BLOCK 382.35 LOT 2 QUALIFICATION CODE ADDRESS (SITE) PERMIT NO. 16-4159

CONSTRUCTION PERMIT APPLICATION

NEW JERSEY UNIFORM CONSTRUCTION CODE

C-16-005053

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

I. IDENTIFICATION

1. Proposed Work Site at: 3 Bow Ave, Brick, NJ 07734
2. Name of Owner in Fee: Rick & Carleen Dopf
   Tel. [redacted] e-mail [redacted]
   Address 3 Bow Ave, Brick, NJ 07734 (street / municipality / zip code)
3. Ownership in Fee: Public ____ Private X
4. Principal Contractor: Green Sun Energy Services Tel. 732.410.7818 x402
   Address 79 McCutcheon Ct. Middletown NJ 07748 e-mail ctorre@greensunnj.com
   License No. OR, if new home, Builder Reg. No. 13HV06229000 Exp. Date 12/31/2017
   Home Improvement Contractor Registration No. or Exemption Reason (if applicable): ____
   Federal Emp. ID No. 274380026 FAX: 732.410.7422
5. Architect or Engineer ____ Contact ____
   Address PO Box 4314, Middletown, NJ 07748 e-mail ____
   Tel. 732.410.7818 x402 FAX: 732.410.7422
6. Responsible Person in Charge once Work has Begun Chris Torre
   Tel. 732.410.7818 x402 FAX. 732.410.7422

V. FEE SUMMARY (for office use only)

		Update	Update
1. Building	$ 182		
2. Electrical	$ 338.00		
3. Plumbing	$		
4. Fire Protection	$		
5. Elevator Devices	$		
6. Subtotal	$		
7. Less 20% for State Plan Review	$		
8. Subtotal	$		
9. State Permit Surcharge Fee	$ 2		
10. Subtotal	$		
11. Cert. of Occupancy			
12. Other			
13. TOTAL	$ 520		

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 (Solar panels)
- [ ] New Building
- [x] Addition
- [ ] Demolition
- [ ] Repair
- [ ] Alteration
- [ ] Renovation
- [ ] Reconstruction
- [ ] Asbestos Abat. -Subch. 8
- [ ] Lead Hazard Abatement
- [ ] Radon Remediation
- [ ] Annual Permit

IIb. SUBCODES (Check all that apply)

	Est. Cost	FOR OFFICE USE ONLY (Optional) Plans Rec'd by	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates Approval	Resubmission Dates Rejection	Re-viewer
[x] Building	3,636.36								
[x] Electrical	19,834.08				10/24/16	PE			
[ ] Plumbing									
[ ] Fire Protection									
[ ] Elevator		Comp Exempt			10/24/16				
TOTAL COST	$ 23,470.44								

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. [ ] LPGas Tanks
12. [ ] Fire Alarm

Brick Township
401 Chambersbridge Rd
Brick, NJ 08723

Date Issued 12/27/2016
Control Number C-16-005053
Permit Number 16-4159
Permit Issue Date 11/30/2016
Certificate Number 16-4159

Certificate

Construction Code Division

(Certificate of Approval)

Identification

Work Site Location: 3 BOW DRIVE Brick Township, NJ 08723 Block: 382.35 Lot: 2 Qual:

Owner in Fee: DOPF, RICHARD W & CARLEEN A

Owner Address: 3 BOW DR BRICK NJ 08723

Telephone: [redacted]

Contractor GREEN SUN ENERGY SERVICES, LLC

Address 79 MCCUTCHEON CT MIDDLETOWN NJ 07748

Telephone: (732) 410-4818 Fax:

License Number or Builders Registration Number: 13VH0622900 Federal Emp. Number:

Home Warranty Number:

Type of Warranty Plan: ☐ State ☐ Private

Use Group: R-5 Construction Classification:

Maximum Live Load: 0 Maximum Occupancy Load: 0

Description of Work/Use: SOLAR PANELS INSTALL 12.6 kw ROOF MOUNT PHOTOVOLTAIC SOLAR SYSTEM

Certificate Comments:

☐ **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.

☐ **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.

☐ **Temporary Certificate of Compliance**
The following conditions must be met no later than
or the owner will be subject to fine or order to vacate:
This certificate has an expiration date of:
Conditions to be met:

☐ **Certificate of Clearance - Lead Abatement 5:17**
This serves notice that based on written certification, lead abatement was performed as per NJAC5:17 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 Clearance - Asbestos Abatement**
This serves notice that based on written certification, asbestos abatement was performed to the following extent.

☐ Total removal of asbestos hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **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

☐ **Temporary Certificate of Occupancy**
The following conditions must be met no later than:
or the owner will be subject to fine or order to vacate:
This certificate has an expiration date of:
Conditions to be met:

David J. Newman Jr.

Construction Official

Fee: $0.00
Check Number:
Collected By:

Date Printed: 12/27/2016

U.C.C. F260 (rev. 08/05)

VECTOR ENGINEERS

UTAH OFFICES
Sandy
Layton
St. George

TOWNSHIP OF BRICK
RELEASED FOR PERMIT INITIAL DATE
Building Subcode
Plumbing Subcode
Fire Subcode
Electrical Subcode
Plan Reviewer
Plans Released
Construction Official

Project Number: U1952-0014-161

November 11, 2016

Green Sun Engergy Services
P.O. Box 4314
Middletown, NJ 07748

REFERENCE: **Dopf Residence: 3 Bow Drive, Brink, NJ 08723**
Solar Panel Installation

FILE COPY

To whom it may concern:

Per your request, we have reviewed the layout relating to the installation of solar panels at the above-referenced site. The following materials and components are proposed in the installation of the solar panels.

Roof Construction: Conventional
Rafter span: 19'
Roof Structure in Area of Panels: 2x6 Rafters @ 16" O.C. w/ Collar ties @ 4' & knee wall @ 8'-3" from ridge
Roof Material: Composite shingles

Based upon our review, it is our conclusion that the installation of solar panels on this existing roof will not adversely affect the structure of this house. The design of solar panel supporting members and connections is by the manufacturer and/or installer. The adopted building code in this jurisdiction is the 2015 International Building Code and ASCE 7-10. Appropriate design parameters which must be used in the design of the supporting members and connections are listed below:

Ground snow load: 20 psf per 2015 IBC (verify with local building department)
Design wind speed for risk category II structures: 122 mph per ASCE 7-10
Wind exposure: Category C

Our conclusion regarding the adequacy of the existing roof is based on the fact that the additional weight related to the solar panels is less than 3 pounds per square foot. In the area of the solar panels, no 20 psf live loads will be present per Section 1607.12.5.3 of the International Building Code, 2015 Edition. Regarding snow loads, it is our conclusion that since the panels are slippery, effective snow loads will likely be reduced in the areas of the panels. The attached calculations verify the capacity of the connections against wind, the governing load case. The rails shall be attached at 72" O.C. maximum with adjacent rails attached to alternating rafters using 5/16" diameter lag screws with a minimum of 3" thread penetration into the rafter or truss. Solar panels will be flush-mounted, parallel to and no more than 6" above the roof surface. Thus, it is our conclusion that any additional wind or seismic loadings related to the addition of these solar panels is negligible.

During design and installation, particular attention must be paid to the maximum allowable spacing of attachments and the location of solar panels relative to roof edges. The use of solar panel support span tables provided by the manufacturer is allowed only where the building type, site conditions, and solar panel configuration match the description of the span tables. Attachments to existing roof joist or rafters must be staggered so as not to over load any existing structural member. Waterproofing around the roof penetration is the responsibility of others. All work performed must be in accordance with accepted industry-wide methods and applicable safety standards. Vector Structural Engineering assumes no responsibility for improper installation of the solar panels.

Please note a representative of Vector Structural Engineering has not physically observed the roof framing. Our conclusions are based upon the assumption that all structural roof components and other supporting elements are in good condition, free of damage and deterioration, and are sized and spaced such that they can resist standard roof loads.

Very truly yours,
VECTOR STRUCTURAL ENGINEERING, LLC

Wells L. Holmes, P.E.
Project Engineer

NJ Certificate of Authorization: 24GA28120600

WLH/klr

11 NOV 2016

VECTOR ENGINEERS

JOB NO.: U1952-0014-161

PROJECT: DOPF RESIDENCE **SUBJECT:** WIND PRESSURE

Components and Cladding Wind Calculations

Label: Solar Panel Array Note: Calculations per ASCE 7-10

SITE-SPECIFIC WIND PARAMETERS:

Basic Wind Speed [mph]:	122
Exposure Category:	C
Risk Category:	II

Notes:

ADDITIONAL INPUT & CALCULATIONS:

Height of roof, h [ft]:	15	(Approximate)	
Comp/Cladding Location:	Gable/Hip Roofs 7° < θ ≤ 27°		
Enclosure Classification:	Enclosed Buildings		
Zone 1 GC_p:	0.9	Figure 30.4-2B	(enter largest abs. value)
Zone 2 GC_p:	1.7		(enter largest abs. value)
Zone 3 GC_p:	2.6		(enter largest abs. value)
α:	9.5	Table 26.9-1	
z_g [ft]:	900	Table 26.9-1	
K_h:	0.849	Table 30.3-1	
K_{zt}:	1	Equation 26.8-1	
K_d:	0.85	Table 26.6-1	
Velocity Pressure, q_h [psf]:	27.5	Equation 30.3-1	
GC_{pi}:	0	Table 26.11-1	(largest abs. value)

OUTPUT:

$$p = q_h[(GC_p) - (GC_{pi})]$$

Zone 1 Pressure, p [psf]:	24.74	psf (1.0W, Interior Zones*)
Zone 2 Pressure, p [psf]:	46.74	psf (1.0W, End Zones*)
Zone 3 Pressure, p [psf]:	71.48	psf (1.0W, Corner Zones* within a)
		(*a=assumed=3')

VECTOR ENGINEERS

JOB NO.: U1952-0014-161

PROJECT: DOPF RESIDENCE **SUBJECT:** GRAVITY LOADS

CALCULATE ESTIMATED GRAVITY LOADS

DEAD LOAD (D)			Increase due to pitch	Original loading	
Roof Pitch/12		2.6			
Composite/Asphalt Shingles		4.1	1.02	4.00	psf
1/2" Plywood		1.0	1.02	1.00	psf
Framing		3.0	psf		
Insulation		0.8	psf		
1/2" Gypsum Clg.		2.2	psf		
M, E & Misc		1.5	psf		
	DL	12.6	psf		
	PV Array DL	2.5	psf		

ROOF LIVE LOAD (Lr)

Existing Design Roof Live Load [psf]	20	ASCE 7-10, Table 4-1
Roof Live Load With PV Array [psf]	0	2015 IBC, Section 1607.12.5

SNOW LOAD (S):	Existing	With PV Array	
Roof Slope (:12):	2.6	2.6	
Roof Slope [°]:	12	12	
Snow Ground Load, p_g [psf]:	20	20	ASCE 7-10, Section 7.2
Terrain Category:	C	C	ASCE 7-10, Table 7-2
Exposure of Roof:	Fully Exposed	Fully Exposed	ASCE 7-10, Table 7-2
Exposure Factor, C_e:	0.9	0.9	ASCE 7-10, Table 7-2
Thermal Factor, C_t:	1.1	1.1	ASCE 7-10, Table 7-3
Risk Category:	II	II	ASCE 7-10, Table 1.5-1
Importance Factor, I_S:	1.0	1.0	ASCE 7-10, Table 1.5-2
Flat Roof Snow Load, p_f [psf]:	14	14	ASCE 7-10, Equation 7.3-1
Minimum Roof Snow Load, p_m [psf]:	20	20	ASCE 7-10, Section 7.3.4
Unobstructed Slippery Surface?	No	Yes	ASCE 7-10, Section 7.4
Slope Factor Figure:	Figure 7-2b	Figure 7-2b	ASCE 7-10, Section 7.4
Roof Slope Factor, C_s:	1.000	0.967	ASCE 7-10, Figure 7-2
Sloped Roof Snow Load, p_s [psf]:	14	13	ASCE 7-10, Equation 7.4-1
Design Snow Load, S [psf]:	20	20	

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

A. ( ) I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

B. ( ) I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(f)1.ix:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

C. ( ) I further certify that I will perform or supervise the following work:
C.1. ( ) Building C.2. ( ) Fire Protection

I further certify that I will perform the following work:
C.3. ( ) Electrical C.4. ( ) Plumbing

D. ( ) I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

(X) Check if contractor.

Agent Name Green Sun Energy Services

Address 79 McCutcheon Ct, Middletown NJ 07748

Telephone 732.410.7818 x402

Signature _____

III. ( ) LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.

VECTOR
ENGINEERS

UTAH OFFICES
Sandy
Layton
St. George

Project Number: U1952-0014-161

November 11, 2016

Green Sun Engergy Services
P.O. Box 4314
Middletown, NJ 07748

REFERENCE: **Dopf Residence: 3 Bow Drive, Brink, NJ 08723**
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Please note a representative of Vector Structural Engineering has not physically observed the roof framing. Our conclusions are based upon the assumption that all structural roof components and other supporting elements are in good condition, free of damage and deterioration, and are sized and spaced such that they can resist standard roof loads.

Very truly yours,
VECTOR STRUCTURAL ENGINEERING, LLC

Wells L. Holmes, P.E.
Project Engineer

NJ Certificate of Authorization: 24GA28120600

WLH/klr

11 NOV 2016

VECTOR ENGINEERS

JOB NO.: U1952-0014-161

PROJECT: DOPF RESIDENCE **SUBJECT:** WIND PRESSURE

Components and Cladding Wind Calculations

Label: Solar Panel Array Note: Calculations per ASCE 7-10

SITE-SPECIFIC WIND PARAMETERS:

		Notes:
Basic Wind Speed [mph]:	122	
Exposure Category:	C	
Risk Category:	II	

ADDITIONAL INPUT & CALCULATIONS:

Height of roof, h [ft]:	15	(Approximate)	
Comp/Cladding Location:	Gable/Hip Roofs 7° < θ ≤ 27°		
Enclosure Classification:	Enclosed Buildings		
Zone 1 GC_p:	0.9	Figure 30.4-2B	(enter largest abs. value)
Zone 2 GC_p:	1.7		(enter largest abs. value)
Zone 3 GC_p:	2.6		(enter largest abs. value)
α:	9.5	Table 26.9-1	
z_g [ft]:	900	Table 26.9-1	
K_h:	0.849	Table 30.3-1	
K_{zt}:	1	Equation 26.8-1	
K_d:	0.85	Table 26.6-1	
Velocity Pressure, q_h [psf]:	27.5	Equation 30.3-1	
GC_{pi}:	0	Table 26.11-1	(largest abs. value)

OUTPUT:

$$p = q_h\left[\left(GC_p\right) - \left(GC_{pi}\right)\right]$$

Zone 1 Pressure, p [psf]:	24.74	psf (1.0W, Interior Zones*)
Zone 2 Pressure, p [psf]:	46.74	psf (1.0W, End Zones*)
Zone 3 Pressure, p [psf]:	71.48	psf (1.0W, Corner Zones* within a)
		(*a=assumed=3')

VECTOR ENGINEERS

JOB NO.: U1952-0014-161

PROJECT: DOPF RESIDENCE **SUBJECT:** CONNECTION CAPACITY

Lag Screw Connection

Capacity:

Lag Screw Size:	5/16	
C_d:	1.6	
Embedment:	2.5	in
Grade:	SPF (G = 0.42)	
Capacity:	205	lbs/in. emb.
Number of Screws:	1	
Total Capacity:	820	lbs

Demand:

	Pressure (0.6 Wind) (psf)	Max Spacing (ft)	Max. Trib. Area (ft^2)	Max. Uplift Force (lbs)
Zone 1:	14.8	6	18	267
Zone 2:	28.0	6	18	505
Zone 3:	42.9	6	18	772

Demand< Capacity: **CONNECTION OKAY**

VECTOR ENGINEERS

JOB NO.: U1952-0014-161

PROJECT: DOPF RESIDENCE **SUBJECT:** GRAVITY LOADS

CALCULATE ESTIMATED GRAVITY LOADS

DEAD LOAD (D)			Increase due to pitch	Original loading	
Roof Pitch/12		2.6			
Composite/Asphalt Shingles		4.1	1.02	4.00	psf
1/2" Plywood		1.0	1.02	1.00	psf
Framing		3.0	psf		
Insulation		0.8	psf		
1/2" Gypsum Clg.		2.2	psf		
M, E & Misc		1.5	psf		
	DL	12.6	psf		
	PV Array DL	2.5	psf		

ROOF LIVE LOAD (Lr)

Existing Design Roof Live Load [psf]	20	ASCE 7-10, Table 4-1
Roof Live Load With PV Array [psf]	0	2015 IBC, Section 1607.12.5

SNOW LOAD (S):	Existing	With PV Array	
Roof Slope (:12):	2.6	2.6	
Roof Slope [°]:	12	12	
Snow Ground Load, p_g [psf]:	20	20	ASCE 7-10, Section 7.2
Terrain Category:	C	C	ASCE 7-10, Table 7-2
Exposure of Roof:	Fully Exposed	Fully Exposed	ASCE 7-10, Table 7-2
Exposure Factor, C_e:	0.9	0.9	ASCE 7-10, Table 7-2
Thermal Factor, C_t:	1.1	1.1	ASCE 7-10, Table 7-3
Risk Category:	II	II	ASCE 7-10, Table 1.5-1
Importance Factor, I_S:	1.0	1.0	ASCE 7-10, Table 1.5-2
Flat Roof Snow Load, p_f [psf]:	14	14	ASCE 7-10, Equation 7.3-1
Minimum Roof Snow Load, p_m [psf]:	20	20	ASCE 7-10, Section 7.3.4
Unobstructed Slippery Surface?	No	Yes	ASCE 7-10, Section 7.4
Slope Factor Figure:	Figure 7-2b	Figure 7-2b	ASCE 7-10, Section 7.4
Roof Slope Factor, C_s:	1.000	0.967	ASCE 7-10, Figure 7-2
Sloped Roof Snow Load, p_s [psf]:	14	13	ASCE 7-10, Equation 7.4-1
Design Snow Load, S [psf]:	20	20	

