T 77 TECHNICAL BULLETIN

Tectum™ Roof Deck and Lightweight Insulating Concrete

July 2014

TECTUM Inc. • P.O. Box 3002 • Newark, OH 43058 • www.tectum.com • 1-888-977-9691

Tectum roof plank and roof tile have been successfully used as a structural substrate for LWIC for several years. The porous nature of Tectum decks allow the LWIC to dry from the underside of the deck without sustaining water damage from the LWIC slurry. The result is a structural, acoustical deck with permanent insulation. The deck can be re roofed without costly replacement and disposal of the existing insulation.

In March of 2002 CTL Engineering, an independent accredited testing agency, witnessed diaphragm load tests to determine what effect if any LWIC had on the overall roof deck system. The test method was ASTM E 455-98, "Method for Static Load Testing of Framed Floor or Roof Diaphragm Constructions for Buildings".

Test I

1. 2" x 31" x 96" Tectum roof tile, grouted in place between 218 bulb tees welded to the steel frame.

2. A 3/8" bead of adhesive, APA spec AFG-01, was applied at all contact points between the tile and steel frame.

3. 3 1/4" 14 ga. Screws with 2" washers were spaced 12 inches on center around the perimeter with 2 screws per plank end within the field. The screws were driven into predrilled 7/32" diameter holes.

4. 3" x 24"x 48" sheets of EPS with six 2" holes per sheet were then set into a butter layer of LWIC.

5. 2" hex 19 ga & 16 ga Galvanized wire mesh was laid over the EPS.

6. 2 inches of Elastizell LWIC was poured over the assembly, floated and smoothed. The assembly was allowed to cure for thirty days.

Results

- The test section reached ultimate failure at a load of 12,243 lbs. per cylinder.
- The maximum test load was 24,486 lbs.
- The maximum shear reaction was 12,243 lbs.
- The maximum shear strength was 1,530 lbs./ft
- The design allowable shear was 509 lbs./ft

TECTUM INC.
The Noise Control Solution

Test II

1. 3"x 31"x 144"Tectum I roof plank, T&G sides were screwed and glued in place onto a wood frame made of 2 ½" x 5 ½" wood beams bolted together.

2. A ⅜" bead of adhesive, APA spec AFG-01, was applied at all contact points between the plank and the wood frame and the longitudinal tongue and groove joints between planks.

3. A 1 ½ inch 16 ga. Formed steel channel was inserted in the longitudinal groove.

4. 4 ½" 14 ga. Dekfast screws with 2" washers were spaced 12 inches on center along the long sides of the perimeter and 10 ½" on center along the short sides of the perimeter. The planks had 2 screws per plank end within the field.

5. 3" x 24" x 48" sheets of EPS with ten 2" holes per sheet were then set into a butter layer of LWIC.

6. 2 inches of Siplast LWIC was poured over the assembly, floated and smoothed. The assembly was allowed to cure for thirty days.

Results

- The test section reached ultimate failure at a load of 13,052 lbs. Per cylinder.
- The maximum test load was 26,103 lbs.
- The maximum shear reaction was 13, 052 lbs.
- The maximum shear strength was 1,631 lbs/ft
- The design allowable shear was 542 lbs./ft

Random pullout tests were then conducted using 7" and 7 ½" GypTec** fasteners. A ⅜" pilot hole was drilled through the LWIC only, the fasteners are self drilling into the Tectum deck.

- 7" fasteners yielded an average pull out of 301# per fastener
- 7 ½" fasteners yielded and average pullout of 405# per fastener

These two roof deck systems are proven long lasting and economical systems for flat and low slope roof decks. It is an ideal solution in areas where higher allowable shear values are required.

**Trademark of ITW Buildex