

BLOCK 838 LOT 33 QUALIFICATION CODE \_\_\_\_\_ ADDRESS (SITE) 11675 Tilford Blvd. PERMIT NO. 16-1939



# CONSTRUCTION PERMIT APPLICATION

C-16-001688

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

## I. IDENTIFICATION

1. Proposed Work Site at: 11675 Tilford Blvd, Brick, NJ, 08724

2. Name of Owner in Fee: Jean Brantley

Tel. [REDACTED] e-mail [REDACTED]

Address Same as above

3. Ownership in Fee: Public ☐ Private ☒ municipality X street 732-503-9178 zip code (648) 221-2777

4. Principal Contractor: Vivint Solar Developer, LLC Tel. (648) 221-2777

Address 1501 Industrial Way, Suite B-687 Prospect St e-mail NJ40ateam@vivintsolar.com

Toms River, NJ 08755 Unit 480, Lakewood, NJ 08701

License No. OR, if new home, Builder Reg. No. 13VH06589300 Exp. Date 03-31-16

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

Federal Emp. ID No. 80-0756438 FAX: (856) 439-6810

5. Architect or Engineer Scott E. Wyssling P.E. Contact Scott Wyssling

Address 321 West Main Street, Boonton, N.J. 07005 e-mail swyssling@wysslingconsulting.com

Tel. (973) 335-3500 FAX: (973) 335-3535

6. Responsible Person in Charge once Work has Begun Jen Gmiskey

Tel. 732-503-9178 FAX: 732-597-7497

## V. FEE SUMMARY (for office use only)

|                                   |               | Update                              | Update |
|-----------------------------------|---------------|-------------------------------------|--------|
| 1. Building                       | \$ <u>150</u> | <input checked="" type="checkbox"/> |        |
| 2. Electrical                     | \$ <u>670</u> | <input checked="" type="checkbox"/> |        |
| 3. Plumbing                       |               |                                     |        |
| 4. Fire Protection                |               |                                     |        |
| 5. Elevator Devices               |               |                                     |        |
| 6. Subtotal                       |               |                                     |        |
| 7. Less 20% for State Plan Review | \$            |                                     |        |
| 8. Subtotal                       | \$            |                                     |        |
| 9. State Permit Surcharge Fee     | \$ <u>17</u>  |                                     |        |
| Subtotal                          | \$            |                                     |        |
| Cert. of Occupancy                | <u>7</u>      |                                     |        |
| 12. Other                         |               |                                     |        |
| 13. TOTAL                         | \$            |                                     |        |

## 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 <input type="checkbox"/> no <input type="checkbox"/> |

## IIa. PROPOSED WORK

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

## IIb. SUBCODES

(Check all that apply)

☒ Building

☒ Electrical

☐ Plumbing

☐ Fire Protection

☐ Elevator

## FOR OFFICE USE ONLY (Optional)

| Est. Cost    | Plans Rec'd by | Date Rec'd | Rejection Date | Approval Date  | Re-viewer  | Resubmission Dates | Re-viewer |
|--------------|----------------|------------|----------------|----------------|------------|--------------------|-----------|
| <u>1,830</u> | <u>HP</u>      |            | <u>4/24/16</u> | <u>4/19/16</u> | <u>DM</u>  |                    |           |
| <u>1,321</u> |                |            |                | <u>4/19/16</u> | <u>AJC</u> |                    |           |
|              |                |            |                |                |            |                    |           |
|              |                |            |                |                |            |                    |           |
|              |                |            |                |                |            |                    |           |
|              |                |            |                |                |            |                    |           |
|              |                |            |                |                |            |                    |           |

TOTAL COST 9,152

## VII. DESCRIPTION OF BUILDING USE

### A. RESIDENTIAL (primary use)

1. State Specific Use: Single Family Home

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 \_\_\_\_\_

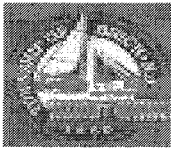
## III. PLAN REVIEW (optional)

### 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 10/24/2016  
Control Number C-16-001688  
Permit Number 16-1939  
Permit Issue Date 6/13/2016  
Certificate Number 16-1939

## Certificate

Construction Code Division  
(Certificate of Approval)

### Identification

Work Site Location: 1675 TILFORD BLVD Brick Township, NJ Block: 838 Lot: 33 Qual: \_\_\_\_\_  
Owner in Fee: BRANTLEY, ROBERT J & JOAN T  
Owner Address: 1675 TILFORD BLVD. BRICK NJ 08724  
Telephone: [REDACTED]  
Contractor VIVINT SOLAR DEVELOPER, LLC  
Address 687 PROSPECT ST UNIT 480 LAKEWOOD NJ 08701  
Telephone: (848) 221-2777 Fax: (732) 597-7497  
License Number or Builders Registration Number: 34EI01108500 Federal Emp. Number: 800756438  
34EB01809700  
13VH06589300

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 4.16 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:**

*Daniel Newman Jr*

Construction Official

Fee: \$0.00

Check Number: \_\_\_\_\_

Collected By: \_\_\_\_\_

## 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.

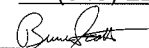
I understand that if any of the above statements are willfully false, I am subject to punishment.

(X) Check if contractor.

Agent Name Vivint Solar

Address 1501 Industrial Way, Suite B  
Toms River, NJ 08755

Telephone (848) 221-2777

Signature 

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



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

4/28/16  
Emailed  
Senn

## Subcode Official Review

Date: Tuesday, April 26, 2016

To: BRANTLEY, ROBERT J & JOAN T  
1675 TILFORD BLVD.  
BRICK, NJ 08724

RE: Building Subcode  
Block: 838 Lot: 33 Qual:  
1675 TILFORD BLVD  
Permit Number: Control Number: C-16-001688  
Last Submit Date: Tuesday, April 26, 2016

Dear BRANTLEY, ROBERT J & JOAN T,

Your request is hereby denied based upon the following infractions.

Letter states in jacket 2x6 rafters 16 inch on center spanning 14.22 with 1 ft overhang total 15.22 ft.  
Drawing shows total 15ft 10 inches total minus 1ft overhang = 14ft 10 inches span chart maximum is 14ft 4inches.

Sincerely,

Peter McNamara, ~~Subcode~~ Official

CC:

RESUBMIT MFF  
SUBCODES B  
DATES 6/7/16



ELECTRICAL SUBCODE  
TECHNICAL SECTION



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

Block 838 Lot 33 Qualification Code 101314

Work Site Location 1675 Ford Blvd

Owner Brock, Nancy

Tel. [REDACTED] mail [REDACTED]

Address [REDACTED] street [REDACTED] municipality [REDACTED]

Contractor: Vivint Solar Developer LLC Tel. (848) 221-2777 zip code [REDACTED]

Address 1501 Industrial Way N e-mail NJ40ATeam@vivintsolar.com

Toms River, NJ 08755

Contractor License No. 34EB01108500 Exp. Date 3-31-18

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

Federal Emp. ID No. 80-0756438 FAX: (732) 279-6193

B. ELECTRICAL CHARACTERISTICS

Use Group Present Proposed [REDACTED]

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

Building Occupied as Single Family Utility Co. JCP&L

Est. Cost of Elec. Work \$ 1,321

JOB SUMMARY (Office Use Only)

PLAN REVIEW

☐ No Plans Required

☐ Partial - Underslab Utilities Approved

Date: [REDACTED] Approved by: [REDACTED]

☒ Electric Plans Approved

Date: 4/11/18 Approved by: PSC

Joint Plan Review Required:

☐ Bidg. ☐ Plumb. ☐ Fire. ☐ Elev.

SUBCODE APPROVAL FOR PERMIT

Date: 4/11/18

Approved by: [REDACTED]

SUBCODE APPROVAL FOR CERTIFICATE

☐ CO ☐ CCO

Date: 4/11/18

Approved by: [REDACTED]

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 in this application.

Applicant sign/Contractor

sign and seal here:

Print name here: Bruce Scott

☐ Licensed Elec. Contractor ☐ Certified Landscape Irrigation Contr. ☐ Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK: Installation of a 4.14 KW PV System (per CAD drawing)

QTY. SIZE

ITEMS

1

Lighting Fixtures

1

Receptacles

1

Switches

1

Detectors

1

Light Poles

1

Motors—Fract. HP

1

Emergency & Exit Lights

1

Communications Points

1

Alarm Devices/F.A.C. Panel

1

Optimizers

1

TOTAL NUMBERS

1

Pool Permit/with UV Lights

1

Storable Pool/Spa/Hot Tub

1

KW Elec. Range/Receptacle

1

KW Oven/Surface Unit

1

KW Elec. Water Heater

1

KW Dishwasher

1

HP Garbage Disposal

1

KW Central A/C Unit

1

HP/KW Space Heater/Air Handler

1

KW Baseboard Heat

1

~~Inverter~~ micr inverter

1

A/C Disconnect

1

AMP Service

1

AMP Subpanels

1

AMP Motor Control Center

1

KW Elec. Sign/Outline Light

KV Array

Administrative Surcharge \$

Minimum Fee \$

State Permit Surcharge Fee \$

TOTAL FEE \$



# CONSTRUCTION PERMIT

Date Issued 6/13/16  
Control # C-16-001688  
Permit # 16-1939

IDENTIFICATION Block: 838 Lot: 33 Qualifier \_\_\_\_\_  
Work Site Location: 1675 TILFORD BLVD Brick Township, NJ Contractor VIVINT SOLAR DEVELOPER, LLC  
Address 687 PROSPECT ST UNIT 480 LAKEWOOD NJ 08701  
Owner in Fee BRANTLEY, ROBERT J & JOAN T  
1675 TILFORD BLVD. BRICK NJ 08724 Telephone: (848) 221-2777  
Lic. No. or Bldrs. Reg. No. 34EI01108500 13VH06589300  
Federal Employee. No. 805756438

Is hereby granted permission to perform the following work:

- ☒ BUILDING ☐ PLUMBING ☐ LEAD HAZARD ABATEMENT  
☒ ELECTRICAL ☐ FIRE PROTECTION ☐ DEMOLITION  
☐ ELEVATOR DEVICES ☐ ASBESTOS ABATEMENT (Subchapter 8 only) ☐ OTHER

## DESCRIPTION OF WORK:

SOLAR PANELS ...INSTALL 4.16 kw ROOF MOUNT PHOTOVOLTAIC SOLAR SYSTEM

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 \$9,151

D. Newman  
Construction Official

6/10/16  
Date

U.C.C. F170  
equiv (rev 1/04)

1 WHITE - INSPECTOR

2 CANARY - OFFICE

3 PINK - TAX ASSESSOR

4 GOLD - APPLICANT

## PAYMENTS (Office Use Only)

|                        |        |
|------------------------|--------|
| Building               | \$150  |
| Electrical             | \$670  |
| Plumbing               | \$0    |
| Fire Protection        | \$0    |
| Elevator Devices       | \$0    |
| Other                  | \$0.00 |
| DCA Training Fee       | \$17   |
| CO Fee                 |        |
| Other                  | \$0    |
| Total                  | \$837  |
| Check No. <u>3603</u>  |        |
| Cash                   | \$0    |
| Credit                 | \$0    |
| Collected By <u>LH</u> |        |

## 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.

☒ Required inspections for all subcodes for one- and two-family dwellings are as follows:

- 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.
- Foundations and all walls up to grade level prior to back filling.
- 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.
- Installation of all finished materials, sealings of exterior joints, plumbing piping, trim and fixtures; electrical wiring, devices and fixtures; mechanical systems equipment.