VECTOR ENGINEERS

JOB NO.: U1952-0014-161

PROJECT: DOPF RESIDENCE

SUBJECT: BEAMS

Abbrev	GRADES		F_{bcc} (psi)	F_{vcc} (psi)	E_{cc} (psi)	g (lb/ft^3)
DFL#1	DFL#1		1,000	180	1,700,000	32
DFL#2	DFL#2		900	180	1,600,000	32
DF1 (5X)	DFL#1 5X5 & LARGER		1,350	170	1,600,000	32
SPF#2	SPF#2		875	135	1,400,000	26.2
SP#2	SP#2		1,100	175	1,400,000	34.3
24F-V4	24F-V4		2,400	240	1,800,000	32
24F-V8	24F-V8		2,400	240	1,800,000	40
LVL (1.9)	LVL (1.9X106E)		2,600	285	1,900,000	40
LVL (2.0)	LVL (2.0X106E)		2,200	285	2,000,000	42
LSL	LSL (1.3X108E)		1,700	400	1,300,000	42
PSL	PSL (2.0X106E)		2,900	290	1,300,000	42

DESIGN LOADS:

Load Types:	Snow	Live	Dead
Roof	20	20	13
Solar			2.5

Add .2*S_{DS} to dead load? No 0 =.2*S_{DS}

note: 'a' must be less than or equal to 'L/2'

CRITERIA (L/)	D_{TL}	D_{LL}	D_{DL}
$A_{(BLANK)}$	120	180	
B	240	480	
C	600		800

Label	Length 'L' (ft)	Roof Trib (ft)	Floor Trib (ft)	Wall Trib (ft)	Add'l Live Load (plf)	Add'l Dead Load (plf)	Point Load From	React (A,B)	Dist 'a' (ft)	Point Live Load 'P_{LL}' (lb)	Point Dead Load 'P_{DL}' (lb)	# PLIES	Grade	Size	*BM/HDR*	D CRITERIA	C_r	C_D	$C_{F,V}$	R_a (lb)	R_b (lb)	M_{max} (ft-lb)	M_{allow} (ft-lb)	V_{max} (lb)	V_{allow} (lb)	D_{TL} (in)	$D_{TLallow}$ (in)	D_{LL} (in) (SEE COND 'C')	$D_{LLallow}$ (in) (SEE COND 'C')	1.5DL GLB Camb	Check
	10.75	1.33				3,333						(1)	SPF#2	2x6			1.15	1.15	1.30	252	252	676	948	230	854	0.483	1.075	0.275	0.717		0.71 M

BUILDING SUBCODE
TECHNICAL SECTION

Date Received Control # 11/30/16

Date Issued Permit # 16-4159

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

Block 382.35 Lot 2 Qualification Code

Work Site Location 3 Bow Ave, Brick, NJ 07734

Owner in Fee: Rick & Carleen Dopf

Tel. [redacted] e-mail [redacted]

Address 3 Bow Ave, Brick, NJ 07734
street municipality zip code

Contractor: Green Sun Energy Services Tel. 732.410.7818 x402

Address 79 McCutcheon Ct. Middletown NJ 07748 e-mail ctorre@greensunnj.com

Contractor License No. or Builder Registration No. 13HV06229000 Exp. Date 12/31/2017

Home Improvement Contractor Registration No. or Exemption Reason (if applicable):

Federal Emp. ID No. 274380026 FAX: 732.410.7422

JOB SUMMARY (Office Use Only)

PLAN REVIEW	Date	Initial
[ ] No Plans Required		
[ ] All	11/30/16	
[ ] Footings/Foundations		
[ ] Structural/Framework		
[ ] Exterior		
[ ] Interior		

Joint Plan Review Required:
[ ] Elec. [ ] Plumb. [ ] Fire [ ] Elevator

SUBCODE APPROVAL for PERMIT
Date: 11/30/16
Approved by:

SUBCODE APPROVAL for CERTIFICATE
[ ] CO [ ] CCO [X] CA
Date: 12/27/16
Approved by:

INSPECTIONS Type:	Dates (Month/Day) Failure	Failure	Approval	Initial
Footing				
Footing Bonding				
Foundation				
Slab				
Frame				
Truss Sys./Bracing				
Barrier-Free				
Insulation				
Finishes -Base Layer				
Finishes -Final				
Energy				
Mechanical				
TCO				
Other				
Final	12/30/16			
Barrier-Free				

B. BUILDING CHARACTERISTICS

Use Group Present _____ Proposed _____

No. of Stories _____

Height of Structure _____ ft.

Area — Largest Floor _____ sq. ft.

New Bldg. Area/All Floors _____ sq. ft.

Volume of New Structure _____ cu. ft.

Max. Live Load _____

Max. Occupancy Load _____

Constr. Class Present _____ Proposed _____

If Industrialized Building:
State Approved _____ HUD _____

Est. Cost of Bldg. Work:

1. New Bldg. $ 3,636.36
2. Rehabilitation $ _____
3. Total (1+ 2) $ 3,636.36

U.C.C. F110 (rev. 11/09)
Internet version

C. CERTIFICATION IN LIEU OF OATH

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

Sign here: [signature]

Print name here: Chris Torre

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

Installation of a Residential Grid Tied Photo Voltaic Solar System . (Please Reference Detailed System Design & Structural Plans included with this package.)

TYPE OF WORK:
- [ ] New Building
- [X] Addition
- [ ] Rehabilitation
- [ ] Roofing
- [ ] Siding
- [ ] Fence _____ Height (exceeds 6')
- [ ] Sign _____ Sq. Ft.
- [ ] Pool
- [ ] Retaining Wall _____ Sq. Ft.
- [ ] Asbestos Abatement Subchapter 8
- [ ] Lead Haz. Abatement NJAC 5:17
- [ ] Radon Remediation
- [ ] Other _____
- [ ] Demolition

FEE (Office Use Only)

$

Administrative Surcharge $
Minimum Fee $
State Permit Surcharge Fee $
TOTAL FEE $

Applicant: When submitting this form to your Local Construction Code Enforcement Office, please provide one original plus three photocopies.

ELECTRICAL SUBCODE
TECHNICAL SECTION

Date Received 1/30/16
Control # 16-4159
Date Issued
Permit #

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

Block 382.35 Lot 2 Qualification Code

Work Site Location 3 Bow Ave, Brick, NJ 07734

Owner in Fee: Rick & Carleen Dopf

Tel. [redacted] e-mail [redacted]

Address 3 Bow Ave, Brick, NJ 07734 (street)

Contractor: Lipari Electric & Maintenance Contractors, LLC (municipality) Tel. (732) 928-6640 (zip code)

Address 1039 Farmingdale Rd e-mail liparielectric@yahoo.com

Jackson NJ, 08527

Contractor License No. 34EI01330200 Exp. Date 3/31/2018

Home Improvement Contractor Registration No. or Exemption Reason (if applicable):

Federal Emp. ID No. FAX: (732) 410-7422

B. ELECTRICAL CHARACTERISTICS

Use Group Present Proposed

[ ] Pole/Pad # [ ] Temporary [ ] Other

Building Occupied as Utility Co. JCPL

Est. Cost of Elec. Work $ 17,734

JOB SUMMARY (Office use Only)

PLAN REVIEW

[ ] No Plans Required

[ ] Partial -Understab Utilities Approved

Date: Approved by:

[ ] Electric Plans Approved

Date 12/29/16 Approved by:

Joint Plan Review Required:

[ ] Bldg. [ ] Plumb. [ ] Fire. [ ] Elev.

SUBCODE APPROVAL for PERMIT

Date:

Approved by:

SUBCODE APPROVAL for CERTIFICATE

[ ] CO [ ] CCO [ ] CA

Date: 12-27-16

Approved by:

INSPECTIONS Type:	Dates (Month/Day) Failure	Failure	Approval	Initial
Rough				
Barrier-Free				
Trench				
Temp. Serv.				
Constr. Serv.				
TCO				
Other				
Service				
Final				
Barrier-Free				
Temp. Cut-in-Card Date Issued				
Final Cut-in-Card Date Issued				
Annual Pool Inspection				
Date of Grounding and Bonding Certification				

C. CERTIFICATION IN LIEU 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 sign/Contractor sign and seal here: Michael Lipari

Print name here: Michael Lipari

[X] Licensed Elec. Contractor [ ] Certif'd Landscape Irrigation Cont'r [ ] Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK:
Installation of Rooftop Residential Photo Voltaic Solar System

QTY.	SIZE	ITEMS	FEE (Office Use Only)
		Lighting Fixtures	
1		Receptacles	
		Switches	
		Detectors	
		Light Poles	
		Motors—Fract. HP	
		Emergency & Exit Lights	
		Communications Points	
		Alarm Devices/F.A.C. Panel	
42		Solar Panels	
42		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 A/C Unit	
		HP/KW Space Heater/Air Handler	
		KW Baseboard Heat	
		HP Motors 1/+ HP	
		KW Transformer/Generator	
		AMP Service	
1	10	kW Inverter	
		AMP Motor Control Center	
		KW Elec. Sign/Outline	
1	60A	AC Disconnect	
		Administrative Surcharge	$
		Minimum Fee	$
		State Permit Surcharge Fee	$
		TOTAL FEE	$

12.6 KW PV

U.C.C. F120 (rev. 11/09)
Internet version

Applicant: When submitting this form to your Local Construction Code Enforcement Office, please provide one original plus three photocopies.

CONSTRUCTION PERMIT

Date Issued 11/30/16
Control # C-16-005053
Permit # 16-4159

IDENTIFICATION Block: 382.35 Lot: 2 Qualifier
Work Site Location: 3 BOW DRIVE Brick Township, NJ 08723
Owner in Fee DOPF, RICHARD W & CARLEEN A
3 BOW DR BRICK NJ 08723
Telephone: [redacted]

Contractor GREEN SUN ENERGY SERVICES, LLC
Address 79 MCCUTCHEON CT MIDDLETOWN NJ 07748
Telephone: (732) 410-4818
Lic. No. or Bldrs. Reg. No. 13VH0622900 13VH0622900
Federal Employee. No. 13VH0622900

Is hereby granted permission to perform the following work:

- [x] BUILDING
- [ ] PLUMBING
- [ ] LEAD HAZARD ABATEMENT
- [x] ELECTRICAL
- [ ] FIRE PROTECTION
- [ ] DEMOLITION
- [ ] ELEVATOR DEVICES
- [ ] ASBESTOS ABATEMENT (Subchapter 8 only)
- [ ] OTHER

DESCRIPTION OF WORK:
SOLAR PANELS INSTALL 12.6 kw ROOF MOUNT PHOTOVOLTAIC SOLAR SYSTEM

PAYMENTS (Office Use Only)

Building	$182
Electrical	$300
Plumbing	$0
Fire Protection	$0
Elevator Devices	$0
Other	$0.00
DCA Training Fee	$41
CO Fee	
Other	$0
Total	$523
Check No.	4061
Cash	$0
Credit	$0
Collected By	CW

+30
573

Note: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.
Estimated Cost of Work $21,370

D. Newman Jr. 11/15/16
Construction Official Date

U.C.C. F170
equiv (rev 1/04)
1 WHITE - INSPECTOR 2 CANARY - OFFICE 3 PINK - TAX ASSESSOR 4 GOLD - APPLICANT

11/30/16 [illegible] 2015[illegible]503
#003 SERV.003
#4159
BUILDING $182.00
ELECTRIC $300.00
DCA $41.00
ZPA $30.00
CHECK $573.00

REQUIRED INSPECTIONS

Construction work must be inspected in accordance with the State Uniform Construction Code Regulations N.J.A.C. 5:23-2.18. This agency will carry out such periodic inspections during the progress of work as are necessary to insure that the work installed conforms with the requirements of the Uniform Construction Code.

The owner or other responsible person in charge of work must notify this agency when work is ready for any required inspections specified below. Requests for inspections must be made at least 24 hours prior to the time the inspection is desired. Inspections will be performed within three business days of the time for which they are requested. The work must not proceed in a manner which will preclude the inspection until it has been made and approval granted.

- [x] Required inspections for all subcodes for one- and two-family dwellings are as follows:
  1. The bottom of footing trenches before placement of footings, except that in cases of pile foundations, inspections shall be made in accordance with the requirements of the building subcode.
  2. Foundations and all walls up to grade level prior to back filling.
  3. All structural framing, connections, wall and roof sheathing and insulation; electrical rough wiring, panel and service installation; rough plumbing. The framing inspection shall take place after the rough electrical and plumbing inspections and after the installation of the heating, ventilation and /or air conditioning duct system. The insulation inspection shall be performed after all other subcode rough inspections and prior to the installation of any interior finish material.
  4. Installation of all finished materials, sealings of exterior joints, plumbing piping, trim and fixtures; electrical wiring, devices and fixtures; mechanical systems equipment.

  Additional required inspections for all subcodes of construction, for other than one- and two-family dwellings, are fire suppression systems, heat producing devices and Barrier Free subcode accessibility, if applicable.

- [ ] Required special inspections. The applicant by accepting the permit will be deemed to have consented to these requirements:

- [x] A final inspection is required for each applicable subcode area before a final Certificate of Occupancy or Approval may be issued. The final inspections include the installation of all interior and exterior finish materials, sealing of exterior joints, mechanical system and other required equipment; electrical wiring, devices and fixtures; plumbing pipes, trim and fixtures; tests required by any provision of the adopted subcodes, Barrier Free accessibility, if applicable; and verification of compliance with NJAC 5:23-3.5, "Posting structures".

- [x] A complete copy of released plans must be kept on the job site.

If you do not understand any of this information, please ask.

BUILDING SUBCODE
TECHNICAL SECTION

Date Received 11/30/16
Control #

Date Issued
Permit # 16-4159

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

Block 382.35 Lot 2 Qualification Code

Work Site Location 3 Bow Ave, Brick, NJ 07734

Owner in Fee: Rick & Carleen Dopf

Tel. [redacted] e-mail [redacted]

Address 3 Bow Ave, Brick, NJ 07734
street municipality zip code

Contractor: Green Sun Energy Services Tel. 732.410.7818 x402

Address 79 McCutcheon Ct. Middletown NJ 07748 e-mail ctorre@greensunnj.com

Contractor License No. or Builder Registration No. 13HV06229000 Exp. Date 12/31/2017

Home Improvement Contractor Registration No. or Exemption Reason (if applicable):

Federal Emp. ID No. 274380026 FAX: 732.410.7422

JOB SUMMARY (Office Use Only)

PLAN REVIEW	Date	Initial
[ ] No Plans Required		
[ ] All		
[ ] Footings/Foundations		
[ ] Structural/Framework		
[ ] Exterior		
[ ] Interior		

Joint Plan Review Required:
[ ] Elec. [ ] Plumb. [ ] Fire [ ] Elevator

SUBCODE APPROVAL for PERMIT
Date:
Approved by:

SUBCODE APPROVAL for CERTIFICATE
[ ] CO [ ] CCO [ ] CA
Date:
Approved by:

INSPECTIONS Type:	Dates (Month/Day) Failure	Failure	Approval	Initial
Footing				
Footing Bonding				
Foundation				
Slab				
Frame				
Truss Sys./Bracing				
Barrier-Free				
Insulation				
Finishes -Base Layer				
Finishes -Final				
Energy				
Mechanical				
TCO				
Other				
Final				
Barrier-Free				

B. BUILDING CHARACTERISTICS

Use Group Present Proposed

No. of Stories

Height of Structure ft.

Area — Largest Floor sq. ft.

New Bldg. Area/All Floors sq. ft.

Volume of New Structure cu. ft.

Max. Live Load

Max. Occupancy Load

Constr. Class Present Proposed

If Industrialized Building:
State Approved HUD

Est. Cost of Bldg. Work:

1. New Bldg. $3,636.36
2. Rehabilitation $
3. Total (1+ 2) $3,636.36

U.C.C. F110 (rev. 11/09)
Internet version

C. CERTIFICATION IN LIEU OF OATH

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

Sign here:

Print name here: Chris Torre

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK
Installation of a Residential Grid Tied Photo Voltaic Solar System . (Please Reference Detailed System Design & Structural Plans included with this package.)

TYPE OF WORK:
[ ] New Building
[X] Addition
[ ] Rehabilitation
[ ] Roofing
[ ] Siding
[ ] Fence Height (exceeds 6')
[ ] Sign Sq. Ft.
[ ] Pool
[ ] Retaining Wall Sq. Ft.
[ ] Asbestos Abatement Subchapter 8
[ ] Lead Haz. Abatement NJAC 5:17
[ ] Radon Remediation
[ ] Other
[ ] Demolition

FEE (Office Use Only)

$

Administrative Surcharge $
Minimum Fee $
State Permit Surcharge Fee $
TOTAL FEE $

Applicant: When submitting this form to your Local Construction Code Enforcement Office, please provide one original plus three photocopies.

