

RECEIVED  
INSPECTORIAL SERVICE  
NEWTON  
**CITY OF NEWTON  
MASSACHUSETTS**

Permit No.: 11040032

District No.: 3

Date Issued: 4-1-11

Inspector: Case

11 MAR 2011 1:27  
**APPLICATION FOR PLAN EXAMINATION  
AND BUILDING PERMIT**

Date Received: 4-1-11

**IMPORTANT: Applicants must complete all items on this page**

**LOCATION  
OF  
BUILDING**

LOCATION 4 Rebecca Road ZONING DISTRICT: SR3  
BETWEEN \_\_\_\_\_ AND \_\_\_\_\_  
SECTION: 44 BLOCK: 17 LOT: 124 MAP NO.: \_\_\_\_\_ YEAR HOUSE BUILT: 1987

**TYPE AND USE OF BUILDING** ~~HISTORIC DISTRICT~~

TYPE OF IMPROVEMENT	PROPOSED USE	
<input type="checkbox"/> New building <input type="checkbox"/> Addition <input checked="" type="checkbox"/> Alteration <input type="checkbox"/> Repair, replacement <input type="checkbox"/> Demolition <input type="checkbox"/> Moving (relocation) <input type="checkbox"/> Foundation only	<b>Residential</b> <input checked="" type="checkbox"/> One family <input type="checkbox"/> Two or more family No. of units: _____ <input type="checkbox"/> Transient hotel, motel, or dormitory No. of units: _____ <input type="checkbox"/> Garage <input type="checkbox"/> Carport <input type="checkbox"/> Other: _____	<b>Non-Residential</b> <input type="checkbox"/> Amusement, recreational <input type="checkbox"/> Church, other religious <input type="checkbox"/> Industrial <input type="checkbox"/> Commercial <input type="checkbox"/> Hospital, institutional <input type="checkbox"/> Public Utility <input type="checkbox"/> Tanks, towers <input type="checkbox"/> Other: _____

**DESCRIPTION OF WORK TO BE PERFORMED:**

Install 20 Solar Panels on south roof

**IDENTIFICATION (Please Type or Print Clearly)**

OWNER Name: Roberta Whalen Phone: 617 559 0859

Address: 4 Rebecca Road Newton, MA.

CONTRACTOR Name: Bruce A. Davis Phone: 781 626 4258

Address: 50 Tower Avenue Marshfield, MA

Supervisor's Construction License: 104740 Exp. Date: 1/19/2014

Home Improvement License: 160104 Exp. Date: 6/25/2012

ARCHITECT/ENGINEER Name: Anderson Engineering Phone: 781 837 6949

Address: 764 Plain St. Marshfield, MA 02050 Reg. No.: 27372

**FEE SCHEDULE: BUILDING PERMIT: \$ 18.60 PER \$ 1000.00 OF THE TOTAL ESTIMATED COST  
SIGN PERMIT: \$ 10.20 PER \$ 100.00 OF THE TOTAL ESTIMATED COST**

Total cost of the job: \$ 23,400 x .0186 = FEE: \$ 435.24

Check No.: 1620 Receipt No.: 18000000664

<b>TYPE OF SEWAGE DISPOSAL</b> Public or private company <input type="checkbox"/> Private (septic tank, etc.) <input type="checkbox"/>	<b>DIMENSIONS</b> Number of Stories: _____ Total square feet of floor area, based on exterior dimensions: _____ Total land area, sq. ft.: _____	<b>NO. OF OFF STREET PARKING SPACES</b> Enclosed: _____ Outdoors: _____
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Signature of Agent/Owner *Robert Wohelen* Signature of Contractor *Bruce A. Dan*

**THE FOLLOWING SECTIONS FOR OFFICE USE ONLY**

Plans Submitted  Plans Waived  Certified Plot Plan  Stamped Plans

**DEPARTMENT APPROVALS:**                      **APPROVED**                      **DISAPPROVED**                      **NOT APPLICABLE**

PLANNING AND DEVELOPMENT	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
CONSERVATION	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
HISTORIC	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
HEALTH	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
FIRE	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
ENGINEERING	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
PUBLIC WORKS	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
SIDEWALK BOND	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
WATER & SEWER	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____