06/13/16 12:30PM 0015581162

|            |          |
|------------|----------|
| BUILDING   | \$150.00 |
| ELECTRICAL | \$670.00 |
| DCA        | \$17.00  |
| CO         | \$0.00   |
| CHECK      | \$887.00 |

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:

☒ 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".

☐ 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



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

Block 838 Lot 33 Qualification Code \_\_\_\_\_  
Work Site Location 1675 Telford Blvd  
Princeton, NJ 08784  
Owner in Fee: Joan Brantley

Tel. \_\_\_\_\_ e-mail \_\_\_\_\_

Address Same as above street \_\_\_\_\_ municipality \_\_\_\_\_ zip code \_\_\_\_\_

Contractor: Vivint Solar Developer, LLC Tel: 848-221-2777 e-mail NJ40atteam@vivintsolar.com

Address 1501 Industrial Way, Suite B e-mail \_\_\_\_\_

Toms River, NJ 08755

Contractor License No. or Builder Registration No. 13VH06589300 Exp. Date 03-31-16

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

Federal Emp. ID No. 80-0756438 FAX: \_\_\_\_\_

## JOB SUMMARY (Office Use Only)

| PLAN REVIEW                                                                                                                    | Date | Initial | INSPECTIONS                                    | Type | Failure | Dates (Month/Day) | Approval | Initial |
|--------------------------------------------------------------------------------------------------------------------------------|------|---------|------------------------------------------------|------|---------|-------------------|----------|---------|
| <input type="checkbox"/> No Plans Required                                                                                     |      |         | <input type="checkbox"/> Footing               |      |         |                   |          |         |
| <input type="checkbox"/> All <u>Other</u>                                                                                      |      |         | <input type="checkbox"/> Footings/Foundations  |      |         |                   |          |         |
| <input type="checkbox"/> Structural/Framework                                                                                  |      |         | <input type="checkbox"/> Foundation            |      |         |                   |          |         |
| <input type="checkbox"/> Exterior                                                                                              |      |         | <input type="checkbox"/> Slab                  |      |         |                   |          |         |
| <input type="checkbox"/> Interior                                                                                              |      |         | <input type="checkbox"/> Frame                 |      |         |                   |          |         |
| <input type="checkbox"/> Joint Plan Review Required:                                                                           |      |         | <input type="checkbox"/> Truss Sys./Bracing    |      |         |                   |          |         |
| <input type="checkbox"/> Elec. <input type="checkbox"/> Plumb. <input type="checkbox"/> Fire <input type="checkbox"/> Elevator |      |         | <input type="checkbox"/> Barrier-Free          |      |         |                   |          |         |
| <input type="checkbox"/> Insulation                                                                                            |      |         | <input type="checkbox"/> Finishes - Base Layer |      |         |                   |          |         |
| <input type="checkbox"/> Finishes - Final                                                                                      |      |         | <input type="checkbox"/> Energy                |      |         |                   |          |         |
| <input type="checkbox"/> Mechanical                                                                                            |      |         | <input type="checkbox"/> TCO                   |      |         |                   |          |         |
| <input type="checkbox"/> Other                                                                                                 |      |         | <input type="checkbox"/> Final                 |      |         |                   |          |         |
| <input type="checkbox"/> Barrier-Free                                                                                          |      |         |                                                |      |         |                   |          |         |

Approved by: WCA Date: 06/09/16

SUBCODE APPROVAL for PERMIT 10/15/16

Approved by: WCA Date: 10/15/16

## 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 \_\_\_\_\_

Const. Class Present \_\_\_\_\_ Proposed \_\_\_\_\_

If Industrialized Building: State Approved \_\_\_\_\_ HUD \_\_\_\_\_

Est. Cost of Bldg. Work:

- New Bldg. \$ \_\_\_\_\_
- Rehabilitation \$ \_\_\_\_\_
- Total (1+2) \$ 14830

## 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: Bruce Scott

Print name here: Bruce Scott

## D. TECHNICAL SITE DATA

### DESCRIPTION OF WORK

-Support for a photovoltaic (PV) system (solar system)

### TYPE OF WORK:

- ☐ New Building
- ☐ Addition
- ☐ Rehabilitation
- ☐ Roofing
- ☐ Siding
- ☐ Fence \_\_\_\_\_ Height (exceeds 6') \_\_\_\_\_ Sq. Ft.
- ☐ Sign \_\_\_\_\_ Sq. Ft.
- ☐ Pool
- ☐ Retaining Wall \_\_\_\_\_ Sq. Ft.
- ☐ Asbestos Abatement Subchapter 8
- ☐ Lead Haz. Abatement NJAC 5:17
- ☐ Radon Remediation
- ☒ Other PV Support
- ☐ Demolition

### FEE (Office Use Only)

|                               |  |
|-------------------------------|--|
| Administrative Surcharge \$   |  |
| Minimum Fee \$                |  |
| State Permit Surcharge Fee \$ |  |
| TOTAL FEE \$                  |  |

RECEIVING CLERK  
DATE REC'D: 4/11/16

# ZONING PERMIT APPLICATION

PERMIT # 20-16-00887  
DATE ISSUED: 6/13/16

BLOCK: 838 LOT: 33 QUALIFIER: \_\_\_\_\_ SITE ADDRESS: 1675 Tiltford Blvd

## IDENTIFICATION:

1. NAME OF OWNER IN FEE: Joan Brantley  
COMPLETE ADDRESS: 1675 Tiltford Blvd

PHONE # [REDACTED] Briek, NJ, 08724  
EMAIL: jbrantley1675@gmail.com

2. NAME OF APPLICANT: Vivint Solar Developer, LLC  
APPLICANT ADDRESS: 687 Prospect St. Unit 480  
Lakewood, NJ 08701

PHONE # 732-503-9178 EMAIL: jennifer.comiskey@vivintsolar.com  
3. RESPONSIBLE PERSON FOR WORK: Jennifer Comiskey  
PHONE # \_\_\_\_\_ FAX # 732-279-6193

4. SIGNATURE OF APPLICANT: [Signature]

## FEE SUMMARY:

FOR OFFICE USE ONLY

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

## REQUIRED BY APPLICANT

RESIDENTIAL: YES  
COMMERCIAL: N/A  
EXISTING USE: SFD  
PROPOSED USE: SFD

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 \_\_\_\_\_

DESCRIPTION: Installation of rooftop solar PV system

ZONING REVIEW: 4-15-16 DATE REVIEWED: 4-15-16 DATE DENIED: \_\_\_\_\_ DATE APPROVED: 4-15-16 INTLS: 2 (SEE BACK PAGE)



RECEIVED  
APR 15 2016  
JGZ

10

DATE REVIEWED: 4/15/16 DATE DENIED:        DATE APPROVED: 4/10/16 INTLS: NEZ

[illegible][illegible]



Brick Township  
401 Chambers Bridge Rd.

Brick, NJ 08723  
(732) 262-1336

Date Issued: \_\_\_\_\_  
Application Number: ZA-16-00592  
Application Date: 04/15/2016  
Project Number: \_\_\_\_\_  
Permit Number: \_\_\_\_\_  
Fee: \$50

## Zoning Permit

Worksite **1675 TILFORD BLVD**  
Location: **Brick Township, NJ 08724**

Block: 838  
Lot: 33  
Qualifier: \_\_\_\_\_  
Zone: R-7.5

Owner: **BRANTLEY, ROBERT J & JOAN T**  
Address: **1675 TILFORD BLVD.**  
**BRICK, NJ 08724**

Applicant: **VIVINT SOLAR DEVELOPER, LLC**  
Address: **687 Prospect St.**  
**UNIT 480**  
**LAKEWOOD, NJ 08701**

Application Approved Date: 04/15/2016

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 - 16- 260W Trina Solar, 4.160kW ENPHASE micro-inverters, mounted on the roof of the house.**

**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. Romo, Assistant Zoning Officer

04/15/2016

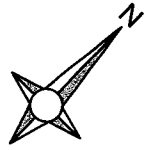
Date

Sean Kinnevy, Zoning Officer

4/15/16

Date

PV SYSTEM SIZE:  
4.160 kW DC



1675 Tilford Blvd, Brick NJ 08724

Zoning Review

APPROVED

4-13-16

JUNCTION BOX ATTACHED TO  
ARRAY USING ECO HARDWARE TO  
KEEP JUNCTION BOX OFF ROOF

40' OF 1" PVC CONDUIT  
FROM JUNCTION BOX  
TO ELECTRICAL PANEL

(16) Trina Solar TSM-260 PD05 08 MODULES WITH AN  
Emphase M215-60-21L-S22-IG MICRO-INVERTER  
MOUNTED ON THE BACK OF EACH MODULE

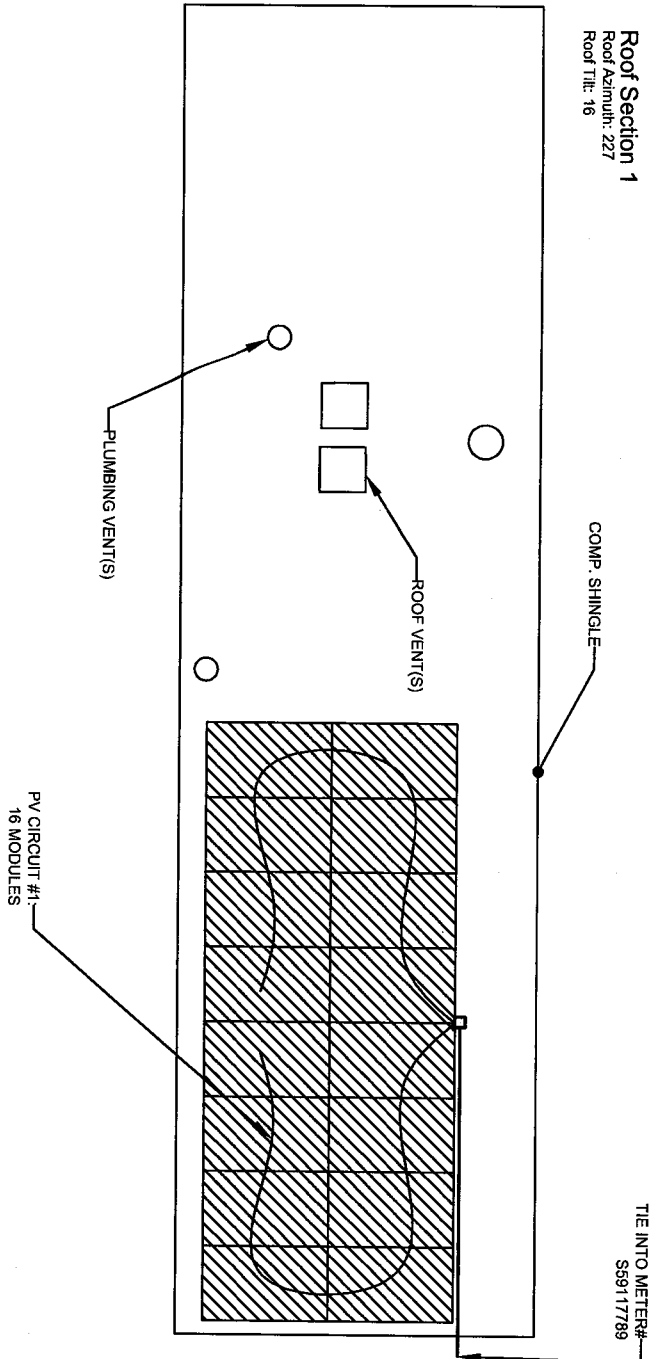
PV INTERCONNECTION POINT -  
LOOKABLE DISCONNECT SWITCH,  
ANSI METER LOCATION,  
& UTILITY METER LOCATION