ELECTRICAL SUBCODE
TECHNICAL SECTION

Date Received 11/30/16
Control #
Date Issued
Permit # 16-4159

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

Block _____ Lot _____ Qualification Code _____

Work Site Location 3 Bow Ave, Brick, NJ 07734

Owner in Fee: Rick & Carleen Dopf

Tel. [redacted] e-mail [redacted]

Address 3 Bow Ave, Brick, NJ 07734

Contractor: Lipari Electric & Maintenance Contractors, LLC (street / municipality) Tel. (732) 928-6640 (zip code)

Address 1039 Farmingdale Rd e-mail liparielectric@yahoo.com

Jackson NJ, 08527

Contractor License No. 34EI01330200 Exp. Date 3/31/2018

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. _____ FAX: (732) 410-7422

B. ELECTRICAL CHARACTERISTICS

Use Group Present _____ Proposed _____

[ ] Pole/Pad # _____ [ ] Temporary [ ] Other _____

Building Occupied as _____ Utility Co. JCPL

Est. Cost of Elec. Work $ 17,734

C. CERTIFICATION IN LIEU 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 sign/Contractor sign and seal here: Michael Lipari

Print name here: Michael Lipari

[X] Licensed Elec. Contractor [ ] Certif'd Landscape Irrigation Cont'r [ ] Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK:
Installation of Rooftop Residential Photo Voltaic Solar System

QTY.	SIZE	ITEMS	FEE (Office Use Only)
		Lighting Fixtures	
1		Receptacles	
		Switches	
		Detectors	
		Light Poles	
		Motors—Fract. HP	
		Emergency & Exit Lights	
		Communications Points	
		Alarm Devices/F.A.C. Panel	
42		Solar Panels	
42		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 A/C Unit	
		HP/KW Space Heater/Air Handler	
		KW Baseboard Heat	
		HP Motors 1/+ HP	
		KW Transformer/Generator	
		AMP Service	
1	10	kW Inverter	
		AMP Motor Control Center	
		KW Elec. Sign/Outline	
1	60A	AC Disconnect	
		Administrative Surcharge	$
		Minimum Fee	$
		State Permit Surcharge Fee	$
		TOTAL FEE	$

12.6 KW PV

JOB SUMMARY (Office Use Only)

PLAN REVIEW
[ ] No Plans Required
[ ] Partial Underslab Utilities Approved
Date: _____ Approved by: _____
[ ] Electric Plans Approved
Date: 12/2/16 Approved by: [signature]
Joint Plan Review Required:
[ ] Bldg. [ ] Plumb. [ ] Fire. [ ] Elev.
SUBCODE APPROVAL for PERMIT
Date: 12/2/16
Approved by: [signature]
SUBCODE APPROVAL for CERTIFICATE
[ ] CO [ ] CCO [ ] CA
Date: _____
Approved by: _____

INSPECTIONS	Dates (Month/Day) Failure	Failure	Approval	Initial
Type:				
Rough				
Barrier-Free				
Trench				
Temp. Serv.				
Constr. Serv.				
TCO				
Other				
Service				
Final				
Barrier-Free				
Temp. Cut-in-Card Date Issued				
Final Cut-in-Card Date Issued				
Annual Pool Inspection				
Date of Grounding and Bonding Certification				

U.C.C. F120 (rev. 11/09)
Internet version

Applicant: When submitting this form to your Local Construction Code Enforcement Office, please provide one original plus three photocopies.

RECEIVING CLERK
DATE REC'D 10-20-16

ZONING PERMIT APPLICATION

PERMIT # ZP-16-01581
DATE ISSUED 11/30/16

BLOCK: 382.35 LOT: 2 QUALIFIER: SITE ADDRESS: 3 Bow Ave, Brick NJ. 08723

IDENTIFICATION:

1. NAME OF OWNER IN FEE: Rick & Carleen Dopf
COMPLETE ADDRESS: 3 Bow Ave Brick NJ 08723
PHONE # [redacted] EMAIL: [redacted].net

2. NAME OF APPLICANT: Green Sun Energy Services
APPLICANT ADDRESS: 79 McCutcheon Ct
Middletown NJ. 07748
PHONE # 732-410-7818 x402 EMAIL: support@greensunnj.com

3. RESPONSIBLE PERSON FOR WORK: Chris Torre
PHONE# 732-410-7818 x402 FAX# 732-410-7822

4. SIGNATURE OF APPLICANT:

FOR OFFICE USE ONLY

FEE SUMMARY:

APPLICATION FEE: $ 50-
OTHER: $
TOTAL: $ 50-

REQUIRED BY APPLICANT

RESIDENTIAL: ✓
COMMERCIAL:
EXISTING USE: SFR
PROPOSED USE: SFR

BOARD APPROVAL: ___ PB ___ ZB
RESOLUTION#:
APPROVAL DATE:

PROJECT DESCRIPTION: (PLEASE CHECK APPLICABLE WORK & DESCRIBE)

*NEW BUILDING: *ADDITION *ALTERATION *PORCH *DECK

POOL: ABOVE GROUND IN GROUND FENCE: HEIGHT TYPE MATERIAL

HEIGHT: (*IF APPLICABLE)

OTHER Rooftop PV Solar System

DESCRIPTION:

ZONING REVIEW:
DATE REVIEWED: 10-19-16 DATE DENIED: DATE APPROVED: 10-19-16 INTLS:

(SEE BACK PAGE)

OFFICE USE ONLY

RECEIVED
OCT 2 0 2016
ZONING

ZONING REVIEW:

DATE REVIEWED: 10/20/16 DATE DENIED: — DATE APPROVED: 10/20/16 INTLS:

DATE:	COMMENTS:	INITIALS:
10/20/16	SENT TO comm	

Brick Township
401 Chambers Bridge Rd.

Brick, NJ 08723
(732) 262-1336

Date Issued: 11/30/16
Application Number: ZA-16-01581
Application Date: 10/19/2016
Project Number:
Permit Number: ZP-16-01698
Fee: $50.00

Zoning Permit

Worksite **3 BOW DRIVE**
Location: **Brick Township, NJ 08723**

Block: **382.35**
Lot: **2**
Qualifier:
Zone: **R-R-2**

Owner: **DOPF, RICHARD W & CARLEEN A**
Address: **3 BOW DR**
BRICK, NJ 08723

Applicant: **Green Sun Energy Services**
Address: **79 McCutcheon Ct.**
Middletown, NJ 07748

Application Approved Date: 10/19/2016

This Certifies that an application for the issuance of a Zoning Permit has been examined.

Use is: Single-Family Residential
Nonconforming Use is:

Work Description:
Solar Energy System - 42- 300W Solar Optimizers, 12.6kW AZIMUTH micro-inverters, mounted on the roof of the house.

A letter of approval from Lions Head North is enclosed.

Additional Zoning Permit is required for additional work.

Upon review it was determined that the Zoning Permit:

- ☑ Permitted by Ordinance
- ☐ Permitted by Variance approved on: _____
- ☐ Valid Nonconforming Use is established by
  - ☐ Zoning Board of Adjustment
  - ☐ Zoning Officer

Christopher J. Romano, Assistant Zoning Officer — 11/29/2016 Date

Sean Kinnevy, Zoning Officer — 10/20/16 **Date**

Lions Head
ASSOCIATION NORTH

200 Courtshire Drive, Brick, NJ 08723

ADMINISTRATOR (732) 920-9409
FAX (732) 920-9451

Resident Control Committee Request Form

Date: 09/20/2016
Resident's/Owner's Name: Rich and Carleen Dopf
Address: 3 Bow Drive
Phone#: 848-232-3198
If different, address work is to be done at:_____

The above named Owner hereby requests Association approval to do the following described work at the above address in Lions Head North:

Install a roof mounted PV Solar System on the residence.
Green Sun Energy Services is the Contractor.

Signature__received by Scott __ If received electronically signature is implied.

Please attach a sketch or diagram showing the location and specifics of the project.

Lions Head
ASSOCIATION NORTH

200 Courtshire Drive, Brick, NJ 08723

ADMINISTRATOR (732) 920-9409
FAX (732) 920-9451

August 7, 2016
Mr. & Mrs. Rich Dopf
3 Bow Drive
Brick, New Jersey 08723

Dear: Rich and Carleen Dopf,

Your request to have PV solar panels (must be black) installed to your home has been approved has described in your request.

All permits are the responsibility of the homeowner and contractor with a copy being furnished to the Control Committee. You and your contractor are responsible for the site cleanup on a daily basis and removal of all construction debris upon the completion of the job.

Any damage or movement to the existing sprinkler lines or heads is the responsibility of you and your contractor and repairs are to be done by our sprinkler company.

Very Truly Yours
The Control Committee

William Matteucci

ENGINEERING PERMIT APPLICATION

RECEIVING CLERK: _____

PERMIT #: _____

BLOCK: 382.35 LOT: 2 ADDRESS: 3 Bow Ave, Brick, NJ 08723

IDENTIFICATION:

1. **WORK SITE ADDRESS:** 3 Bow Ave, Brick, NJ 08723
2. **NAME OF OWNER IN FEE:** Rick & Carleen Dopf [redacted]

   ADDRESS: _____ **PHONE #:** (___) _____

   3 Bow Ave, Brick, NJ 08723 **FAX #:** (___) _____
3. **PRINCIPAL CONTRACTOR:** Green Sun Energy Services

   ADDRESS: _____ **PHONE #:** (732) 410.7818 x 402

   79 McCutcheon Ct, Middletown NJ 07748 **FAX #:** (732) 410.7422
4. **ARCHITECT OR ENGINEER:** N/A

   ADDRESS: _____ **PHONE: #** (___) _____
5. **RESPONSIBLE PERSON FOR WORK:** Chris Torre

   ADDRESS: 79 McCutcheon Ct, Middletown NJ 07748

PHONE #: (732) 410.7818 x 402 **FAX #:** (732) 410.7422 **E-MAIL:** support@greensunnj.com

PROJECT DESCRIPTION: ☐ GRADING/CLEARING ☐ ROAD OPENING
☐ SOIL REMOVAL/FILL ☐ RETAINING WALL ☐ POOL
☐ BULKHEAD/DOCK ☐ DWELLING ☐ TREE REMOVAL _____
☒ OTHER Installation of a rooftop PV Solar system

LENGTH: SEE PLANS **WIDTH:** _____ **HEIGHT:** _____

FEE SUMMARY:

APPLICATION FEE:	$ _____
REVIEW FEE:	$ _____
INSPECTION FEE:	$ _____
OTHER _____ :	$ _____
BOND(S):	$ _____
TOTAL:	$ _____

SPECIAL CONDITIONS:

OCEAN COUNTY SOILS: _____

DRAINAGE EASEMENTS: _____

UTILITY EASEMENTS: _____

CONSERVATION EASEMENTS: _____

FEMA REQUIREMENTS: _____

D.E.P. PERMITS: _____

BOARD APPROVAL: ☐ PB ☐ ZB

APPLICATION NUMBER: _____

APPROVED DATE: _____

ENGINEERING REVIEW:

DATE RECEIVED: _____ **DATE REJECTED:** _____ **DATE APPROVED:** _____ **INITIALS:** _____

VECTOR
ENGINEERS

TOWNSHIP OF BRICK
RELEASED FOR PERMIT INITIAL DATE
Building Subcode
Plumbing Subcode
Fire Subcode
Electrical Subcode PSC 10/24/16
Plan Reviewer
Plans Released
Construction Official

UTAH OFFICES
Sandy
Layton
St. George

Project Number: U1952-0014-161

September 23, 2016

Green Sun Engergy Services
P.O. Box 4314
Middletown, NJ 07748

FILE COPY

REFERENCE: **Dopf Residence: 3 Bow Drive, Brink, NJ 08723**
Solar Panel Installation

To whom it may concern:

Per your request, we have reviewed the layout relating to the installation of solar panels at the above-referenced site. The following materials and components are proposed in the installation of the solar panels.

Roof Structure in Area of Panels: 2x6 Rafters
Roof Material: Composite shingles

Based upon our review, it is our conclusion that the installation of solar panels on this existing roof will not adversely affect the structure of this house. The design of solar panel supporting members and connections is by the manufacturer and/or installer. The adopted building code in this jurisdiction is the 2015 International Building Code and ASCE 7-10. Appropriate design parameters which must be used in the design of the supporting members and connections are listed below:

Ground snow load: 20 psf per 2015 IBC (verify with local building department)
Design wind speed for risk category II structures: 122 mph per ASCE 7-10
Wind exposure: Category C

Our conclusion regarding the adequacy of the existing roof is based on the fact that the additional weight related to the solar panels is less than 2.75 pounds per square foot. In the area of the solar panels, no 20 psf live loads will be present per Section 1607.12.5.3 of the International Building Code, 2015 Edition. Regarding snow loads, it is our conclusion that since the panels are slippery and dark, effective snow loads will likely be reduced in the areas of the panels. Solar panels will be flush-mounted, parallel to and no more than 3" above the roof surface. Thus, it is our conclusion that any additional wind or seismic loadings related to the addition of these solar panels is negligible.

During design and installation, particular attention must be paid to the maximum allowable spacing of attachments and the location of solar panels relative to roof edges. The use of solar panel support span tables provided by the manufacturer is allowed only where the building type, site conditions, and solar panel configuration match the description of the span tables. Attachments to existing roof joist or rafters must be staggered so as not to over load any existing structural member. Waterproofing around the roof penetration is the responsibility of others. All work performed must be in accordance with accepted industry-wide methods and applicable safety standards. Vector Structural Engineering assumes no responsibility for improper installation of the solar panels.

Please note a representative of Vector Structural Engineering has not physically observed the roof framing. Our conclusions are based upon the assumption that all structural roof components and other supporting elements are in good condition, free of damage and deterioration, and are sized and spaced such that they can resist standard roof loads.

Very truly yours,

VECTOR STRUCTURAL ENGINEERING, LLC

Electric sub code only.

Wells L. Holmes, P.E.
Project Engineer

NJ Certificate of Authorization: 24GA28120600

WLH/jrl

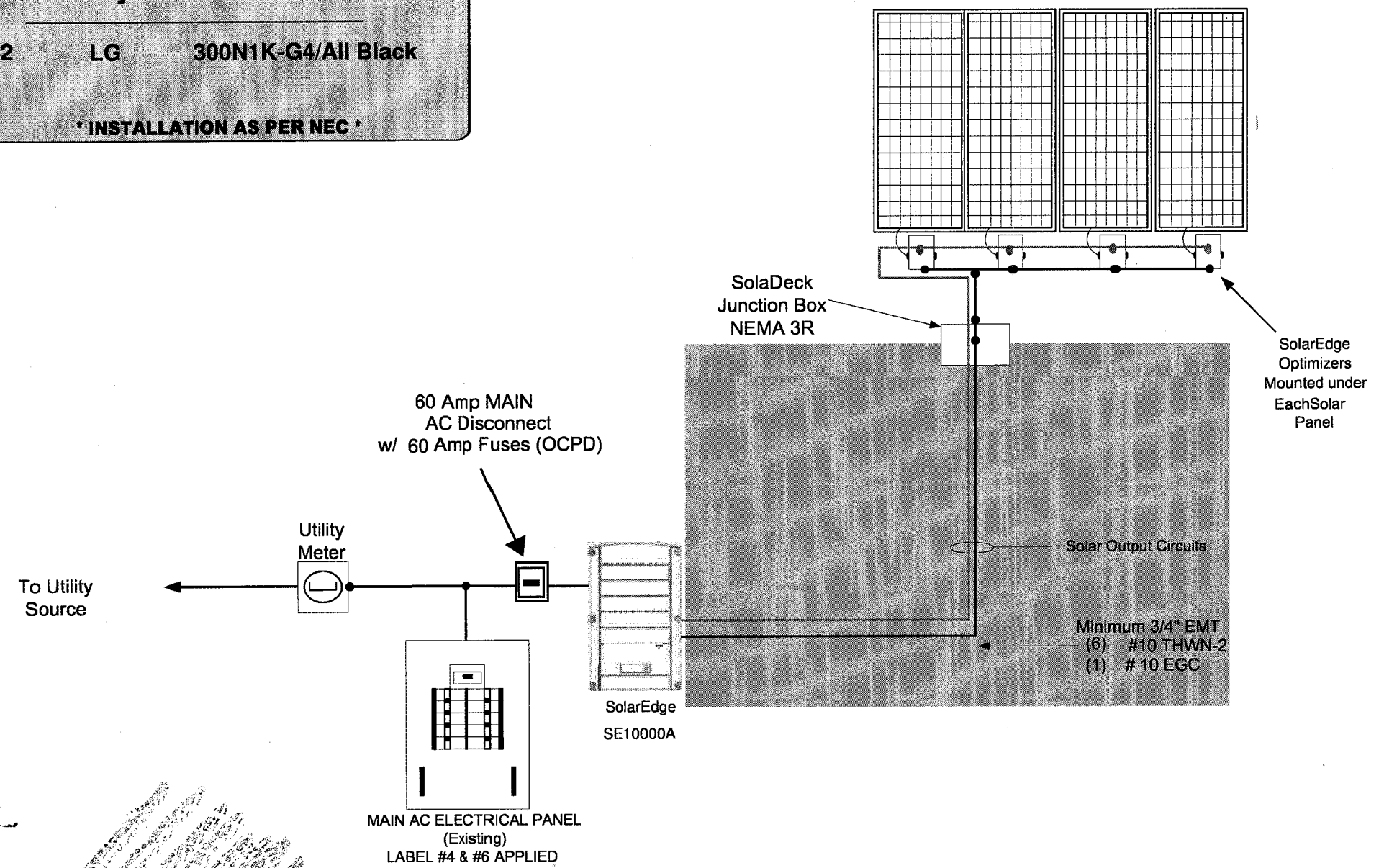
Zoning Review
Approval
By: Solar only
Date: 10-19-16

09/23/2016

Total System Size 12.6 kW

42 LG 300N1K-G4/All Black

*** INSTALLATION AS PER NEC ***



PO Box 4314
Middletown, NJ 07748
732-410-7818

Solar Design for:	**Rick & Carleen Dopf** **3 Bow Ave, Brick, NJ 07734**
42 ea. DC Optimizers 42 ea. 60 Cell PhotoVoltaic Solar Panels	
Sys. Size:12.6 kW	8/21/2016 6:00:39 PM
Electrician: 34EI01330200	Page 1 of 1
Utility Co. Account # 100 118 514 122	

Brick Township
401 Chambers Bridge Rd.

