

BLOCK 39 LOT 4 QUALIFICATION CODE ADDRESS (SITE) 499 Eldridges Hill Rd. PERMIT NO. 20160291



CONSTRUCTION PERMIT APPLICATION

Applicant Completes: Sections I, II, III (optional), IV, VI, and VII

I. IDENTIFICATION

1. Proposed Work Site at: 499 Eldridges Hill Rd
2. Name of Owner in Fee: Dennis Gabriel Bach
Tel. (850) 373-1129 e-mail dennis.gabrielbach@the-star-system.com
Address 499 Eldridges Hill Rd philagroup 08078 com
3. Ownership in Fee: Public ☐ Private ☒
4. Principal Contractor: ENTREPRENEURS INC. Tel. (850) 339-4014
Address 1111 Bay 247 Avenue, Miami, FL 33131 e-mail nicole@entersold.com
License No. OR, if new home, Builder Reg. No. (850) 339-4015 Exp. Date 12/31/2016
Home Improvement Contractor Registration No. or Exemption Reason (if applicable):
Federal Emp. ID No. FAX: ()
5. Architect or Engineer Contact
Address e-mail
Tel. () FAX: ()
6. Responsible Person in Charge once Work has Begun NICOLE BIRD
Tel. (850) 339-4014 FAX: (850) 339-4015

V. FEE SUMMARY (for office use only)

		Update	Update
1. Building	\$ <u>150</u>		
2. Electrical	\$ <u>300</u>		
3. Plumbing			
4. Fire Protection			
5. Elevator Devices			
6. Subtotal			
7. Less 20% for State Plan Review	\$		
8. Subtotal	\$ <u>41</u>		
9. State Permit Surcharge Fee			
10. Subtotal	\$		
11. Cert. of Occupancy			
12. Other			
13. TOTAL	\$ <u>(491)</u>		

VI. BUILDING/SITE CHARACTERISTICS

	(office use only)
1. Number of Stories	
2. Height of Structure	ft.
3. Area — Largest Floor	sq. ft.
4. New Building Area	sq. ft.
5. Volume of New Structure	cu. ft.
6. Max. Live Load	
7. Max. Occupancy Load	
8. If Industrialized Building: State Approved	HUD
9. Total Land Area Disturbed	sq. ft.
10. Flood Hazard Zone	
11. Base Flood Elevation	ft.
12. Wetlands	yes no

IIa. PROPOSED WORK

- ☐ Minor Work ☐ New Building ☐ Addition ☐ Demolition
☐ Repair ☐ Alteration ☐ Renovation ☐ Reconstruction
☐ Asbestos Abat. -Subch. 8 ☐ Lead Hazard Abatement ☐ Radon Remediation ☐ Annual Permit

IIb. SUBCODES

(Check all that apply)

- ☐ Building
☐ Electrical
☐ Plumbing
☐ Fire Protection
☐ Elevator

FOR OFFICE USE ONLY (Optional)

Est. Cost	Plans Rec'd by	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates Approval	Rejection	Re-viewer
<u>2500.00</u>				<u>12/16/16</u>				
<u>19133.00</u>								

TOTAL COST 21,633.00

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL (primary use)

1. State Specific Use:
2. Use Group, Proposed:
3. Change in Use Group, Indicate Present:
4. No. of dwelling units: Total Units Income-restricted
Gained, Sale
Gained, Rental
Lost, Sale
Lost, Rental

B. NON-RESIDENTIAL (primary use)

1. State Specific Use:
2. Use Group, Proposed:
3. Change in Use Group, Indicate Present:

C. MIXED USE -List secondary use(s):

- D. Construct. Classification: Present
Proposed

III. PLAN REVIEW (optional)

DO YOU WANT:

1. ☐ Partial Releases
2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Elevators/Escalators/Lifts/
Dumbwaiters/Moving Walks
2. ☐ High Pressure Boilers
3. ☐ Pressure Vessels
4. ☐ Refrigeration Systems
5. ☐ Cross-Connections/Backflow Preventers
6. ☐ Hazardous Uses/Places of Assembly
7. ☐ Sprinklers/Standpipes
8. ☐ Smoke Control Systems in Open Wells
9. ☐ Underground Storage Tanks
10. ☐ Swimming Pools, Spas and Hot Tubs
11. ☐ LP Gas Tanks
12. ☐ Fire Alarm

Certificate of Approval

IDENTIFICATION

Block/Lot 39/4
Work Site Location 499 ELDRIDGES HILL RD
Owner in Fee/Occupant GIZELBACH, D J JR & REIHMANN, J A
499 ELDRIDGES HILL ROAD
Address PIESGROVE NJ 08098
Telephone _____
Contractor RCL ENTERPRISES INC
Address 29 ALLOWAY-FRIESBURG ROAD
ALLOWAY, NJ 08001-
Telephone (856)339-4014 FAX _____
Lic. No. or Bldrs. Reg. No. 13VH00448000- 3/31/17
Federal Emp. No. 22-3662860

Home Warranty No
Type of Warranty Pl

Use Group
Maximum Live Load
Construction Classi
Maximum Occupan
Description of Work

INSTALL 10.0

CERTIFICATE OF OCCUPANCY

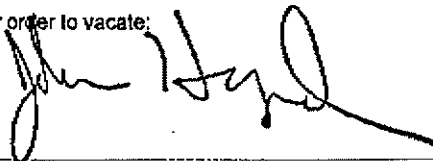
This serves notice that said building or structure has been constructed in accordance with the New Jersey Uniform Construction Code and is approved for occupancy.

CERTIFICATE OF APPROVAL

This serves notice that the work completed has been constructed or installed in accordance with the New Jersey Uniform Construction Code and is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection.

TEMPORARY CERTIFICATE OF OCCUPANCY/COMPLIANCE

If this is a temporary Certificate of Occupancy or Compliance, the following conditions must be met no later than _____ or the owner will be subject to _____ to fine or order to vacate:



John Holroyd, Construction Official

P.001

02/09/2017 13:30 8567695490

TX REPORT

JOB NO.	MODE	NO.	DESTINATION TEL/ID	START TIME	PAGE	RESULT
2685	TX	001	3394015	02/09 13:29	001	OK 00'41

CERTIFICATE OF
This serves notice t
as per NJAC 5:17, l

[] Total remov
[] Partial or lin

CERTIFICATE OF
This serves notice II
there are no immint

CERTIFICATE OF
This serves notice I
maintained in accoi
approved for use ui

Township of Pilesgrove

Municipal Building

Pilesgrove, NJ 08098

(856)769-4814

FAX (856)769-5490

Permit No. 20160291

Control No. 6124

Block/Lot 39/4

Date 2/09/17

Certificate of Approval

IDENTIFICATION

Block/Lot 39/4
Work Site Location 499 ELDRIDGES HILL RD
Owner in Fee/Occupant GIZELBACH, D J JR & REIHMANN, J A
Address 499 ELDRIDGES HILL ROAD
PILESGROVE NJ 08098
Telephone _____
Contractor RCL ENTERPRISES INC
Address 29 ALLOWAY-FRIESBURG ROAD
ALLOWAY, NJ 08001-
Telephone (856)339-4014 FAX _____
Lic. No. or Bldrs. Reg. No. 13VH00448000- 3/31/17
Federal Emp. No. 22-3662860

Home Warranty No. _____
Type of Warranty Plan: ☐ State ☐ Private
Use Group U
Maximum Live Load _____
Construction Classification _____
Maximum Occupancy Load _____
Description of Work/Use:

INSTALL 10.07 KW ROOF MOUNT SOLAR ARRAY

CERTIFICATE OF OCCUPANCY

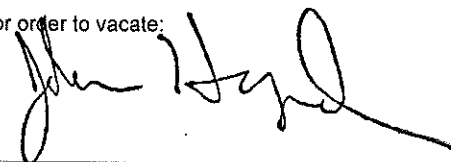
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John Holroyd, Construction Official

CERTIFICATE OF CLEARANCE - LEAD ABATEMENT 5:17

This serves notice that based on written certification, lead abatement was performed as per NJAC 5:17, to the following extent:

