

VINCI & ASSOCIATES

Structural Engineers

CLIENT:

Professional Solar Products, Inc.
1551 S. Rose Ave., Oxnard, CA 93033
Tel: 805-486-4700

Subject: Static load test results for the following:

Mounting System	Maximum Frame Length* (in.)	Maximum Frame Width* (in.)	Load (lbs/ft ²)	Equivalent Wind Speed (mph)**
RoofTrac®	65	40	50	125

TEST SETUP (as shown in attached drawing detail): Three modules, as specified above, were bolted to 136"x1.5"x2.5" Professional Solar Products (PSP) patented RoofTrac® support rails using an assembly of 5/16" Stainless Steel (SS) bolts, SS lock washers and proprietary PSP aluminum clamps and inserts. The RoofTrac® support rail was attached to the PSP RoofTrac® structural attachment device with 3/8" SS hardware at four attachment points. The setup was attached to 2"x6" wooden rafters using 5/16" x 3-1/2" SS lag bolts. The attachment spans consisted of 48" front to rear with structural attachments spaced 72" on center.

TEST PROCEDURE (as shown in attached drawing detail): The test set up was top loaded to 50 lb/ft². The setup remained loaded for an approximate period of 30 minutes. The maximum deflection and any signs of permanent deformation were recorded. The test setup was then inverted and loaded to simulate the uplift condition. The test set up was re-loaded to 50 lb/ft². The setup remained loaded for an approximate period of 30 minutes. The maximum deflection and any signs of permanent deformation were recorded.

TEST RESULTS:

The maximum top load deflection was recorded at 0.313", with no permanent deformation. The maximum uplift deflection was recorded at 0.250", with no permanent deformation.

This document certifies the RoofTrac® mounting system used with the modules, as specified above, withstands a 50 lb/ft² static pressure load, equivalent to a wind speed of approximately 125 mph**. The mounting system performed as expected.

Sincerely,

James R. Vinci, S.E.

This engineering report verifies that Vinci & Associates has provided independent observation for load testing as described in this report. The results of this load test reflect actual deflection values and are generally accepted as the industry standard for testing module mounting systems. Vinci & Associates does not field check installations or verify that the mounting system is installed as described in this engineering report.

To assist the building inspector in verifying the authenticity of silver reflective "RoofTrac®" label, as shown, is placed on at with "Professional Solar Prod. Pat. 6,360,491" on the



this proprietary mounting system, a permanent adhesion, least one of the main support rails or permanently stamped underside of rail.

Structural attachment: Lag bolt attachment should be installed using the proper pilot hole for optimum strength. A 5/16" lag bolt requires a 3/16" pilot hole. It is the responsibility of the installer to insure a proper attachment is made to the structural member of the roof. Failure to securely attach to the roof structure may result in damage to equipment, personal injury or property damage.

This office does not express an opinion as to the load bearing characteristics of the structure the mounting system/modules are being installed on.

ICC accredited laboratory tested structural attachments manufactured by Professional Solar Products (including, but not limited to FastJack®, TileTrac®, and FoamJack®) can be interchanged with this system.

Check with local building department or AHJ for site specific requirements.

*Modules measuring within stated specifications and tested to UL1703, or equivalent, are included in this engineering

**Wind loading values relative to defined load values using wind load exposure (125 mph for 5/12 roof pitch or less; 100 mph for greater than 5/12 roof pitch) and gust factor coefficient "exposure C" as defined in the 2009(IBC) /2010(CBC)

