

MIL-B-11844D(ME)  
 26 August 1976  
 SUPERSEDING  
 MIL-B-11844C(MO)  
 28 March 1966

## MILITARY SPECIFICATION

BRIDGE, FIXED: STEEL, PORTABLE PANEL,  
 BAILEY TYPE M2 (WIDENED ROADWAY)

This specification is approved for use by the Mobility Equipment Research and Development Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

### 1. SCOPE

1.1 This specification covers the structural components of the 12-1/2 foot roadway, M2, Bailey-type bridge.

### 2. APPLICABLE DOCUMENTS

2.1 Issues of documents. The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this specification to the extent specified herein:

### SPECIFICATIONS

#### FEDERAL

FF-B-575	- Bolts, Hexagon and Square.
FF-N-836	- Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat.
FF-S-92	- Screw, Machine: Slotted, Cross-Recessed or Hexagon Head.
FF-S-111	- Screw, Wood.
FF-T-791	- Turnbuckle.
FF-W-92	- Washer, Flat (Plain).
MM-L-736	- Lumber; Hardwood.
MM-L-751	- Lumber; Softwood.

FSC 5420

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QQ-S-781  
RR-C-271

- Strapping, Steel, and Seals.
- Chains and Attachments, Welded and Weldless.
- Wood Preservation: Treating Practices.
- Boxes, Wood, Cleated-Plywood.
- Boxes, Wood, Nailed and Lock-Corner.

TT-W-571

PPP-B-601  
PPP-B-621

MILITARY

MIL-P-116  
MIL-T-704  
MIL-R-52243

- Preservation-Packaging, Methods of.
- Treatment and Painting of Materiel.
- Retainer, Bridge Pin.

STANDARDS

FEDERAL

FED. STD. No. 356  
FED. STD. No. 595

- Commercial Packaging of Supplies and Equipment.
- Colors.

MILITARY

MIL-STD-105  
MIL-STD-129  
MS35751

- Sampling Procedures and Tables for Inspection by Attributes.
- Marking for Shipment and Storage.
- Bolt, Square Neck, Round Head, (Carriage) Steel, Cadmium or Zinc Plated, UNC-2A.

DRAWINGS

ME

D2674-1 through -6  
D6819-1, -2, and -4

- Bridge, Fixed: Steel Portable Panel-M2 Widened Roadway (12'-6") (Bailey-Type).
- Packaging of Components for Bridge, Fixed: Steel, Panel, Bailey-Type M2 (Widened Roadway).

(Copies of specifications, standards, and drawings required by contractor in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- |      |   |
|------|---|
| A27  | - Mild to Medium Strength Carbon-Steel Castings for General Application.                          |
| A36  | - Structural Steel.   |
| A108 | - Cold-Finished Carbon Steel Bars and Shafting.   |
| A120 | - Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses. |
| A183 | - Heat-Treated Carbon Steel Track Bolts and Carbon Steel Nuts.                                    |
| A242 | - High-Strength Low-Alloy Structural Steel.   |
| A322 | - Hot-Rolled Alloy Steel Bars.  |
| A441 | - High-Strength Low-Alloy Structural Manganese Vanadium Steel.                                    |
| A668 | - Steel Forgings, Carbon and Alloy for General Industrial Use.                                    |

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

Boiler and Pressure Vessel Code, Welding Qualifications.

(Application for copies should be addressed to the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.)

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AMERICAN WELDING SOCIETY, INC. (AWS)

- A5.1 - Mild Steel Covered Arc Welding Electrodes.
- A5.18 - Mild Steel Electrodes for Gas Metal-Arc Welding.
- D1.1 - Structural Welding Code, Section 5, Qualification.

(Application for copies should be addressed to the American Welding Society, Inc., 2501 N.W. 7th Street, Miami, FL 33125.)

3. REQUIREMENTS

3.1 Description. The bridge components shall be in accordance with Drawings D2674-1 through -6 and as specified herein.

3.1.1 Drawings. The drawings forming a part of this specification are end product drawings. No deviation from the prescribed dimensions or tolerances is permissible without prior approval of the contracting officer. Where tolerances could cumulatively result in incorrect fits, the contractor shall provide tolerances within those prescribed on the drawings to insure correct fit, assembly, and operation of the bridge components. Any data (e.g. shop drawings, layouts, flow sheets, processing procedures, etc.) prepared by the contractor or obtained from a vendor to support fabrication and manufacture of the production item shall be made available, upon request, for inspection by the contracting officer or his designated representative.