☐ Total removal of lead-based paint hazards in scope of work

☐ Partial or limited time period (_____ years); see file

CERTIFICATE OF CONTINUED OCCUPANCY

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

CERTIFICATE OF COMPLIANCE

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until _____

Permit Fee \$ 491
Paid ☐ Check No. 10882
Collected by: JD

Township of Pilesgrove
Municipal Building
Pilesgrove, NJ 08098
(856)769-4814 FAX (856)769-5490

Permit No. **20160291**
Control No. **6124**
Parcel(Block/Lot)**39/4**
Date **12/19/2016**

Construction Permit

Work Site Location **499 ELDRIDGES HILL RD, Pile**
Owner in Fee..... **GIZELBACH, D J JR & REIHMANN, J A**
Address..... **499 ELDRIDGES HILL ROAD**
Phone..... **PILEGROVE NJ 08098**
(856)373-1129

Contractor... **RCL ENTERPRISES INC**
Address..... **29 ALLOWAY-FRIESBURG ROAD**
ALLOWAY, NJ 08001-
Phone **(856)339-4014**
Lic No..... **13VH00448000- 3/31/17**
Fed Emp No. **22-3662860**

Permission is hereby granted to do the following work:

☒ BUILDING ☐ PLUMBING ☐ DEMOLITION
☒ ELECTRIC ☐ FIRE ☐ ASBESTOS ABATEMENT
☐ ELEVATOR ☐ MECHANICAL ☐ LEAD HAZARD ABATEMENT

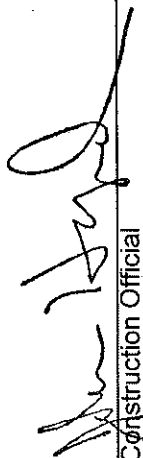
☐ ONGOING -
☐ OTHER

Description of Work:

**INSTALL 10.07 KW ROOF MOUNT SOLAR
ARRAY**

*Note: If construction does not commence within one (1) year
of the date of issuance or if construction ceases for a period
of six(6) months, this permit is Void.*

Estimated Cost of Work: \$21,633


Construction Official _____ Date 12/19/16

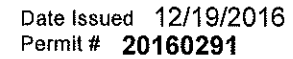
*Failure to obtain all required inspections may result in administrative action
Final inspections are required before final payment is to be made to contractor
An approved set of plans must be kept at the worksite at all times*

PAYMENTS * (Office Use Only)

Building	\$150
Electrical	300
Plumbing	0
Fire Protection	0
Elevator Devices.....	0
Mechanical.....	0
State Training Fee	41
Certificate of Occupancy	0
Other	0
Total	\$491

Check#/Cash.....	10882
Paid	\$491
Collected By	JD

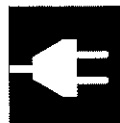
Total Administrative Fee: \$0



Administrative Surcharge \$	0
Minimum Fee \$	
State Permit Surcharge Fee \$	
TOTAL FEE \$	150



Township of Pilesgrove ELECTRICAL SUBCODE TECHNICAL SECTION



A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block/Lot 39/4

Work Site Location 499 ELDRIDGES HILL RD

Owner in Fee: GIZELBACH, D J JR & REIHMANN, J A

Tel. (856)373-1129

e-mail _____

Address: 499 ELDRIDGES HILL ROAD PILESGROVE NJ 08098

Street

municipality

zip code

Contractor: ERIC M KRISE ELECTRICAL Tel. (856)769-3932

Address: 80 BROAD STREET, ELMER, NJ -08318

e-mail _____

Contractor License No. _____ Exp. Date _____

Federal Emp. ID No. 46-0715090

FAX. (856)769-0228

B. ELECTRICAL CHARACTERISTICS

Use Group Present _____ Proposed U

☐ Pole/pad # _____ ☐ Temporary Service ☐ Other _____

Building Occupied as _____ Utility Co. _____

Est. Cost of Elec. Work \$ 19133 Descript: INSTALL 10.07 KW ROOF MOUNT SOLAR ARRAY

C. CERTIFICATION IN UEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

Applicant's Signature/Contractor's Seal and Signature

☐ Licensed Elec Contractor ☐ Cert Landscape Contr ☐ Exempt Applic

D. TECHNICAL SITE DATA

QTY. SIZE ITEMS

Lighting Fixtures
Receptacles
Switches
Detectors
Light Pole
Motors—Fract. H
Emergency & Exit Lights
Communications Pains
Alarm Devices/F.A.C. Panel

TOTAL NUMBERS

Pool Permit/with UW Lights
Storable Pool/Spa/Hot Tub
KW Elec. Range/Receptacle
KW Oven/Surface Unit
KW Elec. Water Heater
KW Elec. Dryer/Receptacle
KW Dishwasher
HP Garbage Disposal
KW Central AC Unit
HP/KW Space Heater/Air Handler
KW Baseboard Heat
HP Motors 11+ HP
KW Transformer/Generator
AMP Service
AMP Subpanels
AMP Motor Control Center
KW Elec. Sign/Outline Light

10

FEE (Office Use Only)

\$ _____

300

0

300

JOB SUMMARY (Office Use Only)

PLAN REVIEW

Date Initial

INSPECTIONS

Dates (Month/Day)

☐ No Plans Required

Type:

Failure

Failure

Approval

Initial

Joint Plan Review Required:

Rough

Barrier-Free

☐ Building

☐ Plumbing

Trench

☐ Fire

☐ Elevator

Temp. Serv.

☐ Elec. Plans Approved

Constr. Serv.

Date: _____

TCO

Approved by: _____

Other

Service

Final

Barrier-Free

SUBCODE APPROVAL

☐ CO

☐ CCO

☒ CA

Temp. Cut-in-Card Date Issued

Final Cut-in-Card Date Issued

Date: 2/6/17

Annual Pool Inspection

Approved by: [Signature]

Date of Grounding and Bonding Certification

Administrative Surcharge \$

Minimum Fee \$

State Permit Surcharge Fee \$

TOTAL FEE \$

LOCATION 499 ELDRIDGES HILL RD

ATANTIC

OWNER GIZELBACH, D J JR & REIHMAN

OCCUPANT

☒ Final ☐ Temporary This approval void after 60 days

DESCRIPTION OF SERVICE

24105

INSTALLED BY ERIC KRISKE LICENSE NO. 16241

DATE 2/06/17 PERMIT NO. 20160291 INSPECTOR JH

INSPECTOR JH

CALLED IN _____

Lic No.: 7215

UCC Form F350B



CUT-IN-CARD

MUNICIPALITY PILES GOVE
LOCATION 499 ELDRIDGES HILL RD UTILITY CO ATLANTIC

BLK/LOT 39/4
OWNER GIZELBACH, D J JR & REIHMAN OCCUPANT SOCAR

"Installation in the above premises has been inspected and is in accordance with N.E.C. and DCA requirements"

☒ Final ☐ Temporary This approval void after 60 days

DESCRIPTION OF SERVICE SOCAR SYS
INSTALLED BY EPAC KRISKE ELEC LICENSE NO. 16241

DATE 2/06/17 PERMIT NO. 20160291 INSPECTOR JH
VALUED IN 7213 Lic No. 7213

UCC Form F350B

P. 001

02/08/2017 09:19 8567695490

***** *** TX REPORT *** *****			
JOB NO.	MODE	DESTINATION TEL/ID	START TIME
2675	TX	ECM 001	02/08 09:18
		8637979	00'12
		OK	RESULT

PILESGROVE TOWNSHIP

1180 Route 40
Pilesgrove, NJ 08089
(856) 769-4814

ZONING PERMIT

PERMIT#: 2129

FEE: \$ 50.00

ISSUED ON: 12/5/16

ISSUED TO: RCL ENTERPRISES, INC

BLOCK: 39 LOT: 4

STREET: 499 ELDRIDGES HILL ROAD, PILESGROVE

PHONE: (856) 339-4014

This Permit certifies that an application for the issuance of a Zoning Permit has been examined and approved as indicated below:

INSTALL 10.07 KW ROOF MOUNT SOLAR ARRAY

☒ PERMITTED BY TOWNSHIP ORDINANCE

☐ PERMITTED BY VARIANCE: RESOLUTION NO.