ZONING BOARD OF APPEALS; VARIANCE; PETITION NO.: \_\_\_\_\_

BOARD OF ALDERMAN; SPECIAL PERMIT; BOA NO.: \_\_\_\_\_

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

BUILDING PERMIT APPROVED AND ISSUED BY: *[Signature]*



Massachusetts - Department of Public Safety  
Board of Building Regulations and Standards  
Construction Supervisor License

License: CS 104740

BRUCE DAVIS  
50 TOWER AVENUE  
MARSHFIELD, MA 02050



*John S. Goff*

Commissioner

Expiration: 1/19/2014

Tr#: 104740



*The Commonwealth of Massachusetts*  
Office of Consumer Affairs & Business Regulation

HOME IMPROVEMENT CONTRACTOR

Registration: 160104

Expiration: 6/25/2012

Type:

Private Corporatio

CERTIFIED SAFE ELECTRIC, INC.

BRUCE DAVIS  
50 TOWER AVE  
MARSHFIELD, MA 02050



*Barbara Ordy*

Undersecretary

LD 02863

City of Newton



Setti D. Warren  
Mayor

# Inspectional Services Department

John D. Lojek, Commissioner  
1000 Commonwealth Avenue  
Newton Centre, MA 02459-1449  
Telephone: (617) 796-1060  
Fax: (617) 796-1086  
www.ci.newton.ma.us

Building/Zoning Inspectors  
(617) 796-1060  
Zoning Board of Appeals  
(617) 796-1060  
Plumbing and Gas Division  
(617) 796-1070  
Electrical Division  
(617) 796-1075  
TDD/TTY: (617) 796-1089

## DEBRIS REMOVAL FORM

Section 111.5 780 CMR, Mass. State Building Code states: "..... a condition of issuing a permit for the demolition, renovation, rehabilitation, or other alteration of a building or structure, M.G.L. Ch. 40 § 54, requires that the debris resulting therefrom shall be disposed of in a properly licensed said waste disposal facility\* as defined by M.G.L.Ch..111, § 150 A."

Job Location: 4 Rebecca Road

Cardboard to be recycled Waste Management

\*Location of facility or Dumpster Company's Name and Address

[Signature]

Signature of permit applicant

Bruce Danz

Print Name

4-1-2011

Date

\*Construction debris is not allowed to be disposed of in the City of Newton Trash Collection System.



The Commonwealth of Massachusetts  
 Department of Industrial Accidents  
 Office of Investigations  
 600 Washington Street  
 Boston, MA 02111  
 www.mass.gov/dia

**Workers' Compensation Insurance Affidavit: Builders/Contractors/Electricians/Plumbers**  
**Applicant Information** **Please Print Legibly**

Name (Business/Organization/Individual): Certified Safe Electric, Inc.  
 Address: 50 Tower Ave  
 City/State/Zip: Marshfield, MA 02010 Phone #: 7816264258

<p><b>Are you an employer? Check the appropriate box:</b></p> <p>1. <input checked="" type="checkbox"/> I am an employer with <u>4</u> employees (full and/or part-time).*</p> <p>2. <input type="checkbox"/> I am a sole proprietor or partnership and have no employees working for me in any capacity. [No workers' comp. insurance required.]</p> <p>3. <input type="checkbox"/> I am a homeowner doing all work myself. [No workers' comp. insurance required.] †</p> <p>4. <input type="checkbox"/> I am a general contractor and I have hired the sub-contractors listed on the attached sheet. ‡ These sub-contractors have workers' comp. insurance.</p> <p>5. <input type="checkbox"/> We are a corporation and its officers have exercised their right of exemption per MGL c. 152, §1(4), and we have no employees. [No workers' comp. insurance required.]</p>	<p><b>Type of project (required):</b></p> <p>6. <input type="checkbox"/> New construction</p> <p>7. <input type="checkbox"/> Remodeling</p> <p>8. <input type="checkbox"/> Demolition</p> <p>9. <input type="checkbox"/> Building addition</p> <p>10. <input type="checkbox"/> Electrical repairs or additions</p> <p>11. <input type="checkbox"/> Plumbing repairs or additions</p> <p>12. <input type="checkbox"/> Roof repairs</p> <p>13. <input type="checkbox"/> Other _____</p>
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\*Any applicant that checks box #1 must also fill out the section below showing their workers' compensation policy information.  
 † Homeowners who submit this affidavit indicating they are doing all work and then hire outside contractors must submit a new affidavit indicating such.  
 ‡ Contractors that check this box must attach an additional sheet showing the name of the sub-contractors and their workers' comp. policy information.

