



**STRONGWELL®**

## **FRP Specifications**

**Section 06 73 13**

### **Fiberglass Reinforced Polymer (FRP) Pedestrian Walkway Planks and Fabrications**

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## **SECTION 06 73 13**

### **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 Pedestrian Walkway Planks in 12” and 24” widths.

##### 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. Substitution of any component or modification of 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 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 plank system. 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. Planks shall not deflect more than  $\frac{1}{4}$ " 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. Planks 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 planks in accordance with the Strongwell Design Manual for in-service temperatures of \_\_\_\_\_ degrees Fahrenheit (example: 125 degrees) with ultimate stress retention of \_\_\_\_\_ (example: 85% for 125 degrees) and a modulus of elasticity retention of \_\_\_\_\_ (example: 90% for 125 degrees).

#### 1.06 SUBMITTALS:

- A. Shop drawings of all fabricated pultruded SAFPLANK® planks shall be submitted to the Design Engineer for approval in accordance with the requirements of Section \_\_\_\_\_. 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 planks or panels.
- C. Detail shop drawings showing:
  - 1. Dimensions
  - 2. Sectional assembly
  - 3. Location and identification mark
  - 4. Size and type of supporting frames required
- D. Samples of each type of product shall be submitted for approval in accordance with the requirements of Section \_\_\_\_\_.

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 SAFPLANK® planks 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, shall 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. FRP planks shall be shipped from the manufacturer, palletized and banded with exposed edges protected to prevent damage in shipment.
- B. Each piece shall be clearly marked showing manufacturer's applicable drawing number.
- C. FRP planks shall be SAFPLANK® as manufactured by Strongwell.

### 2.02 FRP SAFPLANK® PLANKS

#### A. Materials

- 1. The FRP planks shall be manufactured by the pultrusion process. Planks will be manufactured using polyester resin to ANSI/NSF standard 61 certified for potable water applications, if required. The planks shall be 2" (50 mm) deep and \_\_\_\_\_ (select 12" (300 mm) or 24" (600 mm)) wide with interlocking joints on outside legs of plank. The glass fiber reinforcement for the planks shall be a core of continuous glass strand rovings wrapped with continuous strand glass mat. A synthetic surface veil shall be the outermost layer covering the exterior surfaces.
- 2. Fiberglass planks shall be made from a fire retardant (select premium polyester or vinyl ester) resin system that meets the flame spread rating of 25 or less in accordance with ASTM E-84, flammability characteristics of UL 94 V0 and meets the self-extinguishing requirements of ASTM D635. UV inhibitors are added to the resin.
- 3. SAFPLANK® planks shall be manufactured by Strongwell.
- 4. Color shall be slate gray.

## B. Design

1. The top surface of all planks shall have a non-skid grit.
2. Planks shall be fabrication to the sizes show on the drawings.
- 3.

### SAFPLANK® Load / Deflection Data

SPAN		12" SAFPLANK® $I_{12} = 1.69 \text{ in.}^4$ , wt = 2.6 lb/lin. ft (gritted)						24" SAFPLANK® $I_{24} = 3.01 \text{ in.}^4$ , wt = 5.1 lb/lin.ft (gritted)				
		50 u=2394 c= 730	100 u=4788 c=1460	200 u=9576 c=2920	300 u=14364 c=4380	500 u=23990 c=7300	1000 u=47888 c=14600	100 u=4788 c=1460	200 u=9576 c=2920	300 u=14364 c=4380	500 u=28990 c=7300	1000 u=47888 c=14600
		24" 610 mm	$\Delta u$	.006	.011	.023	.034	.057	.113	.015	.030	.045
	$\Delta u$	.152	.279	.584	.864	1.448	2.87	.381	.762	1.143	1.905	3.835
	$\Delta c$	< .005	.009	.018	.027	.045	.091	.012	.024	.036	.060	.121
	$\Delta c$	< .127	.229	.457	.686	1.143	2.311	.305	.610	.914	1.524	3.073
36" 914 mm	$\Delta u$	.022	.043	.087	.130	.217		.046	.092	.138	.231	
	$\Delta u$	.559	1.092	2.210	3.302	5.512		1.168	2.337	3.505	5.867	
	$\Delta c$	.012	.023	.046	.070	.116	.232	.024	.049	.074	.123	.246
	$\Delta c$	.305	.584	1.168	1.778	2.946	5.893	.610	1.245	1.870	3.124	6.248
48" 1219 mm	$\Delta u$	.062	.123	.247	.370			.133	.265	.398		
	$\Delta u$	1.575	3.124	6.274	9.398			3.378	6.731	10.109		
	$\Delta c$	.025	.049	.099	.148	.247	.494	.053	.106	.159	.265	
	$\Delta c$	.635	1.245	2.515	3.759	6.274	12.548	1.346	2.692	4.039	6.731	
60" 1524 mm	$\Delta u$	.140	.281	.562				.302	.605			
	$\Delta u$	3.556	7.137	14.275				7.671	15.367			
	$\Delta c$	.045	.090	.180	.270	.450		.097	.193	.290	.484	
	$\Delta c$	1.143	2.286	4.572	6.858	11.43		2.464	4.902	7.417	12.294	
72" 1829 mm	$\Delta u$	.291	.583					.627				
	$\Delta u$	7.391	14.808					15.926				
	$\Delta c$	.078	.155	.311	.466			.167	.334	.501		
	$\Delta c$	1.981	3.937	7.899	11.836			4.242	8.611	12.725		

Maximum deflections shown are based on a deflection of approximately L/100

u=Uniform load in lbs/ft<sup>2</sup> (N/m<sup>2</sup>). For example, a 100 lb uniform load over 3 ft<sup>2</sup> is 300 lbs of total load.  
 $\Delta u$ =Typical deflection under the uniform load in inches (mm)

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

SAFPLANK® joints have been tested for 300 lbs concentrated point load applied over 4 in.<sup>2</sup> area (See ASCE 7 – Minimum Design Loads for Buildings and other Structures). For 24" span, a 300 lbs concentrated load has a factor of safety (FS) of 6, for 36" FS of 4, and for 48" FS of 3. Spans should be limited to 48" for this type of loading.

## C. Hardware

1. All fasteners, anchors, and structural hardware shall be 316 stainless steel.
2. All connections of SAFPLANK® planks to fiberglass columns or super structure shall be as shown on the approved shop drawings.

SELECT ONE

## D. Approved Manufacturers

1. STRONGWELL



## **PART 3 – EXECUTION**

### **3.01 PREPARATION:**

- A. 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.
- B. Coordinate delivery of all listed items to project site.

### **3.02 INSPECTION AND TESTING:**

- A. The Design Engineer shall have the right to inspect and test all materials to be furnished under these specifications prior to their shipment from the point of manufacture.
- B. All labor, power, materials, equipment and appurtenances 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**