THIS IS A ZONING PERMIT, YOU MAY REQUIRE CONSTRUCTION PERMITS TO COMPLETE YOUR PROJECT. PLEASE CONTACT THE CONSTRUCTION OFFICE FOR INSTRUCTIONS.

145-15. General district regulations.

A.

...Permit duration. Unless the use is commenced, lot cleared and graded, structure erected within one (1) year from the date of the issuance of the permit or prior to a zoning change affecting the issuance of the permit, whichever occurs first, the permit shall be deemed void and of no effect. However, nothing shall prevent requesting the issuance of another permit which would then be evaluated in accordance with the existing land use regulations at the time application for said zoning permit is submitted.



Hubert T Layton, Jr.
Zoning Officer

JAMES A. CLANCY

PROFESSIONAL ENGINEER
601 ASBURY AVENUE
NATIONAL PARK, NJ 08063
(856) 358-1125 FAX: (856) 358-1511

Construction Code Office

Date: September 22, 2016

Re: RCL Enterprises, Inc.
PO Box 647, Alloway, NJ 08001

Subj: Dennis Gizelbach Residence, 499 Eldridges Hill Rd., Pilesgrove, NJ 08098

We have provided an inspection and review of the residence roof construction of the above named property in regards to verifying the capacity of the existing roof for installation of a new Solar Panel Array.

We have found the residence to be of wood frame construction bearing walls with a rafter framed roof system. Array 1 is of 2x6 @ 24" o.c. rafter framed roof and is sheathed with 1/2" ext-ply sheathing and one layer of composite shingles. Array 2 is of 3x4 @ 24" o.c. rafter framed roof and is sheathed with 1/2" ext-ply sheathing and one layer of composite shingles. Array 3 is of 2x6 @ 16" o.c. rafter framed roof and is sheathed with 1/2" ext-ply sheathing and one layer of composite shingles.

The existing roof structure bears directly upon the exterior stud framed wall system. The existing rafters as installed in Array 1 require a knee wall to meet the required load/span ratings with sufficient capacity to carry the minor additional load of 4 #/sf imposed by the proposed solar array per the details below. The existing rafters as installed in Array 2 require 2x4 @ 24" collar ties to meet the required load/span ratings with sufficient capacity to carry the minor additional load of 4 #/sf imposed by the proposed solar array per the details below. The existing rafters as installed in Array 3 meet the required load/span ratings with sufficient capacity to carry the minor additional load of 4 #/sf imposed by the proposed solar array per the details below

Installation of solar rack systems shall be as follows:

Each panel row shall be supported upon 2 mounting rails. Rails shall be screw anchored through roof and directly to rafters below.

Rail attachment points to rafters shall be staggered each row with exception to the first fastener row from the gable end which is attached to two adjacent rafters.

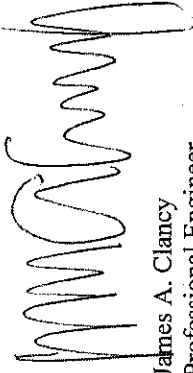
A roofing compatible sealant or shingle flashing kit shall be utilized at each mtg. foot location.

Solar panel mounting systems installed parallel to the plane of a roof shall be no more than 12" above the roof when measured perpendicular to the roof surface.

When installed per the above specifications the system shall exceed 115 MPH wind & 20 PSF snow loads as required by the IRC-2015-NJ.

Should you have any further question or comment please feel free to contact our office.

Respectfully,



James A. Clancy
Professional Engineer
NJ License # 33998

OFFICE

RELEASED PILESGROVE TOWNSHIP

Const. Official

Elec. Official

Fire Official

Plumbing Official

Building Official

Date

Date

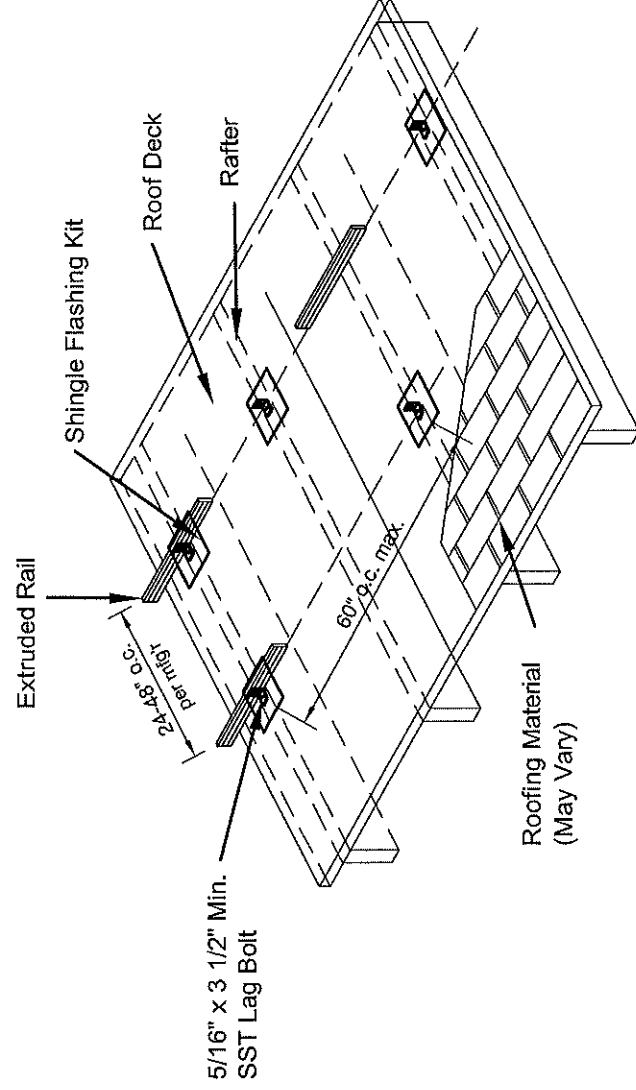
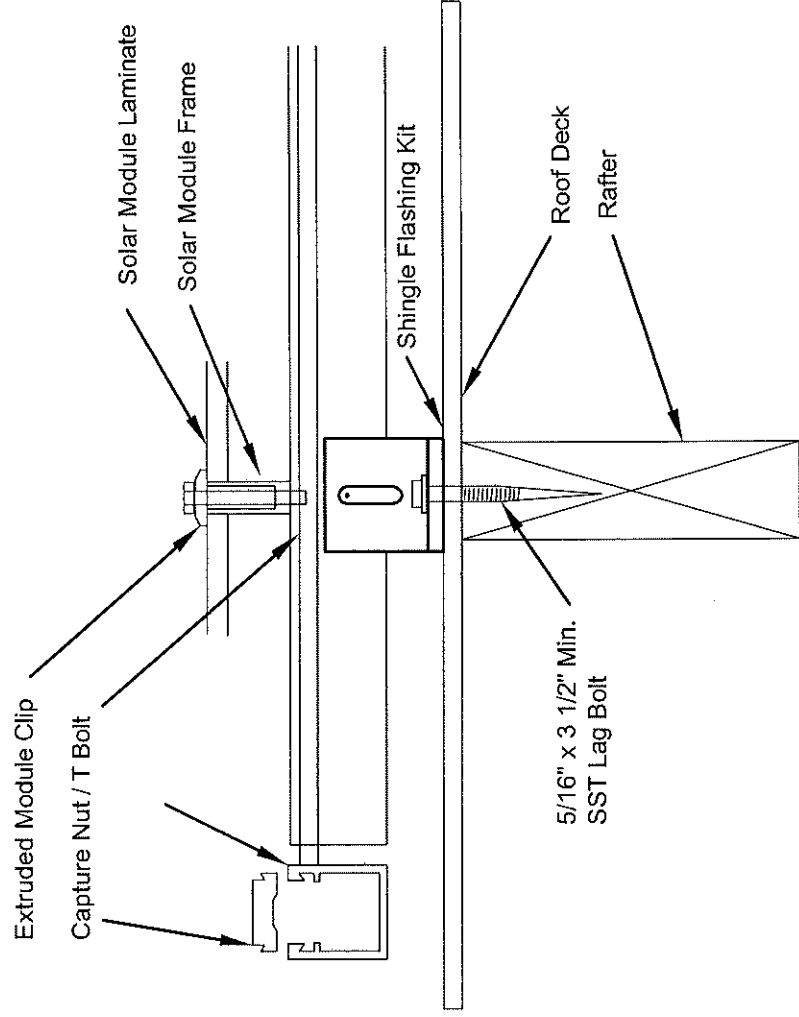
Date

