
Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches

AASHTO Designation: M 219-92 (2021)

Technically Revised: 1992

Reviewed but Not Updated: 2021

Technical Subcommittee: 4b, Flexible and Metallic Pipe

ASTM Designation: B746/B746M-92



**American Association of State Highway and Transportation Officials
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Washington, DC 20004**

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1. SCOPE

- 1.1. This specification covers corrugated aluminum alloy structural plate used in the construction of pipe, pipe-arches, arches, underpasses, and special shapes for field assembly. Appropriate fasteners are also described. The pipe, arches, and other shapes are generally used for drainage purposes, pedestrian and vehicular underpasses, and utility tunnels.
- 1.2. This specification does not include requirements for bedding, backfill, or the relationship between earth cover load and plate thickness of the pipe. Experience has shown that the successful performance of this product depends on the proper selection of plate thickness, type of bedding and backfill, controlled manufacture in the plant, and care in the installation. The purchaser must correlate the above factors and also the corrosion and abrasion requirements of the field installation with the plate thickness. The structural design of corrugated aluminum structural plate pipe and the proper installation procedures are given in *AASHTO LRFD Bridge Design Specifications* and the *AASHTO LRFD Bridge Construction Specifications*. The installation is according to *AASHTO LRFD Bridge Construction Specifications*.

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- M 232M/M 232, Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - *AASHTO LRFD Bridge Design Specifications*
 - *AASHTO LRFD Bridge Construction Specifications*
- 2.2. *ASTM Standards:*
- A563M, Standard Specification for Carbon and Alloy Steel Nuts (Metric)
 - B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
 - B221M, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
 - B666/B666M, Standard Practice for Identification Marking of Aluminum and Magnesium Products
 - B695, Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
 - E29, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

- F467M, Standard Specification for Nonferrous Nuts for General Use (Metric)
- F468M, Standard Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use (Metric)
- F568M, Standard Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners (withdrawn 2012; no replacement)
- F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
- F594, Standard Specification for Stainless Steel Nuts
- F738M, Standard Specification for Stainless Steel Metric Bolts, Screws, and Studs (withdrawn 2015; no replacement)
- F836M, Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric)

2.3. *ANSI Standards:*

- B18.2.3.6M, Bolts, Metric Heavy Hex
- B18.2.4.6M, Hex Nuts, Heavy, Metric

3. TERMINOLOGY

3.1. *Description of Terms Specific to This Standard:*

- 3.1.1. *arch*—a partial circle shape spanning an open invert between the footings on which it rests.
- 3.1.2. *box culvert*—a rectangular box with short radius in upper corners and a long-radius crown. It can be with full invert or with footings pads.
- 3.1.3. *fabricator*—the producer of the components for the finished product.
- 3.1.4. *flat plate*—sheet or plate used to fabricate structural plate.
- 3.1.5. *manufacturer*—the producer of the flat plate and accessories.
- 3.1.6. *pipe*—a conduit having full circular shape; also, in a general context, all structure shapes covered by this specification.
- 3.1.7. *pipe-arch*—an arch shape with an approximate semicircular crown, small-radius corners, and large-radius invert.
- 3.1.8. *pipe, horizontal ellipse*—an elliptically shaped pipe with the horizontal diameter approximately 20 percent greater than the nominal diameter.
- 3.1.9. *pipe, vertically elongated*—an elliptically shaped pipe with the vertical diameter up to 10 percent greater than the nominal diameter.
- 3.1.10. *purchaser*—the purchaser of the finished product.
- 3.1.11. *special shape*—a shape, other than described elsewhere in this section, suitable for fabrication with structural plate.
- 3.1.12. *structural plate*—a corrugated and curved plate, which is field assembled with other structural plates to form the required structure.
- 3.1.13. *vehicular underpass*—a high arch shape with an approximate semicircular crown, large-radius sides, small-radius corners between sides and invert, and large-radius invert.