Brick, NJ 08723
(732) 262-1336

Date Issued:
Application Number: ZA-16-01581
Application Date: 10/19/2016
Project Number:
Permit Number:
Fee: $50.00

Zoning Permit

Worksite Location: **3 BOW DRIVE**
Brick Township, NJ 08723

Block: **382.35**
Lot: **2**
Qualifier:
Zone: **R-R-2**

Owner: **DOPF, RICHARD W & CARLEEN A**
Address: **3 BOW DR**
BRICK, NJ 08723

Applicant: **Green Sun Energy Services**
Address: **79 McCutcheon Ct.**
Middletown, NJ 07748

Application Approved Date: 10/19/2016

This Certifies that an application for the issuance of a Zoning Permit has been examined.

Use is: Single-Family Residential
Nonconforming Use is:

Work Description:

Solar Energy System - 42- 300W Solar Optimizers, 12.6kW AZIMUTH micro-inverters, mounted on the roof of the house.

A letter of approval from Lions Head North is enclosed.

Additional Zoning Permit is required for additional work.

Upon review it was determined that the Zoning Permit:

- ☑ Permitted by Ordinance
- ☐ Permitted by Variance approved on: _____
- ☐ Valid Nonconforming Use is established by
  - ☐ Zoning Board of Adjustment
  - ☐ Zoning Officer

Christopher J. Romano, Assistant Zoning Officer — 10/19/2016 Date

Sean Kinnevy, Zoning Officer — 10/20/16 **Date**

11/10/16
Faxed
732
410
7422

Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1030

Subcode Official Review

Date: Wednesday, November 09, 2016

Resubmit to Building 11/17/16 LH

To: DOPF, RICHARD W & CARLEEN A
3 BOW DR
BRICK, NJ 08723

RE: Building Subcode
Block: 382.35 Lot: 2 Qual:
3 BOW DRIVE
Permit Number: Control Number: C-16-005053
Last Submit Date: Tuesday, October 25, 2016

Dear DOPF, RICHARD W & CARLEEN A,

Your request is hereby denied based upon the following infractions.

Insufficient information provided - Please resubmit and include the following:
1. Stanchion layout and panel layout for each roof plane and shown on a birds view of the entire roof.
2. Engineer certification must include:
A.) Indicate the roofs construction of either conventional or truss or otherwise.
B.) Indicate the rafter size spacing and span measured horizontally.
C.) Indicate the maximum on center spacing of stanchions for connection of panels to roof along with any other special connection details.
Please understand that general references or tables con not be used. Each certification must be site specific.

Your request is hereby denied based upon the following infractions.

Sincerely,

Peter McNamara, [redacted]

CC:

Quick Mount PV®

Project Name: Dopf-3 Bow Ave_copy

Project Address: 3 Bow Ave, Brick, NJ 08723

Code Compliance: IBC 2012, CBC 2012

UL 2703 Listed

UL 1703 Listed - Class A Fire Rating with Module Types 1 & 2

PV Racking: Quick Rack

Project Specifications:

1) 5.40kW

2) Mean Roof Height: < 35'

3) Ground Snow Load: 30 psf

4) ASCE 7-10 Wind Speed: 120 mph

5) Wind Exposure Category: B

6) Roofing Type: Composition Shingle

7) Total system weight: Array 1 - 750.14 lbs.

Part Description	Part Manufacturer	QMPV Product Code	Part Number	Each (Array 1): 5.40 KW	Totals	Boxes	Surplus
Module	LG Solar		LG300N1K-G4-Blac k	18	18	n/a	n/a
Base Mounts	Quick Mount PV	363	QMQR-BM A 6	31	31	6	5
40mm 8-inch Clamp	Quick Mount PV	375	QMQR-CP40.8 B 6	21	21	4	3
40mm 2-inch Clamp	Quick Mount PV	376	QMQR-CP40.2 B 24	27	27	2	21
Skirt	Quick Mount PV	444	QMQR-SL65.8 B 4	6	6	2	2
Skirtcap Set	Quick Mount PV	494	QMQR-SC B 25	3	3	1	22
Ground Lug	Quick Mount PV	436	QMQR-GL A 25	1	1	1	24
Electrical (optional)	Enphase/SolarEdge			18	18	n/a	n/a
Electrical Clamp (optional)	Quick Mount PV		AFB/EFM	18	18	1	7
Wire Management Clips (Estimate)	Heyco/Wiley/Nine Fasteners/SolarWorld			72	72	n/a	n/a

Contiguous Array 1:

PV Module

Quick Mount PV
Quick Rack

Extra Mount

Ground Lug

Soladeck

40mm 2" Clamp

Skirt

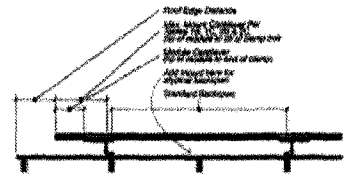
Skirt Cap Set

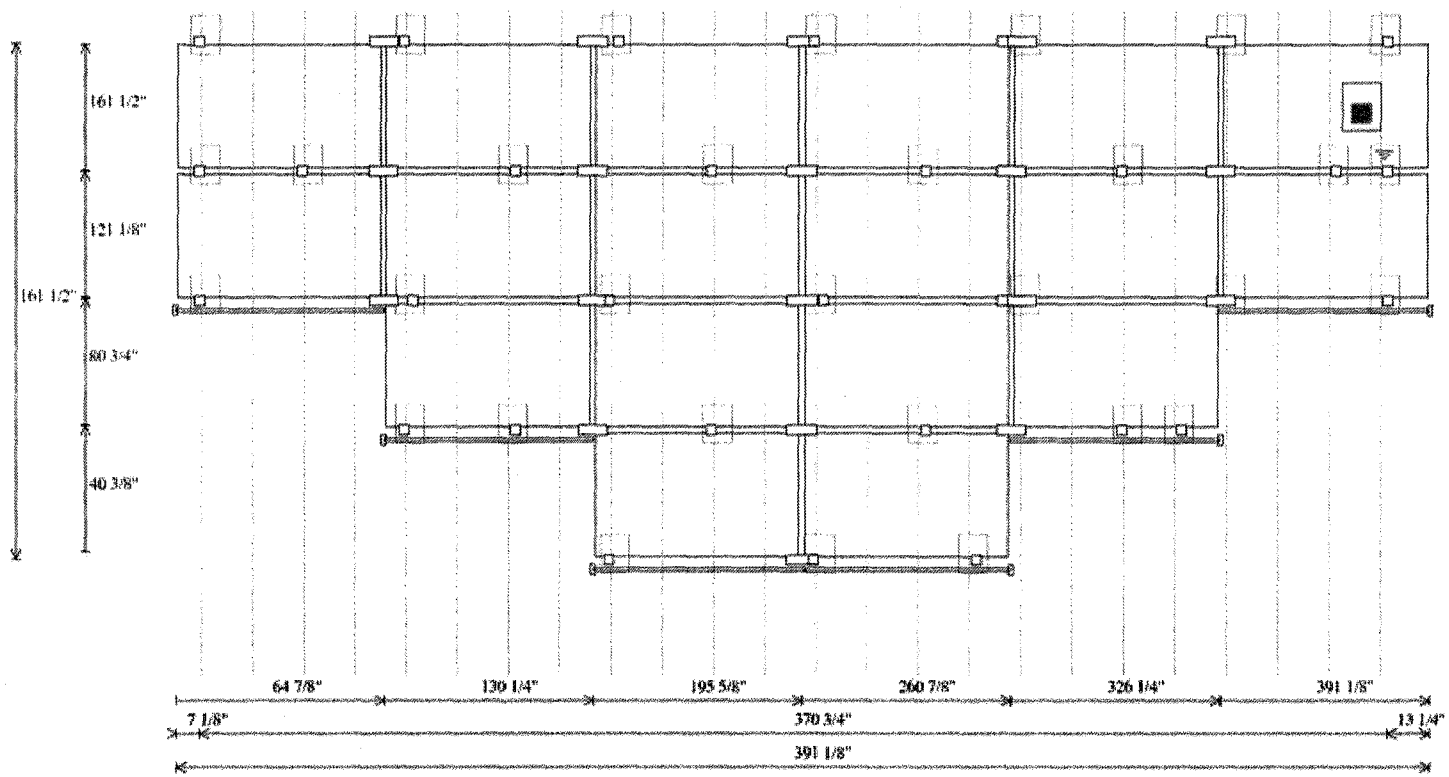
40mm 8" Clamp

Total kW: 5.4kW
Rafter/Truss Spacing: 16"
Roof Slope: 12° or 3:12
Max Module Cantilever (L): 17.7"
Max Mount Spacing (L): 72"
Staggered Mount Required: Yes
Module Dimensions: 39.37" x 64.57"

Max mount (East/West) cantilever per roof edge distance category:

Roof Edge Distance	12" - 18"	18.5" - 24"	24" - 36"	36+"
Standard Racking Backspan (L)	18"	21"	24"	24"
Atypical Racking Backspan (L)	24"	24"	24"	24"



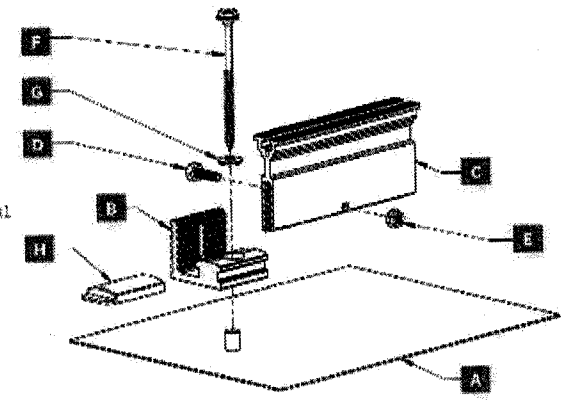


II. Quick Rack Assemblies

NOTE: Part quantities are per assembly.

Base Mount Assembly Parts

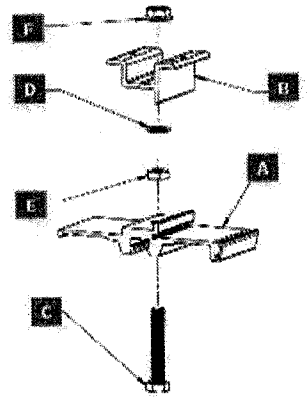
- A Flashing x1
- B QBlock Slider x1
- C Leg Slider x1
- D Custom Hex Head Cap Screw x1
  Torque: 60 lbs
- E Serrated Flange Hex Nut x1
- F T-30/Hex Head Structural Screw, 5/16" x1
- G EPDM/SS Sealing Washer x1
- H EPDM Screw Cover x1



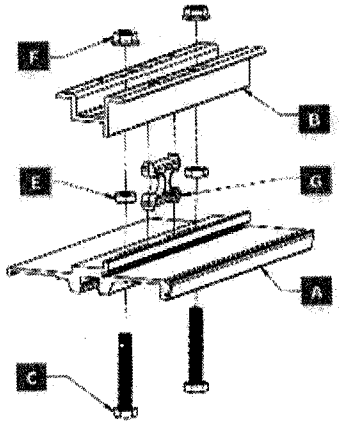
Panel Clamp Assembly Parts

- A Clamp Base x1
- B Panel Clamp (2" or 8") x1
- C Hex Head Cap Screw x1 (x2 for 8")
- D Plastic Retainer Ring x1 (2" clamp only)
- E Hex Nut x1 (x2 for 8")
- F Serrated Flange Hex Nut x1 (x2 for 8")
  Torque: 13 ft-lbs
- G Clamp Spring (8" clamp only)

2" Panel Clamp Assembly

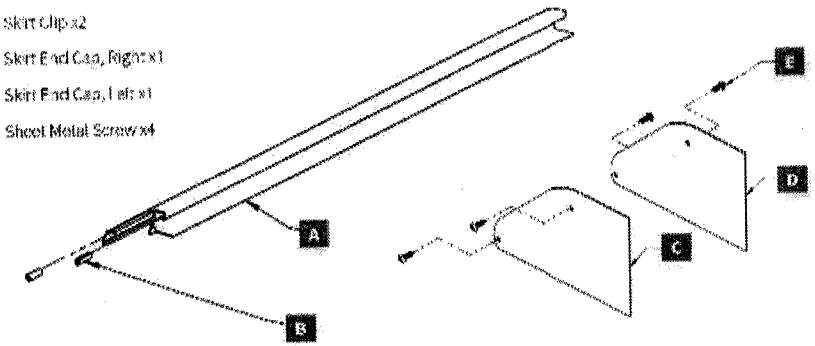


8" Panel Clamp Assembly



Skirt Assembly Parts

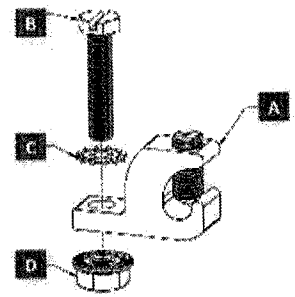
- A Skirt x1
- B Skirt Clip x2
- C Skirt End Cap, Right x1
- D Skirt End Cap, Left x1
- E Sheet Metal Screw x4



Grounding Lug Assembly Parts

- A Ilsco GBL-4DBT Grounding Lug with Set Screw x1
- B Slotted Stainless Steel Hex Head Cap Screw x1
- C Star Washer Stainless Steel x1
- D Serrated Flange Stainless Steel Hex Nut x1

See page 11 for torque specs
All Grounding Lug hardware provided by Quick Mount PV.
Minimum of 1/8" clearance required between lugs (copper wire and aluminum).
Recommend use of conductor compound. Dock between all mount surfaces and bond wire, including underside of grounding lug.



Quick Mount PV®

Project Name: Dopf-3 Bow Ave

Project Address: 3 Bow Ave, Brick, NJ 08723

Code Compliance: IBC 2012, CBC 2012

UL 2703 Listed

UL 1703 Listed - Class A Fire Rating with Module Types 1 & 2

PV Racking: Quick Rack

Project Specifications:

1) 7.20kW

2) Mean Roof Height: < 35'

3) Ground Snow Load: 30 psf

4) ASCE 7-10 Wind Speed: 120 mph

5) Wind Exposure Category: B

6) Roofing Type: Composition Shingle

7) Total system weight: Array 1 - 992.68 lbs.

Part Description	Part Manufacturer	QMPV Product Code	Part Number	Each (Array 1@ 7.20 KW	Totals	Boxes	Surplus
Module	LG Solar		LG300N1K-G4-Blac k	24	24	n/a	n/a
Base Mounts	Quick Mount PV	363	QMQR-BM A 6	37	37	7	5
40mm 8-inch Clamp	Quick Mount PV	375	QMQR-CP40.8 B 6	28	28	5	2
40mm 2-inch Clamp	Quick Mount PV	376	QMQR-CP40.2 B 24	31	31	2	17
Skirt	Quick Mount PV	444	QMQR-SL65.8 B 4	6	6	2	2
Skirtcap Set	Quick Mount PV	494	QMQR-SC B 25	1	1	1	24
Ground Lug	Quick Mount PV	436	QMQR-GL A 25	1	1	1	24
Electrical (optional)	Enphase/SolarEdge			24	24	n/a	n/a
Electrical Clamp (optional)	Quick Mount PV		AFB/EFM	24	24	1	1
Wire Management Clips (Estimate)	Heyco/Wiley/Nine Fasteners/SolarWorld			96	96	n/a	n/a

Contiguous Array 1:

PV Module

Quick Mount PV
Quick Rack

Extra Mount

Ground Lug

Soladeck

40mm 2" Clamp

Skirt

Skirt Cap Set

40mm 8" Clamp

Total kW: 7.2kW
Rafter/Truss Spacing: 16"
Roof Slope: 12° or 3:12
Max Module Cantilever (L): 17.7"
Max Mount Spacing (L): 72"
Staggered Mount Required: Yes
Module Dimensions: 39.37" x 64.57"

Max mount (East/West) cantilever per roof edge distance category:

Roof Edge Distance	12" - 18"	18.5" - 24"	24" - 36"	36+"
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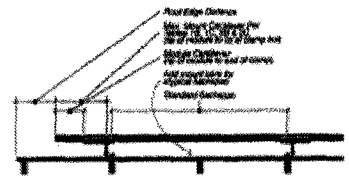