Date

Date

12-12-16

Rooftop Mounting Cross-Section
Composite Shingle Roof
and similar
For Basic Wind Speed Design
Up To 115-MPH



JAMES A. CLANCY
PROFESSIONAL ENGINEER
601 ASBURY AVENUE
NATIONAL PARK, NJ 08063
(856) 358-1125 FAX: (856) 358-1511

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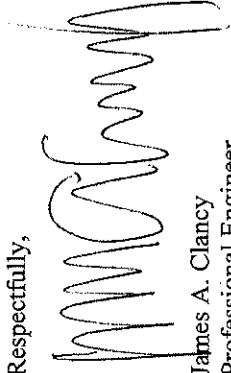
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When installed per the above specifications the system shall exceed 115 MPH wind & 20 PSF snow loads as required by the IRC-2015-NJ.

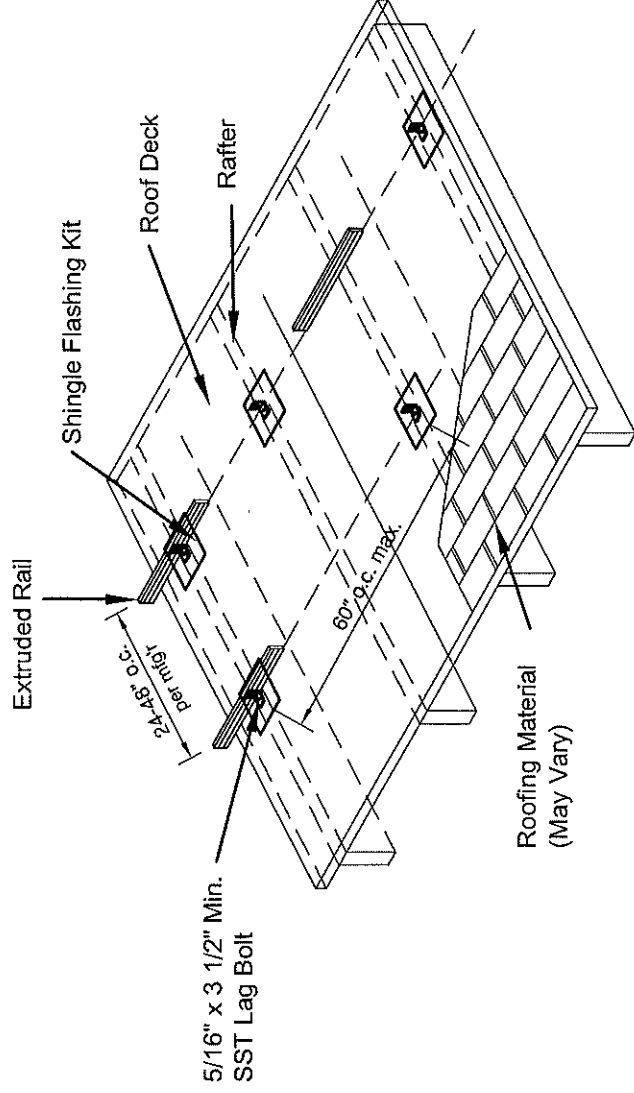
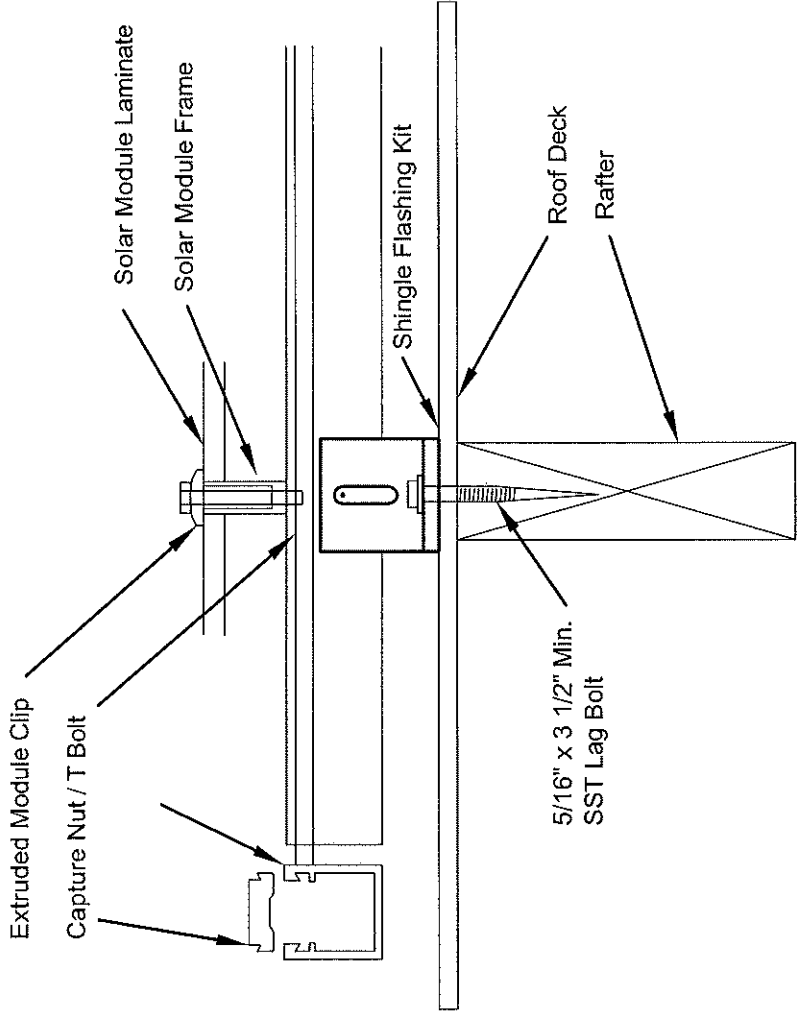
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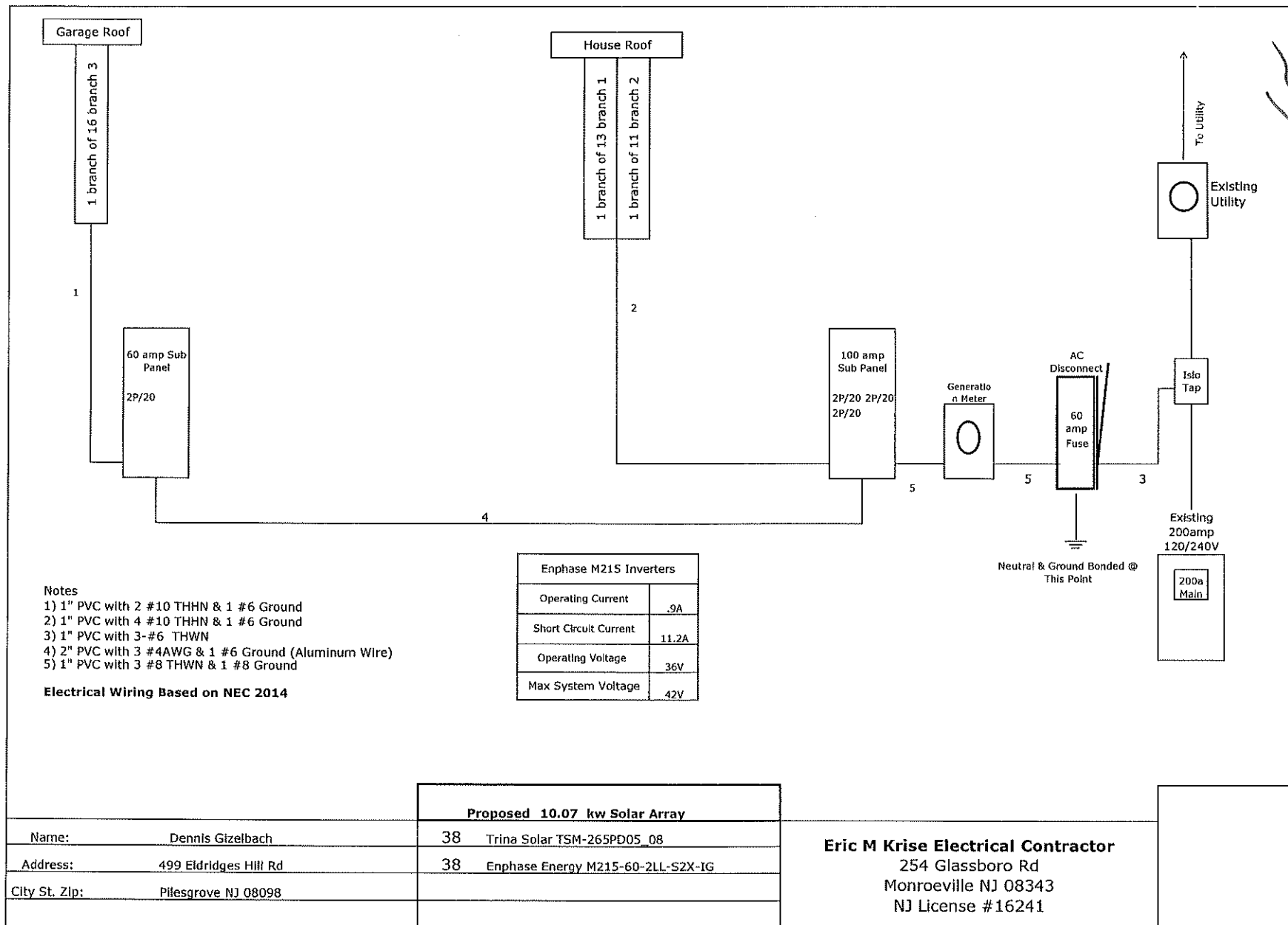
Respectfully,