*I am an employer that is providing workers' compensation insurance for my employees. Below is the policy and job site information.*

Insurance Company Name: The Hartford  
 Policy # or Self-ins. Lic. #: 08WELIT 2331 Expiration Date: 8/1/2011  
 Job Site Address: 4 Rebecca Rd City/State/Zip: Newton, MA

**Attach a copy of the workers' compensation policy declaration page (showing the policy number and expiration date).**  
 Failure to secure coverage as required under Section 25A of MGL c. 152 can lead to the imposition of criminal penalties of a fine up to \$1,500.00 and/or one-year imprisonment, as well as civil penalties in the form of a STOP WORK ORDER and a fine of up to \$250.00 a day against the violator. Be advised that a copy of this statement may be forwarded to the Office of Investigations of the DIA for insurance coverage verification.

*I do hereby certify under the pains and penalties of perjury that the information provided above is true and correct.*

Signature: [Signature] Date: 4-1-11  
 Phone #: 7816264258

**Official use only. Do not write in this area, to be completed by city or town official.**

City or Town: \_\_\_\_\_ Permit/License # \_\_\_\_\_

Issuing Authority (circle one):  
 1. Board of Health 2. Building Department 3. City/Town Clerk 4. Electrical Inspector 5. Plumbing Inspector  
 6. Other \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone #: \_\_\_\_\_

# Information and Instructions

Massachusetts General Laws chapter 152 requires all employers to provide workers' compensation for their employees. Pursuant to this statute, an *employee* is defined as "...every person in the service of another under any contract of hire, express or implied, oral or written."

An *employer* is defined as "an individual, partnership, association, corporation or other legal entity, or any two or more of the foregoing engaged in a joint enterprise, and including the legal representatives of a deceased employer, or the receiver or trustee of an individual, partnership, association or other legal entity, employing employees. However the owner of a dwelling house having not more than three apartments and who resides therein, or the occupant of the dwelling house of another who employs persons to do maintenance, construction or repair work on such dwelling house or on the grounds or building appurtenant thereto shall not because of such employment be deemed to be an employer."

MGL chapter 152, §25C(6) also states that "**every state or local licensing agency shall withhold the issuance or renewal of a license or permit to operate a business or to construct buildings in the commonwealth for any applicant who has not produced acceptable evidence of compliance with the insurance coverage required.**"

Additionally, MGL chapter 152, §25C(7) states "Neither the commonwealth nor any of its political subdivisions shall enter into any contract for the performance of public work until acceptable evidence of compliance with the insurance requirements of this chapter have been presented to the contracting authority."

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## Applicants

Please fill out the workers' compensation affidavit completely, by checking the boxes that apply to your situation and, if necessary, supply sub-contractor(s) name(s), address(es) and phone number(s) along with their certificate(s) of insurance. Limited Liability Companies (LLC) or Limited Liability Partnerships (LLP) with no employees other than the members or partners, are not required to carry workers' compensation insurance. If an LLC or LLP does have employees, a policy is required. Be advised that this affidavit may be submitted to the Department of Industrial Accidents for confirmation of insurance coverage. **Also be sure to sign and date the affidavit.** The affidavit should be returned to the city or town that the application for the permit or license is being requested, **not** the Department of Industrial Accidents. Should you have any questions regarding the law or if you are required to obtain a workers' compensation policy, please call the Department at the number listed below. Self-insured companies should enter their self-insurance license number on the appropriate line.

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## City or Town Officials

Please be sure that the affidavit is complete and printed legibly. The Department has provided a space at the bottom of the affidavit for you to fill out in the event the Office of Investigations has to contact you regarding the applicant. Please be sure to fill in the permit/license number which will be used as a reference number. In addition, an applicant that must submit multiple permit/license applications in any given year, need only submit one affidavit indicating current policy information (if necessary) and under "Job Site Address" the applicant should write "all locations in \_\_\_\_\_ (city or town)." A copy of the affidavit that has been officially stamped or marked by the city or town may be provided to the applicant as proof that a valid affidavit is on file for future permits or licenses. A new affidavit must be filled out each year. Where a home owner or citizen is obtaining a license or permit not related to any business or commercial venture (i.e. a dog license or permit to burn leaves etc.) said person is NOT required to complete this affidavit.