3.2 First article (preproduction model). The contractor shall furnish two or more bridge components for examination within the time frame specified (see 6.2), to prove prior to starting production that his production methods will produce bridge components that comply with the requirements of this specification. Examination and tests shall be as specified in Section 4 and shall be subject to surveillance and approval by the Government (see 6.3).

3.3 Material. Material shall be as specified herein and as shown on the applicable drawings. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

- 3.3.1 Structural steel. Structural steel shall conform to ASTM A36.
- 3.3.2 Low-alloy structural steel. Low-alloy steel shall conform to ASTM A441 or A242.
- 3.3.3 Steel castings. Steel castings shall conform to ASTM A27, Grade 70-40, full annealed.
- 3.3.4 Steel bars and rods. Steel bars and rods except for the panel connector pins shall conform to ASTM A108, Grade Designation 1020.
- 3.3.5 Steel forgings. Steel forgings shall conform to ASTM A668, Class C, annealed or normalized.
- 3.3.6 Lumber.
- 3.3.6.1 Softwood. The lumber for the chess shall conform to MM-L-751 and the grade of lumber shall be Southern Pine No. 1 Dense or Longleaf No. 1 Dense or Douglass Fir No. 1 Dense, S4S. Lumber shall be preservative treated after all cutting has been completed with fluor-chrome arsenate phenol mixture, Type I, in accordance with TT-W-571, minimum net retention 0.50 pound per cubic foot.
- 3.3.6.2 Hardwood. Hardwood for the base plate filler blocks shall conform to MM-L-736, Type II, sound grade, S4S, and shall be preservative treated as specified in 3.3.6.1.
- 3.4 Welding electrodes. Welding electrodes shall conform to AWS A5.1 or AWS A5.18 classification and size as required for the operation.
- 3.5 Turnbuckles. Turnbuckles shall conform to FF-T-791, Type I, form optional, Class 2, 1-1/8 by 6 inches, self-colored, equipped with one jamnut as shown for Type III.
- 3.6 Chain. Chain shall conform to RR-C-271, Type I, Grade C, Class 5, Style 1.
- 3.7 Steel pipe. Steel pipe shall conform to ASTM A120, black, standard weight or extra strong as required, except that the ends shall not be threaded and the hydrostatic test will not be required.
- 3.8 Wood screws. Wood screws shall conform to FF-S-111, Style 2s, carbon steel.

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3.9 Machine screws. Machine screws shall conform to FF-S-92, Type I, Style 1s, carbon steel, cadmium plated.

3.10 Carriage bolts. Carriage bolts shall conform to MS35751.

3.11 Bolts, nuts, and washers.

3.11.1 Bolts. Bolts except for chord bolts shall conform to FF-B-575, Type 2.

3.11.2 Nuts. Nuts shall conform to FF-N-836, Type II, Style 4, UNC-2B.

3.11.3 Washers. Washers shall conform to FF-W-92, Type A, Grade I, Class A.

3.11.4 Chord bolts. Chord bolts shall be fabricated from steel conforming to ASTM A183.

3.12 Bridge-pin retainers. The bridge-pin retainers shall conform to MIL-R-52243, nominal length 5-9/16 inches.

3.13 Panel pins. Panel pins shall be fabricated from steel conforming to ASTM A322, Grade 4140, quenched and tempered to produce a minimum yield strength of 125,000 pounds per square inch (psi), minimum ultimate tensile strength of 140,000 psi, and a minimum elongation of 15 percent in 2 inches.

3.14 Transom clamps and J-bolts. Transom clamps and J-bolts shall be either steel forgings or weldments.

3.15 Treatment and painting. All parts of the bridge components except as specified herein shall be treated and painted in accordance with MIL-T-704, Type A, with a lusterless finish added matching Color No. 36231 of FED. STD. No. 595. Ribband J-bolts, pins, bolts, nuts, washers, and threaded surfaces of components shall not be painted but shall be coated with preservative as specified in 5.1.

3.16 Stenciling. The nomenclature, National Stock Number, weight, and cubage shall be stenciled on each major bridge component on one side and one end of the part. The letters "NET WT" shall precede the numerals in the weight and the letters "CU" shall precede the cubic displacement. Markings shall be Gothic-type capitals and Arabic numerals 3/4 inch high. Stenciling shall conform to MIL-T-704.