James A. Clancy
Professional Engineer
NJ License # 33998

Rooftop Mounting Cross-Section
Composite Shingle Roof
and similar
For Basic Wind Speed Design
Up To 115-MPH





THE ALLMAX MODULE

60 CELL
MULTICRYSTALLINE MODULE

250-265W
POWER OUTPUT RANGE

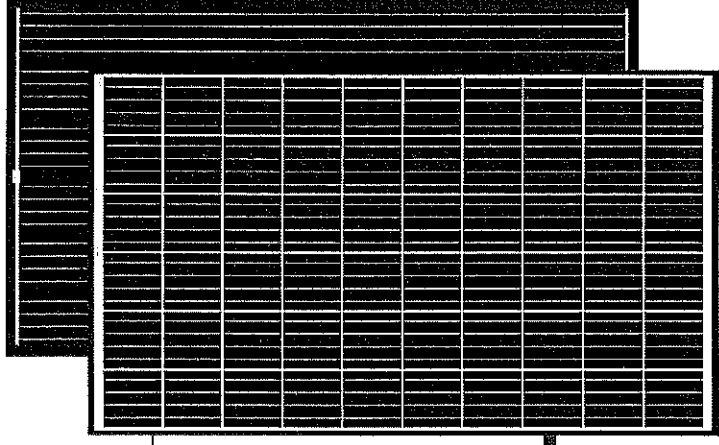
16.2%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

As a leading global manufacturer of next generation photovoltaic products, we believe close cooperation with our partners is critical to success. With local presence around the globe, Trina is able to provide exceptional service to each customer in each market and supplement our innovative, reliable products with the backing of Trina as a strong, bankable partner. We are committed to building strategic, mutually beneficial collaboration with installers, developers, distributors and other partners as the backbone of our shared success in driving Smart Energy Together.

Trina Solar Limited
www.trinasolar.com

Trinasolar
Smart Energy Together



Our most versatile product

- Compatible with all major BOS components and system designs
- 1000V UL/1000V IEC certified



One of the industry's most trusted modules

- Field proven performance



Highly reliable due to stringent quality control

- Over 30 in-house tests (UV, TC, HF, and many more)
- In-house testing goes well beyond certification requirements
- PID resistant

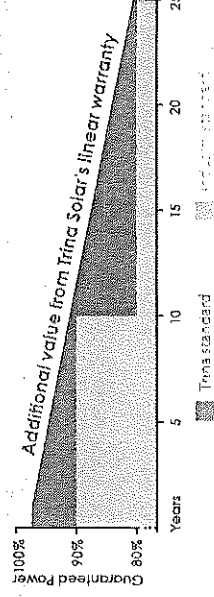


Certified to withstand challenging environmental conditions

- 2400 Pa wind load
- 5400 Pa snow load

LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty

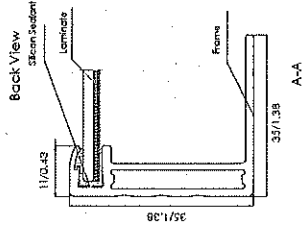
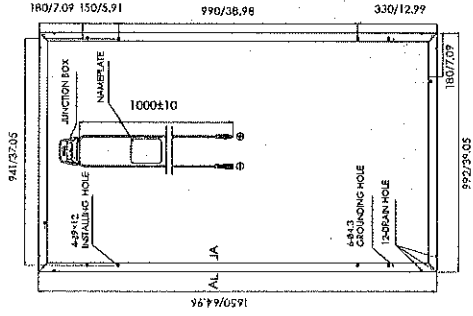


Trina Solar Limited
www.trinasolar.com

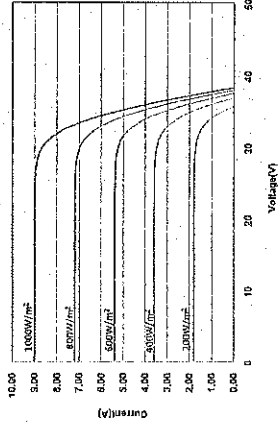
THE A₁MAX MODULE

PRODUCTS	POWER RANGE
TSM-PD05.08	255-265W
TSM-PD05.05	250-260W

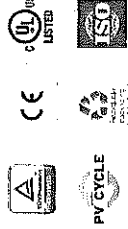
DIMENSIONS OF PV MODULE
unit:mm/in



I-V CURVES OF PV MODULE (250W)



CERTIFICATION



TinaSolar
Smart Energy Together

ELECTRICAL DATA (STC)

Peak Power Watts- P_{max} (Wp)	250	255	260	265
Power Output Tolerance- P_{max} (W)	0 ~ +5			
Maximum Power Voltage- V_{mp} (V)	30.3	30.5	30.6	30.8
Maximum Power Current- I_{mp} (A)	8.27	8.37	8.50	8.61
Open Circuit Voltage- V_{oc} (V)	36.0	36.1	36.2	36.3
Short Circuit Current- I_{sc} (A)	8.79	8.88	9.00	9.10
Module Efficiency η (%)	15.3	15.6	15.9	16.2

STC: Irradiance 1000 W/m², Cell Temperature 25°C, Air Mass AM1.5.
Typical efficiency reduction of 4.5% at 200 W/m² according to EN 60904-1.

ELECTRICAL DATA (NOCT)

Maximum Power- P_{max} (Wp)	186	189	193	197
Maximum Power Voltage- V_{mp} (V)	28.1	28.2	28.4	28.6
Maximum Power Current- I_{mp} (A)	6.63	6.71	6.81	6.89
Open Circuit Voltage- V_{oc} (V)	35.3	35.3	35.4	35.5
Short Circuit Current- I_{sc} (A)	7.10	7.17	7.27	7.35

NOCT: Irradiance of 800 W/m², Ambient Temperature 20°C, Wind Speed 1 m/s.