The Office of Investigations would like to thank you in advance for your cooperation and should you have any questions, please do not hesitate to give us a call.

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The Department's address, telephone and fax number:

The Commonwealth of Massachusetts  
Department of Industrial Accidents  
**Office of Investigations**  
600 Washington Street  
Boston, MA 02111

Tel. # 617-727-4900 ext 406 or 1-877-MASSAFE

Fax # 617-727-7749

[www.mass.gov/dia](http://www.mass.gov/dia)

# ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
07/06/2010

PRODUCER 781.344.3200 FAX 781.344.1425  
**Malcolm & Parsons Ins. Agcy. Inc.**  
 6 Freeman St.  
 P.O. Box 527  
 Stoughton, MA 02072

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED **Certified Safe Electric, Inc.**  
**DBA: Certified Electrical Companies**  
 50 Tower Avenue  
 Marshfield, MA 02050-5131

**INSURERS AFFORDING COVERAGE**

NAIC #

INSURER A: **The Hartford**

INSURER B:

INSURER C:

INSURER D:

INSURER E:

**COVERAGES**

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR ADD'L LTR	INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A		GENERAL LIABILITY	08SBMVU6675	07/15/2010	07/15/2011	EACH OCCURRENCE	\$ 1,000,000
		<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY				DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 300,000
		<input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR				MED EXP (Any one person)	\$ 10,000
						PERSONAL & ADV INJURY	\$ 1,000,000
						GENERAL AGGREGATE	\$ 2,000,000
						PRODUCTS - COMP/OP AGG	\$ 2,000,000
		GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO. JECT <input type="checkbox"/> LOC					
		AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT (Ea accident)	\$
		<input type="checkbox"/> ANY AUTO				BODILY INJURY (Per person)	\$
		<input type="checkbox"/> ALL OWNED AUTOS				BODILY INJURY (Per accident)	\$
		<input type="checkbox"/> SCHEDULED AUTOS				PROPERTY DAMAGE (Per accident)	\$
		GARAGE LIABILITY				AUTO ONLY - EA ACCIDENT	\$
		<input type="checkbox"/> ANY AUTO				OTHER THAN EA ACC	\$
						AUTO ONLY: AGG	\$
A		EXCESS/UMBRELLA LIABILITY	08SBMVU6675	07/15/2010	07/15/2011	EACH OCCURRENCE	\$ 1,000,000
		<input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE				AGGREGATE	\$ 1,000,000
		<input type="checkbox"/> DEDUCTIBLE					\$
		<input checked="" type="checkbox"/> RETENTION \$ 10,000					\$
A		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	08WECIT2331	08/01/2010	08/01/2011	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTH-ER	
		ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED?				E.L. EACH ACCIDENT	\$ 500,000
		If yes, describe under SPECIAL PROVISIONS below				E.L. DISEASE - EA EMPLOYEE	\$ 500,000
						E.L. DISEASE - POLICY LIMIT	\$ 500,000
		OTHER					

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS  
**Electrician. General Liability coverage applies on a primary & non-contributory basis and includes Massachusetts Clean Energy Technology Center, the system owner, and as applicable the host customer are Additional Insured with respect to General Liability. Covered operations include Residential work. Blanket Additional Insured coverage would extend to subcontractors in the event the one is hired. Cancellation Notice: 10-day Non-pay, 20-day Misrepresentation, 30-day All Other as per State Guidelines**

**CERTIFICATE HOLDER**

**Massachusetts Clean Energy Technology Center**  
 c/o Ebix BPO  
 P.O. Box 881639  
 Routing Number a799w-jjct-mp  
 San Diego, CA 92168

**CANCELLATION**

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

**David Parsons**



# ANDERSON STRUCTURAL ENGINEERING, INC.

764 PLAIN STREET  
MARSHFIELD, MASSACHUSETTS 02050  
781-837-6949  
FAX 781-834-6253

March 29, 2011

Mr. Bruce Davis  
Certified Safe Electric  
10 Tower Avenue  
Marshfield, MA 02050

Re: 11-039 Wayland Residence  
4 Rebecca Road  
Newton, MA  
Roof Evaluation

Dear Bruce,

As requested we have reviewed the structural adequacy of the above referenced existing roof structure to accommodate the additional loads of proposed installation of solar panels. Based on the information that you have provided and our subsequent review we make the following comments and recommendations.

