

FRP Specifications

Fiberglass Reinforced Polymer (FRP) Light Duty Decking Panels and Fabrications

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FIBERGLASS REINFORCED POLYMER (FRP) PRODUCTS AND FABRICATIONS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

1.02 SUMMARY:

- A. This section includes FRP Products & Fabrications for FRP Light Duty Decking panels.

1.03 SCOPE OF WORK:

- A. Furnish all labor, materials, equipment and incidentals governed by this section necessary to install the fiberglass reinforced polymer (FRP) products as specified herein.

1.04 QUALITY ASSURANCE:

- A. The material covered by these specifications shall be furnished by an ISO-9001 certified manufacturer of proven ability who is regularly engaged in the manufacture, fabrication and installation of FRP systems.
- B. The substitution of any component or modification of the system shall be made only when approved by the Architect or Design Engineer.
- C. Fabricator Qualifications: Firm experienced in successfully producing FRP fabrications similar to that indicated for this project, with sufficient production capacity to produce required units without causing delay in the work.
- D. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

1.05 DESIGN CRITERIA:

- A. The design of FRP products, including connections, shall be in accordance with governing building codes and standards as applicable.
- B. Design load is considered as uniform loading over the entire decking panels. Design live loads shall be in accordance with the following minimum design loads based on the latest adopted International Building Code:
 - 60 psf live load (non-emergency exit walkways)
 - 300 lb concentrated load (on 12" x 12" area)
- C. Decking panels shall not deflect more than 1/4" and structural support members shall not deflect more than L/240 of span for structural members unless specifically stated otherwise in drawings and/or supplementary conditions. Connections shall be designed to transfer the design loads.
- D. Panels weakened by penetrations, cuts, etc. shall be stiffened or reinforced as necessary to restore their capacity to withstand the specified loading and deflection limits.
- E. Design decking panels in accordance with the Strongwell Design Manual for in-service temperatures of 125 degrees F with ultimate stress retention of 85% for 125 degrees and a modulus of elasticity retention of 90% for 125 degrees.

1.06 SUBMITTALS:

- A. Shop drawings of all fabricated pultruded Light Duty Decking Panels shall be submitted to the Design Engineer for approval. Fabrication shall not start until receipt of Design Engineer's approval marked "Approved as Submitted" or "Approved As Noted".
- B. Manufacturer's catalog data showing:
 - 1. Materials of construction
 - 2. Dimensions, spacings, and construction of grating, handrails and building panels.
- C. Detail shop drawings showing:
 - 1. Dimensions
 - 2. Sectional assembly
 - 3. Location and identification mark
 - 4. Size and type of supporting frames required

1.07 SHIPPING AND STORAGE INSTRUCTIONS:

- A. All systems, sub-systems and structures shall be shop fabricated and assembled into the largest practical size suitable for transporting.
- B. All materials and equipment necessary for the fabrication and installation of pultruded Light Duty Decking Panels and appurtenances shall be stored before, during, and after shipment in a manner to prevent cracking, twisting, bending, breaking, chipping

or damage of any kind to the materials or equipment, including damage due to over exposure to the sun. Any material which, in the opinion of the Design Engineer, has become damaged as to be unfit for use, should be promptly removed from the site of work, and the Contractor shall receive no compensation for the damaged material or its removal.

- C. Identify and match-mark all materials, items and fabrications for installation and field assembly.

PART 2 – PRODUCTS

2.01 GENERAL:

- A. Materials used in the manufacture of the FRP products shall be raw materials in conformance with the specification and certified as meeting the manufacturer's approved list of raw materials.
- B. All raw materials shall be as specified by the contract.
- C. The visual quality of the pultruded shapes shall conform to ASTM D4385.
- D. FRP Light Duty Decking Panels shall be manufactured using a pultruded process utilizing polyester or vinyl ester resin with flame retardant and ultraviolet (UV) inhibitor additives. A synthetic surface veil fabric shall encase the glass reinforcement. FRP shapes shall achieve a flame spread rating of 25 or less in accordance with ASTM test method E-84, the flammability characteristics of UL 94 V0 and the self-extinguishing requirements of ASTM D635. Polyester resin is available without flame retardant and UV inhibitor additives.
- E. If required, after fabrication, all cut ends, holes and abrasions of FRP shapes shall be sealed with a compatible resin coating.
- F. FRP products exposed to weather shall contain an ultraviolet inhibitor. Should additional ultraviolet protection be required, a one mil minimum UV coating can be applied.
- G. All exposed surfaces shall be smooth and true to form, consistent with ASTM D4385.
- H. Pultruded FRP products shall be manufactured and fabricated in the USA. Manufacturers shall provide a written Certificate of Compliance.
- I. The materials covered by these specifications shall be furnished by an ISO-9001 certified manufacturer.
- J. For walkway surfaces the top of all panels shall have a non-skid grit surface.

