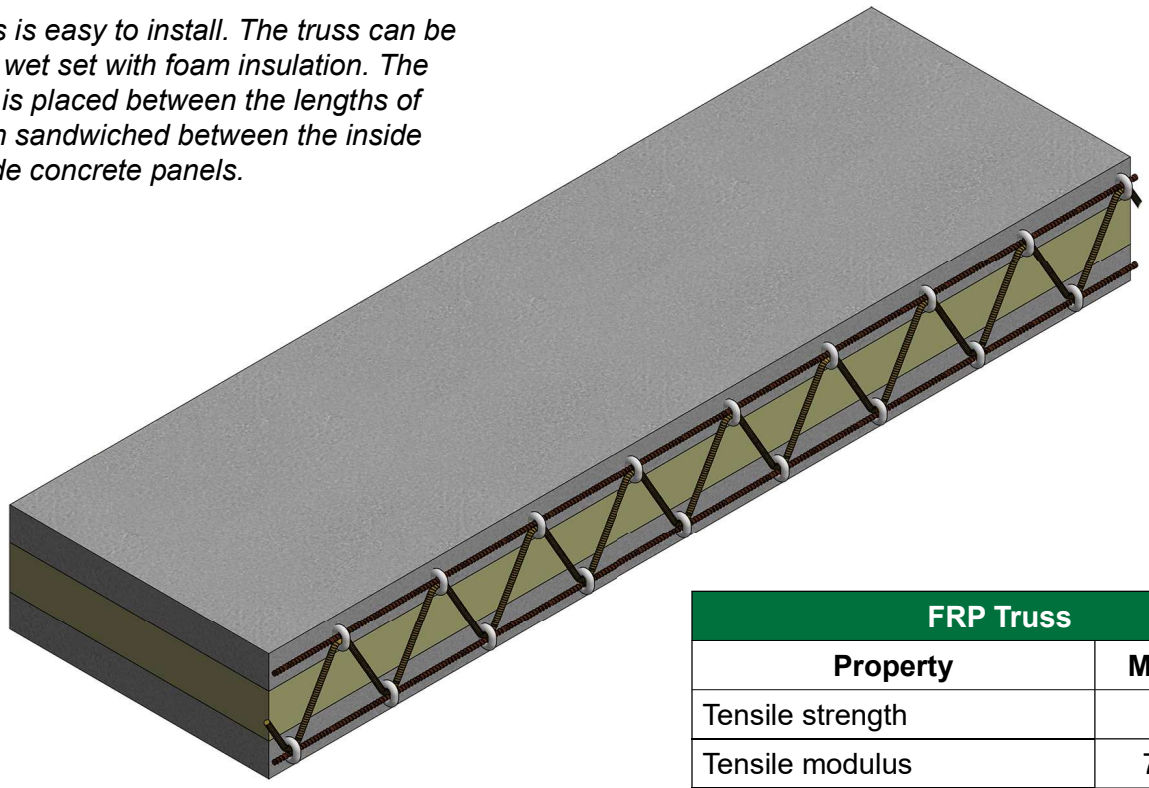
FRP Truss

Low-thermal conducting fiber reinforced truss for precast concrete “sandwich” panels

This FRP Truss develops strength and rigidity from a fiber reinforced design. Two parallel rods are attached top and bottom to a zig-zag rod with plastic connectors at every intersection. Foam insulation is placed between lengths of FRP Truss and sandwiched between the inside and outside concrete panels to provide the following advantages:

- Fiber reinforced material improves the thermal efficiency of panels and reduces cold bridging.
- Supports all working loads, including stripping, handling, transportation, installation, and service.
- Shape provides composite action between the inside and outside concrete panels.
- Durable and corrosion resistant material is 2.5 times stronger than steel and does not stain.
- Adapts to locally available foam insulation materials.

FRP Truss is easy to install. The truss can be pre-set or wet set with foam insulation. The insulation is placed between the lengths of truss, then sandwiched between the inside and outside concrete panels.



FRP Truss	
Property	**Min Value***
Tensile strength	145 ksi
Tensile modulus	7,251 ksi
Flexural strength	145 ksi
Pulling force/static tension	4.5K

** No safety factors applied.*

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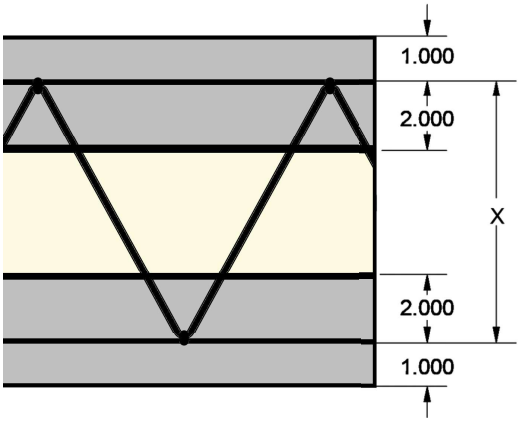
The FRP Truss is a product consisting of two parallel rods attached top and bottom to a zig-zag rod with plastic connectors at every intersection.



FRP Truss					
Part No.	**Description**	**H**	**L**	**l**	**d**
SBFRPT710	FRP Truss 7”x10’	7”	10’	8”	3/16”
SBFRPT810	FRP Truss 8”x10’	8”	10’	8”	3/16”
SBFRPT910	FRP Truss 9”x10’	9”	10’	8”	3/16”

H - Distance between guide rods of the flexible coupling
L - Length of flexible connection
l - Wave step of diagonal rod of a flexible coupling
d - Diameter of the flexible connection rod

Shear Test

A panel was installed in a vertical position and secured against movement by anchors and crossbars through the force floor. The mounting loops were welded to the metal uprights. The internal layer was also pinched. A uniformly distributed load on the outer layer of the panel was transferred from the hydraulic jack through a rigid metal plate. Results:

- The maximum load applied to the outer layer of the panel was 5.8 K/ft. Cracks and signs of destruction of the panel were not detected.
- At a design load of 993 lbs/ft the actual mutual displacement of the outer layer relative to the inner layer was 0.0196”.
- At the maximum load of 5.8 K/ft, the displacement of the outer layer was 0.2”.

Fire Resistance Test

A load of 548 lbs/ft was applied to the outer layer of the panel for 30 minutes. A fire load was applied to the inner layer of the panel for a further 30 minutes. After exposure to fire, the product was kept under load for 24 hours to cool to room temperature. At the final stage of testing, a load was applied to the outer layer of the panel in increments of 13.7 lbs/ft before failure. Results:

- The time of occurrence of the limit state for loss of integrity (E) during the test is not reached.
- The time of occurrence of the limit state of the carrying capacity (R) during the test is not reached.
- The time of occurrence of the limiting state of loss of thermal insulating ability (I) during the test is not reached.
- The maximum load applied to the outer layer of the panel after the fire impact was 4.83 times higher than the benchmarks, amounting to 2.6 K/ft.
- The fire resistance limit of a panel is at least REI 30.