The existing gable roof rafters are 2x10 @ 16" on center that span approximately 12'-0". Our calculations find the existing roof structure can safely support the additional loads of the solar panels without additional reinforcement.

Please note that our review is limited to the roof structure and no other aspects of the existing construction have been reviewed by our office.

If you have any questions or comments regarding this, please don't hesitate to contact us.

Sincerely,



Thomas E. Anderson  
Senior Project Manager



3/29/11

Encl.

# 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 <sup>2</sup> )	Equivalent Wind Speed (mph)**
RoofTrac®	65	40	55	135

**TEST SETUP (as shown in attached drawing detail):** Three modules, as specified above, were bolted to 136"x1.5"x1.5" Professional Solar Products (PSP) patented RoofTrac® support rails using an assembly of 5/16" Stainless Steel (SS) bolts, SS lock washers and proprietary aluminum clamps and inserts. The RoofTrac® support rail was attached to the PSP RoofTrac® structural attachment device with a 3/8" SS nut and SS washer at six 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 48" on center.

**TEST PROCEDURE (as shown in attached drawing detail):** The test set up was top loaded to 55 lb/ft<sup>2</sup>. 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 55 lb/ft<sup>2</sup>. 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 0.469", with no permanent deformation.  
The maximum uplift deflection was recorded at 0.313", with no permanent deformation.

This document certifies the RoofTrac® mounting system used with modules, as specified above, withstands a 55 lb/ft<sup>2</sup> static pressure load, equivalent to a wind speed of approximately 135 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 this proprietary mounting system, a permanent adhesion, silver reflective "RoofTrac®" label, as shown to the right, is placed on at least one of the main support rails or permanently stamped with "Professional Solar Prod. Pat. #6,360,491" on the 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 FastJack®, TileTrac®, and FoamJack®) can be interchanged with this system.

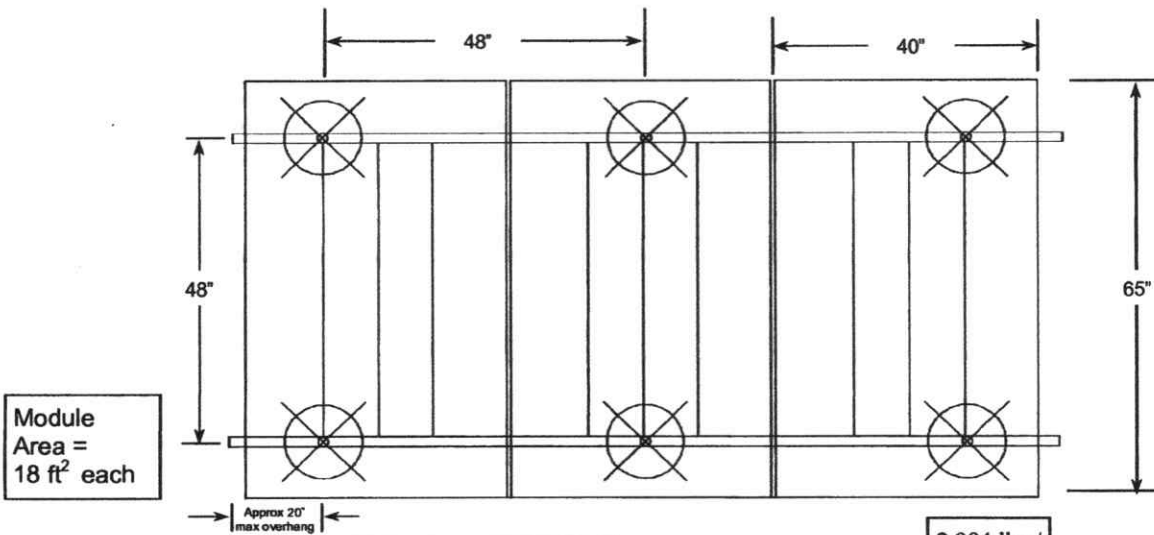
\*Modules measuring within stated specifications and tested to UL1703, or equivalent, are included in this engineering.