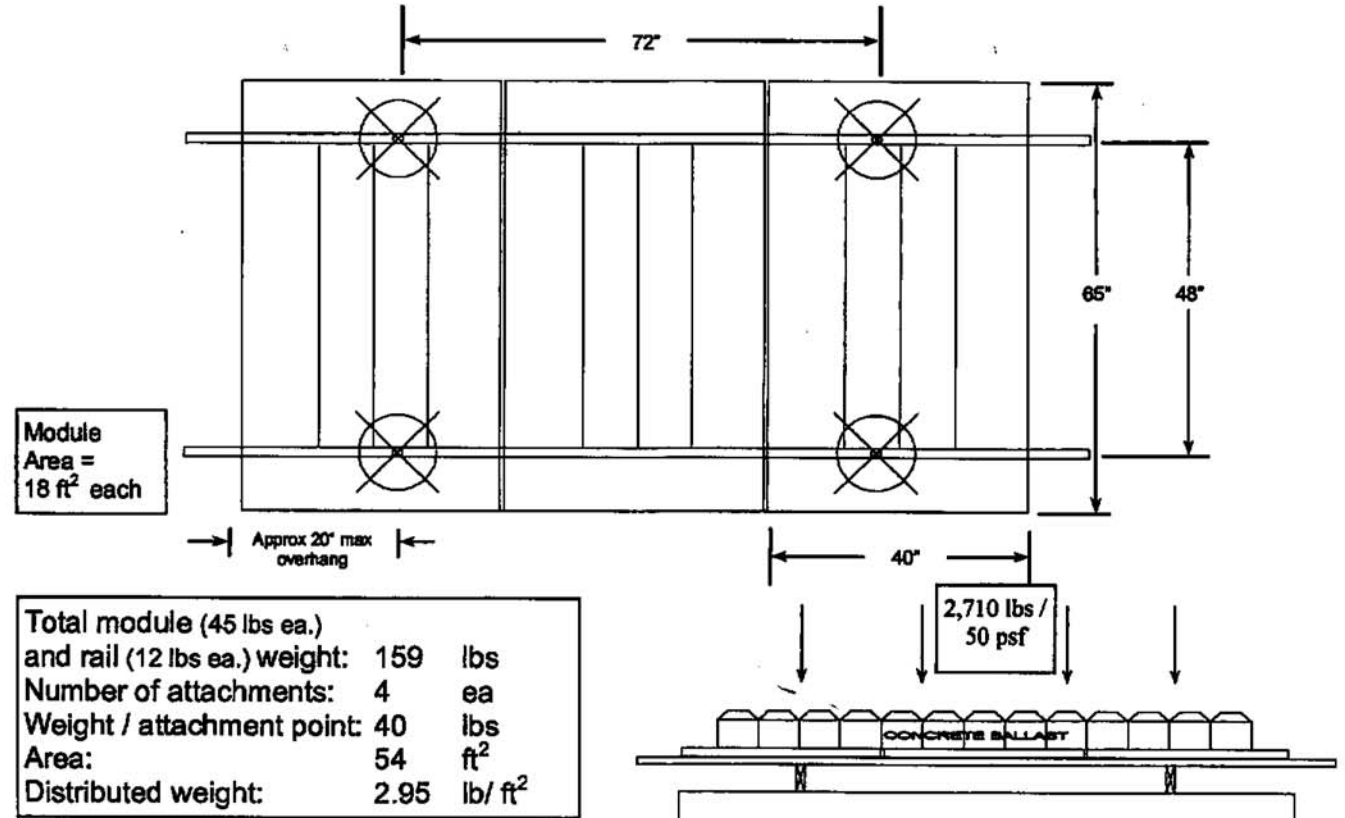
***Module tested: 64.6" x 39.4" x 1.7" (sln)

****Est. snow load rating of 25 lb/ft² based on 2.0 safety factor

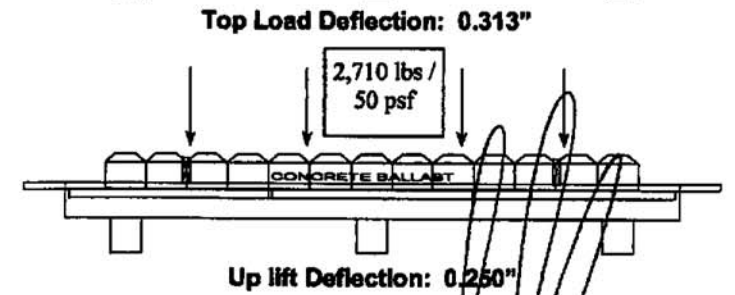
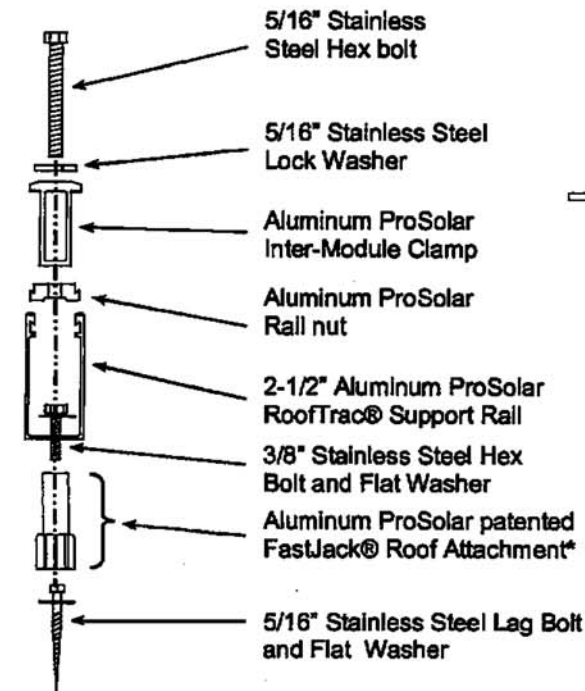
Thousand Oaks, CA 91362