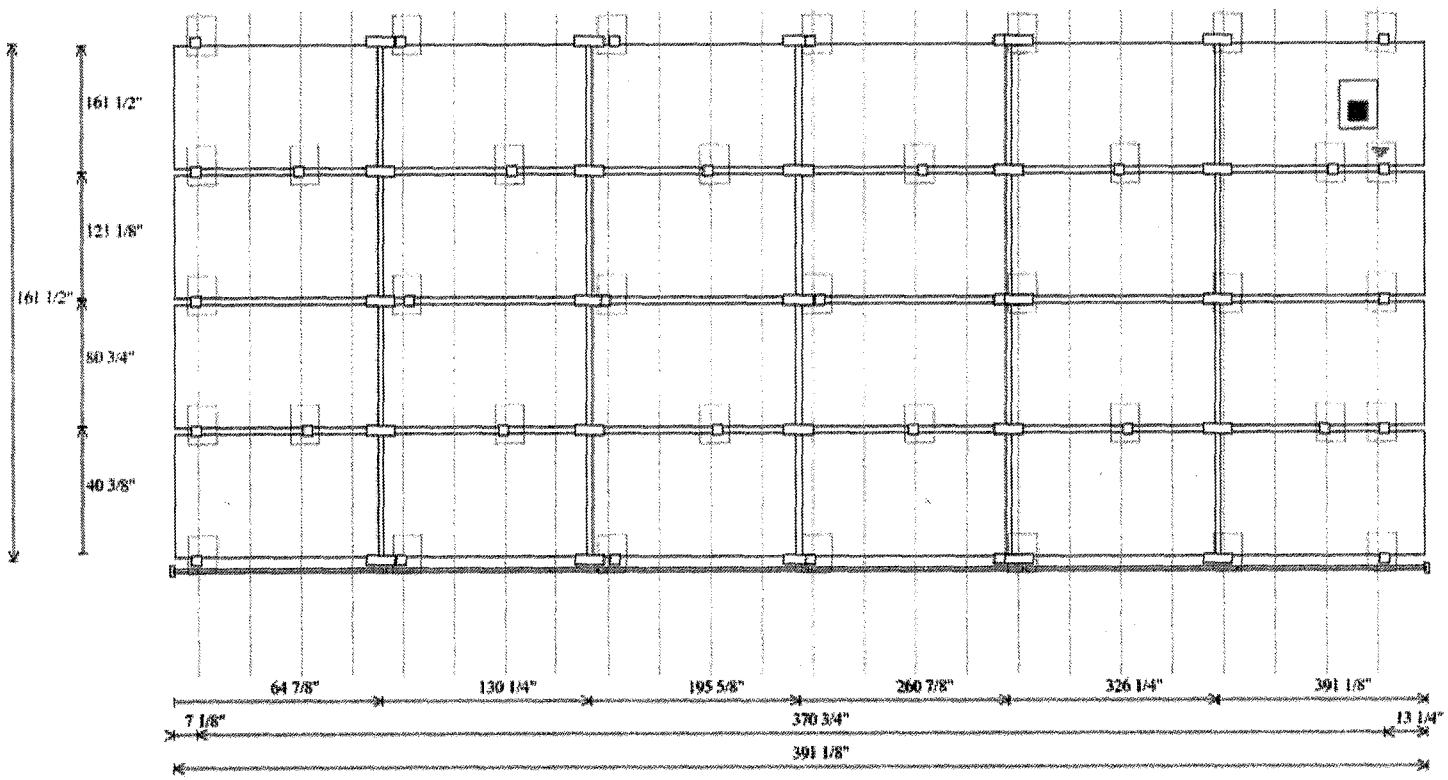

II. Quick Rack Assemblies

NOTE: Part quantities are per assembly.

Base Mount Assembly Parts

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- B QBlock Slider x1
- C Top Slider x1
- D Custom Hex Head Cap Screw x1
  Torque: 60 lbs
- E Serrated Flange Hex Nut x1
- F T-30/Hex Head Structural Screw, 5/16" x1
- G EPDM/SS Sealing Washer x1
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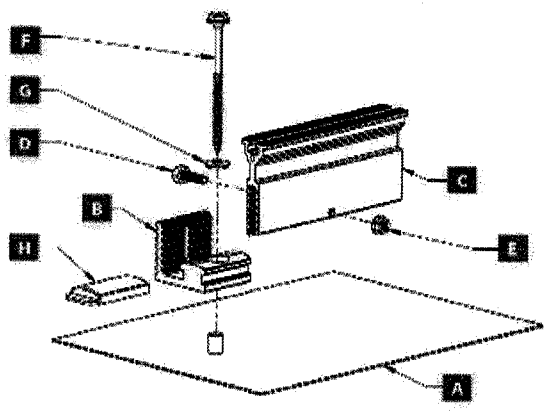

Panel Clamp Assembly Parts

- A Clamp Base x1
- B Panel Clamp (2" or 8") x1
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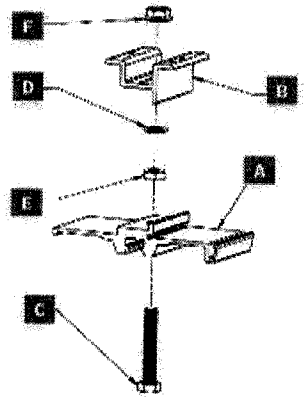
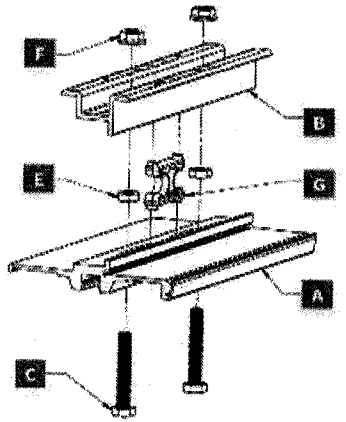
- D Plastic Retainer Ring x1 (2" clamp only)
- E Hex Nut x1 (x2 for 8")
- F Serrated Flange Hex Nut x1 (x2 for 8")
  Torque: 13 ft lbs
- G Clamp Spring (8" clamp only)

2" Panel Clamp Assembly



8" Panel Clamp Assembly



Skirt Assembly Parts

- A Skirt x1
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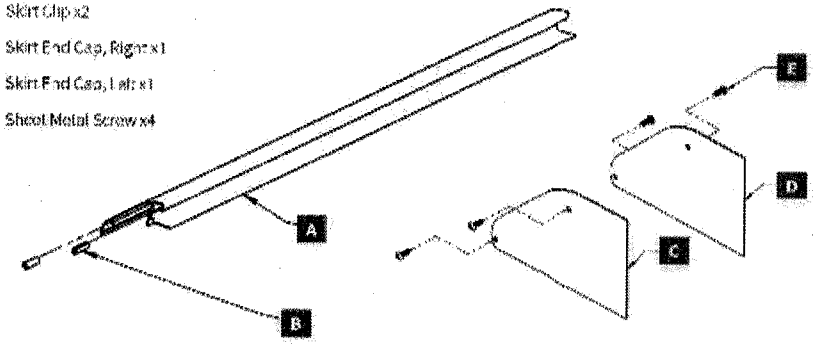

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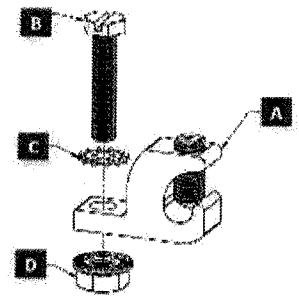
See page 11 for torque specs
All Grounding Lug hardware provided by Quick Mount PV.
Minimum of 1/4" clearance applied between bare copper wire and structure.
Recommend use of conductor compound, Ideal, between all mount surfaces and bond wire, including wireway of grounding lug.



* * * Communication Result Report (Nov. 10. 2016 8:29AM) * * *

1)
2)

Date/Time: Nov. 10. 2016 8:28AM

File No.	Mode	Destination	Pg(s)	Result	Page Not Sent
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Reason for error
E. 1) Hang up or line fail
E. 2) Busy
E. 3) No answer
E. 4) No facsimile connection
E. 5) Exceeded max. E-mail size
E. 6) Destination does not support IP-Fax

Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1030

Subcode Official Review

Date: Wednesday, November 09, 2016

To: DOPF, RICHARD W & CARLEEN A
3 BOW DR
BRICK, NJ 08723

RE: Building Subcode
Block: 382.35 Lot: 2 Qual:
3 BOW DRIVE
Permit Number: Control Number: C-16-005053
Last Submit Date: Tuesday, October 25, 2016

Dear DOPF, RICHARD W & CARLEEN A,

Your request is hereby denied based upon the following infractions.

Insufficient information provided - Please resubmit and include the following:
1. Stanchion layout and panel layout for each roof plane and shown on a birds view of the entire roof.
2. Engineer certification must include:
A.) Indicate the roofs construction of either conventional or truss or otherwise.
B.) Indicate the rafter size spacing and span measured horizontally.
C.) Indicate the maximum on center spacing of stanchions for connection of panels to roof along with any other special connection details.
Please understand that general references or tables can not be used. Each certification must be site specific.

Your request is hereby denied based upon the following infractions.

Sincerely,

Peter McNamara, [redacted]

CC:

Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1030

Subcode Official Review

Date: Wednesday, November 09, 2016

To: DOPF, RICHARD W & CARLEEN A
3 BOW DR
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Block: 382.35 Lot: 2 Qual:
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Please understand that general references or tables con not be used. Each certification must be site specific.

Your request is hereby denied based upon the following infractions.

Sincerely,

Peter McNamara, [redacted]

CC:

THIS DOCUMENT IS PRINTED ON WATERMARKED PAPER, WITH A MULTI-COLORED BACKGROUND AND MULTIPLE SECURITY FEATURES. PLEASE VERIFY AUTHENTICITY.

State Of New Jersey
New Jersey Office of the Attorney General
Division of Consumer Affairs

THIS IS TO CERTIFY THAT THE
Board of Exam. of Electrical Contractors

HAS LICENSED

Michael Lipari
1039 Farmingdale Road
Jackson, NJ 08527

FOR PRACTICE IN NEW JERSEY AS A(N): Electrical Contractor

03/21/2015 TO 03/31/2018
VALID

Signature of Licensee/Registrant/Certificate Holder

34EI01330200
LICENSE/REGISTRATION/CERTIFICATION #

ACTING DIRECTOR

New Jersey Office of the Attorney General
Division of Consumer Affairs
THIS IS TO CERTIFY THAT THE
Board of Exam. of Electrical Contractors
HAS LICENSED
Michael Lipari
Electrical Contractor
03/21/2015 TO 03/31/2018
VALID
34EI01330200
SIGNATURE
ACTING DIRECTOR

PLEASE DETACH HERE

IF YOUR LICENSE/REGISTRATION/ CERTIFICATE ID CARD IS LOST PLEASE NOTIFY:
Board of Exam. of Electrical Contra
P.O. Box 45006
Newark, NJ 07101

PLEASE DETACH HERE

BACKGROUND AND MULTIPLE SECURITY FEATURES. PLEASE VERIFY AUTHENTICITY.

NOT AN ELECTRICIAN'S OR PLUMBER'S LICENSE

State Of New Jersey
New Jersey Office of the Attorney General
Division of Consumer Affairs

THIS IS TO CERTIFY THAT THE
Division of Consumer Affairs

HAS REGISTERED

Green Sun Energy Services, LLC
Glen A. Koedding, Christopher R. Torre, The L A Trust
79 McCutcheon Ct
Middletown NJ 07748

FOR PRACTICE IN NEW JERSEY AS A(N): Home Improvement Contractor

02/02/2016 TO 03/31/2017
VALID

13VH06229000
LICENSE/REGISTRATION/CERTIFICATION #

Signature of Licensee/Registrant/Certificate Holder

ACTING DIRECTOR

New Jersey Office of the Attorney General
Division of Consumer Affairs
THIS IS TO CERTIFY THAT THE
Division of Consumer Affairs
HAS REGISTERED
Green Sun Energy Services, LLC
Home Improvement Contractor
NOT AN ELECTRICIAN'S OR PLUMBER'S LICENSE
02/02/2016 TO 03/31/2017 VALID
13VH06229000

PLEASE DETACH HERE

IF YOUR LICENSE/REGISTRATION/ CERTIFICATE ID CARD IS LOST PLEASE NOTIFY:
Division of Consumer Affairs
P.O. Box 46016
Newark, NJ 07101

PLEASE DETACH HERE

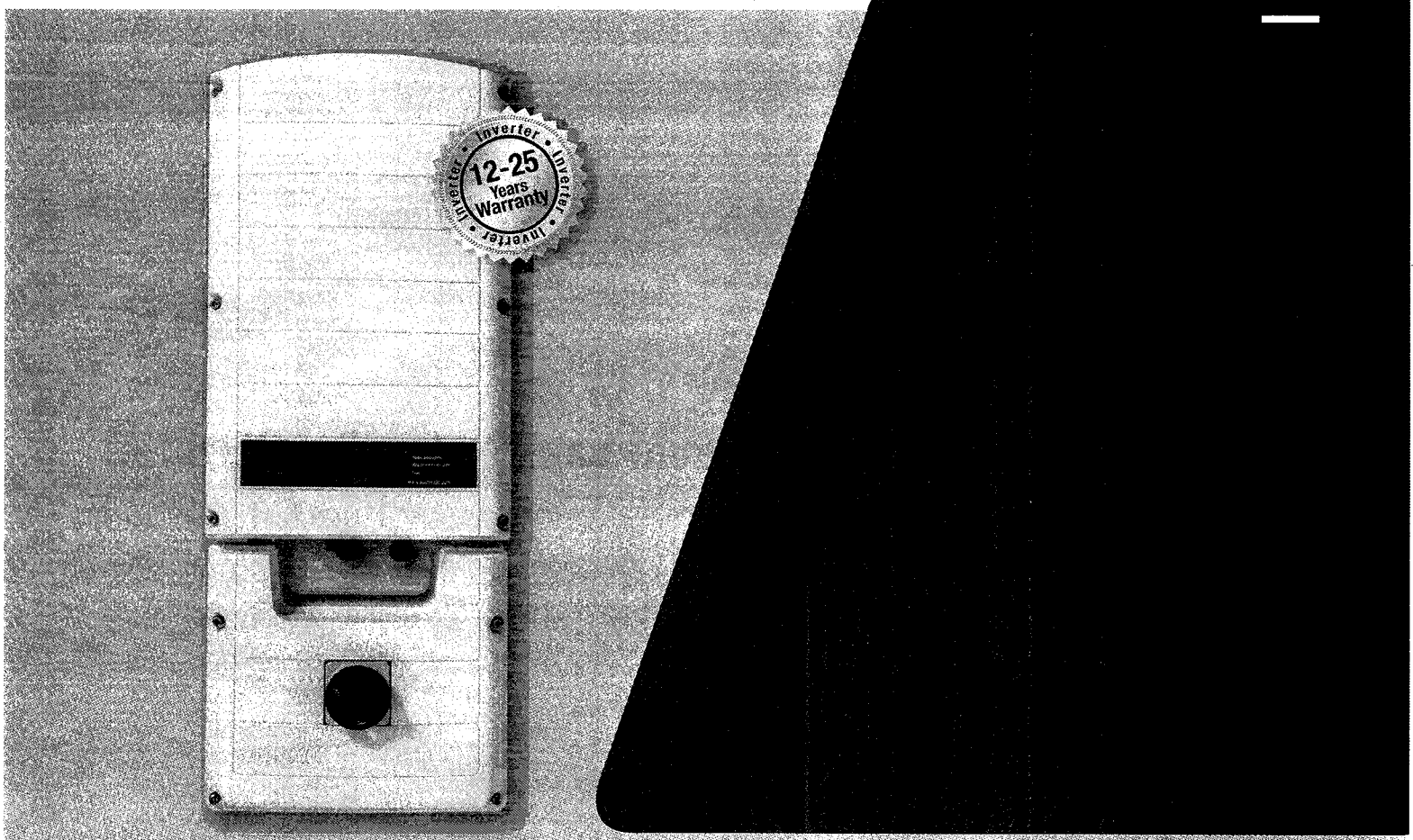
solaredge

INVERTERS

SolarEdge Single Phase Inverters

For North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US /
SE7600A-US / SE10000A-US / SE11400A-US



The best choice for SolarEdge enabled systems

- Integrated arc fault protection for NEC 2011 690.11 compliance
- Rapid shutdown for NEC 2014 690.12
- Superior efficiency (98%)
- Small, lightweight and easy to install on provided bracket
- Built-in module-level monitoring
- Internet connection through Ethernet or Wireless
- Outdoor and indoor installation
- Fixed voltage inverter, DC/AC conversion only
- Pre-assembled Safety Switch for faster installation
- Optional – revenue grade data, ANSI C12.1

Single Phase Inverters for North America

SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US / SE7600A-US / SE10000A-US / SE11400A-US

	SE3000A-US	SE3800A-US	SE5000A-US	SE6000A-US	SE7600A-US	SE10000A- US	SE11400A-US	
OUTPUT								
Nominal AC Power Output	3000	3800	5000	6000	7600	9980 @ 208V 10000 @240V	11400	VA
Max. AC Power Output	3300	4150	5400 @ 208V 5450 @240V	6000	8350	10800 @ 208V 10950 @240V	12000	VA
AC Output Voltage Min.-Nom.-Max.[1] 183 - 208 - 229 Vac	-	-	✓	-	-	✓	-	
AC Output Voltage Min.-Nom.-Max.[1] 211 - 240 - 264 Vac	✓	✓	✓	✓	✓	✓	✓	
AC Frequency Min.-Nom.-Max.[1]	59.3 - 60 - 60.5							Hz
Max. Continuous Output Current	12.5	16	24 @ 208V 21 @ 240V	25	32	48 @ 208V 42 @ 240V	47.5	A
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							Yes
INPUT								
Maximum DC Power (STC)	4050	5100	6750	8100	10250	13500	15350	W
Transformer-less, Ungrounded	Yes							
Max. Input Voltage	500							Vdc
Nom. DC Input Voltage	325 @ 208V / 350 @ 240V							Vdc
Max. Input Current[2]	9.5	13	16.5 @ 208V 15.5 @ 240V	18	23	33 @ 208V 30.5 @ 240V	34.5	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600kΩ Sensitivity							
Maximum Inverter Efficiency	97.7	98.2	98.3	98.3	98	98	98	%
CEC Weighted Efficiency	97.5	98	97 @ 208V 98 @ 240V	97.5	97.5	97 @ 208V 97.5 @ 240V	97.5	%
Nighttime Power Consumption	< 2.5					< 4		W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, RS232, Ethernet, ZigBee (optional)							
Revenue Grade Data, ANSI C12.1	Optional[3]							
Rapid Shutdown – NEC 2014 690.12	Yes							
STANDARD COMPLIANCE								
Safety	UL1741, UL1699B, UL1998 , CSA 22.2							
Grid Connection Standards	IEEE1547							
Emissions	FCC part15 class B							
INSTALLATION SPECIFICATIONS								
AC output conduit size / AWG range	3/4" minimum / 16-6 AWG					3/4" minimum / 8-3 AWG		
DC input conduit size / # of strings / AWG range	3/4" minimum / 1-2 strings / 16-6 AWG					3/4" minimum / 1-3 strings / 14-6 AWG		
Dimensions with Safety Switch (HxWxD)	30.5 x 12.5 x 7.2 / 775 x 315 x 184					30.5 x 12.5 x 10.5 / 775 x 315 x 260		in / mm
Weight with Safety Switch	51.2 / 23.2		54.7 / 24.7			88 .4 / 40.1		lb / kg
Cooling	Natural Convection				Natural convection and internal fan (user replaceable)	Fans (user replaceable)		
Noise	< 25					< 50		dBA
Min.-Max. Operating Temperature Range	-13 to +140 / -25 to +60 (-40 to +60 version available[4])							°F / °C
Protection Rating	NEMA 3R							

[1] For other regional settings please contact SolarEdge support.
[2] A higher current source may be used; the inverter will limit its input current to the values stated.
[3] Revenue grade inverter P/N: SExxxxA-US000NNR2 (for 7600W inverter:SE7600A-US002NNR2).
[4] -40 version P/N: SExxxxA-US000NNU4 (for 7600W inverter:SE7600A-US002NNU4).