\*\*Wind loading values relative to defined load values using wind load exposure (135 mph for 5/12 roof pitch or less; 115 mph for greater than 5/12 roof pitch) and gust factor coefficient "exposure C" as defined in the 2006(IBC)/2007(CBC)

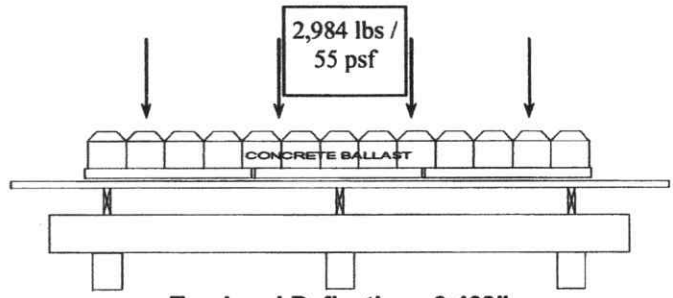
\*\*\* Module tested: 64.6" x 39.1" x 1.8" (shrp)

\*\*\*\*Est. snow load rating of 30 lb/ft<sup>2</sup> based on 1.6 safety factor

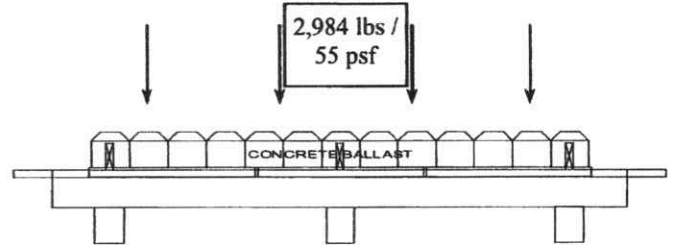




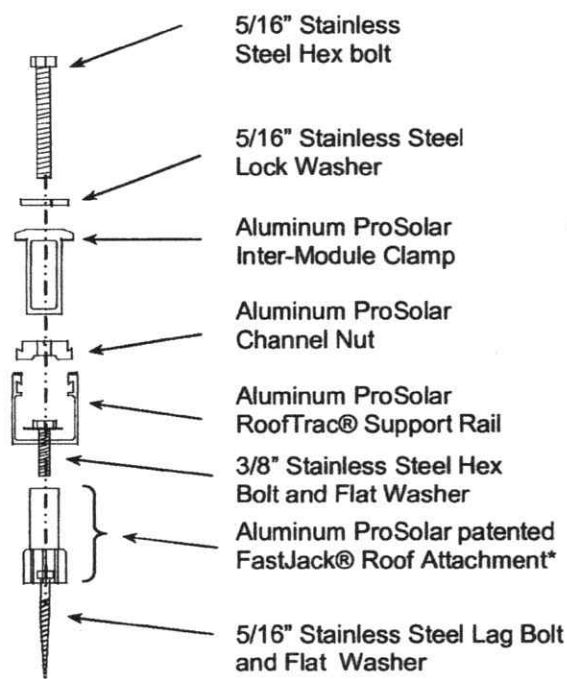
Total module (45 lbs ea.) and rail (10 lbs ea.) weight:		155	lbs
Number of attachments:		6	ea
Weight / attachment point:		26	lbs
Area:		54	ft <sup>2</sup>
Distributed weight:		2.9	lb/ft <sup>2</sup>



