Designation: A 964/A 964M – 03

Standard Specification for Corrugated Steel Box Culverts[1]

This standard is issued under the fixed designation A 964/A 964M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers material, geometric, and wall section properties of steel box culverts manufactured from corrugated plate or sheet, with or without attached stiffeners, for field assembly. Appropriate fasteners and optional materials such as steel invert plates and headwalls are also described. Applications for steel box culverts include conduits for gravity flow drainage of surface water such as culverts and storm drains, as well as for small bridges and grade separation structures such as pedestrian or vehicular underpasses, and utility tunnels.

1.2 This specification does not include requirements for foundations, backfill, or the relationship between earth cover or live loads and strength requirements. These important design considerations are described in the AASHTO LRFD Bridge Design Specifications, Customary U.S. Units (LRFD Bridge Design Specifications, SI Units).

1.3 This specification does not include requirements for the hydraulic design of these structures. Hydraulic design, placement of footings or inverts, and end treatments to resist scour are described in FHWA HDS No. 5.

1.4 Appendix X1 lists nominal dimensions of box culvert sizes commonly available. Also listed are cross-sectional area and hydraulic design parameters for these sizes.

1.5 Appendix X2 lists manufacturers' suggested design properties for the box culvert types described in this specification, and for the spacing classes and material thicknesses typically available.

1.6 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 6/A 6M Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

A 36/A 36M Specification for Carbon Structural Steel

A 123/A 123M Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A 761/A 761M Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches

A 796/A 796M Practice for Structural Design of Corrugated Steel Pipe, Pipe-Arches, and Arches for Storm and Sanitary Sewers and Other Buried Applications

A 902 Terminology Relating to Metallic Coated Steel Products

2.2 *AASHTO Standard:*

LRFD Bridge Design Specifications, Customary U.S. Units (LRFD Bridge Design Specifications, SI Units)[3]

2.3 *FHWA Standard:*

HDS No. 5, Hydraulic Design of Highway Culverts, Report No. FHWA-IP-85-15[4]

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of general terms related to metallic coated steel products refer to Terminology A 902.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *box culvert, n*—a generally rectangular conduit having a cross section symmetric about a vertical axis, with a long radius crown segment, short radius haunch segments, and straight side segments, with or without stiffeners, footing plates, or invert plates.

[1] This specification is under the jurisdiction of ASTM Committee A05 on Metallic Coated Iron and Steel Products and is the direct responsibility of Subcommittee A05.17 on Corrugated Steel Pipe Specifications.

Current edition approved October 1, 2003. Published December 2003. Originally approved in 1996. Last previous edition approved in 2002 as A 964/A 964M - 02.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American Association of State Highway and Transportation Officials, 444 N. Capitol St. N.W., Suite 225, Washington, DC 20001.

[4] Available from the National Technical Information Service, Springfield, VA 22161.

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