RoHS

LG
Life's Good

Innovation for a Better Life

LG NeON™ 2 Black LG300N1K-G4

60 cell

LG's new module, LG NeON™ 2 Black, adopts Cello technology. Cello technology replaces 3 busbars with 12 thin wires to enhance power output and reliability. LG NeON™ 2 Black demonstrates LG's efforts to increase customer's values beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.

APPROVED PRODUCT
KM 564573 BS EN 61215
Photovoltaic Modules

Enhanced Performance Warranty

LG NeON™ 2 Black has an enhanced performance warranty. The annual degradation has fallen from -0.7%/yr to -0.6%/yr. Even after 25 years, the cell guarantees 2.4%p more output than the previous LG NeON™ modules.

High Power Output

Compared with previous models, the LG NeON™ 2 Black has been designed to significantly enhance its output efficiency, thereby making it efficient even in limited space.

Aesthetic Roof

LG NeON™ 2 Black has been designed with aesthetics in mind; thinner wires that appear all black at a distance. The product may increase the value of a property with its modern design.

Outstanding Durability

With its newly reinforced frame design, LG has extended the warranty of the LG NeON™ 2 Black for an additional 2 years. Additionally, LG NeON™ 2 Black can endure a front load up to 6000 Pa, and a rear load up to 5400 Pa.

Better Performance on a Sunny Day

LG NeON™ 2 Black now performs better on sunny days thanks to its improved temperature coefficiency.

Double-Sided Cell Structure

The rear of the cell used in LG NeON™ 2 Black will contribute to generation, just like the front; the light beam reflected from the rear of the module is reabsorbed to generate a great amount of additional power.

About LG Electronics

LG Electronics is a global player who has been committed to expanding its capacity, based on solar energy business as its future growth engine. We embarked on a solar energy source research program in 1985, supported by LG Group's rich experience in semi-conductor, LCD, chemistry, and materials industry. We successfully released first Mono X® series to the market in 2010, which were exported to 32 countries in the following 2 years, thereafter. In 2013, NeON™ (previously known as Mono X® NeON) & 2015 NeON2 with CELLO technology won "Intersolar Award", which proved LG is the leader of innovation in the industry.

LG NeON™ 2 Black

LG300N1K-G4

Mechanical Properties

Cells	6 x 10
Cell Vendor	LG
Cell Type	Monocrystalline / N-type
Cell Dimensions	156.75 x 156.75 mm / 6 inches
# of Busbar	12 (Multi Wire Busbar)
Dimensions (L x W x H)	1640 x 1000 x 40 mm 64.57 x 39.37 x 1.57 inch
Front Load	6000 Pa / 125 psf
Rear Load	5400 Pa / 113 psf
Weight	17.0 ± 0.5 kg / 37.48 ± 1.1 lbs
Connector Type	MC4, MC4 Compatible, IP67
Junction Box	IP67 with 3 Bypass Diodes
Length of Cables	2 x 1000 mm / 2 x 39.37 inch
Glass	High Transmission Tempered Glass
Frame	Anodized Aluminum

Certifications and Warranty

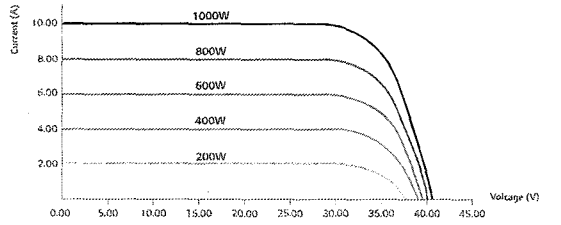
Certifications	IEC 61215, IEC 61730-1/-2
	IEC 62716 (Ammonia Test)
	IEC 61701 (Salt Mist Corrosion Test)
	ISO 9001
	UL 1703
Module Fire Performance (USA)	Type 2 (UL 1703)
Fire Rating (for CANADA)	Class C (ULC/ORD C1703)
Product Warranty	12 years
Output Warranty of Pmax	Linear warranty*

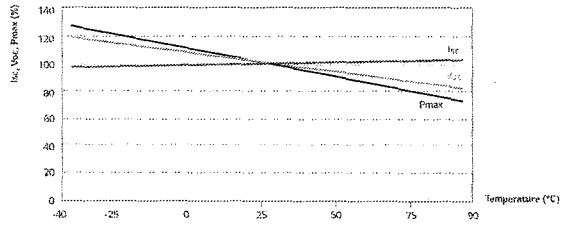
* 1) 1st year: 98%, 2) After 2nd year: 0.6%p annual degradation, 3) 83.6% for 25 years

Temperature Characteristics

NOCT	45 ± 3 °C
Pmpp	-0.38 %/°C
Voc	-0.28 %/°C
Isc	0.03 %/°C

Characteristic Curves





Electrical Properties (STC *)

Module Type	**300 W**
MPP Voltage (Vmpp)	32.5
MPP Current (Impp)	9.26
Open Circuit Voltage (Voc)	39.7
Short Circuit Current (Isc)	9.70
Module Efficiency (%)	18.3
Operating Temperature (°C)	-40 ~ +90
Maximum System Voltage (V)	1000 (IEC/UL)
Maximum Series Fuse Rating (A)	20
Power Tolerance (%)	0 ~ +3

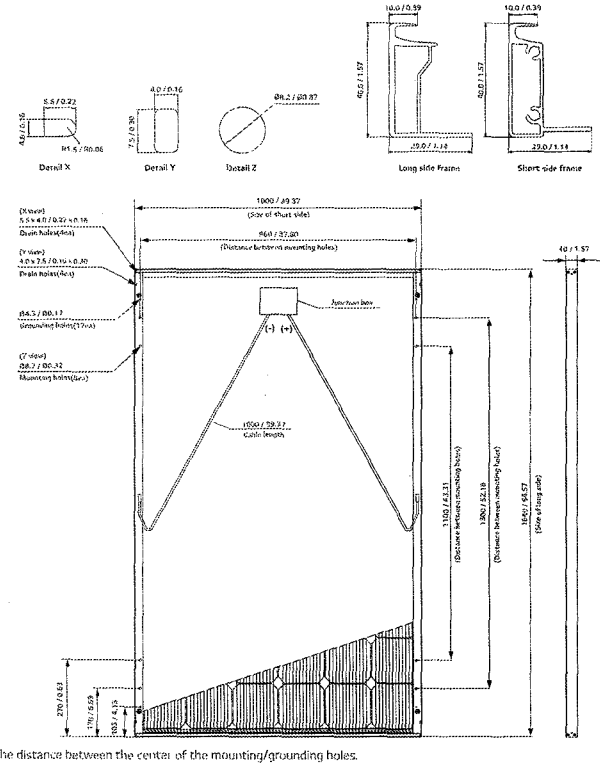
* STC (Standard Test Condition): Irradiance 1000 W/m², Module Temperature 25 °C, AM 1.5
* The nameplate power output is measured and determined by LG Electronics at its sole and absolute discretion.
* The typical change in module efficiency at 200 W/m² in relation to 1000 W/m² is -3.0%.

Electrical Properties (NOCT*)

Module Type	**300 W**
Maximum Power (Pmax)	222
MPP Voltage (Vmpp)	30.1
MPP Current (Impp)	7.38
Open Circuit Voltage (Voc)	36.9
Short Circuit Current (Isc)	7.81

* NOCT (Nominal Operating Cell Temperature): Irradiance 800 W/m², ambient temperature 20 °C, wind speed 1 m/s

Dimensions (mm/in)



* The distance between the center of the mounting/grounding holes.

LG
Life's Good

North America Solar Business Team
LG Electronics U.S.A. Inc
1000 Sylvan Ave, Englewood Cliffs, NJ 07632

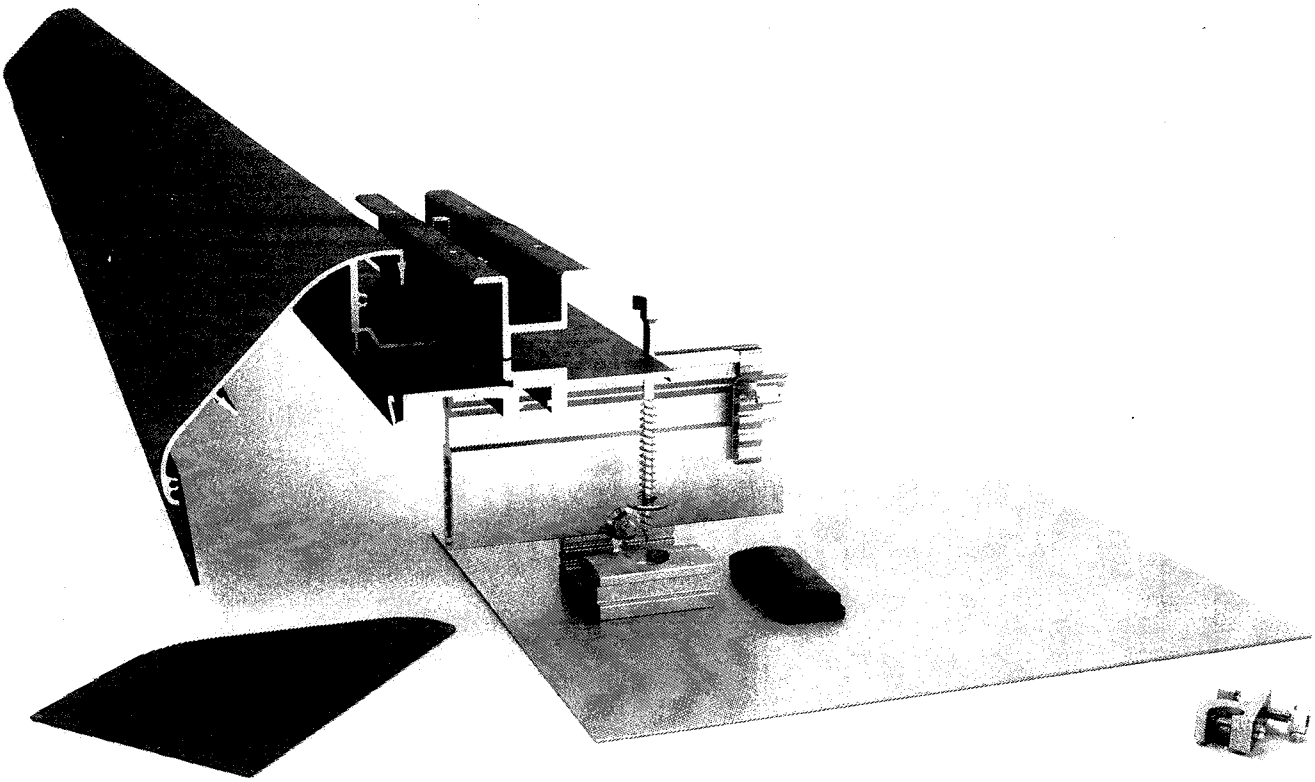
Contact: lg.solar@lge.com
www.lgsolarusa.com

Product specifications are subject to change without notice.
DS-N2-60-K-G-F-EN-50427

Innovation for a Better Life

Quick Rack™

Rail-Free Mounting System



Efficient // Reliable // Economical

Quick Mount PV®

RESPECT THE ROOF

Intertek
4008516
UL SUB 2703

A No-Compromise Rail-Free Mounting System

Quick Rack, featuring QRack™ technology, is the most reliable and cost-effective rail-free mounting system available. With only 3 main components, it works with standard module frames and features Quick Mount PV's high-quality, patented Elevated Water Seal to ensure a long, watertight life on the roof.

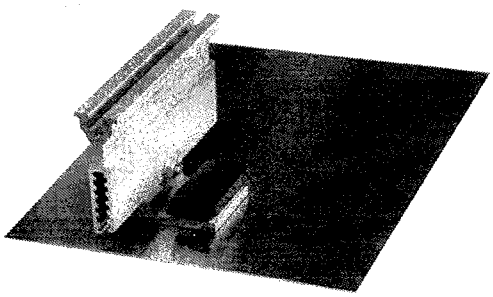
Features & Benefits

- Integrated roof mount and racking system
- Fewer components = quick to install
- Works with standard module frames - no special grooves required
- Incorporates Quick Mount PV's Elevated Water Seal technology
- Integrated grounding up to 300 modules
- Meets or exceeds roofing industry best practices

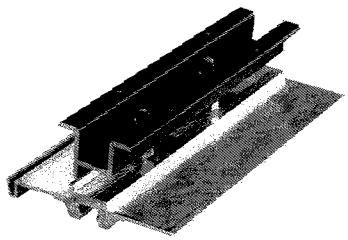
Technical Features

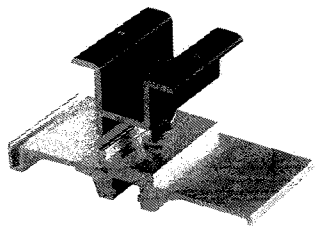
- UL SUB 2703
- 2009 International Building Code
- 2013 California Building Code
- ASCE 7-05
- ASCE 7-10

Quick Rack Components

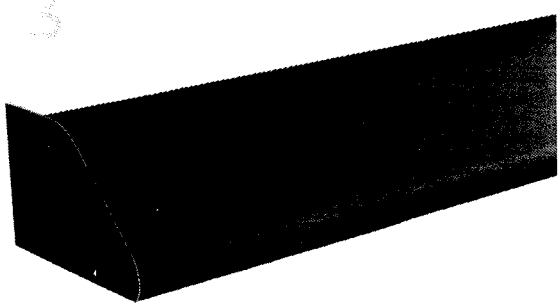


Base Mount
Featuring Quick Mount PV's patented Elevated Water Seal.





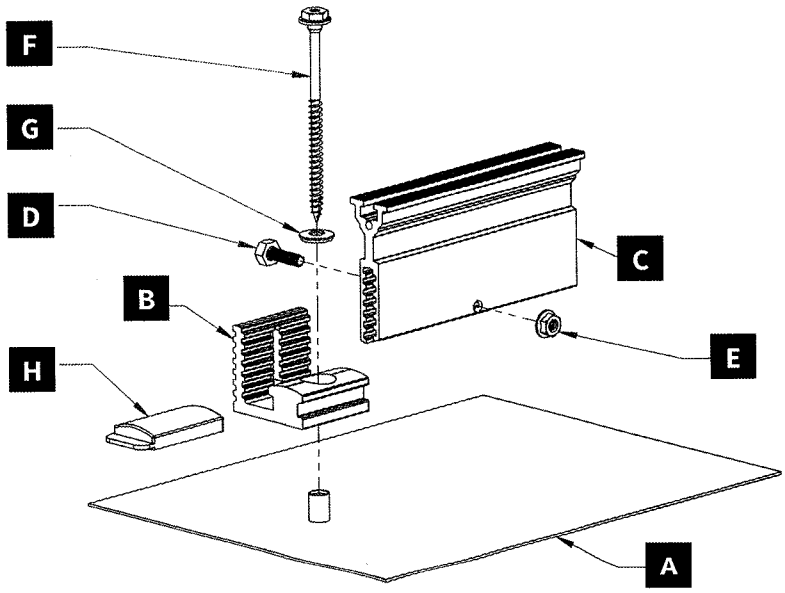
Panel Clamp
Available in two sizes (2" & 8") for both mid- and end-clamping that *works with standard module frames.*



Skirt
Snaps right into place for an elegant, streamlined finish.

