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ANSI/AWWA **A100-20**
(Revision of ANSI/AWWA A100-15)

AWWA Standard

Water Wells

Effective date: July 1, 2020.

First edition approved by Board of Directors May 10, 1946.

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Approved by American National Standards Institute Feb. 6, 2020.



American Water Works
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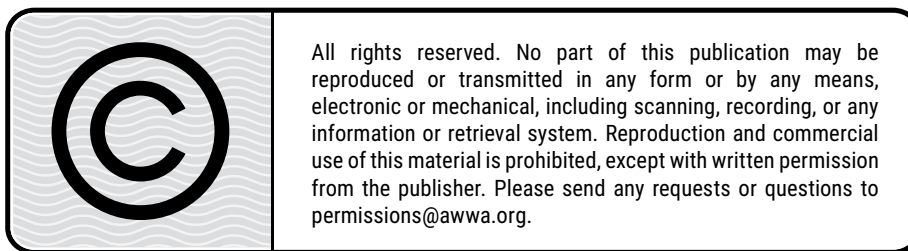
AWWA Standard

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA A100.*

I. Introduction.

I.A. *Background.* This standard was originally used more as a specification than as a standard. Subsequent changes have been directed at developing a true standard as opposed to a specification. This standard is designed primarily for vertical wells for municipal and industrial water supply.

I.B. *History.* The first edition of this standard was approved by the AWWA Board of Directors on May 10, 1946, and was titled "Standard Specifications for Deep Wells," with the designation 4A1-1946. Amendments to Sec. 1-1.1, Sec. 1-3.2, and Sec. 1-3.3 of that standard were approved by the board on Oct. 1, 1946, and the standard was redesignated AWWA A100-46. Subsequently, a number of minor editorial changes were made; a recommended procedure for sealing abandoned wells was added as appendix Sec. A1-13; and the standard was published on June 18, 1952, titled "Standard for Deep Wells." The standard was revised on Jan. 26, 1958, and was adopted jointly by AWWA and the National Water Well Association (NWWA). The standard was revised again in 1966. In 1984, the standard was reorganized substantially and revised to be a standard for well construction, rather than a specification, and republished under the title "Standard for Water Wells." The standard was again revised in 1990 and 1997. Subsequent editions were approved by the AWWA Board of Directors on Feb. 12, 2006, and June 7, 2015. This edition was approved on Jan. 23, 2020.

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 Water Research Foundation (formerly 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

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

[†] Persons outside the United States should contact the appropriate authority having jurisdiction.

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. Specific policies of the state or local agency.
2. Two standards developed under the direction of NSF*: NSF/ANSI/CAN[†] 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects.

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

Annex A, “Toxicology Review and Evaluation Procedures,” to NSF/ANSI/CAN 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 A100 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.

II.A. *Screen Capacity.* The physical conditions of aquifers, as well as the experience and practice related to their utilization as groundwater resources, vary between well sites and geographic regions. Historically, a common practice for sizing well-screen length and diameter was based on screen open area and inlet velocity (entrance velocity). However, the recommended upper limit for this screen inlet velocity has varied greatly among designers and remains a subject of considerable technical debate. Many designers have, for various technical reasons, limited well-screen entrance velocities to not exceed 0.1 ft/s (0.03 m/s). Others have used and demonstrated successful well designs and installations with velocities substantially exceeding 0.1 ft/s

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

† Standards Council of Canada, 55 Metcalfe Street, Suite 600, Ottawa, ON K1P 6L5 Canada.

(0.03 m/s), and prior editions of this standard (through the 1997 edition) proposed an upper limit of entrance velocity of 1.5 ft/s (0.46 m/s).

Based on a significant body of ongoing research within the groundwater industry, the committee recognizes as part of this current standard that there is no singular uniquely defined criterion for permissible velocity through the screen slot openings that is solely suitable for designing a well screen without consideration of the aquifer characteristics and the manner of well construction. In particular, the aspects of flow surrounding the well screen in the filter and at the filter–aquifer interface are known to play a prominent role in the well’s performance and are, in fact, more influential than screen entrance velocity in determining screen dimensions. Similarly, the sizing of screen length and diameter are greatly influenced by the aquifer thickness, stratigraphic layering, and pump size. Accordingly, the applicable design approach must be regarded as a multifaceted and dynamic problem. Within this context, this standard does not recommend screen design solely on the basis of screen entrance velocity criterion (Sec. 4.5.3).

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 information should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA A100, Water Wells, of latest revision.
2. Whether compliance with NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects, is required, in addition to the requirements of the Safe Drinking Water Act.
3. Scope of the exploratory investigation (Sec. 4.2.1).
4. Whether additional formation samples are needed (Sec. 4.2.2.2).
5. Time, place, and mode of sample delivery (Sec. 4.2.2.5).
6. Type of geophysical log desired, if any (Sec. 4.2.3).
7. Details of federal, state, and local requirements (Sec. 4.3).
8. Options for type of casing material (Sec. 4.3.4).
9. Whether the purchaser wants to specify temporary casings (Sec. 4.4.1).
10. Minimum casing wall thickness (Sec. 4.4.5).
11. Determination of the capacity of the well screen by careful evaluation of the composition of the aquifer. (The well-screen selection should be made by a qualified professional engineer, hydrogeologist, or well-drilling constructor.) (See Sec. 4.5, Appendix L, and Sec. II.A, Screen Capacity, of the foreword.)

12. Maximum rate of flow from well (Sec. 4.5.2 and Sec. 4.5.3).
13. Available options for screen construction (Sec. 4.5.7).
14. Requirements for approval of filter pack sampling (Sec. 4.6.3).
15. Alternate-alignment tolerance (Sec. 4.7.9.4 and Appendix D).
16. The depth of the completed well, which defines the lower limit to which construction tolerances are to be applied (Sec. 4.7.9.5).
17. Height of well casing above ground level (Sec. 4.7.10.3).
18. Flow rate and protocol for performance testing (Sec. 5.1 and Sec. E.4.2 in Appendix E).
19. Accuracy of water-level measurements (Sec. E.2.2 in Appendix E).

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

IV. Major Revisions. Major revisions made to the standard in this edition include the following:

1. The scope was clarified that this standard is primarily for vertical wells for municipal and industrial water supply (Sec. 1.1).
2. “Gravel packed” terminology was updated to “filter packed” material throughout the standard. The definition was updated to recognize that packs can range from sand to coarse gravel depending on the formation.
3. Test duration was added to the list of driller’s log items (Sec. 4.2.5.1).
4. A constructor requirement to remove drilling fluids has been added to Sec. 4.8.2.
5. Disinfection level of available chlorine has been updated to 100 mg/L for the entire water depth of the well (Sec. 4.9.2).
6. An Alternate-Alignment Tolerance Warning was added to the beginning of Appendix D.
7. The equations in Appendix K have been updated to clarify conversions for use with metric units.

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, FAX at 303.795.7603; write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email at standards@awwa.org.



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ANSI/AWWA A100-20
(Revision of ANSI/AWWA A100-15)

AWWA Standard

Water Wells

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes the minimum requirements for vertical water supply wells and is designed primarily for municipal and industrial applications.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for water wells, including consideration of the influences of geologic and hydrologic conditions and water quality and well construction.

Sec. 1.3 Application

This standard can be referenced in specifications for constructing water wells and can be used as a guide for vertical water supply wells. The stipulations of this standard apply when this document has been referenced and only to water wells used in water supply service applications. Application of this standard is not limited by well depth.

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 the standard. In any case of conflict, the requirements of this standard shall prevail.