Foreword

(This Foreword is not a part of AASHTO/AWS D1.5M/D1.5:2002, Bridge Welding Code, but is included for information purposes only.)

The preparation of this specification was undertaken in response to a need for a common welding specification for the fabrication of steel highway bridges by welding. The departments of highways and transportation in the 50 states, the District of Columbia, and Puerto Rico that make up the American Association of State Highway and Transportation Officials have routinely used the specifications of the American Welding Society Structural Welding Committee, with appropriate modifications, to produce contract documents suitable for the construction of bridges using Federal Highway funds. The proliferation of requirements by the 50 states, District of Columbia and Puerto Rico that make up AASHTO (American Association of State Highway and Transportation Officials) resulted in the recognition of the need for a single document that could produce greater economies in bridge fabrication, while at the same time addressing the issues of structural integrity and public safety.

The first AWS code for Fusion Welding and Gas Cutting in Building Construction was published in 1928. In 1934, a committee was appointed to prepare specifications for the design, construction, alteration, and repair of highway and railway bridges. The first bridge specification was published in 1936. Until 1963, there were separate AWS committees for bridges and buildings. These two committees joined in 1963 to form the Structural Welding Committee of the American Welding Society. The committee has since promulgated standards for the application of welding to the design and construction of structures.

The Federal Highway Administration of the United States Department of Transportation requires states using federal funds for the construction of welded highway bridges to conform to specified standards for design and construction. Conformance to the AWS Specification for Welded Highway and Railway Bridges was first specified in the third edition of the AASHTO Standard Specifications for Highway Bridges in 1941. In 1962, the Bureau of Public Roads, now the Federal Highway Administration (FHWA), required conformance to a Circular Memorandum, dated November 13, 1962, which transmitted additional provisions for welding A36 steel pending publication of an AWS specification which would contain certain essential provisions not then in the code. Another Circular Memorandum, dated February 11, 1965, specified requirements for CVN testing, and a further Circular Memorandum, dated August 19, 1966, modified provisions of the 1966 Edition of the AWS D2.0-66, Specification for Welded Highway and Railway Bridges. An FHWA notice, dated July 7, 1971, recommended that ultrasonic inspection not be used for final acceptance of welds made by electrogas or electroslag procedures because of concern that the acceptance levels of AWS D2.0-69, Appendix C, were not suitable to detect or reject piping porosity of major dimensions.

In 1974, AASHTO published the first edition of the Standard Specification for Welding of Structural Steel Highway Bridges. The Eleventh Edition of the AASHTO Standard Specifications for Highway Bridges, dated 1977, directed “Welding shall conform to the requirements of the AASHTO Standard Specifications for Welding of Structural Steel Highway Bridges 1974 and subsequent interim specifications…” AASHTO published the Second and Third editions of the Standard Specifications for Welding of Structural Steel Highway Bridges in 1977 and 1981. All of the AASHTO specifications were required to be part of the Contract Documents as modifications or additions to the AWS Structural Welding Code—Steel. This was a cumbersome procedure.

In 1982, a subcommittee was formed jointly by AASHTO and AWS, with equal representation from both organizations, to seek accommodation between the separate and distinct requirements of bridge Owners and existing provisions of AWS D1.1. The Bridge Welding Code is the result of an agreement between AASHTO and AWS to produce a joint AASHTO/AWS Structural Welding Code for steel highway bridges that addresses essential AASHTO needs and makes AASHTO revisions mandatory.

The 1988 version of the Bridge Welding Code provided for the qualification of welding procedures by test to assure that weld had the strength, ductility, and toughness necessary for use in redundant structures. Nonredundant fracture critical bridge members were not provided for in the first edition of the code. While qualification of welding procedures is
required, a major effort has been made to specify the minimum number of tests and the simplest tests that give reasonable assurance of required mechanical properties. Efforts are made to discourage individual States from requiring duplication of weld testing unless that testing is specified in the bid documents. Special attention is directed to avoidance of unnecessary hardening of base metal HAZs and the avoidance of hydrogen and other items that can lead to weld or base-metal cracking.

Consequently, while the D1.5-88 document has a superficial resemblance to D1.1 in its general format, there are significant differences that users should be aware of, among them the lack of provisions relating to statically loaded structures, tubular construction or the modification of existing structures. Users are encouraged to develop their own requirements for these applications or use existing documents (e.g., D1.1) with the appropriate modifications.

The publication of AASHTO/AWS D1.5M/D1.5:2002 was justified by the need to monitor, revise, and update code provisions based on the needs of AASHTO member states and industry. The following is a list of the major revisions in 2002 edition:

1. Addition of U.S. Customary Units.
2. Addition of a Commentary for Sections 1, 2, 3, 5, 6, 7, and 12.
3. Deletion of Section 9 and incorporation of that information into other parts of the code. (See Annex F for a description of the changes.)
4. Revision to WPS Qualification Test Methods.
5. Addition of the use of edge blocks for RT.
6. Revision to Tables 4.1 and 4.2
7. Addition of undermatching specifications.

Changes in Code Requirements. Changes to the text of the 2002 edition are indicated by underlining. Changes to illustrations are highlighted by vertical lines in the margin.

Future revisions to this code will be made based on proposals from the Joint AASHTO/AWS Committee as well as those from document users. It should be re-emphasized here that the Joint Committee is the primary agency for receiving feedback from industry, and requires this input in order to produce a quality document. Other documents that do not receive the ANSI/AASHTO/AWS accreditation should not be relied on as substitutes for the Joint Committee’s interpretation of D1.5 provisions.

While the D1.1 and D1.5 codes do share a number of common provisions, it should not be assumed that revisions to one document provision automatically revises its analogous provision in the other; therefore, users are encouraged to treat each code as an independent document.

This code was prepared by the AASHTO/AWS Bridge Welding Committee operating as a Subcommittee of the AWS Structural Welding Committee. The Committee is made up of representatives from the AWS Structural Welding Committee and the AASHTO Technical Committee for Welding. Accommodation was sought on all items where there was disagreement between AASHTO and AWS members. Specific issues considered essential by AASHTO were included in this code to eliminate the need for supplemental exclusions or additions by AASHTO.

The AASHTO/AWS D1.5, Bridge Welding Code, will be subject to regular review by the Bridge Welding Committee and will be republished or reaffirmed on an as-needed basis, at intervals not to exceed five years. All proposed changes to this code will be subject to approval by AWS and AASHTO prior to publication.

Comments or inquiries pertaining to this code are welcome (see Annex D). They should be addressed to the Secretary, Structural Welding Committee, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126, or to the Chairman of the AASHTO Technical Committee for Welding, American Association of State Highway and Transportation Officials, 444 N. Capitol Street, N.W., Suite No. 225, Washington, DC 20001.

Official interpretations of any of the technical requirements of this standard may be obtained by sending a request, in writing, to the Managing Director of Technical Services Division, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126. A formal reply will be issued after it has been reviewed by the appropriate personnel following established procedures.