3.17 Government-loaned property. Unless otherwise specified (see 6.2), the following property in the quantities indicated will be loaned by the Government (see 6.4):

Item No.	Description	Identification	Quantity
1.	Inspection equipment for Bridge, Fixed: Steel, Portable Panel, Bailey-Type M2 (Widened Roadway)	Quality Assurance Pamphlet, AMXFB-P715-127	1

3.18 Workmanship. The fabricated bridge components shall be free of sharp edges, slivers, or burrs.

3.18.1 Steel fabrication. Steel used in the fabrication of the bridge components shall be free from lamination, kinks, and sharp bends. Steel shall be cut by shearing, sawing, or flame cutting. Burned surfaces of flame cut material shall be ground or machined to remove ash and cooling checks. The straightening of material shall be done by methods that will not cause injury to the metal. Precautions shall be taken to avoid overheating, and heated metal shall be allowed to cool slowly.

#### 3.18.2 Welders and welding.

3.18.2.1 Welders. Before assigning any welder to manual or automatic welding work covered by this specification, the contractor shall provide the contracting officer with certification that the welder has passed qualification tests as prescribed by either of the following listed codes for the type of welding operations to be performed and that such qualification is effective as defined by the particular code:

AWS D1.1, Structural Welding Code, Section 5, Qualification.  
ASME Boiler and Pressure Vessel Code, Section IX, Welding Qualifications.

Contractors who make only horizontal welds need not qualify welders for "all position welding". Subject to approval by the Government, the contractor's standard welder qualification may be substituted in lieu of the above codes provided that the contractor's procedure is equivalent to the above codes. The contractor shall be responsible for determining that automatic welding equipment operators are capable of producing quality welds in accordance with AWS or ASME codes. Operators of automatic welding equipment shall be considered welders.

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3.18.2.2 Welding. The surface of parts to be welded shall be free from scale, paint, grease, and other foreign matter. Welding shall be done by the shielded, electric-arc method and shall conform to the provisions of the current American Welding Society publication "D1.1 Structural Welding Code" and as further specified herein. Work shall be positioned for flat welding whenever practicable. Before welding over previously deposited weld metal, all traces of slag shall be removed, and the deposit and adjoining base metal shall be wire brushed clean. The finished item shall be straight and within toleranced dimensions. Straightening and stress relieving shall be permitted to relieve distortion, provided the straightening process does not damage the end item.

3.18.2.2.1 Welding jigs. Components shall be assembled in steel jigs or frames and welded while held in position. The jigs or frames shall be of a design that will limit the distortion to an amount that can be removed without changing the physical characteristics of the metal of the parts being welded.

3.18.3 Pin connections. All pin holes shall be accurately drilled or bored full size through steel drilling templates after all welding has been completed. As an alternate, the pin holes may be subpunched in the plates or shapes or cored undersize in the castings prior to assembly and welding, and then reamed to full size through steel drilling templates after assembly and welding. The cored or subpunched holes shall have a maximum diameter  $3/8$  inch less than the hole size specified and shall be accurately located so that the entire surface of the cored or subpunched hole will be cut during reaming. The holes shall be drilled, bored, or reamed straight through the various parts and shall be within the tolerances specified for position and size. Special care shall be taken to keep panel pin holes in line where so noted on the drawings. The steel drilling template shall be equipped with hardened steel drilling bushings accurately located.

3.18.4 Interchangeability. Like units shall be fabricated to be duplicates within the tolerances specified and shall be interchangeable.

3.18.5 Machine work. Tolerances and gages for metal fits shall conform to the limitations specified herein and on the applicable drawings. Tolerances for positioning of holes and parts shall be referenced from one end or side of the member and shall not be cumulative.



#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Component and material inspection. The contractor is responsible for insuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- (a) Preproduction inspection (see 4.3).
- (b) Quality conformance inspection (see 4.4).
- (c) Inspection of packaging (see 4.6).

#### 4.3 Preproduction inspection.

4.3.1 Examination. The bridge components shall be examined as specified in 4.5.1 and 4.5.2. Presence of one or more defects shall be cause for rejection.

#### 4.4 Quality conformance inspection.

4.4.1 Sampling. Sampling for examination shall be in accordance with MIL-STD-105.

#### 4.4.2 Examination.

4.4.2.1 Individual. Each bridge component shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.4.2.2 Samples. Samples selected in accordance with 4.4.1 shall be examined as specified in 4.5.2. AQL shall be 2.5 percent defective.

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#### 4.5 Inspection procedures.

4.5.1 Individual examination. Each bridge component shall be measured or gaged for conformance to the dimensions identified by the symbol  $\textcircled{I}$  on the drawings. Nonconformance to any dimension identified by the symbol  $\textcircled{I}$  on the drawings shall constitute failure of this examination.

4.5.2 Sample examination. The sample bridge components shall be examined for the following defects:

101. Nonconformance to the dimensions other than those identified by the symbol  $\textcircled{I}$  shown on the drawings.
102. Material not as specified.
103. Components missing or not as specified.
104. Identification marking incorrect, missing, or illegible.
105. Treatment and painting not as specified.
106. Stenciling not as specified.
107. Workmanship not as specified.

