



**American Water Works
Association**

The Authoritative Resource on Safe WaterSM

ANSI/AWWA C600-05
(Revision of ANSI/AWWA C600-99)

AWWA Standard

Installation of Ductile- Iron Water Mains and Their Appurtenances



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Foreword

This Foreword is for information only and is not a part of ANSI/AWWA C600.

I. Introduction.

I.A. *Background.* The provisions of this standard are intended to act as a guide for installing extensions to existing distribution systems and in preparing contract documents for the construction of new systems or extensions. The standard is to be used as a guide for installing bell-and-spigot cast-iron pipe and does not cover the provision and delivery of material, any other type of pipe, or any other type of joint. The standard includes a model addendum that was to be used with project contract documents and is designed to be used as a part of the contract documents.

I.B. *History.* The first edition of this AWWA standard, titled “Standard Specifications for Laying Cast-Iron Pipe” (7D.1-1938), was adopted in April 1938. The standard was published in the February 1938 edition of *Journal AWWA*. The standard was revised in 1949, including a change of title to “Standard Specifications for Installation of Cast-Iron Water Mains” (7D.1-T-1949 and C600-49T). The standard was expanded by adding numerous tables and installation guidelines. The model addendum was also expanded. The revised standard was published in the December 1949 edition of *Journal AWWA*. Section 9b, Joining of Mechanical-Joint Pipe, was added in May 1954. Section 9c, Joining of Push-On Joint Pipe, was added in 1964.

In 1975, the AWWA Standards Council formed the present C600 committee to revise ANSI/AWWA C600 to reflect current practices and to add ductile iron as a pipe material. To do this, the committee decided to completely change the character of the standard, removing the model addendum and making the standard consistent with the style of other AWWA standards.

In 1980, an addendum to the standard was approved that revised parts of Sec. 3.4 regarding mechanical-joint assembly.

The revisions made in the 1982 edition included the elimination of references to gray cast-iron pipe as a material for new pipeline installation, because it was no longer manufactured for water utility service. Also, metric conversions were included in the 1982 revision; these were direct conversions of customary US inch-pound units, rather than those shown in International Organization for Standardization (ISO) standards.

The revisions made in 1987 included new references, a caveat against prolonged exposure of polyethylene film to sunlight, revised sections on thrust restraint and hydrostatic testing, and a discussion on making service taps on polyethylene-encased iron mains. Subsequent revisions to ANSI/AWWA C600 were approved by the AWWA Board of Directors in 1993 and 1999. This tenth edition of C600 was approved by the AWWA Board of Directors on June 12, 2005.

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 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, NSF[†]/ANSI[‡] 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 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.

*Persons outside the United States should contact the appropriate authority having jurisdiction.

†American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

‡NSF International, 789 N. Dixboro Road, Ann Arbor, MI 4810.

§Both publications available from National Academy of Sciences, 500 Fifth Street, N.W., Washington, DC 20001.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI 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.

Annex A, “Toxicology Review and Evaluation Procedures,” to NSF/ANSI 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 Annex A procedures may not always be identical, depending on the certifier.

ANSI/AWWA C600 does not address additives requirements. 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. ANSI/AWWA C600, Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances, can be used as a reference when making extensions to existing distribution or transmission systems or when constructing new distribution or transmission systems using ductile-iron mains with either mechanical or push-on joints. It is not intended for this standard to be used as a contract document, but it may be used as a reference in contract documents. It is based on a consensus of the committee on the minimum practice consistent with sound, economical service under normal conditions, and its applicability under any circumstances must be reviewed by a responsible engineer. The standard is not intended to preclude the manufacture, marketing, purchase, or the use of any product, process, or procedure.

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products described in that standard are suitable for use in the particular application being considered.

III.A. Purchaser Options and Alternatives. The following items should be provided by the purchaser:

1. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required, in addition to the requirements of the Safe Drinking Water Act.

2. Details and requirements of state, local, and provincial requirements (Sec. 4.2).

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

IV. **Major Revisions.** Major revisions to this edition of the standard include the following:

1. The format has been changed to AWWA style.
2. Editorial changes throughout the standard for clarification of various installation issues.
3. Highway and railroad crossing restrictions for filling the void space between carrier and casing pipe are addressed (Sec. 4.5.3).
4. Trenchless application methods are discussed (Sec. 4.6).
5. Modification of the hydrostatic testing allowance formulas to reflect more conservative testing values (Sec. 5.2).

V. **Comments.** If you have any comments or questions about this standard, please call the AWWA Volunteer and Technical Support Group at 303.794.7711, FAX 303.795.7603, write to the group at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.



AWWA Standard

Installation of Ductile-Iron Water Mains and Their Appurtenances

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes installation procedures for ductile-iron mains and their appurtenances for water service.

1.1.1 *Conditions not discussed.* Installations that require special attention, techniques, and materials are not discussed. Each of these installations requires special considerations based on many influencing factors that cannot be discussed adequately in a single standard. These installations may require design by a competent engineer and consultation with representatives of the material manufacturing industry. Some of these installations include the following:

1. Piping through rigid walls.
2. Piping on supports above or below ground.
3. Piping requiring insulation.
4. Treatment plant or pump-station piping.
5. Flanged joint piping.
6. Ball and socket piping.
7. Grooved and shouldered piping.
8. Restrained joint piping.

9. Industrial piping.
10. Piping through geologically hazardous areas.
11. Piping in high-density, stray-current environments.
12. Piping through corrosive soil.
13. Piping through unstable soil.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for the installation of ductile-iron water mains and their appurtenances, including materials, dimensions, tolerances, and testing procedures.

Sec. 1.3 Application

This standard can be referenced in specifications for installing ductile-iron water mains and their appurtenances. The stipulations of this standard apply when this document has been referenced and then only to the installation of ductile-iron water mains and their appurtenances.

SECTION 2: REFERENCES

This standard references the following documents. In their latest editions, they form a part of this standard to the extent specified within this standard. In any case of conflict, the requirements of this standard shall prevail.

AASHTO* T99, The Moisture-Density Relations of Soils Using a 2.5 kg (5.5 lb) Rammer and a 305 mm (12 in.) Drop.

ANSI†/AWWA C105/A21.5—American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.

ANSI/AWWA C111/A21.11—American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

ANSI/AWWA C150/A21.50—American National Standard for the Thickness Design of Ductile-Iron Pipe.

ANSI/AWWA C500—Metal-Seated Gate Valves for Water Supply Service.

*American Association of State Highway and Transportation Officials, 444 N. Capitol St. N.W., Ste. 429, Washington, DC 20001.

†American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.