MECHANICAL DATA

Solar cells	Multicrystalline 156 × 156 mm (6 inches)
Cell orientation	60 cells (6 × 10)
Module dimensions	1650 × 992 × 35 mm (64.95 × 39.05 × 1.37 inches)
Weight	18.6 kg (41 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Tempered Glass
Backsheet	White (PD05.08); Black (PD05.05)
Frame	Black Anodized Aluminium Alloy
J-Box	IP 65 or IP 67 rated
Cables	Photovoltaic Technology cable 4.0mm² (0.006 inches²), 1000mm (39.37 inches)
Connector	UTX Amphenol
Fire Type	Type 1 or 2

TEMPERATURE RATINGS

Nominal Operating Cell Temperature (NOCT)	44°C (±2°C)
Temperature Coefficient of P_{max}	-0.41%/°C
Temperature Coefficient of V_{oc}	-0.32%/°C
Temperature Coefficient of I_{sc}	0.05%/°C

MAXIMUM RATINGS

Operational Temperature	-40 ~ +85°C
Maximum System Voltage	1000V DC (IEC) 1000V DC (UL)
Max Series Fuse Rating	15A

WARRANTY

10 year Product Workmanship Warranty
25 year Linear Power Warranty
(Please refer to product warranty for details)

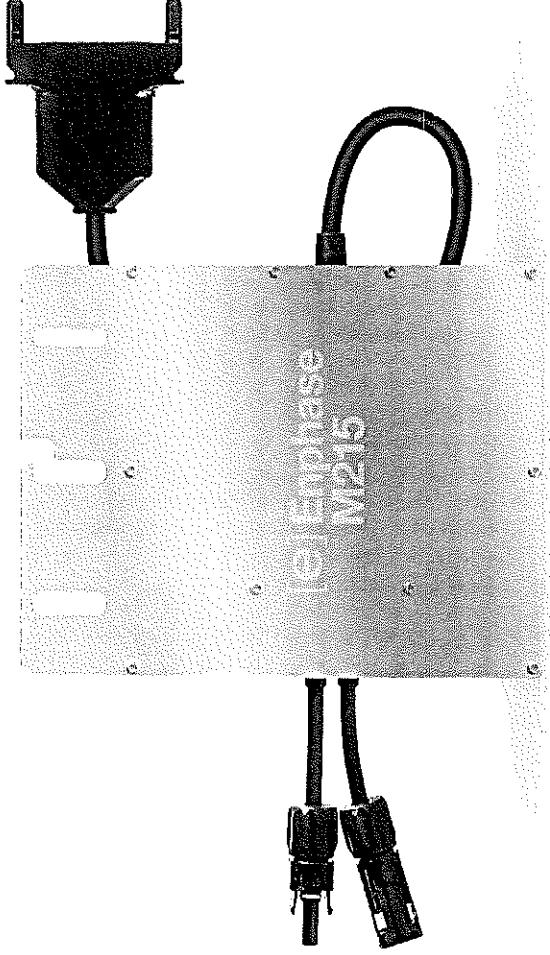
PACKAGING CONFIGURATION

Modules per box: 30 pieces
Modules per 40' container: 840 pieces

TSM_EN_2015_8

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.
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Enphase® M215



The Enphase® M215 Microinverter with integrated ground delivers increased energy harvest and reduces design and installation complexity with its all-AC approach. With the advanced M215, the DC circuit is isolated and insulated from ground, so **no Ground Electrode Conductor (GEC) is required for the microinverter**. This further simplifies installation, enhances safety, and saves on labor and materials costs.

The Enphase M215 integrates seamlessly with the Engage® Cable, the Envoy® Communications Gateway™, and Enlighten®, Enphase's monitoring and analysis software.

PRODUCTIVE

- Maximizes energy production
- Minimizes impact of shading, dust, and debris
- No single point of system failure

SIMPLE

- No GEC needed for microinverter
- No DC design or string calculation required
- Easy installation with Engage Cable

RELIABLE

- More than 1 million hours of testing and millions of units shipped
- Industry-leading warranty, up to 25 years

Enphase® M215 Microinverter // DATA

INPUT DATA (DC)

M215-60-2LL-S22-IG, M215-60-2LL-S25-IG

Recommended input power (STC)	190 - 270 W
Maximum input DC voltage	48 V
Peak power tracking voltage	27 V - 39 V
Operating range	16 V - 48 V
Min/Max start voltage	22 V / 48 V
Max DC short circuit current	15 A

OUTPUT DATA (AC)

@208 VAC @240 VAC

Peak output power	225 W	225 W
Rated (continuous) output power	215 W	215 W
Nominal output current	1.03 A (A rms at nominal duration)	0.9 A (A rms at nominal duration)
Nominal voltage/range	208 V / 183-229 V	240 V / 211-264 V
Nominal frequency/range	60.0 / 57-61 Hz	60.0 / 57-61 Hz
Extended frequency range*	57-62.5 Hz	57-62.5 Hz
Power factor	>0.95	>0.95
Maximum units per 20 A branch circuit	25 (three phase)	17 (single phase)
Maximum output fault current	850 mA rms for 6 cycles	850 mA rms for 6 cycles

EFFICIENCY

CEC weighted efficiency, 240 VAC	96.5%
CEC weighted efficiency, 208 VAC	96.5%
Peak inverter efficiency	96.5%
Static MPPT efficiency (weighted, reference EN50530)	99.4 %
Night time power consumption	65 mW max

MECHANICAL DATA

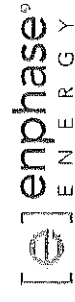
Ambient temperature range	-40°C to +65°C
Dimensions (WxHxD)	171 mm x 173 mm x 30 mm (without mounting bracket)
Weight	1.6 kg (3.4 lbs)
Cooling	Natural convection - No fans
Enclosure environmental rating	Outdoor - NEMA 6
Connector type	M215-60-2LL-S22-IG: MC4 M215-60-2LL-S25-IG: Amphenol H4

FEATURES

Compatibility	Compatible with 60-cell PV modules.
Communication	Power line
Integrated ground	The DC circuit meets the requirements for ungrounded PV arrays in NEC 690.35. Equipment ground is provided in the Engage Cable. No additional GEC or ground is required. Ground fault protection (GFP) is integrated into the microinverter.
Monitoring	Enlighten Manager and MyEnlighten monitoring options
Compliance	UL1741/IEEE1547, FCC Part 15 Class B, CAN/CSA-C22.2 NO. 0-M91, 0.4-04, and 107.1-01

* Frequency ranges can be extended beyond nominal if required by the utility

To learn more about Enphase Microinverter technology,
visit enphase.com



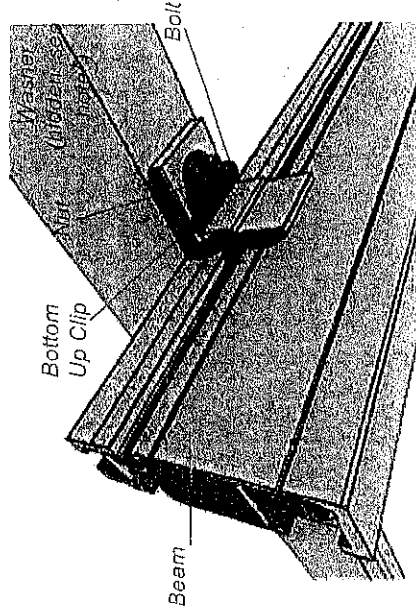
SolarMount Technical Datasheet

Pub 110818-11d V1.0 August 2011

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End Clamp.....	2
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SolarMount Module Connection Hardware

SolarMount Bottom Up Module Clip Part No. 302000C



- Bottom Up Clip material: One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
 - Ultimate tensile: 38ksi, Yield: 35 ksi
 - Finish: Clear Anodized
 - Bottom Up Clip weight: ~0.031 lbs (14g)
 - Allowable and design loads are valid when components are assembled with SolarMount series beams according to authorized UNIRAC documents
 - Assemble with one 1/4"-20 ASTM F593 bolt, one 1/4"-20 ASTM F594 serrated flange nut, and one 1/4" flat washer
 - Use anti-seize and tighten to 10 ft-lbs of torque
 - Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory
 - Module edge must be fully supported by the beam
- * **NOTE ON WASHER:** Install washer on bolt head side of assembly. DO NOT install washer under serrated flange nut

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor FS	Design Load lbs (N)	Resistance Factor
Tension Y	366 (8367)	606 (20634)	2.28	1005 (4515)	2.952
Transverse X	1123 (5019)	329 (1463)	3.43	457 (2013)	9.141
Shear Z	69 (282)	27 (119)	2.44	41 (131)	5.513



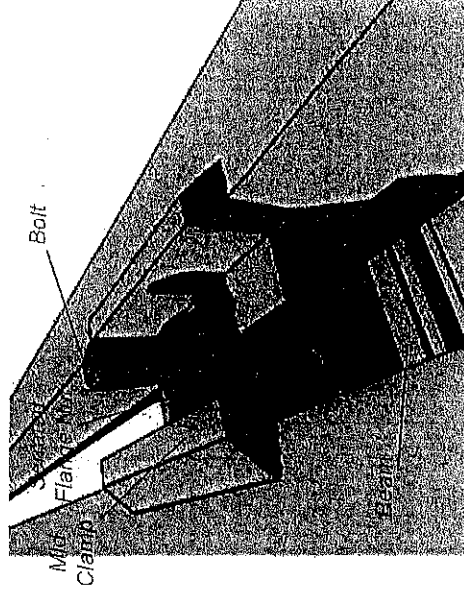
Dimensions in inches and millimeters are given.

