



Product Specifications

Bedford M•E•2 Pedestrian Bridge

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Specification for FRP Pedestrian Bridge

PART 1 – GENERAL

1.1 Scope

- A. This specification covers the details about the design criteria, material qualification, fabrication, shipping and installation of a pre-engineered clear span Fiberglass Reinforced Polymer (FRP) composite pedestrian bridge.

1.2 Submittals

- A. Product Data include material descriptions, dimensions of individual components and profiles, and finishes for pedestrian bridge.
- B. Shop Drawings include plans, elevations, section and assembly details.
- C. Shop drawings shall designate all piece marks and components for field assembly of bridge.
- D. Shop drawings and assembly drawings, along with complete calculation package, include all components and connections. Drawing and calculation package shall be sealed and signed by a registered professional engineer.

1.3 Quality Assurance

- A. Manufacturer Qualification: The bridge manufacturer shall have been in business of producing products for bridges for a minimum of five years and provide a list of at least five successful bridge projects of similar construction.
- B. Product Tests: The manufacturer shall furnish test data indicating the FRP products comply with the requirements.

PART 2 – DESIGN

- 2.1 The span and width of the bridge shall be measured between end to end of the bridge, inside faces of the structural members at the deck level respectively. These dimensions shall be given in feet, inches (Ex: XX', YY").

2.2 Design Standards

- A. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures

2.3 Structural Performance

- A. Uniform Live Load: 85 psf for bridge lengths up to 50 feet and 60 psf for bridge lengths above 50 feet
- B. Vehicle Live Load: None. The design shall allow the occasional use of an ATV or similar vehicle for trail maintenance operations.
- C. Snow Load, Wind Load and Seismic Load: As per ASCE 7-10 Minimum Design Loads for Buildings and Other Structures

2.4 Serviceability Criteria

- A. If applicable, pre-camber the bridge to eliminate the dead load deflection.
- B. Limit deflection to a maximum of $L/240$.
- C. Vertical fundamental frequency shall be greater than or equal to 5 Hz.
- D. Horizontal fundamental frequency shall be greater than or equal to 3 Hz.

2.5 Railing and Toeplates

- A. The top rail shall be a minimum of 42" above the walking surface and shall follow the OSHA standard 1910.29 load rating for handrails.
- B. Mid-rails/Guards and Toeplates: The mid-rails shall be continuous and spaced at a maximum distance of 9". The toeplates shall be a continuous FRP toeplate with a projection of at least 2" above adjacent walking surface.

2.6 Pultruded Products

- A. All the pultruded products shall be made of Isophthalic Polyester resin system. The resin may contain fillers and additives such as flame retardants, UV light absorbers, pigments, etc., as needed.
- B. All the pultruded parts shall have a minimum of 50% glass and all the glass reinforcements shall be made of either E-glass or superior continuous glass rovings and/or continuous stranded mats.

- C. Unless specified, all the parts shall have a minimum of 7 mil thick synthetic polyester surface veil on the outer surface of the pultruded part.
- D. All the pultruded parts shall be in conformance with latest ASTM D 4385 for “Standard Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Products” and latest ASTM D 3917 for “Standard Specification for Dimensional Tolerance of Thermosetting Glass-Reinforced Plastic Pultruded Shapes.”
- E. The mechanical, physical, fire and electrical properties shall meet or exceed the values given in Table 1:

Table 1. Minimum Properties

Property	ASTM	Value
Tensile Strength, psi	D 638	30000
Tensile Modulus, psi	D 638	2.5 x 10 ⁶
Flexural Strength, psi	D 790	30000
Flexural Modulus, psi	D 790	1.8 x 10 ⁶
Short Beam Shear, psi	D 2344	4500
Full Section Modulus, psi	N/A	2.8 x 10 ⁶
Density, lb/in ³	D 792	0.062-0.07

- 2.7 Color:** Bedford Reinforced Plastics Standard Brown/Green
- 2.8 Bridge Decking:** 3 x 12 #2 Southern Yellow Pine (SYP) lumber planking installed perpendicular to the direction of traffic on the bridge with gaps provided between planks of no more than 0.5" and no less than 0.25".
- 2.9 Fasteners**
 - A. Bolted connections shall utilize a minimum of A307 hot-dipped galvanized steel bolts, nuts and washers.
- 2.10 Mounting Devices**
 - A. Metal components for mounting or anchorage to foundations shall be galvanized or stainless steel.

PART 3 – FABRICATION

- 3.1** Fully fabricate and mark all components for field assembly without field modification.
- 3.2** Fabricate all connections in a manner to allow free draining of water away from the connection.
- 3.3** The manufacturer shall furnish all the engineering data including the support reactions, anchor bolt location and placement to the contract. It is owner/contractor’s responsibility to design and construct the bridge supporting foundations.

PART 4 – SHIPPING AND INSTALLATION

- 4.1** Delivery of the fabricated parts or assembled bridge shall be made to the agreed upon location. Transportation from the delivery site to location of installation shall be the responsibility of the owner.
- 4.2** Vendor shall notify the owner/contractor at least 24 hours in advance of the expected time of delivery of the fabricated parts or assembled bridge.
- 4.3** Unloading, splicing and placement of the bridge shall be the responsibility of the owner/contractor.