#### 4.6 Inspection of packaging.

##### 4.6.1 Quality conformance inspection of pack.

4.6.1.1 Unit of product. For the purpose of inspection, a completed pack prepared for shipment shall be considered a unit of product.

4.6.1.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105.

4.6.1.3 Examination. Samples selected in accordance with 4.6.1.2 shall be examined for the following defects. AQL shall be 2.5 percent defective.

108. Materials and containers not as specified for Level A or B. Each incorrect material or container shall be considered one defect.
109. Unpainted metal surfaces requiring a contact preservative in accordance with the referenced document not coated with the specified preservative for Level A or B or Commercial.
110. Components not prepared for delivery in accordance with the referenced drawings for Level A or B.

111. Contents not blocked, braced, anchored, or immobilized in accordance with the referenced document for Level A or B.
112. Strapping not as specified for Level A or B.
113. Marking illegible, incorrect, incomplete, or missing for Level A or B, or Commercial.

## 5. PACKAGING

5.1 Preservation. Unprotected metal surfaces of structural members and other components such as bracing, connector, and ribband bolts, transom clamps, connector, sway brace, and retainer pins, and any other unprotected metal surfaces requiring the application of a contact preservative in accordance with MIL-P-116 shall be coated with Type P-1 preservative. The preservative shall conform to the applicable specification listed in and shall be applied in accordance with MIL-P-116.

5.2 Packing. Packing shall be Level A or B, or Commercial as specified (see 6.2).

5.2.1 Level A. The bridge components shall be prepared for delivery as loose, boxed, or bundled components as shown on Drawings D6819-1, -2, and -4. Boxes shall conform to PPP-B-621, Class 2, style optional, or PPP-B-601, Overseas Type, Grade B, style optional. The box contents shall be blocked, braced, or anchored as required to prevent movement. Box closure and strapping shall be in accordance with the appendix to the applicable box specification. The strapping for boxes and bundles shall conform to QQ-S-781, Class 1, Type I or IV, size as applicable, and unless otherwise specified shall be Finish B (see 6.2). When specified, Finish A strapping shall be used.

5.2.2 Level B. The bridge components shall be prepared for delivery as specified in 5.2.1 for Level A except boxes shall be Domestic Type or Class, as applicable.

5.2.3 Commercial. The bridge components shall be prepared for delivery in accordance with FED. STD. No. 356.

## 5.3 Marking.

5.3.1 Military. Boxes, bundles, and loose components shall be marked in accordance with MIL-STD-129.

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5.3.2 Commercial. Boxes, bundles, and loose components shall be marked in accordance with FED. STD. No. 356.

6. NOTES

6.1 Intended use. The bridge components are intended for use in the assembly of fixed bridges and panel crib piers and towers in both tactical and line of communication usage.

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Time frame required for submission of the preproduction model and number of preproduction components required (see 3.2).
- (c) When other than Finish B strapping is required (see 5.2.1).
- (d) Level of packing required (see 5.2).

6.3 Preproduction model. Any changes or deviations of production bridge components from the approved preproduction model during production will be subject to the approval of the contracting officer. Approval of the preproduction model will not relieve the contractor of his obligation to furnish bridge components conforming to this specification.

6.4 Government-loaned property. The contracting officer should arrange to loan the inspection equipment specified in 3.17.

Custodian:  
Army - ME

Preparing activity:  
Army - ME

Project 5420-A233

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL		OMB Approval No. 22-R255
<p><b>INSTRUCTIONS:</b> The purpose of this form is to solicit beneficial comments which will help achieve procurement of suitable products at reasonable cost and minimum delay, or will otherwise enhance use of the document. DoD contractors, government activities, or manufacturers/vendors who are prospective suppliers of the product are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity.</p>		
DOCUMENT IDENTIFIER AND TITLE <b>MIL-B-11844D(ME) Bridge, Fixed; Steel, Portable Panel, Bailey Type M2 (Widened Roadway)</b>		
NAME OF ORGANIZATION AND ADDRESS	CONTRACT NUMBER	
	MATERIAL PROCURED UNDER A <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT	
<p>1. HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.</p> <p>B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES</p>		
2. COMMENTS ON ANY DOCUMENT REQUIREMENT CONSIDERED TOO RIGID		
<p>3. IS THE DOCUMENT RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO (If "Yes", in what way?)</p>		
4. REMARKS		
SUBMITTED BY (Printed or typed name and address - Optional)		TELEPHONE NO.
		DATE