**Top Load Deflection: 0.469"**



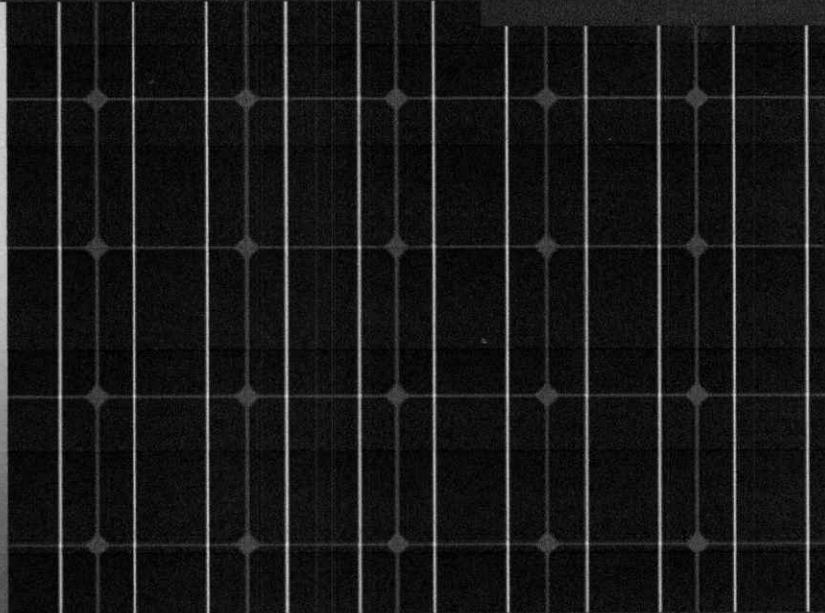
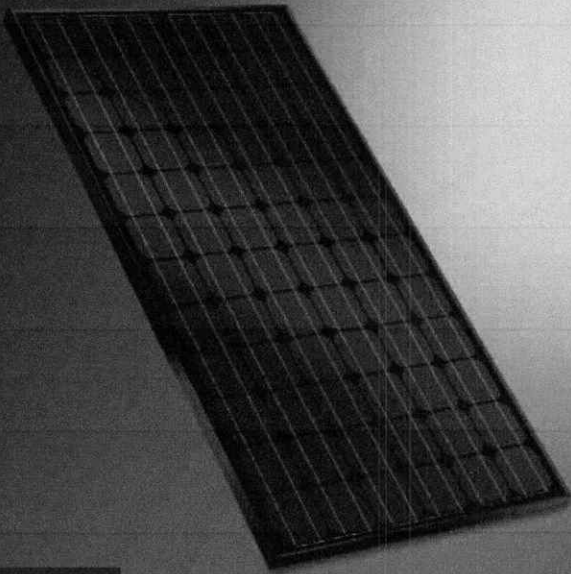
**Up lift Deflection: 0.313"**



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

# Schüco MPE modules in the MS 05 series

Technical information on performance classes 170 to 185 W<sub>p</sub>



Schüco MPE modules in the MS 05 Series assure high-powered, reliable performance for solar projects both on- and off-grid.

Each PV cell features anti-reflective coatings, state-of-the-art silver front contacts, and full-coverage aluminum back contacts with a back surface field. Our PV cells are meticulously manufactured in accordance with the highest technical standards, ensuring excellence at every stage of the production process and resulting in highly efficient, long-life cells.

The frames are constructed of aluminum alloy for maximum endurance in rugged weather conditions. They are also given a double oxidation coating for added protection against the elements, assuring impressive longevity even under adverse conditions. The load bearing capacity for snow and wind loads is 50 lbs/sq ft (2.394 kN / sqm).

The modules fully adhere to Germany's stringent ISO 9001 and ISO 14001 quality and environmental standards. The modules are fully UL certified and UL listed based on UL 1703.

Every cell is individually inspected and power-matched to ensure consistent performance between the cells in the module array. Moreover, each PV cell is individually inspected and checked for current reversion, micro cracks, chipping and warping.