SOLARMount Technical Datasheets

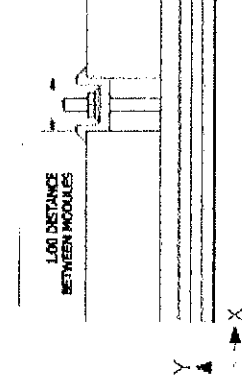


SolarMount Mid Clamp

Part No. 302101C, 302101D, 302103C, 302104D,
302105D, 302106D



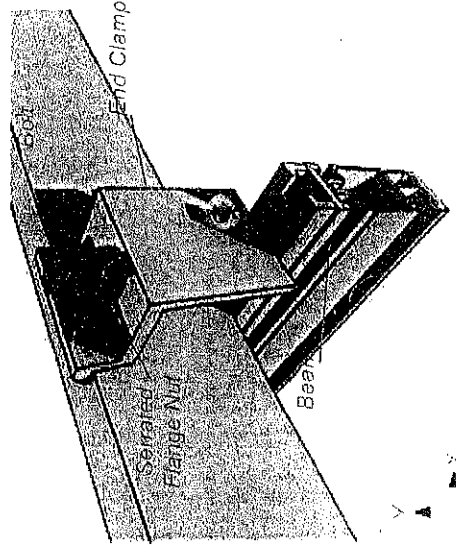
- Mid clamp material: One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- Ultimate tensile: 38ksi, Yield: 35 ksi
- Finish: Clear or Dark Anodized
- Mid clamp weight: 0.050 lbs (23g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Values represent the allowable and design load capacity of a single mid clamp assembly when used with a SolarMount series beam to retain a module in the direction indicated
- Assemble mid clamp with one Unirac 1/4"-20 T-bolt and one 1/4"-20 ASTM F594 serrated flange nut
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory



Dimensions specified in inches unless noted

SolarMount End Clamp

Part No. 302001C, 302002C, 302002D, 302003C,
302003D, 302004C, 302004D, 302005C, 302005D,
302006C, 302006D, 302007D, 302008C, 302008D,
302009C, 302009D, 302010C, 302011C, 302012C

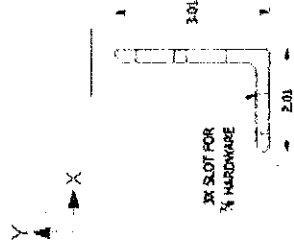
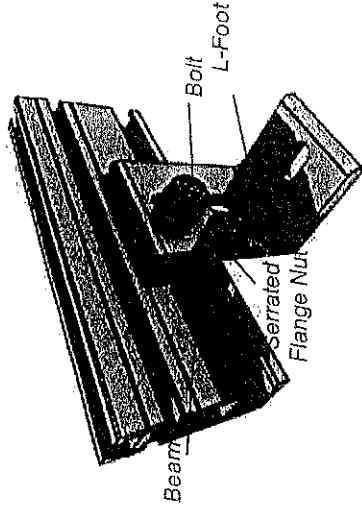


- End clamp material: One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- Ultimate tensile: 38ksi, Yield: 35 ksi
- Finish: Clear or Dark Anodized
- End clamp weight: varies based on height: ~0.058 lbs (26g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Values represent the allowable and design load capacity of a single end clamp assembly when used with a SolarMount series beam to retain a module in the direction indicated
- Assemble with one Unirac 1/4"-20 T-bolt and one 1/4"-20 ASTM F594 serrated flange nut
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory
- Modules must be installed as shown in the diagram

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor FS	Design Load lbs (N)	Resistance Factor Φ
Tension, Y+	2020 (8987)	891 (3963)	2.27	1348 (5994)	0.687
Transverse, Z±	520 (2313)	229 (1017)	2.27	346 (1539)	0.665
Sliding, X±	1194 (5312)	490 (2179)	2.44	741 (3295)	0.620

SolarMount Beam Connection Hardware

SolarMount L-Foot
Part No. 304000C, 304000D



Dimensions specified in inches unless noted

- L-Foot material: One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- Ultimate tensile: 38ksi, Yield: 35 ksi
- Finish: Clear or Dark Anodized
- L-Foot weight: varies based on height: ~0.215 lbs (98g)
- Allowable and design loads are valid when components are assembled with SolarMount series beams according to authorized UNIRAC documents
- For the beam to L-Foot connection:
 - Assemble with one ASTM F593 3/8"-16 hex head screw and one ASTM F594 3/8"serrated flange nut
 - Use anti-seize and tighten to 30 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory

NOTE: Loads are given for the L-Foot to beam connection only; be sure to check load limits for standoff, lag screw, or other attachment method

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Load lbs (N)	Resistance Factor, Φ
Sliding, Z $\pm$	1766 (7856)	755 (3356)	2.34	1141 (5077)	0.646
Tension, Y+	1859 (8269)	707 (3144)	2.63	1069 (4755)	0.575
Compression, Y-	3258 (14492)	1325 (5893)	2.46	2004 (8913)	0.615
Traverse, X $\pm$	486 (2162)	213 (949)	2.28	323 (1436)	0.664

SolarMount Beams

Part No. 310132C, 310132C-B, 310168C, 310168C-B, 310168D
 310208C, 310208C-B, 310240C, 310240C-B, 310240D,
 410144M, 410168M, 410204M, 410240M

Properties	Units	SolarMount	SolarMount HD
Beam Height	in	2.5	3.0
Approximate Weight (per linear ft)	plf	0.811	1.271
Total Cross Sectional Area	in ²	0.676	1.059
Section Modulus (X-Axis)	in ³	0.353	0.898
Section Modulus (Y-Axis)	in ³	0.113	0.221
Moment of Inertia (X-Axis)	in ⁴	0.464	1.450
Moment of Inertia (Y-Axis)	in ⁴	0.044	0.267
Radius of Gyration (X-Axis)	in	0.289	1.170
Radius of Gyration (Y-Axis)	in	0.254	0.502