PV SYSTEM SITE PLAN

SCALE: 1/8" = 1'-0"

|        |                  |               |                |                                  |  |                         |                                                                                                       |
|--------|------------------|---------------|----------------|----------------------------------|--|-------------------------|-------------------------------------------------------------------------------------------------------|
| PV 1.0 | SHEET<br>NUMBER: | SITE<br>PLAN  | SHEET<br>NAME: | INSTALLER: VIVINT SOLAR          |  | <b>vivint.solar</b>     | Brantley Residence<br>1675 Tilford Blvd<br>Brick, NJ 08724<br>UTILITY ACCOUNT NUMBER: 100 017 405 901 |
|        |                  |               |                | INSTALLER NUMBER: 1.877.404.4129 |  |                         |                                                                                                       |
|        |                  |               |                | NJ LICENSE: 13VH06589300         |  | Last Modified: 3/1/2016 |                                                                                                       |
|        |                  | DRAWN BY: EKB |                | S- 4835519                       |  |                         |                                                                                                       |

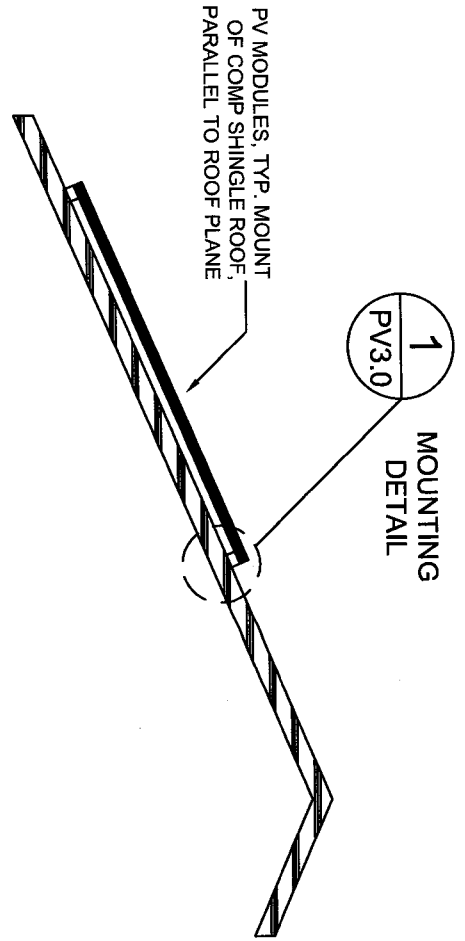
**Roof Section 1**  
 Roof Azimuth: 227  
 Roof Pitch: 16



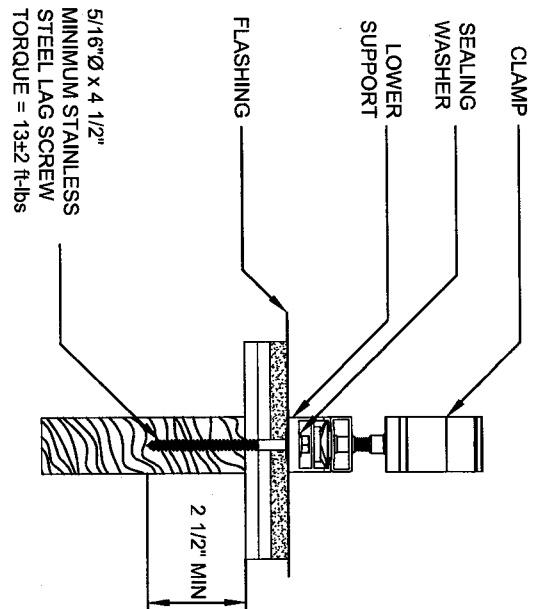
**PV SYSTEM ROOF PLAN**

SCALE: 1/8" = 1'-0"

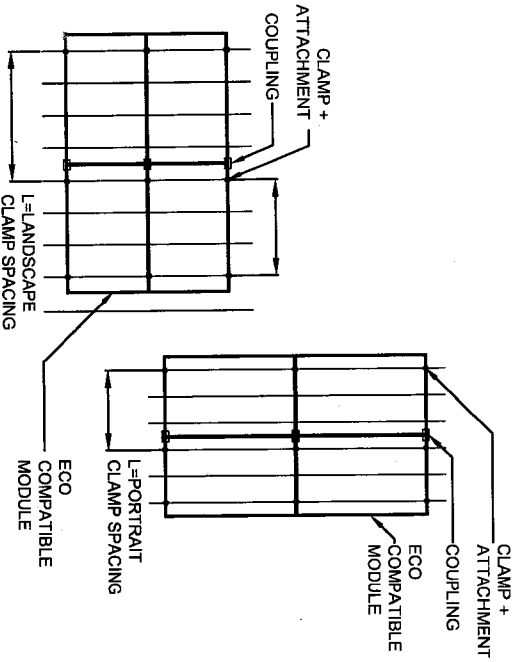
|        |                  |              |                                  |                         |                     |                                                                                                       |
|--------|------------------|--------------|----------------------------------|-------------------------|---------------------|-------------------------------------------------------------------------------------------------------|
| PV 2.0 | SHEET<br>NUMBER: | ROOF<br>PLAN | SHEET<br>NAME:                   | INSTALLER: VIVINT SOLAR | <b>vivint.solar</b> | Brantley Residence<br>1575 Tilford Blvd<br>Brick, NJ 08724<br>UTILITY ACCOUNT NUMBER: 100 017 405 901 |
|        |                  |              | INSTALLER NUMBER: 1.877.404.4129 |                         |                     |                                                                                                       |
|        |                  |              | NJ LICENSE: 13VH06589300         |                         |                     |                                                                                                       |
|        |                  |              | DRAWN BY: EKB                    | S- 4835519              |                     |                                                                                                       |



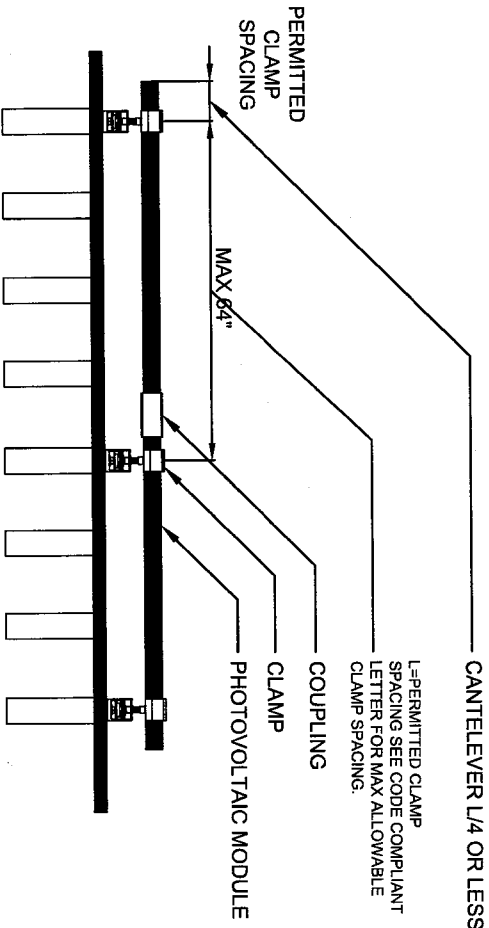
PV ARRAY TYP. ELEVATION  
NOT TO SCALE



CLAMP ATTACHMENT  
NOT TO SCALE

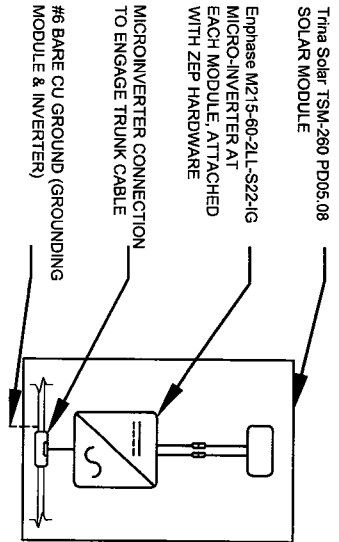


MODULES IN PORTRAIT/LANDSCAPE  
NOT TO SCALE



PV SYSTEM MOUNTING DETAIL  
NOT TO SCALE  
1

# MODULE DETAIL



Enphase M215-60-21L-S22-IG  
Solar Solar TSM-280 PD05.08  
MICRO-INVERTER AT EACH MODULE, ATTACHED WITH ZEP HARDWARE

MICROINVERTER CONNECTION TO ENGAGE TRUNK CABLE

#6 BARE CU GROUND (GROUNDING MODULE & INVERTER)

| Inverter Ratings (Guide Section 4) |                            |
|------------------------------------|----------------------------|
| Inverter Model/Model               | Enphase M215-60-21L-S22-IG |
| Max DC Volt Rating                 | 48 Volts                   |
| Max Power @ 40°C                   | 215 Watts                  |
| Max AC Current                     | 240 Amps                   |
| Max AC Voltage                     | 0.9000 Volts               |
| Max OCPD Rating                    | 12 Amps                    |
| Max Number of Panels/Circuit       | 12                         |

| Conduit and Conductor Schedule |                               |            |                   |                |
|--------------------------------|-------------------------------|------------|-------------------|----------------|
| Tag                            | Description                   | Wire Gauge | # of Conductors   | Conduit Type   |
| 1                              | Enphase engage cable - THWN-2 | 12 AWG     | 4 (1, 1, 2, N, G) | N/A - Free Air |
| 2                              | Bare Copper Ground (EGC/GEC)  | 6 AWG      | 1                 | N/A - Free Air |
| 3                              | THWN-2                        | 10 AWG     | 3 (1, 1, 2, N)    | PVC            |
| 4                              | THWN-2                        | 8 AWG      | 1                 | PVC            |
| 5                              | THWN-2                        | 6 AWG      | 3 (1, 1, 2, N)    | PVC            |
| 6                              | THWN-2                        | 8 AWG      | 1                 | PVC            |

1) IF UTILITY REQUIRES A VISIBLE BREAK SWITCH, DOES THIS SWITCH MEET THE REQUIREMENTS?  
YES NO X N/A

2) IF GENERATION METER REQUIRED, DOES THIS METER SOCKET MEET THE REQUIREMENTS?  
YES NO X N/A

3) SIZE PHOTOVOLTAIC POWER SOURCE (DC) CONDUCTORS BASED ON MAX CURRENT ON NEC 690.53 SIGN OR OCPD RATING AT DISCONNECT.