RT_6



Total module (45 lbs ea.) and rail (12 lbs ea.) weight:	159	lbs
Number of attachments:	4	ea
Weight / attachment point:	40	lbs
Area:	54	ft ²
Distributed weight:	2.95	lb/ft ²



*Lab tested structural attachments manufactured by Professional Solar Products (including FastJack®, TileTrac®, and FoamJack®) can be interchanged with this system.

Professional Solar Products RoofTrac® Patent# 6,360,491
Photovoltaic mounting system

RoofTrac®
Solar Modules
Static load test illustration

RT_6

CLIENT: Professional Solar Products
1551 S. Rose
Oxnard, CA 93033
Attn: Ignacio Coral

Test Report No: RJ0729P-1	Date: August 2, 2010
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SUBJECT: Uplift and Side Lateral Load Tests on Two TileTrac® Roof Attachment Assemblies.

SAMPLE ID: The following test material was submitted and identified by the Client:

- 1) One uplift load test assembly consisting of one 3/8-inch diameter by 6-inch long stainless steel threaded rod, one TileTrac® Roof Attachment and one 5/16-inch diameter by 3 1/2-inch long lag bolt and washer fastened into a simulated roof member. A detailed drawing of the test assembly is provided in the appendix of this report.
- 2) One side lateral test assembly consisting of three 3/8-inch diameter by 6-inch long stainless steel threaded rods, three TileTrac® Roof Attachments and three 5/16-inch diameter by 3 1/2-inch long lag bolts and washers fastened into simulated roof members. A detailed drawing of the test assembly is provided in the appendix of this report.

DATE OF RECEIPT: Samples were received on May 15, 2010.

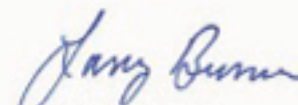
TESTING PERIOD: May 28, 2010.

AUTHORIZATION: Signed QAI Job Ticket dated May 19, 2010.

TEST PROCEDURES: Testing was conducted following client specified test procedures. See page 2 of this report for detailed test procedures.

TEST RESULTS: See page 2 of this report for detailed test results.

Prepared By



Larry Burmer
Project Specialist

**Signed for and on behalf of
QAI Laboratories Inc.**



Andrew Tan, P.E.
Manager, Construction Materials

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UPLIFT LOAD TEST

Test Procedure: The test assembly was mounted to the base of an Instron Tension/Compression Machine. A vertical (uplift) load was applied to the $\frac{3}{8}$ -inch diameter by 6-inch long stainless steel threaded rod attached to the moveable crosshead of the Tension/Compression Machine. The load was applied at a constant rate of 0.2-inch per minute until failure.

Test Results: At a test load of 1,100 pounds, the $\frac{5}{16}$ -inch diameter by 3½-inch long lag bolt pulled out of the 2 x 4 wood stud.

SIDE LATERAL LOAD TEST

Test Procedure: The test assembly was mounted to the base of an Instron Tension/Compression Machine. A horizontal (side lateral) load was applied to the end of a 2-inch wide by ½-inch thick steel bar which was attached to the top of the three $\frac{3}{8}$ -inch diameter by 6-inch long stainless steel threaded rods. The load was applied at a constant rate of 0.2-inch per minute until failure.

Test Results: At a test load of 4,500 pounds, the aluminum brackets holding the $\frac{3}{8}$ -inch diameter by 6-inch long stainless steel threaded rods in place on the TileTrac® Roof Attachments began to slip and dig into the aluminum channels.

APPENDIX