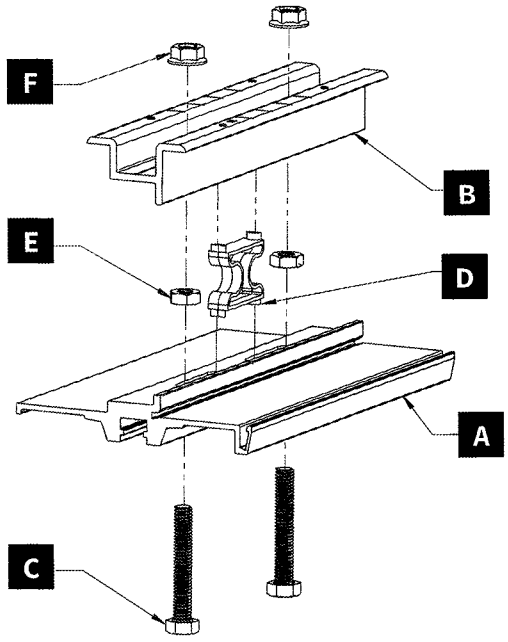
Base Mount Assembly Parts

- [A] Flashing x1
- [B] QBlock Slider x1
- [C] Top Slider x1
- [D] Custom Hex Head Cap Screw x1
- [E] Serrated Flange Hex Nut x1
- [F] T-30/Hex Head Structural Screw, 5/16" x1
- [G] EPDM/SS Sealing Washer x1
- [H] EPDM Screw Cover x1



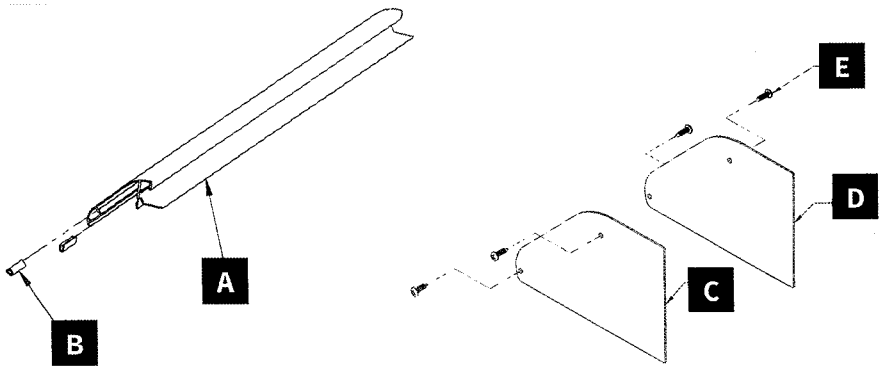
Panel Clamp Assembly Parts

- [A] Clamp Base (2" or 8") x1
- [B] Panel Clamp (2" or 8") x1
- [C] Hex Head Cap Screw x1 (x2 for 8")
- [D] Clamp Spring (8" clamp only)
- [E] Hex Nut x1 (x2 for 8")
- [F] Serrated Flange Hex Nut x1 (x2 for 8")



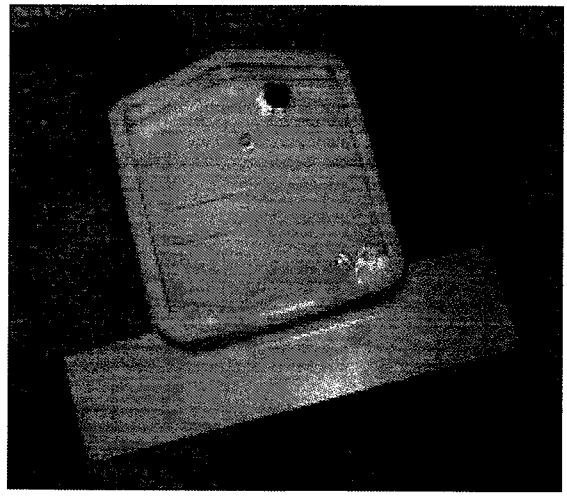
Skirt Assembly Parts

- [A] Skirt x1
- [B] Skirt Clip x2
- [C] Skirt End Cap, Right x1
- [D] Skirt End Cap, Left x1
- [E] Sheet Metal Screw x4



SolaDeck

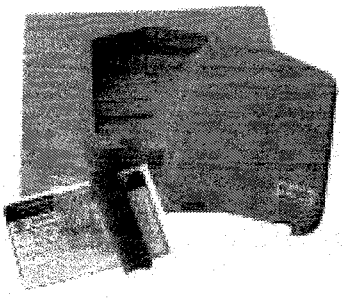
FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURE



SolaDeck Model SD 0783

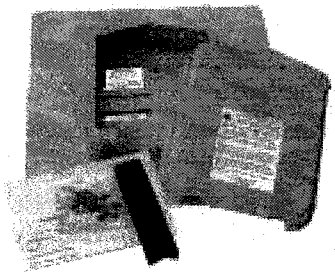
Basic Features

- Stamped Seamless Construction
- 18 Gauge Galvanized Steel
- Powder Coated Surfaces
- Flashes into the roof deck
- 3 Roof deck knockouts .5", .75", 1"
- 5 Centering dimples for entry/exit fittings or conduit
- 2 Position Ground lug installed
- Mounting Hardware Included



SolaDeck UL50 Type 3R Enclosures

Available Models:
Model SD 0783 - (3" fixed Din Rail)
Model SD 0786 - (6" slotted Din Rail)



SolaDeck UL 1741 Combiner/Enclosures

Models SD 0783-41 and SD 0786-41 are labeled and ETL listed UL STD 1741 according to the UL STD 1741 for photovoltaic combiner enclosures.

Max Rated - 600VDC, 120AMPS

Model SD 0783-41 3" Fixed Din Rail fastened using Norlock System

****Typical System Configuration**

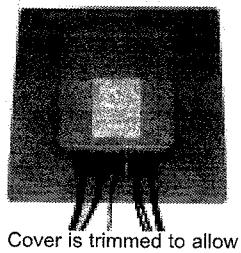
4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
1- Power Distribution Block 600VDC 175AMP
1- Bus Bar with UL lug

Model SD 0786-41 6" Slotted Din Rail fastened using steel studs

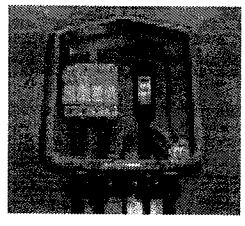
****Typical System Configuration**

4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
4- Din Rail Mounted Terminal Blocks
Bus Bars with UL lug

**Fuse holders and terminal blocks added in the field must be UL listed or recognized and meet 600 VDC 30 AMP 110C for fuse holders, 600V 50 AMP 90C for rail mounted terminal blocks and 600 V 175 AMP 90C for Power Distribution Blocks. Use Copper Wire Conductors.



Cover is trimmed to allow conduit or fittings, base is center dimpled for fitting locations.



Model SD 0783-41, wired with Din Rail mounted fuse holders, bus bar and power distribution block.

Model SD 0786-41, wired with Din Rail mounted fuse holders, terminal blocks and bus bars.

RSTC Enterprises, Inc • 2219 Heimstead Road • Eau Cliare, WI 54703
For product information call 1(866) 367-7782

Fax

To	From
Brick Construction Fax: (732) 262-2941	Engineering & Technology (732) 410-7818

Date:	November 15, 2016 06:27 PM
Pages:	15 (including cover)
Re:	

Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1030

Subcode Official Review

Date: Wednesday, November 09, 2016

To: DOPF, RICHARD W & CARLEEN A
3 BOW DR
BRICK, NJ 08723

RE: Building Subcode
Block: 382.35 Lot: 2 Qual:
3 BOW DRIVE
Permit Number: Control Number: C-16-005053
Last Submit Date: Tuesday, October 25, 2016

Dear DOPF, RICHARD W & CARLEEN A,

Your request is hereby denied based upon the following infractions.

Insufficient information provided - Please resubmit and include the following:
1. Stanchion layout and panel layout for each roof plane and shown on a birds view of the entire roof.
2. Engineer certification must include:
A.) Indicate the roofs construction of either conventional or truss or otherwise.
B.) Indicate the rafter size spacing and span measured horizontally.
C.) Indicate the maximum on center spacing of stanchions for connection of panels to roof along with any other special connection details.
Please understand that general references or tables con not be used. Each certification must be site specific.

Your request is hereby denied based upon the following infractions.

Sincerely,

Peter McNamara, [redacted]

CC:

Quick Mount PV

Project Name: Dopf-3 Bow Ave_copy

Project Address: 3 Bow Ave, Brick, NJ 08723

Code Compliance: IBC 2012, CBC 2012

UL 2703 Listed

UL 1703 Listed - Class A Fire Rating with Module Types 1 & 2

PV Racking: Quick Rack

Project Specifications:

1) 5.40kW

2) Mean Roof Height: < 35'

3) Ground Snow Load: 30 psf

4) ASCE 7-10 Wind Speed: 120 mph

5) Wind Exposure Category: B

6) Roofing Type: Composition Shingle

7) Total system weight: Array 1 - 750.14 lbs;

Part Description	Part Manufacturer	QMQV Product Code	Part Number	Each (Array 1): 5.40 kW	Totals	Rows	Supports
Module	LG Solar		LG300N1K-G4-Blac k	18	18	n/a	n/a
Base Mounts	Quick Mount PV	363	QMQR-BM A 6	31	31	6	5
40mm 8-inch Clamp	Quick Mount PV	375	QMQR-CP40.8 B 6	21	21	4	3
40mm 2-inch Clamp	Quick Mount PV	376	QMQR-CP40.2 B 24	27	27	2	21
Skirt	Quick Mount PV	444	QMQR-SL65.8 B 4	6	6	2	2
Skirtcap Set	Quick Mount PV	494	QMQR-SC B 25	3	3	1	22
Ground Lug	Quick Mount PV	436	QMQR-GL A 25	1	1	1	24
Electrical (optional)	Enphase/SolarEdge			18	18	n/a	n/a
Electrical Clamp (optional)	Quick Mount PV		AFB/EFM	18	18	1	7
Wire Management Clips (Estimate)	Heyco/Wiley/Nine Fasteners/SolarWorld			72	72	n/a	n/a

Learn more at www.quickrackpv.com.

Dopf-3 Bow Ave_copy
Array Layout 1
Page 2

Contiguous Array 1:

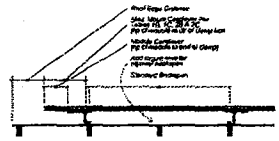
PV Module | Quick Mount PV Quick Rack | Extra Mount | Ground Lug | Soladeck

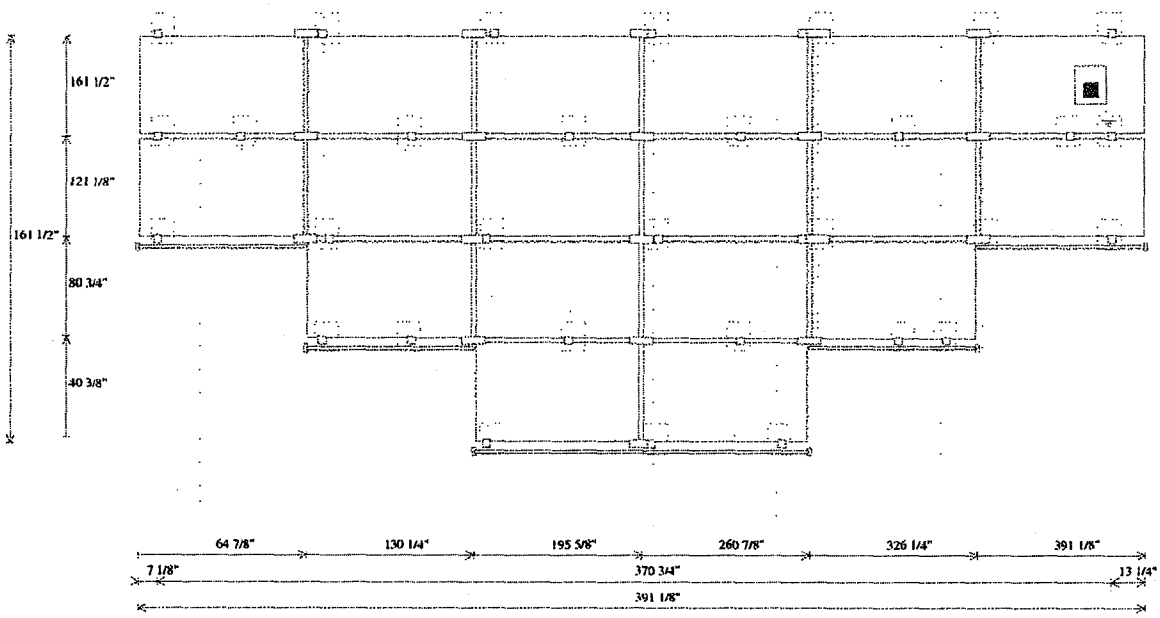
40mm 2" Clamp | Skirt | Skirt Cap Set | 40mm 8" Clamp

Total kW: 5.4kW
Rafter/Truss Spacing: 16"
Roof Slope: 12° or 3:12
Max Module Cantilever (L): 17.7"
Max Mount Spacing (L): 72"
Staggered Mount Required: Yes
Module Dimensions: 39.37" x 64.57"

Max mount (East/West) cantilever per roof edge distance category:

Roof Edge Distance	0'-10'	10'-20'	20'-30'	30'-40'
Standard Racking Backspan (L)	18"	21"	24"	24"
Atypical Racking Backspan (L)	24"	24"	24"	24"





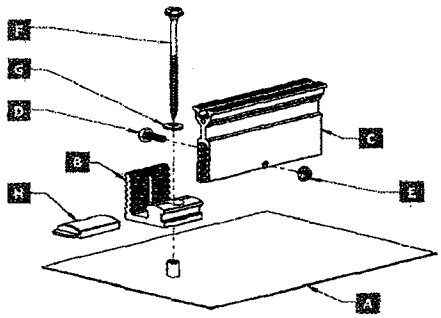
Learn more at www.quickrackpv.com.

II. Quick Rack Assemblies

NOTE: Part quantities are per assembly.

Base Mount Assembly Parts

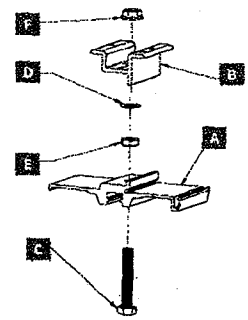
- [A] Flashing x1
- [B] QBlock Slider x1
- [C] Top Slider x1
- [D] Custom Hex Head Cap Screw x1
  Torque: 6ft-lbs
- [E] Serrated Flange Hex Nut x1
- [F] T-30/Hex Head Structural Screw, 5/16" x1
- [G] EPDM/SS Sealing Washer x1
- [H] EPDM Screw Cover x1



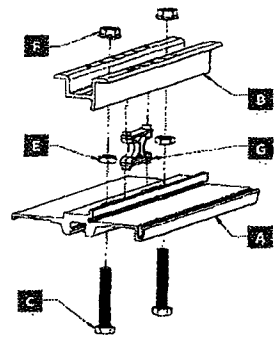
Panel Clamp Assembly Parts

- [A] Clamp Base x1
- [B] Panel Clamp (2" or 8") x1
- [C] Hex Head Cap Screw x1 (x2 for 8")
- [D] Plastic Retainer Ring x1 (2" clamp only)
- [E] Hex Nut x1 (x2 for 8")
- [F] Serrated Flange Hex Nut x1 (x2 for 8")
  Torque: 13 ft-lbs
- [G] Clamp Spring (8" clamp only)

2" Panel Clamp Assembly

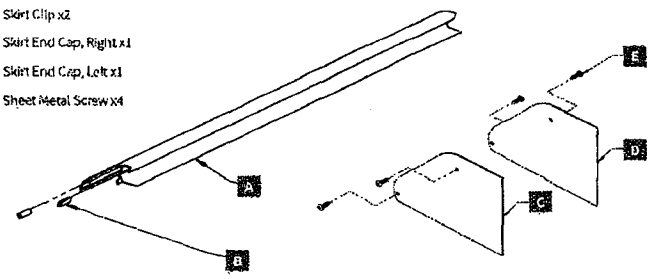


8" Panel Clamp Assembly



Skirt Assembly Parts

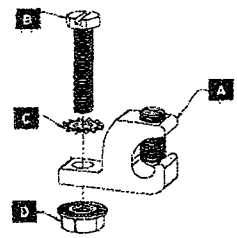
- [A] Skirt x1
- [B] Skirt Clip x2
- [C] Skirt End Cap, Right x1
- [D] Skirt End Cap, Left x1
- [E] Sheet Metal Screw x4



Grounding Lug Assembly Parts

- [A] ilsco GBL-4DBT Grounding Lug with Set Screw x1
- [B] Slotted Stainless Steel Hex Head Cap Screw x1
- [C] Star Washer Stainless Steel x1
- [D] Serrated Flange Stainless Steel Hex Nut x1

See page 11 for torque specs.
All Grounding Lug hardware provided by Quick Mount PV.
Maximum of 1/4" clearance required between bare copper wire and aluminum.
Recommend use of conductor compound, Ilsco, between all mount surfaces and hardware, including wireway of grounding lug



Quick Mount PV®

Project Name: Dopf-3 Bow Ave

Project Address: 3 Bow Ave, Brick, NJ 08723

Code Compliance: IBC 2012, CBC 2012

UL 2703 Listed

UL 1703 Listed - Class A Fire Rating with Module Types 1 & 2

PV Racking: Quick Rack

Project Specifications:

1) 7.20kW

2) Mean Roof Height: < 35'

3) Ground Snow Load: 30 psf

4) ASCE 7-10 Wind Speed: 120 mph

5) Wind Exposure Category: B

6) Roofing Type: Composition Shingle

7) Total system weight: Array 1 - 992.68 lbs;

Part Description	Part Manufacturer	QMPV Product Code	Part Number	Each (Array 1: 7.20 kW	Totals	Box	Supplier
Module	LG Solar		LG300N1K-G4-Blac k	24	24	n/a	n/a
Base Mounts	Quick Mount PV	363	QMQR-BM A 6	37	37	7	5
40mm 8-inch Clamp	Quick Mount PV	375	QMQR-CP40.8 B 6	28	28	5	2
40mm 2-inch Clamp	Quick Mount PV	376	QMQR-CP40.2 B 24	31	31	2	17
Skirt	Quick Mount PV	444	QMQR-SL65.8 B 4	6	6	2	2
Skircap Set	Quick Mount PV	494	QMQR-SC B 25	1	1	1	24
Ground Lug	Quick Mount PV	436	QMQR-GL A 25	1	1	1	24
Electrical (optional)	Enphase/SolarEdge			24	24	n/a	n/a
Electrical Clamp (optional)	Quick Mount PV		AFB/EFM	24	24	1	1
Wire Management Clips (Estimate)	Heyco/Wiley/Nine Fasteners/SolarWorld			96	96	n/a	n/a

Learn more at www.quickrackpv.com.