4) SIZE INVERTER OUTPUT (AC) CONDUCTORS ACCORDING TO INVERTER OCPD AMPERE RATING (See Guide Section 8).

5) TOTAL OF 1 INVERTER OCPD(s), ONE FOR EACH PV CIRCUIT. DOES TOTAL SUPPLY BREAKERS COMPLY WITH 120% BUSBAR EXCEPTION IN NEC 800.64(B)(2)(a)? X YES NO

## Signs (See Guide Section 7)

Sign for Inverter OCPD and AC Disconnect.

| Solar PV System AC Point of Connection                 |                |
|--------------------------------------------------------|----------------|
| AC Output Current                                      | 18.000000 Amps |
| Nominal AC Voltage                                     | 240 Volts      |
| THIS PANEL FED BY MULTIPLE SOURCES (UTILITY AND SOLAR) |                |

| PV Module Ratings @ STC (Guide Section 5) |                             |
|-------------------------------------------|-----------------------------|
| Model Name/Model                          | Trina Solar TSM-280 PD05.08 |
| Max Power Point Current (Imp)             | 8.500 Amps                  |
| Max Power Point Voltage (Vmp)             | 30.6 Volts                  |
| Open-Circuit Voltage (Voc)                | 38.2 Volts                  |
| Short-Circuit Current (Isc)               | 9.1 Amps                    |
| Max Series Fuse (OCOPD)                   | 15 Amps                     |
| Nominal Maximum Power at STC (Pmax)       | 260 Watts                   |
| Maximum System Voltage                    | 1000(IEC)/600(UL)           |
| Voc Temperature Coefficient               | -0.32 %/°C                  |

1) Lowest expected ambient temperature based on ASHRAE minimum mean extreme dry bulb temperature for ASHRAE location most similar to installation location: -24°C

2) Highest continuous ambient temperature based on ASHRAE highest month 2% dry bulb temperature for ASHRAE location most similar to installation location: 33°C

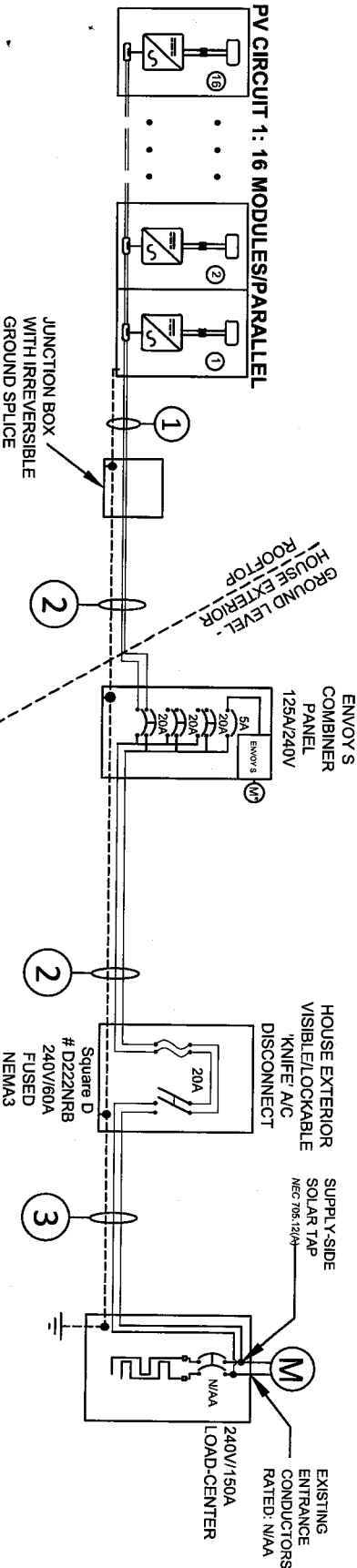
3) 2005 ASHRAE Fundamentals 2% design temperatures do not exceed 47°C in the United States. For less than 9 current-carrying conductors in roof-mounted sunlit conduit at least 0.5' above roof and using the outdoor design temperature of 47°C or less (all of United States).

a) 12 AWG, 90°C conductors are generally acceptable for modules with Isc of 7.68 Amps or less when protected by a 12-Amp or smaller fuse.

b) 10 AWG, 90°C conductors are generally acceptable for modules with Isc of 9.6 Amps or less when protected by a 15-Amp or smaller fuse.

NOTE: NEUTRAL CONDUCTOR(S) OMITTED FOR CLARITY  
ALL INVERTER OUTPUT CIRCUITS WILL HAVE A NEUTRAL CONDUCTOR

## POINT OF DELIVERY AND INTERCONNECTION



PV CIRCUIT 1: 16 MODULES/PARALLEL

JUNCTION BOX WITH IRREVERSIBLE GROUND SPLICE

ENVY'S COMBINER PANEL 125A/240V

HOUSE EXTERIOR VISIBLE LOCKABLE KNIFE/AC DISCONNECT

SUPPLY-SIDE SOLAR TAP NEC 705.12(A)

EXISTING ENTRANCE CONDUCTORS RATED: N/A

240V/150A LOAD-CENTER

INSTALLER: VIVINT SOLAR  
INSTALLER NUMBER: 1.877.404.4129  
NJ LICENSE: 13VH06589300  
DRAWN BY: EKB S: 4835519

**vivint.**

Last Modified: 3/1/2016

**Brantley Residence**

1675 Tilford Blvd  
Brick, NJ 08724  
UTILITY ACCOUNT NUMBER: 100 017 405 901

1-LINE DIAGRAM

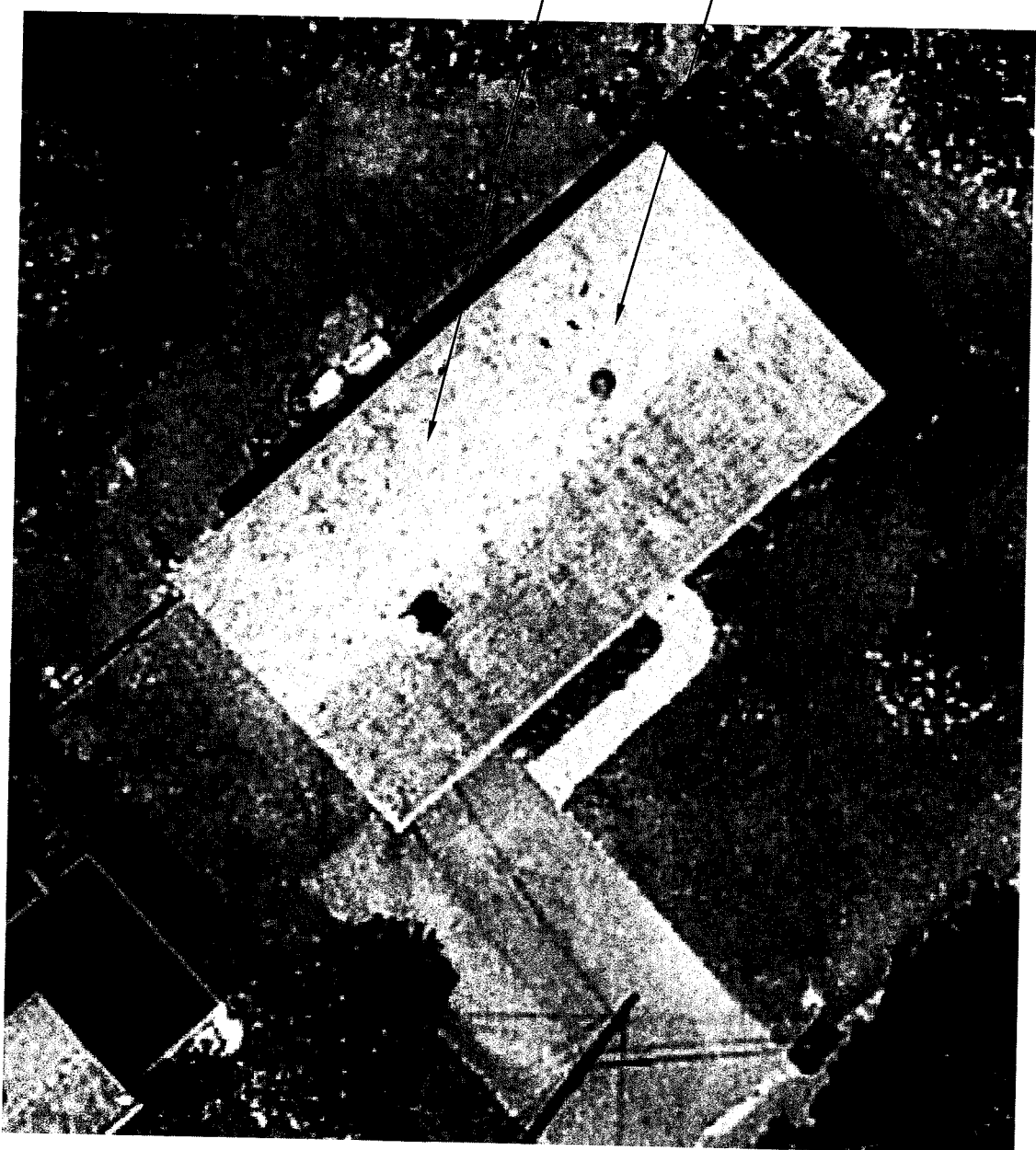
SHEET NUMBER:

2014 NEC COMPLIANT

E 1.0

ALL OTHER ROOF  
SECTIONS WERE  
NOT SURVEYED

16 MODULES  
AT 1013 SUNHOURS  
COMP. SHINGLE



USAGE CONSTRAINT

ESTIMATED UTILITY OFFSET: 96.9%

|        |                  |                 |                                  |            |                         |                     |                                                                                                        |
|--------|------------------|-----------------|----------------------------------|------------|-------------------------|---------------------|--------------------------------------------------------------------------------------------------------|
| PV 5.0 | SHEET<br>NUMBER: | DESIGN<br>LOGIC | SHEET NAME:                      |            | INSTALLER: VIVINT SOLAR | <b>vivint.solar</b> | Brantley Residence<br>1675 Tiltford Blvd<br>Brick, NJ 08724<br>UTILITY ACCOUNT NUMBER: 100 017 405 901 |
|        |                  |                 | INSTALLER NUMBER: 1.877.404.4129 |            |                         |                     |                                                                                                        |
|        |                  |                 | NJ LICENSE: 13VH06589300         |            |                         |                     |                                                                                                        |
|        |                  |                 | DRAWN BY: EKB                    | S- 4835519 | Last Modified: 3/1/2016 |                     |                                                                                                        |

# ENGINEERING PERMIT APPLICATION

BLOCK: 838

LOT: 33

ADDRESS: 1675 Tiford Blvd

RECEIVING CLERK: \_\_\_\_\_  
PERMIT #: \_\_\_\_\_

## IDENTIFICATION:

1. WORK SITE ADDRESS: 1675 Tiford Blvd

2. NAME OF OWNER IN FEE: Joan Brantley

ADDRESS: 1675 Tiford Blvd

PHONE #: [REDACTED]

Brick, NJ, 08724

FAX #: ( )

3. PRINCIPAL CONTRACTOR: Vivint Solar Developer, LLC

ADDRESS: 687 Prospect St, Unit 480

PHONE #: ( )

Lakewood, NJ, 08701

FAX #: ( )

4. ARCHITECT OR ENGINEER: Scott E. Wyssling P.E.

ADDRESS: 321 W Main St Boonton, NJ PHONE: # ( )

5. RESPONSIBLE PERSON FOR WORK: Jennifer Comiskey

ADDRESS: 687 Prospect St, Unit 480, Lakewood, NJ, 08701

PHONE #: (733) 503-9178

FAX #: (733) 597-7497

E-MAIL: \_\_\_\_\_

PROJECT DESCRIPTION: ☐ GRADING/CLEARING ☐ ROAD OPENING

☐ SOIL REMOVAL/FILL ☐ RETAINING WALL

☐ POOL

☐ BULKHEAD/DOCK ☐ DWELLING

☐ TREE REMOVAL

☒ OTHER Installation of rooftop solar PV system

LENGTH: \_\_\_\_\_

WIDTH: \_\_\_\_\_

HEIGHT: \_\_\_\_\_

ENGINEERING REVIEW: \_\_\_\_\_

DATE RECEIVED: \_\_\_\_\_

DATE REJECTED: \_\_\_\_\_

DATE APPROVED: \_\_\_\_\_

INITIALS: \_\_\_\_\_

## 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: \_\_\_\_\_



**TOWNSHIP OF BRICK**  
OCEAN COUNTY, NEW JERSEY  
401 CHAMBERS BRIDGE ROAD, BRICK, N.J. 08723

John G. Ducey, Mayor

**Township Council:**

Paul Mummolo - President  
Heather deJong - Vice President  
Jim Fozman  
Susan Lydecker  
Bob Moore  
Marianna Pontoriero  
Andrea Zapcic



Division of Engineering

Elissa C. Commins, PE, PP, CME, CPWM, CFM  
Township Engineer & Floodplain Manager  
[Ecommins@twp.brick.nj.us](mailto:Ecommins@twp.brick.nj.us)

732-262-1040  
Fax: 732-262-2941  
[www.twp.brick.nj.us](http://www.twp.brick.nj.us)

Date: 4/8/16

**ENGINEERING  
PLOT PLAN EXEMPT FORM  
(ONLY IF NOT IN A FLOOD ZONE)**

Block: 838 Lot: 33

Property Address: 1675 Tilford Blvd

I, Jennifer Comiskey of Vivint Solar  
(name) (address)

request to be exempt from the plot plan requirement for an addition, fence, shed, deck, pool, retaining wall, etc. as outlined in the Township Code, Chapter 245, Section 245-29.

  
Applicant's Signature

The following shall be submitted with this request:

1. Submit surveys locating existing dwelling and proposed addition. Dimensions of the addition should be included.
2. Proof that the property is not located in a Flood Hazard Area.

Note: Prior to approval a site inspection by the Engineering Department will be performed to verify that the proposed addition will not create a drainage problem.

**FOR OFFICE USE ONLY**

Approved on: \_\_\_\_\_ Signed: \_\_\_\_\_

Rejected on: \_\_\_\_\_ Signed: \_\_\_\_\_

Comments:



April 07, 2016  
Revised May 17, 2016

FILE COPY

Mr. Dan Rock, Project Manager  
Vivint Solar  
3301 North Thanksgiving Way, Suite 500  
Lehi, UT 84043

Re: Structural Engineering Services  
Brantley Residence  
1675 Tilford Blvd, Brick, NJ  
S-4835519  
4.16 kW

Dear Mr. Rock:

Pursuant to your request, we have reviewed the following information regarding solar panel installation on the roof of the above referenced home:

1. Site Visit/Verification Form prepared by a Vivint Solar representative identifying specific site information including size and spacing of members for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information was prepared by the Design Group and will be utilized for approval and construction of the proposed system.
3. Photovoltaic Rooftop Solar System Permit Submittal identifying design parameters for the solar system.
4. Photographs of the interior and exterior of the roof system identifying existing structural members and their conditions.

Based on the above information we have evaluated the structural capacity of the existing roof system to support the additional loads imposed by the solar panels and have the following comments related to our review and evaluation:

**Description of Residence:**

The existing residence is typical wood framing construction with the roof system consisting of the following:

- Roof Section 1: Roof section is composed of 2x6 dimensional lumber at 16" on center with 1x8 collar ties every 48". The attic space is unfinished and photos indicate that there was free access to visually inspect the size and condition of the roof members. The interior horizontal length of the rafter used for design verification is 14.22' with an additional 1' eave.

Our evaluation is based on detailed structural calculations specific to this residence prepared by this office. Our calculations are based on ASCE 7-10/NDS code requirements and the specific wood properties of the structural members for this roof system, (see enclosed calculations). Span tables were not utilized in our determination as they are conservative, general, and not job specific.

All wood material utilized for the roof system is assumed to be Hem-Fir #2 or better with standard construction components. The existing roofing material consists of composite shingle.

**Stability Evaluation:**

**A. Wind Uplift Loading**

1. Calculations for uplift are based on ASCE/SEI 7-10 Minimum Design Loads for Buildings and other Structures, a wind speed of 110 mph based on Exposure Category B and 16 degree roof slopes on the dwelling areas. Roof snow load is 30 PSF for Exposure B, Zone 1 per (ASCE/SEI 7-10).

2. Total area subject to wind uplift is calculated for the Interior, Edge and Corner Zones of the dwelling.

#### **B. Loading Criteria**

10 PSF = Dead Load (roofing/framing)

30 PSF = Roof Snow Load

3 PSF = Dead Load (solar panels/mounting hardware)

Total Dead Load = 13 PSF

The above values are within acceptable limits of recognized industry standards for similar structures. Analysis performed on the existing roof structure utilizing the above loading criteria indicates that the existing members will support the additional panel loading without damage, if installed correctly.

#### **C. Roof Structure Capacity**

1. The photographs provided of the attic space and roof rafters show that the framing is in good condition with no visible signs of damage caused by prior overstressing.

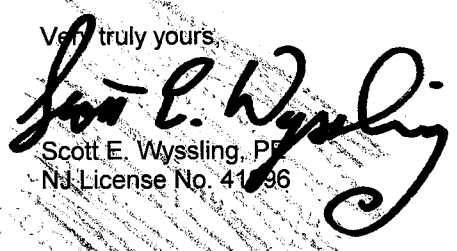
#### **D. Solar Panel Anchorage**

1. The solar panels shall be mounted in accordance with the most recent "Ecolibrium Solar Installation Manual", which can be found on the Ecolibrium Solar website (ecolibriumsolar.com). If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. The solar panels are 1 1/2" thick and mounted 4 1/2" off the roof for a total height off the existing roof of 6". At no time will the panels be mounted higher than 6" above the existing plane of the roof.
3. Maximum allowable pullout per lag screw is 235 lbs/inch of penetration as identified in the Nation Design Specifications (NDS) of timber construction specifications for Hem-Fir (North Lumber) assumed. Based on our evaluation, the pullout value, utilizing a penetration depth of 2 1/2", is less than the maximum allowable per connection and therefore is adequate.
4. Roof Section 1: Considering the roof slopes, the size, spacing, condition of the roof, the panel supports shall be placed at and attached no greater than every fourth roof member as panels are installed perpendicular across members and no greater than the panel length when installed parallel to the members (*portrait*). No panel supports spacing shall be greater than four (4) spaces or 64" o/c, whichever is less.
5. Panel support connections shall be staggered to distribute load to adjacent members.

Based on the above evaluation, with appropriate panel anchors being utilized the roof system will adequately support the additional loading imposed by the solar panels. This evaluation is in conformance with the 2015 International Residential Code New Jersey Edition, current industry standards and practice, and the information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,

  
Scott E. Wyssling, PE  
NJ License No. 41196

**Scott E. Wyssling, PE**  
Head of Structural Engineering

**Existing Rafter Analysis**

scott.wyssling@vivintsolar.com

Existing Rafter Properties

Lumber = Hem-Fir (North)  
Grade = No. 2 E = 1700000 psi  
Nominal size = 2x6 A = 8.25 in<sup>2</sup> S = 7.56 in<sup>3</sup> I = 20.80 in<sup>4</sup>  
Max Span = 14.22 ft  
Rafter Spacing = 16 in o.c.  
Tilt = 16 °

Brantley Residence  
1675 Tilford Blvd  
Brick, NJ  
Date: May 17, 2016

Loading of Existing Rafter

DL = 13 psf Dead Load of Existing Structure and Panels  
 $w_{DL} = DL \times \text{spacing} = 17 \text{ plf}$  Dead Load of Existing Structure and Panels  
LL = 30 psf Roof Snow Load (ASCE/SEI 7-10)  
 $w_{LL} = LL \times \text{spacing} = 40 \text{ plf}$  Live Load

Capacity of Wood Rafter

Adjustment Factors

|            | Shear    | Moment |                                                         |
|------------|----------|--------|---------------------------------------------------------|
| $C_D =$    | 1.15     | 1.15   | Load Duration Factor, NDS Table 2.3.2                   |
| $C_M =$    | 1        | 1      | Wet Service Factor, NDS Table 4A                        |
| $C_t =$    | 1        | 1      | Temperature Factor, NDS Table 10.3.4                    |
| $C_L =$    |          | 1      | Beam Stability Factor, NDS Section 3.3.3                |
| $C_F =$    |          | 1.3    | Size Factor, NDS Table 4A                               |
| $C_{fu} =$ |          | 1      | Flat Use Factor, NDS Table 4A                           |
| $C_i =$    | 1        | 1      | Incising Factor, NDS Section 4.3.8                      |
| $C_r =$    |          | 1.15   | Repetitive Member Factor, NDS Table 4A                  |
| $F_b =$    | 1200 psi |        | Reference Design Allowable Bending Stress, NDS Table 4A |
| $F_v =$    | 145 psi  |        | Reference Design Allowable Shear Stress, NDS Table 4A   |