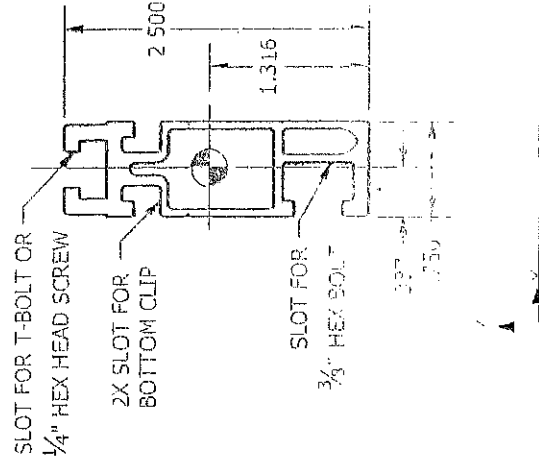


Figure 1: Beam

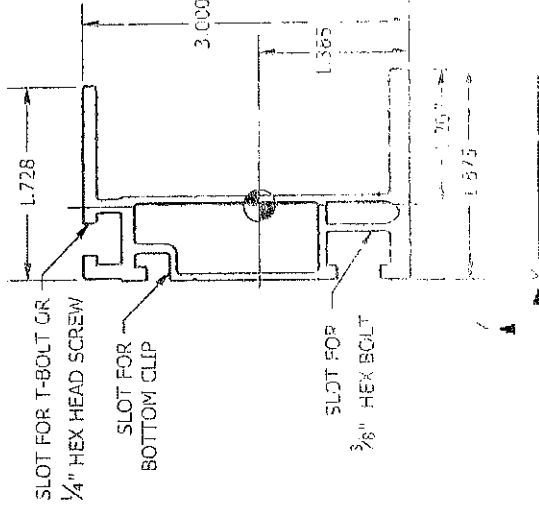
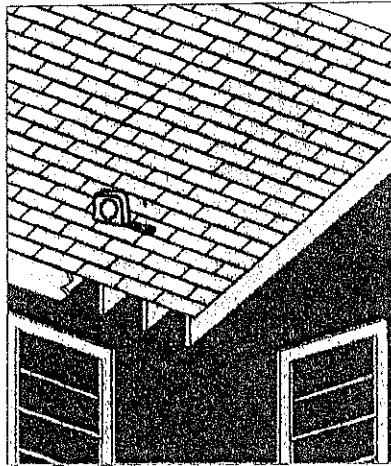
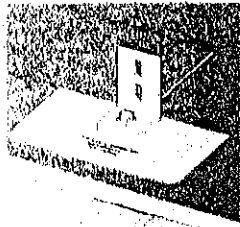
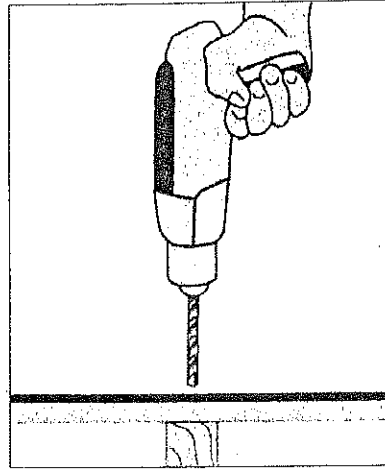


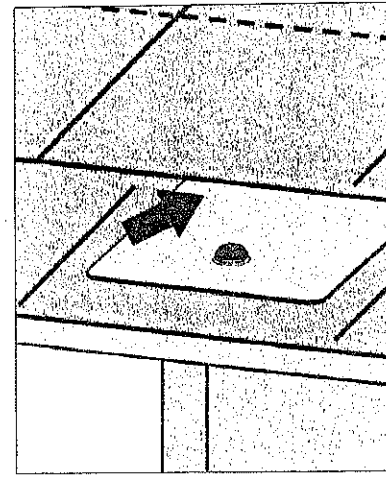
Figure 2: Beam



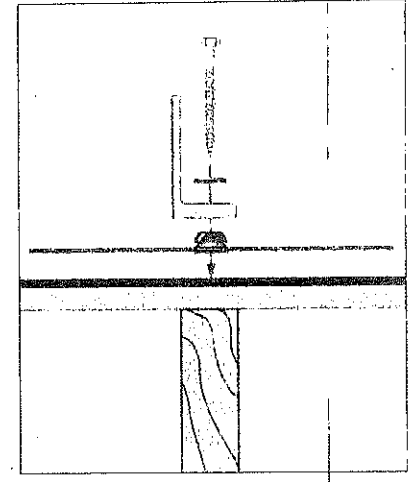
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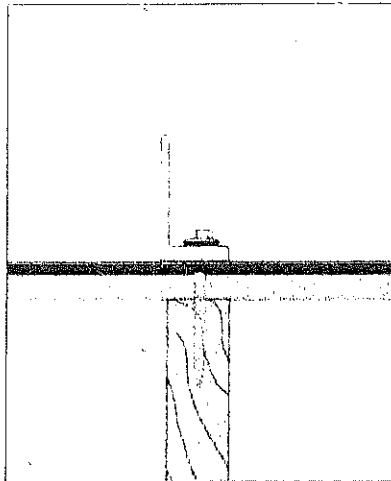
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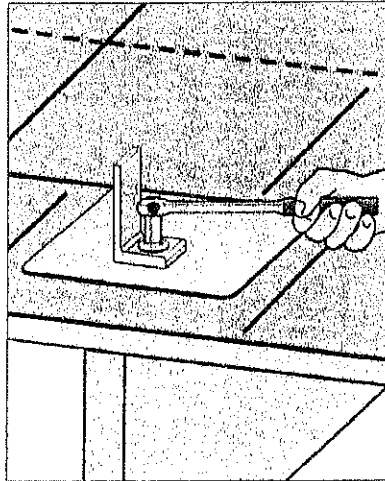
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6

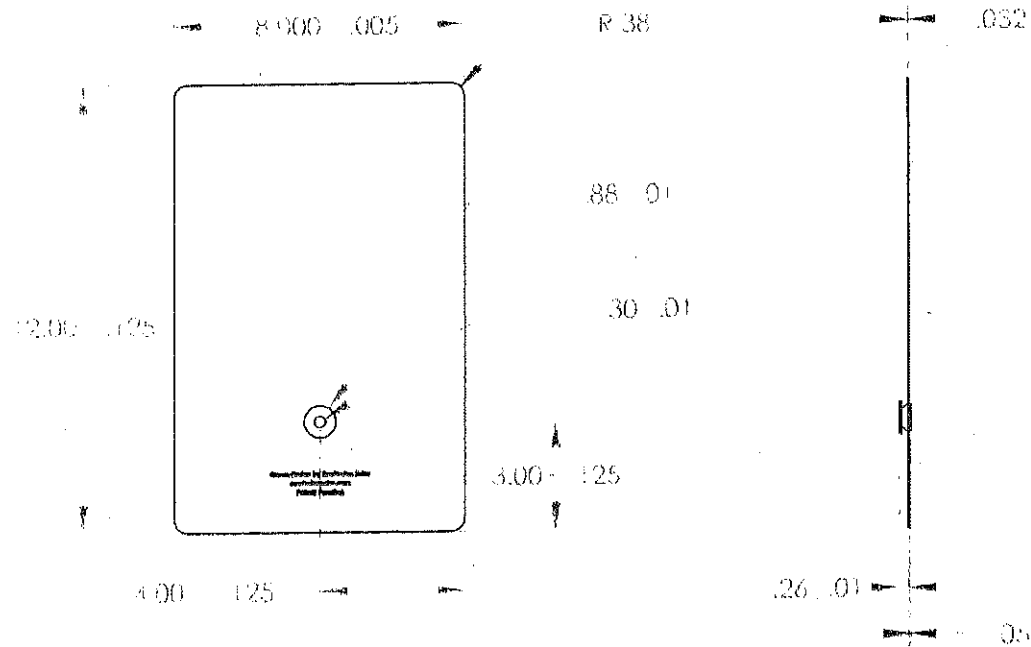
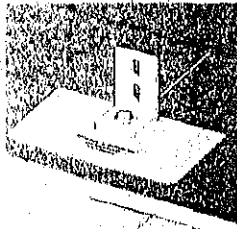
Instructions

* For detailed product illustration see previous page, for required tools see next page.

1. Locate the rafters and snap horizontal and vertical lines to mark the installation position for each GreenFasten Flashing.
2. Drill a pilot hole (1/4" diameter) for the lag bolt. Backfill with sealant.*
3. Insert the flashing so the top part is under the next row of shingles and pushed far enough up slope to prevent water infiltration through vertical joint in shingles.
4. Line up pilot hole with GreenFasten hole.
5. Insert the lag bolt through the EPDM washer; the top compression component (L-Bracket pictured) and the gasketed hole in the flashing and into the rafter.
6. Torque to 140 inch-pounds

Consult an engineer or go to www.ecofastensolar.com for engineering data.

*EcoFasten recommends Geocel 2300



Finish Options
 BLK = Matte Black
 BRZ = Medium Bronze
 MLL = Mill Finish

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