SCHÜCO

# Schüco MPE modules in the MS 05 series

Photovoltaic Modules				
Product name	MPE 170 MS 05	MPE 175 MS 05	MPE 180 MS 05	MPE 185 MS 05
Schüco article number	232 558	232 559	232 560	232 561
Electrical specifications				
STC Rated output (P <sub>mpp</sub> )*	170 Wp	175 Wp	180 Wp	185 Wp
PTC Rated output (P <sub>mpp</sub> )	153.3 Wp	158.0 Wp	162.6 Wp	167.1 Wp
Output tolerance STC (Δ P <sub>mpp</sub> )	-0/+5 %	-0/+5 %	-0/+5 %	-0/+5 %
Warranted power output STC (P <sub>mpp</sub> min)	170 Wp	175 Wp	180 Wp	185 Wp
Rated voltage (V <sub>mpp</sub> )*	35.9 V	36.1 V	36.3 V	36.5 V
Rated current (I <sub>mpp</sub> )*	4.76 A	4.85 A	4.96 A	5.09 A
Open circuit voltage (V <sub>oc</sub> )*	44.2 V	44.4 V	44.6 V	44.8 V
Short circuit current (I <sub>sc</sub> )*	5.18 A	5.26 A	5.35 A	5.47 A
Module efficiency	13.3 %	13.7 %	14.1 %	14.5 %
Temperature coefficient α (P <sub>mpp</sub> )*	-0.44 %/C	-0.44 %/C	-0.44 %/C	-0.44 %/C
Temperature coefficient β (I <sub>sc</sub> )*	+0.030 %/C	+0.030 %/C	+0.030 %/C	+0.030 %/C
Temperature coefficient γ (V <sub>oc</sub> )*	-0.33 %/C	-0.33 %/C	-0.33 %/C	-0.33 %/C
Temperature coefficient δ (I <sub>mpp</sub> )*	+0.030 %/C	+0.030 %/C	+0.030 %/C	+0.030 %/C
Temperature coefficient ε (V <sub>mpp</sub> )*	-0.33 %/C	-0.33 %/C	-0.33 %/C	-0.33 %/C
Normal Operating Cell Temperature (NOCT)**	113° F (45° C)	113° F (45° C)	113° F (45° C)	113° F (45° C)
Maximum system voltage USA NEC	600 V	600 V	600 V	600 V
Maximum system voltage SCII	600 V	600 V	600 V	600 V
Max. series fuse rating	10 A	10 A	10 A	10 A
Cell Technology				
Cell type	monocrystalline	monocrystalline	monocrystalline	monocrystalline
Number of cells/cell arrangement	72/6 × 12	72/6 × 12	72/6 × 12	72/6 × 12
Cell dimension	5" (127 mm)	5" (127 mm)	5" (127 mm)	5" (127 mm)
Mechanical specifications				
Outer dimensions	62.20 × 31.81 × 1.57 in (1580 x 808 x 40 mm)	62.20 × 31.81 × 1.57 in (1580 x 808 x 40 mm)	62.20 × 31.81 × 1.57 in (1580 x 808 x 40 mm)	62.20 × 31.81 × 1.57 in (1580 x 808 x 40 mm)
Frame technology (if applicable)	Aluminum frame, Black	Aluminum frame, Black	Aluminum frame, Black	Aluminum frame, Black
Compound	Glass / EVA / Backsheet	Glass / EVA / Backsheet	Glass / EVA / Backsheet	Glass / EVA / Backsheet
Weight (module only)	33.1 lbs (15 kg)	33.1 lbs (15 kg)	33.1 lbs (15 kg)	33.1 lbs (15 kg)
Junction Box IP rating	IP 65	IP 65	IP 65	IP 65
Cable length / diameter (if applicable)	40 in ± 2 in (1016 mm ± 50.8 mm)	40 in ± 2 in (1016 mm ± 50.8 mm)	40 in ± 2 in (1016 mm ± 50.8 mm)	40 in ± 2 in (1016 mm ± 50.8 mm)
Connector type	Schüco MC-T4 compatible	Schüco MC-T4 compatible	Schüco MC-T4 compatible	Schüco MC-T4 compatible
Qualification and warranties				
Product standard	UL 1703	UL 1703	UL 1703	UL 1703
Extended product warranty	5 years	5 years	5 years	5 years
Output warranty of 90% performance P <sub>mpp</sub> (STC)	12 years	12 years	12 years	12 years
Output warranty of 80% performance P <sub>mpp</sub> (STC)	25 years	25 years	25 years	25 years
Miscellaneous				
Packing unit	2 modules	2 modules	2 modules	2 modules
Weight of packing unit	68.4 lbs (33 kg)	68.4 lbs (33 kg)	68.4 lbs (33 kg)	68.4 lbs (33 kg)

\* Irradiance 1,000 W/m<sup>2</sup>, air mass index 1.5, cell temperature 25° C

\*\* Irradiance 800 W/m<sup>2</sup>, ambient temperature 20° C, wind speed 1 m/s, air mass index 1.5

Schüco USA L.P.  
www.schuco-usa.com

Schüco Canada Inc.  
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