$F'_b = F_b \times \text{Adjustment Factors} = 2063.1 \text{ psi}$  (allowable bending stress)

**OK IN BENDING**

$f_b = M/S = 1765.3 \text{ psi}$  (actual bending stress)

$F'_v = F_v \times \text{Adjustment Factors} = 166.75 \text{ psi}$  (allowable shear stress)

**OK IN SHEAR**

$f_v = 3V/2bd = 56.88 \text{ psi}$  (actual shear stress)

*Scott E. Wyssling*

Bruce Scott  
YOUR LICENSE/REGISTRATION/CERTIFICATE NUMBER IS 34EI 01108500 . PLEASE USE IT IN ALL  
CORRESPONDENCE TO THE DIVISION OF CONSUMER AFFAIRS. USE THIS SECTION TO REPORT ADDRESS  
CHANGES. YOU ARE REQUIRED TO REPORT ANY ADDRESS CHANGES IMMEDIATELY TO THE ADDRESS NOTED  
BELOW

EXPIRATION DATE 2018

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NEWJC (Rev. 04/30/2014)

CA-20

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**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

Bruce Scott  
3301 N Thanksgiving Way  
Suite 500  
Lehi UT 84043

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

New Jersey Office of the Attorney General  
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Bruce Scott  
Electrical Contractor

03/26/2015 TO 03/31/2018

03/26/2015 TO 03/31/2018  
VALID

Signature of Licensee/Registrant/Certificate Holder

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Vivint Solar Developer, LLC  
Vivint Solar Inc.  
3301 N Thanksgiving Way  
Suite 500  
Lehi UT 84043

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

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02/08/2016 TO 03/31/2017  
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13VH06589300  
LICENSE/REGISTRATION/CERTIFICATION #

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P.O. Box #8026  
Newark, NJ 07102

Vivint Solar Developer, LLC

EXPIRATION DATE 2017

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CHRIS CHRISTIE  
Governor

KIM GUADAGNO  
Lt Governor

## New Jersey Office of the Attorney General

Division of Consumer Affairs  
Board of Examiners of Electrical Contractors  
124 Halsey Street, 6<sup>th</sup> Floor, Newark, NJ 07102



ROBERT LOUGY  
Acting Attorney General

STEVE C. LEE  
Acting Director

**Mailing Address:**  
P O. Box 45006  
Newark, NJ 07101  
(973) 504-6410

May 25, 2016

### TO WHOM IT MAY CONCERN

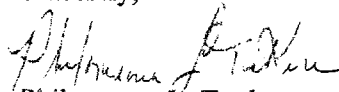
Our records indicate that the holder of License and Business Permit No. **34EB01809700** has applied to the Board of Electrical Contractors for a pressure seal which has not yet been issued to him/her by the vendor.

Please accept this sealed letter as an interim device pending the furnishing of a seal to:

**MATTHEW K HOFHERR**  
**Vivint Solar Developer LLC**  
**3301 N Thanksgiving Way Suite 500**  
**Lehi UT 84043**

This letter will be rendered invalid **180 days** after the date of its issuance.

Sincerely,

  
Philameana E. Tucker  
Executive Director

PLT:gkb

Block: 838  
Lot: 33  
Permit: 16-1939

1675 TILFORD BLVD  
CHANGE OF CONTRACTOR

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

THIS IS TO CERTIFY THAT THE  
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HAS LICENSED

Vivint Solar Developer LLC  
MATTHEW K HOFHERR  
25 E 7th Street  
Clifton NJ 07011

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

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  
VIVINT SOLAR DEVELOPER LLC  
ELECTRICAL BUSINESS PERMIT

05/23/2016 TO 03/31/2018

VALID

34EB01809700

SIGNATURE  
THOMAS J. DIAMANTOPOULOS

05/23/2016 TO 03/31/2018  
VALID

34EB01809700  
LICENSE REGISTRATION/CERTIFICATION #

*Matthew K Hofherr*  
Signature of Licensee/Registrant/Certificate Holder

*Thomas J. Diamantopoulos*  
ACTING DIRECTOR

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Vivint Solar Developer LLC

EXPIRATION DATE 2018

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FILE COPY

**vivint. solar**  
Structural Group

Scott E. Wyssling, PE  
Senior Manager of Engineering

**TOWNSHIP OF BRICK**

RELEASED FOR PERMIT INITIAL DATE  
Building Subcode \_\_\_\_\_  
Plumbing Subcode \_\_\_\_\_  
Fire Subcode \_\_\_\_\_  
Electrical Subcode \_\_\_\_\_  
Plan Reviewer \_\_\_\_\_  
Plans Released \_\_\_\_\_  
Construction Official \_\_\_\_\_

3301 North Thanksgiving Way, Suite 500  
Lehi, UT 84043  
P: (801) 234-7050

scott.wyssling@vivintsolar.com

March 01, 2016  
Revised: April 07, 2016

*For ECU only.*

Mr. Dan Rock, Project Manager  
Vivint Solar  
3301 North Thanksgiving Way, Suite 500  
Lehi, UT 84043

Zoning Review  
Approval

Re: Structural Engineering Services  
Brantley Residence  
1675 Tilford Blvd, Brick NJ  
S-4835519  
4.16 kW

By: CE  
Date: 4-15-16 Sub on reg

Dear Mr. Rock:

Pursuant to your request, we have reviewed the following information regarding solar panel installation on the roof of the above referenced home:

1. Site Visit/Verification Form prepared by a Vivint Solar representative identifying specific site information including size and spacing of members for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information was prepared by the Design Group and will be utilized for approval and construction of the proposed system.
3. Photovoltaic Rooftop Solar System Permit Submittal identifying design parameters for the solar system.
4. Photographs of the interior and exterior of the roof system identifying existing structural members and their conditions.

Based on the above information we have evaluated the structural capacity of the existing roof system to support the additional loads imposed by the solar panels and have the following comments related to our review and evaluation:

**Description of Residence:**

The existing residence is typical wood framing construction with the roof system consisting of the following:

- Roof Section 1: Roof section is composed of assumed 2x6 dimensional lumber at 16" on center with 1x8 collar ties every 48". The attic space is finished and photos indicate that there was no access to visually inspect the size and condition of the roof members. The interior horizontal length of the rafter used for design verification is 14.22' with an additional 1' eave.

All wood material utilized for the roof system is assumed to be Hem-Fir #2 or better with standard construction components. The existing roofing material consists of composite shingle. Our review of the photos of the exterior roof does not indicate any signs of settlement or misalignment caused by overstressed underlying members.

**Stability Evaluation:**

**A. Wind Uplift Loading**

1. Calculations for uplift are based on ASCE/SEI 7-10 Minimum Design Loads for Buildings and other Structures, a wind speed of 110 mph based on Exposure Category B and 16 degree roof slopes on the dwelling areas. Ground snow load is 30 PSF for Exposure B, Zone 1 per (ASCE/SEI 7-10).
2. Total area subject to wind uplift is calculated for the Interior, Edge and Corner Zones of the dwelling.

**vivint. solar**

**B. Loading Criteria**

10 PSF = Dead Load (roofing/framing)  
3 PSF = Dead Load (solar panels/mounting hardware)  
Total Dead Load = 13 PSF

30 PSF = Live Load (ground snow load)

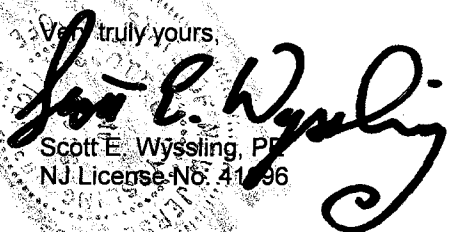
The above values are within acceptable limits of recognized industry standards for similar structures. Analysis performed on the existing roof structure utilizing the above loading criteria indicates that the existing members will support the additional panel loading without damage, if installed correctly.

**C. Solar Panel Anchorage**

1. The solar panels shall be mounted in accordance with the most recent "Ecolibrium Solar Installation Manual", which can be found on the Ecolibrium Solar website (ecolibrumsolar.com). If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. The solar panels are 1 1/2" thick and mounted 4 1/2" off the roof for a total height off the existing roof of 6". At no time will the panels be mounted higher than 6" above the existing plane of the roof.
3. Maximum allowable pullout per lag screw is 235 lbs/inch of penetration as identified in the Nation Design Standards (NDS) of timber construction specifications for Hem-Fir (North Lumber) assumed. Based on our evaluation, the pullout value, utilizing a penetration depth of 2 1/2", is less than the maximum allowable per connection and therefore is adequate.
4. Roof Section 1: Considering the roof slopes, the size, spacing, condition of the roof, the panel supports shall be placed at and attached no greater than every fourth roof member as panels are installed perpendicular across members and no greater than the panel length when installed parallel to the members (*portrait*). No panel supports spacing shall be greater than four (4) spaces or 64" o/c, whichever is less.
5. Panel support connections shall be staggered to distribute load to adjacent members.

