory (Sec. 4.3.1).
6. If a tabulated layout schedule will be required (Sec. 4.3.2).
7. Type of cement required, if there is a preference (Sec. 4.4.1.1).
8. If the manufacturer is not permitted to use pozzolanic materials as a cement replacement (Sec. 4.4.1.1).
9. If aggregate samples will be required (Sec. 4.4.4).
10. If submission of the type and amount of admixtures will be required (Sec. 4.4.6).
11. If submission of manufacturer's design calculations will be required (Sec. 4.5.2).
12. If submission of welding procedure specifications will be required (Sec. 4.6.3).
13. Variance in curing, if permitted (Sec. 4.6.7.1).
14. If details of specials and fittings are to be furnished by the manufacturer (Sec. 4.7.1).
15. If the purchaser desires to inspect the material, pipe, and fittings at the manufacturer's plant (Sec. 5.1.1).
16. If any material or manufacturing test reports will be required (Sec. 5.1.2).
17. If steel test specimens will be required (Sec. 5.2.5).
18. If testing of welds in reinforcing bars is required (Sec. 5.2.7).
19. If identification marks referenced to layout drawings and schedules are required (Sec. 6.1).
20. If elliptical reinforcement is acceptable (Sec. 6.1 and AWWA Manual M9, *Concrete Pressure Pipe*).
21. If an affidavit of compliance will be required (Sec. 6.3).

III.B. *Modification to Standard.* Any modification to the provisions, definitions, or terminology in this standard must be provided in the purchaser's specifications.

IV. Major Revisions. Major changes made to the standard in this revision include the following:

1. The format has been changed to AWWA standard style.

2. The acceptance clause (Sec. I.C) and the definitions of parties (Sec. 3) have been revised to approved wording.
3. Requirements for submitting samples of aggregates have been deleted (former Sec. 2.3).
4. A minimum limit for fine and coarse aggregate specific gravity has been added, and minimum test frequency for fine and coarse aggregates is required (Sec. 4.4.2 and 4.4.3).
5. Minimum testing and measuring frequency for steel cylinder material is required and thickness tolerances are established (Sec. 4.4.7.5 and 4.4.7.6).
6. Table 1, Requirements for pipe of various sizes, has been expanded to include sizes 102 in. through 144 in. (2,590 mm through 3,660 mm).
7. A qualification requirement for all welders, welding operators, and welding procedures has been added (Sec. 4.6.2 and 4.6.3).
8. Cylinder weld sampling and testing requirements have been added (Sec. 4.6.4.2.1 and 4.6.4.2.2).
9. A limitation on width of cracks in pipe wall, which are acceptable without repair, has been added (Sec. 4.6.8).
10. The section on repair of concrete has been expanded (Sec. 4.6.9).
11. A requirement for test equipment calibration has been added (Sec. 5.2.8).
12. The material previously located in appendix A has been incorporated into AWWA Manual M9, *Concrete Pressure Pipe*.

V. Comments. If you have any comments or questions about this standard, please call the AWWA Standards and Materials Development Department, (303) 794-7711 ext. 6283, FAX (303) 795-1440, or write to the department at 6666 W. Quincy Ave., Denver, CO 80235.