



American Water Works
Association

AWWA C604-06
(First Edition)

The Authoritative Resource on Safe Water®

AWWA Standard

Installation of Steel Water Pipe—4 In. (100 mm) and Larger



Effective date: Dec. 1, 2007.

First edition approved by AWWA Board of Directors: Feb. 12, 2006.

This edition approved: Feb. 12, 2006.

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AWWA Standard

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Foreword

This foreword is for information only and is not a part of AWWA C604.

I. Introduction.

I.A. *History of Standard.* This standard pertains to the in-ground installation of steel pipelines for use in the distribution and transmission of water, air, and other products in water system facilities. It has been prepared by the AWWA Standards Committee on Steel Pipe, initially formed as Committee A7A in 1939. At that time, the Steel Water Pipe Manufacturers Technical Advisory Committee was organized as a subsidiary group to function as a source of technical information for the parent committee. Committee A7A and its successors, Committee 8310D and the AWWA Standards Committee on Steel Pipe have assumed responsibility for all AWWA standards and manuals pertaining to steel pipe, fittings, linings and coatings, field installations, and related items.

In 1996 the AWWA Standards Council directed the Standards Committee on Steel Pipe to develop a standard for the installation of steel pipelines and their appurtenances used in water treatment or conveying facilities. This standard, AWWA C604, is the first steel pipe installation standard developed by AWWA.

I.B. *Discussion.* AWWA C604 includes all types of steel pipe 4 in. (100 mm) in diameter and larger typically used in the water industry, regardless of pipe manufacturing source. With adequate quality assurance, pipe manufactured in a fabricator's shop or in a steel-pipe mill is suitable for water utility service. Pipe produced in a fabricator's shop or pipe mill for installation in accordance with AWWA C604 shall meet the stringent design, quality control, and testing requirements of AWWA Manual M11 and AWWA C200. Shop and mill-fabricated pipe made from materials and in accordance with the quality control measures stipulated in AWWA Manual M11 and AWWA C200 will ensure fabricated pipe of high quality.

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 Environ-

mental 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.

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.

AWWA C604-06 does not address additives requirements. Thus, users of this standard should consult the appropriate state or local agency having jurisdiction in order to

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

†NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

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

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

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.

II.A. *Application.* AWWA C604-06, Standard for Installation of Steel Water Pipe—4 In. (100 mm) and Larger, can be used as a reference when making extensions to existing distribution or transmission systems or when constructing new distribution or transmission systems using steel pipe. It is not the intent 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. 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.* The following items should be included in the purchaser's specifications.

Considerable supplemental information is required in conjunction with the use of this standard, including, but not limited to, contract documents consisting of detailed plans and specifications. The specifications should cover, as a minimum, detailed instructions pertaining to all references in this standard to "as specified" and "in accordance with the specifications." In addition, the purchaser shall provide specific supplementary information to the contract documents regarding the following:

1. Pipe design criteria and type of pipe ends.
2. Pipe laying schedules, line drawings, markings, appurtenances, vaults, valves, and existing utilities.
3. Pipe bedding specification and drawing details.
4. Inspection for pipe joints, protective coatings and linings, and pipe zone compaction.

5. Surface restoration.
6. Special handling requirements.

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. This is the first edition of this standard.

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



AWWA Standard

Installation of Steel Water Pipe— 4 In. (100 mm) and Larger

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard provides the field installation guidelines for buried steel water pipe, 4 in. (100 mm)* and larger, and their appurtenances.

The information contained in this standard is intended to be used as a guide to assist in the installation of steel water pipe. Whenever the methods contained herein conflict with those of the contract documents and/or the purchaser, the contract documents and/or purchaser should be followed.

1.1.1 *Conditions which may require additional considerations.* Installations that require special attention, techniques, and materials are not covered. Some of these installations are

1. Piping through rigid walls.

*Metric conversions given in this standard are direct conversions of US customary units and are not those specified in the International Organization for Standardization (ISO) standards.

2. Piping on supports above or below ground, connected to appurtenances.
3. Piping requiring insulation.
4. Treatment plant or pump-station piping.
5. Industrial piping.
6. Piping through geologically hazardous areas.
7. Piping in high-density-stray-current environments.
8. Piping through corrosive soil.
9. Piping through unstable soil.
10. Piping subjected to excessive loads.

Sec. 1.2 Purpose

This standard is intended to cover typical pipeline construction practices that are deemed adequate for the satisfactory installation of steel water pipe and appurtenances. Individual project requirements can vary substantially and should always be thoroughly reviewed prior to bidding or construction startup. For this reason, some practices discussed in this standard may not be suitable for all project conditions, and, in some cases specialized installation techniques may be required that are beyond the scope of this standard.

Sec. 1.3 References

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

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

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

ANSI/AWWA C509—Resilient-Seated Gate Valves for Water Supply Service.

ANSI/AWWA C651—Disinfecting Water Mains.

AWWA Manual M3, *Safety Practices for Water Utilities*, AWWA, Denver, Colo. (1990).

The reader is referred to the following standards for additional information on the use or limitations of specific products.

*American Association of State Highway and Transportation Officials, 444 North Capitol Street N.W., Suite 249, Washington, DC 20001-1512.

ANSI/AWWA AWWA C203—Coal-Tar Protective Coatings and Linings for Steel Water Pipelines—Enamel and Tape—Hot-Applied.

ANSI/AWWA C205—Cement-Mortar Protective Lining and Coating for Steel Water Pipe—4 In. (100 mm) and Larger—Shop Applied.

ANSI/AWWA C206—Field Welding of Steel Water Pipe.

ANSI/AWWA C207—Steel Pipe Flanges for Waterworks Service—Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm).

ANSI/AWWA C208—Dimensions for Fabricated Steel Water Pipe Fittings.

ANSI/AWWA C209—Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.

ANSI/AWWA C210—Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.

ANSI/AWWA C216—Heat-Shrinkable Cross-Linked Polyolefin Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.

ANSI/AWWA C217—Petrolatum and Petroleum Wax Tape Coatings for the Exterior of, Connections and Fittings for Steel Water Pipelines.

ANSI/AWWA C219—Bolted Sleeve-Type Couplings for Plain-End Pipe.

ANSI/AWWA C222—Polyurethane Coatings for the Interior and Exterior of Steel Water Pipe and Fittings.

ANSI/AWWA C504—Rubber-Seated Butterfly Valves.

ANSI/AWWA C800—Underground Service Line Valves and Fittings.

OSHA 29 CFR 1986*—Health Regulations for Construction.

AWWA M11—Steel Water Pipe: A Guide for Design and Installation.

AWS† D1.1—Structural Welding Code.

Sec. 1.4 Definitions

In this standard, the following definitions shall apply:

1.4.1 *Bevel:* The angle formed between the prepared edge of a pipe end and a plane perpendicular to the longitudinal axis of the pipe. Bevels are generally used for butt welding of pipe ends.

*Occupational Safety and Health Administration, Code of Federal Regulations; available from Government Printing Office, 720 N. Main, Pueblo, CO 81003.

†American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126-5699.