Based on the above evaluation, with appropriate panel anchors being utilized the roof system will adequately support the additional loading imposed by the solar panels. This evaluation is in conformance with the 2015 International Residential Code New Jersey Edition, current industry standards and practice, and the information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,  
  
Scott E. Wyssling, PE  
NJ License No. 41196

## Customer Info

Name:  
Email:  
Phone:

## Project Info

Identifier: 4835519  
Street Address Line 1:  
Street Address Line 2:  
City:  
State:  
Zip:  
Country:

## System Info

Module Manufacturer: Trina Solar  
Module Model: TSM-260PD05.08  
Module Quantity: 16  
Array Size (DC watts): 4160.0  
Mounting System Manufacturer: Ecolibrium Solar  
Mounting System Product: EcoX  
Inverter Manufacturer: Enphase Energy  
Inverter Model: M215-60-2LL-S22-IG (240)

## Project Design Variables

Module Weight: 41.005932 lbs  
Module Length: 64.960665 in  
Module Width: 39.0551392 in  
Basic Wind Speed: 115.0 mph  
Ground Snow Load: 30.0 psf  
Seismic: 1.5  
Exposure Category: B  
Importance Factor: I  
Exposure on Roof: Partially Exposed  
Topographic Factor: 1.0  
Wind Directionality Factor: 0.85  
Thermal Factor for Snow Load: 1.2  
Lag Bolt Design Load - Upward: 820 lbf  
Lag Bolt Design Load - Lateral: 288 lbf  
EcoX Design Load - Downward: 918 lbf  
EcoX Design Load - Upward: 720 lbf  
EcoX Design Load - Downslope: 460 lbf  
EcoX Design Load - Lateral: 252 lbf  
Module Design Moment – Upward: 3655 in-lb  
Module Design Moment – Downward: 3655 in-lb  
Effective Wind Area: 20 ft<sup>2</sup>  
Min Nominal Framing Depth: 2.5 in  
Min Top Chord Specific Gravity: 0.42

**Plane Calculations (ASCE 7-10): South West Roof**

Roof Shape:  
 Roof Type: Composition Shingle  
 Average Roof Height: 25.0 ft  
 Least Horizontal Dimension: 57.7020066802026 ft  
 Roof Slope: 16.0 deg  
 Truss Spacing: 16.0 in

Edge and Corner Dimension: 5.770200668020263 ft  
 Stagger Attachments: Yes  
 Include Snow Guards: Yes  
 Include North Row Extensions: No

**Snow Load Calculations**

| Description         | Interior | Edge | Corner | Unit |
|---------------------|----------|------|--------|------|
| Flat Roof Snow Load | 20.2     | 20.2 | 20.2   | psf  |
| Slope Factor        | 1.0      | 1.0  | 1.0    |      |
| Roof Snow Load      | 20.2     | 20.2 | 20.2   | psf  |

**Wind Pressure Calculations**

| Description                                        | Interior | Edge  | Corner | Unit |
|----------------------------------------------------|----------|-------|--------|------|
| Net Design Wind Pressure Uplift                    | -21.2    | -34.9 | -52.4  | psf  |
| Net Design Wind Pressure Downforce                 | 12.5     | 12.5  | 12.5   | psf  |
| Adjustment Factor for Height and Exposure Category | 1.0      | 1.0   | 1.0    |      |
| Design Wind Pressure Uplift                        | -21.2    | -34.9 | -52.4  | psf  |
| Design Wind Pressure Downforce                     | 16.0     | 16.0  | 16.0   | psf  |

**ASD Load Combinations**

| Description                   | Interior | Edge  | Corner | Unit |
|-------------------------------|----------|-------|--------|------|
| Dead Load                     | 2.3      | 2.3   | 2.3    | psf  |
| Snow Load                     | 20.2     | 20.2  | 20.2   | psf  |
| Downslope: Load Combination 3 | 6.0      | 6.0   | 6.0    | psf  |
| Down: Load Combination 3      | 20.9     | 20.9  | 20.9   | psf  |
| Down: Load Combination 5      | 11.8     | 11.8  | 11.8   | psf  |
| Down: Load Combination 6a     | 23.4     | 23.4  | 23.4   | psf  |
| Up: Load Combination 7        | -11.4    | -19.6 | -30.1  | psf  |
| Down Max                      | 23.4     | 23.4  | 23.4   | psf  |

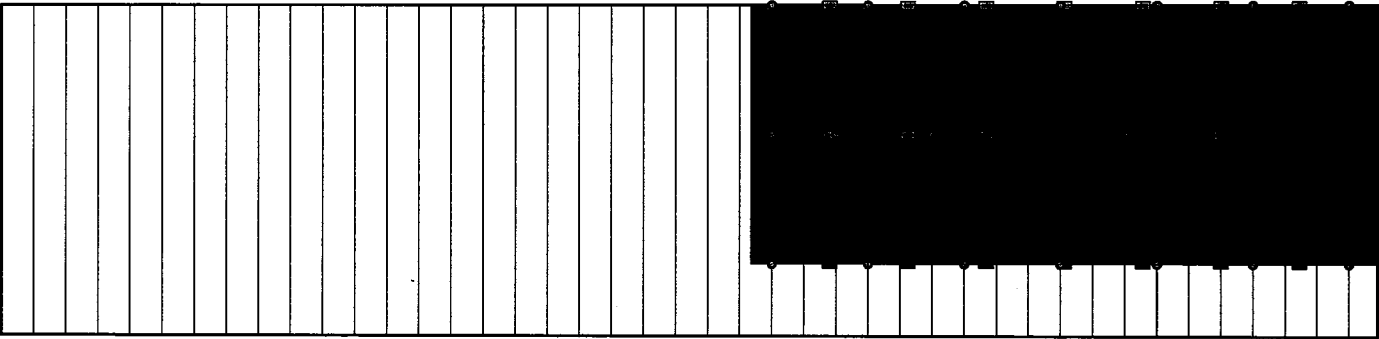
**Spacing Results (Landscape)**

| Description                                                          | Interior | Edge | Corner | Unit |
|----------------------------------------------------------------------|----------|------|--------|------|
| Max Allowable Spacing Between Attachments                            | 67.9     | 67.9 | 59.9   | in   |
| Max Spacing Between Attachments With Rafter/Truss Spacing of 16.0 in | 64.0     | 64.0 | 48.0   | in   |
| Max Cantilever from Attachment to Perimeter of PV Array              | 22.6     | 22.6 | 20.0   | in   |

**Spacing Results (Portrait)**

| Description                                                          | Interior | Edge | Corner | Unit |
|----------------------------------------------------------------------|----------|------|--------|------|
| Max Allowable Spacing Between Attachments                            | 52.6     | 52.6 | 46.4   | in   |
| Max Spacing Between Attachments With Rafter/Truss Spacing of 16.0 in | 48.0     | 48.0 | 32.0   | in   |
| Max Cantilever from Attachment to Perimeter of PV Array              | 17.5     | 17.5 | 15.5   | in   |

Layout



Skirt

Coupling

End Coupling

Clamp

End Clamp

North Row Extension

Bonding Jumper

Note: If the total width of a continuous array exceeds 35 ft, break array to allow for thermal expansion and contraction. See Installation Guide for details.  
Warning: PV Modules may need to be shifted with respect to roof trusses to comply with maximum allowable overhang.

## **Roof Weights**

In Conformance with Solar ABC's Expedited Permit Process

Module Quantity: 16

Weight of Modules: 656 lbs

Weight of Mounting System: 44 lbs

Total Plane Weight: 700 lbs

Total Plane Array Area: 282 ft<sup>2</sup>

Distributed Weight: 2.48 psf

Number of Attachments: 22

Weight per Attachment Point: 32 lbs

**Bill Of Materials**

| <b>Part</b> | <b>Name</b>                   | <b>Quantity</b> |
|-------------|-------------------------------|-----------------|
| ES10195     | EcoX Base, Comp Shingle       | 22              |
| ES10197     | EcoX Flashing, Comp Shingle   | 22              |
| ES10065     | EcoX Connector Bracket, Large | 16              |
| ES10144     | EcoX Junction Box Bracket     | 1 (Optional)    |
| ES10132     | EcoX Power Accessory Bracket  | 16              |
| ES10184     | PV Cable Clip                 | 48              |
| ES10139     | Trunk Cable Clip              | 32              |
| ES10103     | EcoX Clamp Assembly           | 15              |
| ES10136     | EcoX End Clamp Assembly       | 7               |
| ES10201     | EcoX Bonding Jumper           | 1               |
| ES10121     | EcoX Coupling Assembly        | 14              |
| ES10146     | EcoX End Coupling             | 7               |

|                  |                   |                              |                 |
|------------------|-------------------|------------------------------|-----------------|
| Customer AR      | S-4835519         | Utility Company Name         | JCPL            |
| Customer Address | 1675 Tilford Blvd | Utility Account Number       | 100 017 405 901 |
|                  | Brick, NJ         | Electrical Meter Number      | S59117789       |
|                  |                   | Estimated Annual CONSUMPTION | 4345            |
|                  |                   | Estimated Annual PRODUCTION  | 4212            |
|                  |                   |                              | Offset: 96.9%   |

|                                                                  |                         |
|------------------------------------------------------------------|-------------------------|
| Number of Panels                                                 | 16                      |
| Total System Size/DC Source Rating/Total Array Output (DC Watts) | 4160                    |
| Inverter Ampere Rating (Amps AC)                                 | 0.9                     |
| Number of Phases                                                 | 1                       |
| Inverter Voltage Rating                                          | 240                     |
| Nominal DC Volts                                                 | 30.6                    |
| Inverter Power Factor (%)                                        | 0.95                    |
| Module Manufacturer and Model Number                             | Trina TSM 260-PD05.08   |
| Power Rating per Module (DC Watts)                               | 260                     |
| Inverter Manufacturer and Model Number                           | Enphase M215-60-2LL-S22 |
| Inverter Continuous AC Rating (AC Watts)                         | 215                     |
| Inverter Peak Efficiency (%)                                     | 96.3%                   |

|                                                      | Totals      |
|------------------------------------------------------|-------------|
| Number of Modules/Inverters                          | 16          |
| System Size/DC Source Rating/Array Output (DC Watts) | 4160        |
| Total Inverter Rating (kW AC)                        | 0.215       |
| Total Inverter Output (AC Watts)                     | 215         |
| Estimated Production                                 | 4212        |
| Building Permit Valuation                            | \$ 1,830.40 |
| Electrical Permit Valuation                          | \$ 7,321.60 |
| Total Valuation                                      | \$ 9,152.00 |
| @ \$2.2/Watt:                                        | \$ 2.20     |
|                                                      | \$ 9,152.00 |

|                                      |         |
|--------------------------------------|---------|
| Building Permit Valuation per watt   | \$ 0.44 |
| Electrical Permit Valuation per watt | \$ 1.76 |
| Constraint:                          | usage   |

|                                   |                                |
|-----------------------------------|--------------------------------|
| Customer Estimated Monthly Usage: | (Total annual usage: 4345 kWh) |
|-----------------------------------|--------------------------------|

|         |
|---------|
| January |
| 400     |

|          |
|----------|
| February |
| 300      |

|       |
|-------|
| March |
| 300   |

|       |
|-------|
| April |
| 235   |

|     |
|-----|
| May |
| 370 |

|      |
|------|
| June |
| 410  |

|      |
|------|
| July |
| 530  |

|        |
|--------|
| August |
| 425    |

|           |
|-----------|
| September |
| 485       |

|         |
|---------|
| October |
| 300     |

|          |
|----------|
| November |
| 300      |

|          |
|----------|
| December |
| 290      |



# POST-INSTALL COMMISSIONING TEST

|                               |  |
|-------------------------------|--|
| Irradiance pyranometer:       |  |
| Current/Voltage meter:        |  |
| Cell temperature thermometer: |  |

|                |  |
|----------------|--|
| Date:          |  |
| Time:          |  |
| Ambient Temp.: |  |
| Weather:       |  |

$$\frac{\text{Amps}}{\text{(Actual Current)}} \times \frac{\text{Volts}}{\text{(Actual Voltage)}} = \frac{\text{AC Watts}}{\text{(Actual Array Power)}}$$