Dopf-3 Bow Ave
Array Layout 1
Page 2

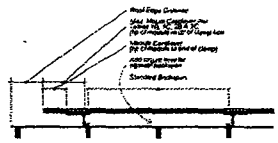
Contiguous Array 1:

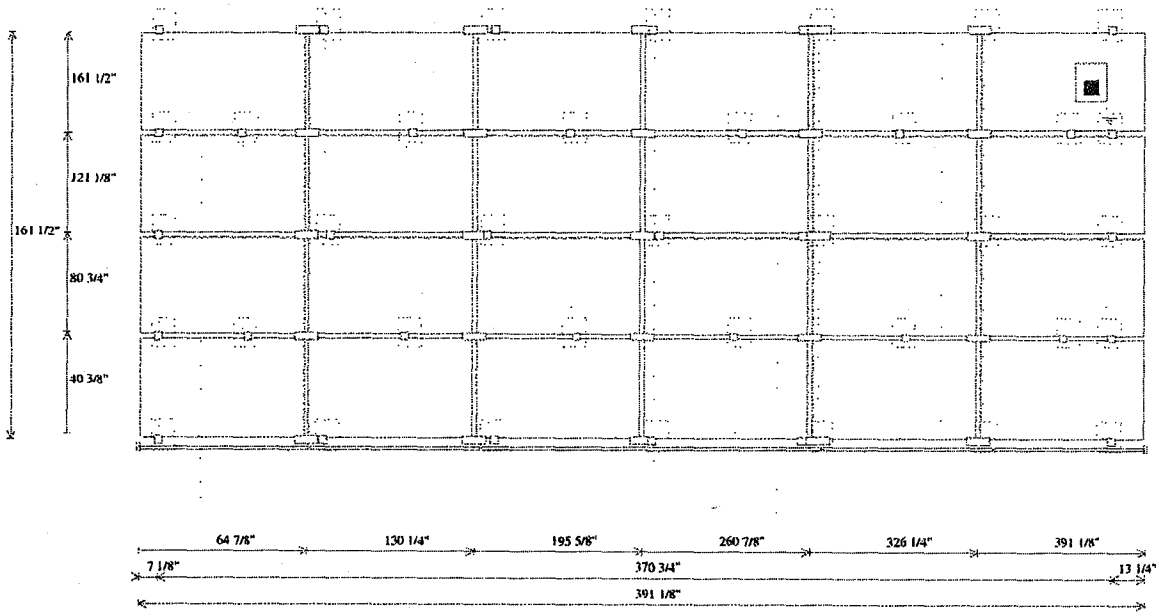
PV Module	Quick Mount PV Quick Rack	Extra Mount	Ground Lug	Sohadeck
	40mm 2" Clamp	Skirt	Skirt Cap Set	40mm 8" Clamp

Total kW: 7.2kW
Rafter/Truss Spacing: 16"
Roof Slope: 12" or 3:12
Max Module Cantilever (L): 17.7"
Max Mount Spacing (L): 72"
Staggered Mount Required: Yes
Module Dimensions: 39.37" x 64.57"

Max mount (East/West) cantilever per roof edge distance category:

Roof Edge Distance	10'- 15'	15'- 20'	20'- 25'	25'- 30'
Standard Racking Backspan (L)	18"	21"	24"	24"
Atypical Racking Backspan (L)	24"	24"	24"	24"





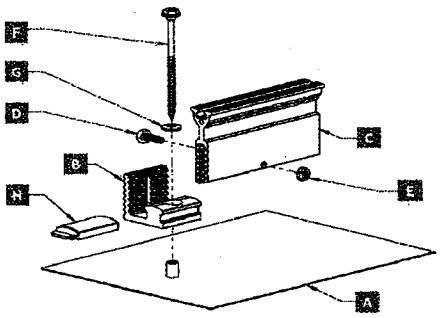
Learn more at www.quickrackpv.com.

II. Quick Rack Assemblies

NOTE: Part quantities are per assembly.

Base Mount Assembly Parts

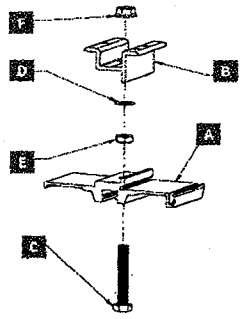
- [A] Flashing x1
- [B] QBlock Slider x1
- [C] Top Slider x1
- [D] Custom Hex Head Cap Screw x1
  Torque: 6ft-lbs
- [E] Serrated Flange Hex Nut x1
- [F] T-30/Hex Head Structural Screw, 5/16" x1
- [G] EPDM/SS Sealing Washer x1
- [H] EPDM Screw Cover x1



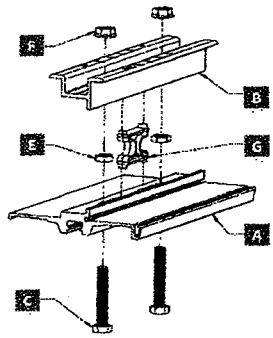
Panel Clamp Assembly Parts

- [A] Clamp Base x1
- [B] Panel Clamp (2" or 8") x1
- [C] Hex Head Cap Screw x1 (x2 for 8")
- [D] Plastic Retainer Ring x1 (2" clamp only)
- [E] Hex Nut x1 (x2 for 8")
- [F] Serrated Flange Hex Nut x1 (x2 for 8")
  Torque: 13 ft-lbs
- [G] Clamp Spring (8" clamp only)

2" Panel Clamp Assembly

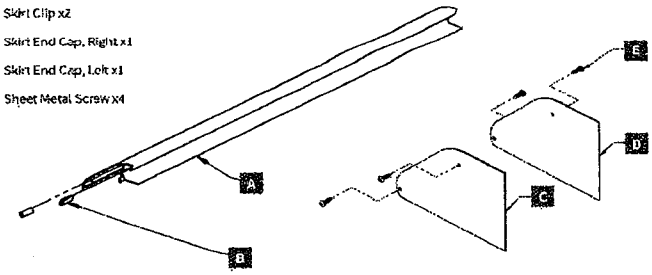


8" Panel Clamp Assembly



Skirt Assembly Parts

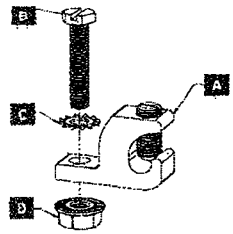
- [A] Skirt x1
- [B] Skirt Clip x2
- [C] Skirt End Cap, Right x1
- [D] Skirt End Cap, Left x1
- [E] Sheet Metal Screw x4



Grounding Lug Assembly Parts

- [A] Ilsco GBL-4DBT Grounding Lug with Set Screw x1
- [B] Slotted Stainless Steel Hex Head Cap Screw x1
- [C] Star Washer Stainless Steel x1
- [D] Serrated Flange Stainless Steel Hex Nut x1

See page 11 for torque specs.
All Grounding Lug hardware provided by Quick Mount PV.
Maximum of 1/4" clearance required between bare copper wire and aluminum.
Recommend use of conductor compounds. Paste, between all mount surfaces and hardware, including wire-entry of grounding lug.



SYSTEM DESIGN
Vent
Vent
Vent
AZIMUTH 90°
Total Solar Panels : 42
Rafters: 2"x6"-16"O.C.
S
E
W
N
Solar Design for:
3 Bow Ave, Brick, NJ 07734
42 ea. Solar Optimizers
42 ea. 300W Solar Panels
Sys. Size:12.6 kW
Date: 7/27/2016
Electrician:
Page 1 of 1
Utility Co. Account # 100 118 514 122
GreenSun
PO Box 4314
Middletown, NJ 07748
732-410-7818

REFERENCE: **Dopf Residence: 3 Bow Drive, Brink, NJ 08723**
Solar Panel Installation

To whom it may concern:

Per your request, we have reviewed the layout relating to the installation of solar panels at the above-referenced site. The following materials and components are proposed in the installation of the solar panels.

Roof Construction: Conventional
Rafter span: 19'
Roof Structure in Area of Panels: 2x6 Rafters @ 16" O.C. w/ Collar ties @ 4' & knee wall @ 8'-3" from ridge
Roof Material: Composite shingles

Based upon our review, it is our conclusion that the installation of solar panels on this existing roof will not adversely affect the structure of this house. The design of solar panel supporting members and connections is by the manufacturer and/or installer. The adopted building code in this jurisdiction is the 2015 International Building Code and ASCE 7-10. Appropriate design parameters which must be used in the design of the supporting members and connections are listed below:

Ground snow load: 20 psf per 2015 IBC (verify with local building department)
Design wind speed for risk category II structures: 122 mph per ASCE 7-10
Wind exposure: Category C

Our conclusion regarding the adequacy of the existing roof is based on the fact that the additional weight related to the solar panels is less than 3 pounds per square foot. In the area of the solar panels, no 20 psf live loads will be present per Section 1607.12.5.3 of the International Building Code, 2015 Edition. Regarding snow loads, it is our conclusion that since the panels are slippery, effective snow loads will likely be reduced in the areas of the panels. The attached calculations verify the capacity of the connections against wind, the governing load case. The rails shall be attached at 72" O.C. maximum with adjacent rails attached to alternating rafters using 5/16" diameter lag screws with a minimum of 3" thread penetration into the rafter or truss. Solar panels will be flush-mounted, parallel to and no more than 6" above the roof surface. Thus, it is our conclusion that any additional wind or seismic loadings related to the addition of these solar panels is negligible.

During design and installation, particular attention must be paid to the maximum allowable spacing of attachments and the location of solar panels relative to roof edges. The use of solar panel support span tables provided by the manufacturer is allowed only where the building type, site conditions, and solar panel configuration match the description of the span tables. Attachments to existing roof joist or rafters must be staggered so as not to over load any existing structural member. Waterproofing around the roof penetration is the responsibility of others. All work performed must be in accordance with accepted industry-wide methods and applicable safety standards. Vector Structural Engineering assumes no responsibility for improper installation of the solar panels.

Please note a representative of Vector Structural Engineering has not physically observed the roof framing. Our conclusions are based upon the assumption that all structural roof components and other supporting elements are in good condition, free of damage and deterioration, and are sized and spaced such that they can resist standard roof loads.

Very truly yours,
VECTOR STRUCTURAL ENGINEERING, LLC

Wells L. Holmes, P.E.
Project Engineer

NJ Certificate of Authorization: 24GA28120600

WLH/klr

11 NOV 2016

Label: Solar Panel Array Note: Calculations per ASCE 7-10

SITE-SPECIFIC WIND PARAMETERS:

Basic Wind Speed [mph]:	122	Notes:
Exposure Category:	C	
Risk Category:	II	

ADDITIONAL INPUT & CALCULATIONS:

Height of roof, h [ft]:	15	(Approximate)	
Comp/Cladding Location:	Gable/Hip Roofs: 7° < θ ≤ 27°		
Enclosure Classification:	Enclosed Buildings		
Zone 1 GC_p:	0.9	Figure 30.4-2B	(enter largest abs. value)
Zone 2 GC_p:	1.7		(enter largest abs. value)
Zone 3 GC_p:	2.6		(enter largest abs. value)
α:	9.5	Table 26.9-1	
z_g [ft]:	900	Table 26.9-1	
K_h:	0.849	Table 30.3-1	
K_{zt}:	1	Equation 26.8-1	
K_d:	0.85	Table 26.6-1	
Velocity Pressure, q_h [psf]:	27.5	Equation 30.3-1	
GC_{pi}:	0	Table 26.11-1	(largest abs. value)

OUTPUT:

$$p = q_h\left[(GC_p) - (GC_{pi})\right]$$

Zone 1 Pressure, p [psf]:	24.74	psf (1.0W, Interior Zones*)
Zone 2 Pressure, p [psf]:	46.74	psf (1.0W, End Zones*)
Zone 3 Pressure, p [psf]:	71.48	psf (1.0W, Corner Zones* within a)
		(*a=assumed=3')

Lag Screw Connection

Capacity:

Lag Screw Size:	5/16	
C_d:	1.6	
Embedment:	2.5	in
Grade:	SPF (G = 0.42)	
Capacity:	205	lbs/in. emb.
Number of Screws:	1	
Total Capacity:	820	lbs

Demand:

	Pressure (0.6 Wind) (psf)	Max Spacing (ft)	Max. Trib. Area (ft^2)	Max. Uplift Force (lbs)
Zone 1:	14.8	6	18	267
Zone 2:	28.0	6	18	505
Zone 3:	42.9	6	18	772

Demand< Capacity: **CONNECTION OKAY**

DEAD LOAD (D)			Increase due to pitch	Original loading	
Roof Pitch/12		2.6			
Composite/Asphalt Shingles		4.1	1.02	4.00	psf
1/2" Plywood		1.0	1.02	1.00	psf
Framing		3.0 psf			
Insulation		0.8 psf			
1/2" Gypsum Clg.		2.2 psf			
M, E & Misc		1.5 psf			
	DL	12.6 psf			
	PV Array DL	2.5 psf			

ROOF LIVE LOAD (Lr)

Existing Design Roof Live Load [psf]	20	ASCE 7-10, Table 4-1
Roof Live Load With PV Array [psf]	0	2015 IBC, Section 1607.12.5

SNOW LOAD (S):	Existing	With PV Array	
Roof Slope (:12):	2.6	2.6	
Roof Slope [°]:	12	12	
Snow Ground Load, p_g [psf]:	20	20	ASCE 7-10, Section 7.2
Terrain Category:	C	C	ASCE 7-10, Table 7-2
Exposure of Roof:	Fully Exposed	Fully Exposed	ASCE 7-10, Table 7-2
Exposure Factor, C_e:	0.9	0.9	ASCE 7-10, Table 7-2
Thermal Factor, C_t:	1.1	1.1	ASCE 7-10, Table 7-3
Risk Category:	II	II	ASCE 7-10, Table 1.5-1
Importance Factor, I_S:	1.0	1.0	ASCE 7-10, Table 1.5-2
Flat Roof Snow Load, p_f [psf]:	14	14	ASCE 7-10, Equation 7.3-1
Minimum Roof Snow Load, p_m [psf]:	20	20	ASCE 7-10, Section 7.3.4
Unobstructed Slippery Surface?	No	Yes	ASCE 7-10, Section 7.4
Slope Factor Figure:	Figure 7-2b	Figure 7-2b	ASCE 7-10, Section 7.4
Roof Slope Factor, C_s:	1.000	0.967	ASCE 7-10, Figure 7-2
Sloped Roof Snow Load, p_s [psf]:	14	13	ASCE 7-10, Equation 7.4-1
Design Snow Load, S [psf]:	20	20	

VECTOR ENGINEERS

JOB NO.: U1952-0014-161

PROJECT: DOPF RESIDENCE

SUBJECT: BEAMS

DESIGN LOADS:

Load Types:	Snow	Live	Dead
Roof	20	20	13
Solar			2.5

Add .2*S_{DS} to dead load? No 0 =.2*S_{DS}

CRITERIA (L/)

	D_{TL}	D_{LL}	D_{OL}
$A_{(BLANK)}$	120	180	
B	240	480	
C	800		800

Abbrev	GRADES			F_{bxx} (psi)	F_{vxx} (psi)	E_{xx} (psi)		g (lb/ft³)
DFL#1	DFL#1			1,000	180	1,700,000		32
DFL#2	DFL#2			900	180	1,600,000		32
DF1 (5X)	DFL#1 5X5 & LARGER			1,350	170	1,600,000		32
SPF#2	SPF#2			875	135	1,400,000		26.2
SP#2	SP#2			1,100	175	1,400,000		34.3
24F-V4	24F-V4			2,400	240	1,800,000		32
24F-V8	24F-V8			2,400	240	1,800,000		40
LVL (1.9)	LVL (1.9X106E)			2,600	285	1,900,000		40
LVL (2.0)	LVL (2.0X106E)			2,200	285	2,000,000		42
LSL	LSL (1.3X106E)			1,700	400	1,300,000		42
PSL	PSL (2.0X106E)			2,900	290	1,300,000		42

note: 'a' must be less than or equal to 'L/2'

Label	Length 'L' (ft)	Roof Trib (ft)	Floor Trib (ft)	Wall Trib (ft)	Add'l Live Load (plf)	Add'l Dead Load (plf)	Point Load From	React (A,B)	Dist 'a' (ft)	Point Live Load 'P_{LL}' (lb)	Point Dead Load 'P_{DL}' (lb)	# PLIES	Grade	Size	"BM/HDR"	D CRITERIA	C_r	C_D	$C_{F,V}$	R_a (lb)	R_b (lb)	M_{max} (ft-lb)	M_{allow} (ft-lb)	V_{max} (lb)	V_{allow} (lb)	D_{TL} (in)	$D_{TLallow}$ (in)	D_{LL} (in) (SEE COND 'C')	$D_{LLallow}$ (in) (SEE COND 'C')	1.5DL GLB Camb	Check
	10.75	1.33				3,933						(1)	SPF#2	2x6			1.15	1.15	1.30	252	252	676	948	230	854	0.463	1.075	0.275	0.717		0.71 M