2.02 FRP SAFDECK® PANEL

- A. Materials

- Each Light Duty Decking Panel shall be manufactured by pultrusion. A minimum of 7 mil. The synthetic surface veil shall be the outermost layer covering the exterior surface.
- SAFDECK® Panels shall be manufactured by Strongwell.
- Fabrication and design by National Water Treatment Products 7870 West Ridge Road Suite #9 Fairview PA, 16415 dvorse@nationalcomposites.com

B. Design

24" SAFDECK® Load / Deflection Data

I = 0.439 in.⁴ Wt = 4.1 lb/lin. Ft (gritted)

SPAN LENGTH (l)		25 u=1197 c=365	50 u=2394 c=730	60 u=2873 c=876	75 u=3591 c=1095	100 u=4788 c=1460	200 u=9576 c=2920	300 u=14364 c=4380
24" 610mm	Δu	0.015	0.030	0.036	0.044	0.059	0.119	0.179
	Δu	0.38	0.76	0.91	1.12	1.50	3.02	4.55
	Δc	0.012	0.023	0.029	0.036	0.048	0.096	0.143
	Δc	0.30	0.58	0.74	0.91	1.22	2.44	3.63
36" 914mm	Δu	0.063	0.126	0.151	0.189	0.252		
	Δu	1.60	3.20	3.84	4.80	6.40		
	Δc	0.032	0.064	0.81	0.101	0.134	0.269	
	Δc	0.81	1.63	2.06	2.57	3.40	6.83	
48" 1219mm	Δu	0.215	0.430					
	Δu	5.46	10.92					
	Δc	0.073	0.147	0.206	0.257	0.343		
	Δc	1.85	3.73	5.23	6.53	8.71		

Maximum deflections shown are based on a deflection of approximately L/100. To calculate the maximum deflection for a simply supported continuous beam spanning two equal lengths with the uniform or concentrated load on one span only, multiply the above deflections by 0.71.

u=Uniform load in lbs/ft² (N/m²). For example, a 100 lb uniform load over 3 ft² is 300 lbs of total load.
 Δu=Typical deflection under the uniform load in inches (mm)

c =Concentrated load in lbs/ft of width (N/m of width)
 Δc =Typical deflection under concentrated load in inches (mm)

C. Hardware

- All fasteners, anchors, and structural hardware shall be 316 stainless steel.
- All connections of SAFDECK® Panels to fiberglass columns or super structure shall be as shown in the approved shop drawings.

PART 3 – EXECUTION

3.01 PREPARATION:

- Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction.
- Coordinate delivery of all listed items to the project site.

3.02 INSPECTION AND TESTING:

- A. All labor, power, materials, equipment, and appurtenance required for testing shall be furnished by the Contractor at no cost to the Owner.

3.03 INSTALLATION, GENERAL:

- A. Fastening to in-place construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous FRP fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts and other connectors as determined by the Design Engineer.
- B. Cutting, fitting and placement: Perform cutting, drilling, and fitting required for installation of miscellaneous FRP fabrications. Set FRP fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true and free of rack; measured from established lines and levels.
- C. Provide temporary bracing or anchors in form work for items that are to be built into concrete masonry or similar construction.

3.04 ALL FRP INSTALLATION:

- A. If required, all field cut and drilled edges, holes and abrasions shall be sealed with a catalyzed resin compatible with the original resin as recommended by the manufacturer.
- B. Install items specified as indicated and in accordance with manufacturer's instructions.

End of Section 06600