|                |                                                                                                                                                                                                      |                                     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Roof Section 1 | $\left( \frac{\text{\# of modules}}{\text{Irradiance/1000}} \times \frac{\text{Module Imp}}{\text{Module Vmp}} \right) \times \left( \frac{\text{Temp. Factor}}{\text{Cell temp. - 25°C}} \right) =$ | Roof Section 1<br>Theoretical Power |
| Roof Section 2 | $\left( \frac{\text{\# of modules}}{\text{Irradiance/1000}} \times \frac{\text{Module Imp}}{\text{Module Vmp}} \right) \times \left( \frac{\text{Temp. Factor}}{\text{Cell temp. - 25°C}} \right) =$ | Roof Section 2<br>Theoretical Power |
| Roof Section 3 | $\left( \frac{\text{\# of modules}}{\text{Irradiance/1000}} \times \frac{\text{Module Imp}}{\text{Module Vmp}} \right) \times \left( \frac{\text{Temp. Factor}}{\text{Cell temp. - 25°C}} \right) =$ | Roof Section 3<br>Theoretical Power |
| Roof Section 4 | $\left( \frac{\text{\# of modules}}{\text{Irradiance/1000}} \times \frac{\text{Module Imp}}{\text{Module Vmp}} \right) \times \left( \frac{\text{Temp. Factor}}{\text{Cell temp. - 25°C}} \right) =$ | Roof Section 4<br>Theoretical Power |
| Roof Section 5 | $\left( \frac{\text{\# of modules}}{\text{Irradiance/1000}} \times \frac{\text{Module Imp}}{\text{Module Vmp}} \right) \times \left( \frac{\text{Temp. Factor}}{\text{Cell temp. - 25°C}} \right) =$ | Roof Section 5<br>Theoretical Power |
| Roof Section 6 | $\left( \frac{\text{\# of modules}}{\text{Irradiance/1000}} \times \frac{\text{Module Imp}}{\text{Module Vmp}} \right) \times \left( \frac{\text{Temp. Factor}}{\text{Cell temp. - 25°C}} \right) =$ | Roof Section 6<br>Theoretical Power |

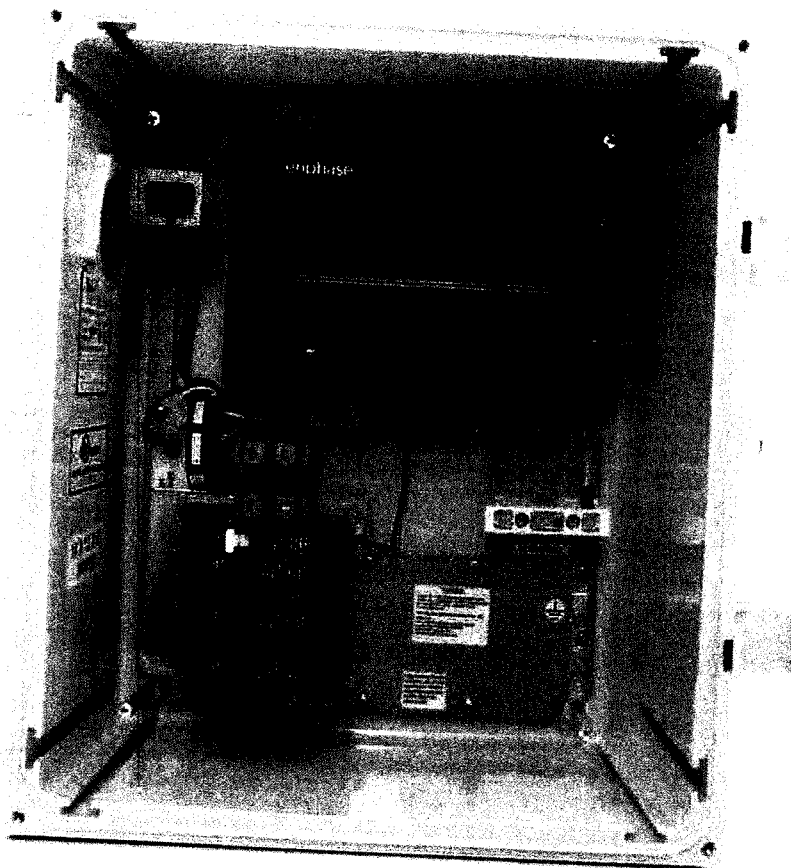
★ Actual Array Power must be within 10% of Total Array Theoretical Power

(add Theoretical Power from all  
roof sections)

★ DC  
(Total Array Theoretical Power) Watts

**Enphase** AC Combiner Box

# Enphase **AC Combiner Box**



The Enphase® AC Combiner Box with Envoy-S consolidates interconnection equipment into a single enclosure and streamlines PV installations by providing a consistent, pre-wired solution for residential applications.

## **SMART**

- Includes Envoy-S for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular

## **SIMPLE**

- Three pre-installed 20 A / 240 VAC circuit breakers
- Pre-configured revenue-grade metering available

## **RELIABLE**

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year warranty

## Enphase AC Combiner Box // DATA

| MODEL NUMBER                                 |                                                                                                                                                                                                                                                   |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC Combiner Box, Metered<br>XAM1-120         | AC combiner with Enphase® Envoy-S Metered for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%, pending) and optional consumption monitoring (+/- 2.5%).                                                                     |
| ACCESSORIES (Order Separately)               |                                                                                                                                                                                                                                                   |
| Enphase® Mobile Connect<br>CELLMODEM-01      | Plug and play industrial grade cellular modem with five-year data plan for systems up to 12 kW. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) |
| Consumption Monitoring CT<br>CT-200-SPLIT    | Split core current transformers enable whole home consumption metering (+/- 2.5%).                                                                                                                                                                |
| ELECTRICAL SPECIFICATIONS                    |                                                                                                                                                                                                                                                   |
| Maximum system size                          | 11.5 kW at 240 VAC                                                                                                                                                                                                                                |
| Rating                                       | Continuous duty                                                                                                                                                                                                                                   |
| Maximum system voltage                       | 240 VAC                                                                                                                                                                                                                                           |
| Rated output current                         | 48 A                                                                                                                                                                                                                                              |
| Rated input current, each input              | 16 A                                                                                                                                                                                                                                              |
| Maximum fuse/circuit breaker rating (output) | 60 A                                                                                                                                                                                                                                              |
| Solar branch circuit breakers                | Three 2-pole 20A/240 VAC DIN rail-mounted breakers                                                                                                                                                                                                |
| Production Metering CT                       | 200A solid core pre-installed on solar busbar and wired to Envoy-S                                                                                                                                                                                |
| MECHANICAL DATA                              |                                                                                                                                                                                                                                                   |
| Dimensions (WxHxD)                           | 38.0 x 38.7 x 20.3 cm (15.0" x 15.3" x 8.0")                                                                                                                                                                                                      |
| Weight                                       | 5.1 kg (11.2 lbs)                                                                                                                                                                                                                                 |
| Ambient temperature range                    | -40° C to +46° C (-40° to 115° F)                                                                                                                                                                                                                 |
| Cooling                                      | Vented, natural convection                                                                                                                                                                                                                        |
| Enclosure environmental rating               | Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction                                                                                                                                                                                 |
| Wire size                                    | 10 AWG for branch inputs<br>4 AWG for combined output (3 circuits)<br>6 AWG for combined output (2 circuits)                                                                                                                                      |
| Altitude                                     | To 2000 meters (6,560 feet)                                                                                                                                                                                                                       |
| INTERNET CONNECTION OPTIONS                  |                                                                                                                                                                                                                                                   |
| Integrated Wi-Fi                             | 802.11b/g/n                                                                                                                                                                                                                                       |
| Ethernet                                     | 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)                                                                                                                                                                                         |
| Cellular                                     | Optional, CELLMODEM-01 (not included)                                                                                                                                                                                                             |
| COMPLIANCE                                   |                                                                                                                                                                                                                                                   |
| Compliance, Combiner Box                     | UL 1741                                                                                                                                                                                                                                           |
| Compliance, Envoy-S                          | UL 916<br>CAN/CSA C22.2 No. 61010-1<br>47 CFR, Part 15, Class B, ICES 003<br>IEC/EN 61010-1:2010,<br>EN50065-1, EN61000-4-5, EN61000-6-1, EN61000-6-2<br>Metering: ANSI C12.20 accuracy class 0.5 (Pending)                                       |

To learn more about Enphase Microinverter technology,  
visit [enphase.com](http://enphase.com)



OFFICE DATE RECEIVED: \_\_\_\_\_

| VIII. PRIOR APPROVALS CHECKLIST<br>(office use only)                 | LOCAL APPROVAL    |            | COUNTY APPROVAL   |            | REGIONAL APPROVAL |            | STATE APPROVAL    |            | COMMENTS    |
|----------------------------------------------------------------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------|
|                                                                      | Prelimin. Initial | Final Date | Prelimin. Initial | Final Date | Prelimin. Initial | Final Date | Prelimin. Initial | Final Date |             |
| <input checked="" type="checkbox"/> Zoning Officer                   | SC                | 4/10/16    |                   |            |                   |            |                   |            | 2A-16-00092 |
| <input type="checkbox"/> Planning Board                              |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> Zoning Board                                |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> Sewer Authority                             |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> Water Authority                             |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> Police Department                           |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> Health Department                           |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> Soil Conservation                           |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> N.J. Department of Community Affairs        |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> N.J. Department of Transportation           |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> N.J. Department of Environmental Protection |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/> Utility Dig No.                             |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/>                                             |                   |            |                   |            |                   |            |                   |            |             |
| <input type="checkbox"/>                                             |                   |            |                   |            |                   |            |                   |            |             |

| IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional) |                                |
|----------------------------------------------------------------------------|--------------------------------|
| Name of Code & Edition                                                     | Name of Code & Edition         |
| Building _____                                                             | Energy _____                   |
| Electrical _____                                                           | Barrier Free _____             |
| Plumbing _____                                                             | Flood Hazard _____             |
| Fire Protection _____                                                      | As Built Elevation Cert. _____ |
| Mechanical _____                                                           | Other _____                    |

| X. CERTIFICATES ISSUED (office use only)                      |           | DATE ISSUED |       | DATE EXPIRED |       |
|---------------------------------------------------------------|-----------|-------------|-------|--------------|-------|
| <input type="checkbox"/> Temporary Certificate of Occupancy   | No. _____ | _____       | _____ | _____        | _____ |
| <input type="checkbox"/> Temporary Certificate of Compliance  | No. _____ | _____       | _____ | _____        | _____ |
| <input type="checkbox"/> Continued Certificate of Occupancy   | No. _____ | _____       | _____ | _____        | _____ |
| <input type="checkbox"/> Certificate of Compliance            | No. _____ | _____       | _____ | _____        | _____ |
| <input type="checkbox"/> Certificate of Occupancy             | No. _____ | _____       | _____ | _____        | _____ |
| <input type="checkbox"/> Certificate of Approval              | No. _____ | _____       | _____ | _____        | _____ |
| <input type="checkbox"/> Lead Abatement Clearance Certificate | No. _____ | _____       | _____ | _____        | _____ |