

FIBERGLASS TRUSSES



STANDARD SPECIFICATION For PRESTRESSED BEAM-TRUSSES

1.0 GENERAL

1.1 Scope

These specifications for fully engineered prestressed beam-trusses of fiber reinforced plastic (FRP) construction in buildings shall be regarded as minimum standards for design and construction. The specifications are governed by criteria specified in the IBC and ASCE Codes. The prestressed beam-trusses shall be designed by Fiberglass Trusses, Inc., 213 Monroe St., Philadelphia, PA 19147. Call (215) 901-5619 if you have any questions.

1.2 Qualified Suppliers

The manufacturer shall provide a list of 5 successful projects demonstrating expertise in prestressed beam-truss and truss design. Each of these projects has been in service for at least 5 years. List the location and contact reference for each project.

2.0 DESIGN FEATURES

2.1 Definition

The term “prestressed” refers to preloading of a beam-truss component before the application of the required design load. This provides increased strength and stiffness to the component in the support of floor and roof type systems.

2.2 Components

Prestressed beam-trusses have been standardized in depths ranging from 2'-0" to 5'-0" for spans up to 50'-0". The maximum uniform distributed load capacity can be found in the Prestressed Beam-Truss Load Table provided. Custom prestressed beam-trusses can be designed upon request.

3.0 ENGINEERING

3.1 Basis

Prestressed beam-trusses shall be designed in accordance with this specification as simply-supported members supporting a floor or roof deck. It is assumed that the floor or roof deck brace the top member of the prestressed beam-truss against lateral buckling.

3.2 Allowable Stress Design Approach

Structural design shall be performed by or under the direct supervision of a Licensed Professional Engineer and done in accordance with recognized engineering practices and principles.

The Allowable Strength Design (ASD) method is used for the design of all structural members.

Factors of safety used are as follows: (Based on Ultimate Strength of FRP material)

Tension	- 2.5
Compression	- 2.5
Shear	- 2.5
Bending	- 2.5
End Bearing	- 2.5
Connections	- 2.5

3.3 Serviceability Criteria

Service loads are used for the design of all structural members when addressing deflection issues. Recommended criteria are as follows:

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Deflection:

Floor Live Load L/360

Roof Live Load **L/360 (plaster ceiling)**
L/240

Total Live Load **L/180**

3.4 Uniform Live Load

Floor Live Load = 40 psf (unless otherwise required)
Roof Live Load = 20 psf

3.5 Snow Loading

Snow Load = 25 psf (unless otherwise required)

3.6 Wind Loading

Wind Load = 20 psf (unless otherwise required)

3.7 Seismic Load

Seismic Design Site class D for soil per IBC (unless otherwise required)

4.0 FRP MATERIAL:

4.1 Prestressed beam-trusses are fabricated from high strength E-glass and isophthalic polyester resin unless otherwise specified. Weathering and ultraviolet light protection shall be provided by addition of a veil to the laminate construction.

4.2 Minimum material specifications (ultimate strength and Young's Modulus) are as follows for open and closed sections:

Tension - **60,000 psi**
Compression - **60,000 psi**
Shear - **5,000 psi**
Bending - **60,000 psi**

Young's Modulus(E) - 4,500,000 psi
(can be higher depending on the shape)

The minimum thickness of FRP shapes shall be as follows unless otherwise specified: Square tube members (closed type shape) shall be 0.25 in. Wide flange beams, channel sections and angles (open type shapes) shall be a minimum thickness of 0.25 in. Standard plate shall be a minimum thickness of 0.25 in.

4.3 Decking

High strength E-glass/isophthalic polyester resin roof and/or floor decking will be provided unless otherwise specified.

4.4 Hardware

Bolted connections and mounting devices will be galvanized A307 steel unless otherwise specified.

5.0 SUBMITTALS

5.1 Submittal Drawings

Schematic drawings and diagrams shall be submitted to the client for their review after receipt of order. As required, all drawings shall be signed by a licensed Professional Engineer.

5.2 Submittal Calculations

As required, structural calculations shall be submitted to the client. All calculations will be signed and sealed by a licensed Professional Engineer.

6.0 FABRICATION

6.1 Tolerances

All cutting and drilling fabrication will be done by experienced fiberglass workers using carbide or diamond-tipped tooling to a tolerance of 1/16". No material deviations beyond industry standards are accepted. All cut edges will be cleaned and sealed. CNC equipment can also be used in the fabrication process.

7.0 FINISHING

Component color shall be determined by the client with green, dark grey and tan as standard options. No painting is required as the color is added during the manufacturing process. Custom colors can be provided upon request. A urethane protective coating is recommended for outdoor usage.

8.0 DELIVERY

Delivery is made by truck to a location nearest the site accessible by roads. Fiberglass Trusses, Inc. will notify the client in advance of the expected time of arrival at the site. Prestressed beam-trusses will be shipped assembled unless otherwise specified. Components shipped unassembled can be completely assembled on site using standard hand tools. Unloading, splicing (if required) and placement of the prestressed beam-trusses will be the responsibility of the client.

9.0 ERECTION

Prestressed beam-trusses will be shipped assembled unless otherwise specified. Fiberglass Trusses, Inc. shall advise the client of the actual weights and lifting points of the components for proper installation. Location drawings will be provided. For components shipped partially assembled or unassembled, drawings and a recommended assembly procedure will be provided.

10.0 WARRANTY

Fiberglass Trusses, Inc. shall warrant the structural integrity of all FRP materials, design and workmanship for 15 years.

This warranty shall not cover defects in the prestressed beam-truss components caused by foundation failures, abuse, misuse, overloading, accident, faulty construction or alteration, or other cause not the result of defective materials or workmanship.

This warranty shall be limited to the repair or replacement of structural defects, and shall not include liability for consequential or incidental damages.