



CITY OF ORANGE HISTORIC PRESERVATION COMMISSION

ORANGE CITY HALL

29 North Day Street, Orange, New Jersey 07050

PHONE (973) 952- 6344 FAX (973) 672-6643

**CITY OF ORANGE PRESERVATION COMMISSION
APPLICATION FOR CERTIFICATION OF APPROPRIATENESS**

DATE RECEIVED _____ APPLICATION # _____

APPLICANT(S):

Name of Applicant(s): Suntuity Solar LLC

Address: 2137 Rt 35 N, Holmdel, NJ 07733

Email: njpermitting@suntuity.com

Telephone (Day) 732-353-1720 opt 2,

(Eve) _____

(Fax) 732-979-2401

Relationship of Applicant to Property owner:

- Owner(s)
- Lessee
- Property Under Contract
- Other (Specify)

Explanation if Other: Contractor/Solar Installer

OWNER(S), IF DIFFERENT THAN APPLICANT:

Name(s) of Owner(s): Emmanuel Mensah

Address: 628 Argyle Avenue

Email: emensahsr@gmail.com

Telephone Number: (Day) (973) 476-7295

(Eve) (973) 476-7295

Street Address of the Property that is subject of Application: _____

628 Argyle Avenue, Orange, New Jersey 07050

Tax Block: 7001

Lot: 4

Name of Historic District in which Property lies: _____

- Orange Valley
- Montrose Seven Oaks Park
- Main Street
- St. John's

Existing use of the Property:

Single Family; Residential

Existing zoning of the Property:

Single Family; Residential

Describe in detail the proposed work to be done at the Property.

Install PV solar system on roof with 15 modules. Panels will be flat mounted, but will not exceed roof peak.

Explain how you plan to prevent, minimize and mitigate any adverse effects to this Property, to nearby historically significant properties, and to the Historic District?

Suntuity strives for a clean and efficient installation for the homeowner and property.

Each Application must be accompanied by sketches, drawings, photographs, descriptions or other information sufficient to show the proposed alterations, additions, changes or new construction. The Commission may require the subsequent submission of such additional materials as it reasonably requires to make an informed decision. A submission shall include:

- A photograph of each elevation of the structure.
- Three (3) copies of drawings, photographs, material brochures, samples, specifications or information that may be necessary to assist the Commission. Copies may be submitted electronically, or by CD or flash drive.
- Three (3) copies of a survey, or if applicable, a site plan showing the location of new and existing structures on the site and their location with respect to the building line, property line, and the front of those buildings or structures immediately adjacent to each side of the lot to be built upon.
- Three (3) copies of façade elevation(s), if applicable, of the proposed work in sufficient detail to identify the limits and location of the proposed work, and existing and proposed materials to be used.
- \$70.00 Application fee (check or money order made to the City of Orange).

By signing this Application, I hereby certify that the owner of record authorizes the proposed work and I have been authorized by the owner to make this Application as his/her authorized agent. By signing this Application, the owner hereby grants authorization to the Commission members, and its professional and support staff to enter the Property in question for inspection purposes. By signing this application I further agree that the attorney’s and professional staff’s review of my application is chargeable to me and that I agree to pay for such review separately from the application fee, by depositing an escrow payment of \$ 70.

Daniel W. Dunzik

370 Burnt Hill Rd. Skillman NJ. 08558
StudioGdesign@comcast.net

Architect LEED-AP

908-872-3664

August 30, 2023

Re: Proposed 6 kw Photovoltaic Solar Panel Installation

Emmanuel Mensah
628 Argyle Avenue
Orange, New Jersey 07050

Suntuity Solar

2137 Route 35N
Holmdel, NJ 07733

Dear Plan Reviewer:

We have reviewed the information received regarding the installation of solar panels on the above referenced structure. We have evaluated the structure to verify the existing capacity. We have reviewed the equipment to be utilized on this project and make the following certification:

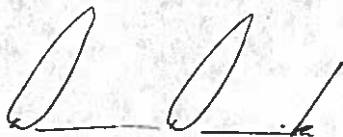
The roof structure has sufficient structural capacity for the applied PV loads. No additional support is required.

We have reviewed the engineering testing reports for all mounting equipment to be utilized on this project. All products are capable of supporting the code required loads and are suitable for this installation when installed in strict compliance with the latest manufacturers printed instructions. Attachment system and hardware are as indicated on the drawings. Ecofasten Rockit + Deckmount installed in strict compliance with manufacturers latest printed specifications.

The following calculations are for the structural evaluation of the photovoltaic panels and are valid only for the project info referenced above.

All aspects of the installation shall comply with NJUCC, ASCE 7-16, IBC NJ 2021, NEC 2020(NFPA-70), IRC NJ 2021. Please review the attached certifications prepared by the manufacturer.

If you have any questions or if you require additional information relating to this matter, please contact me at your earliest convenience. Thank you.



Daniel W. Dunzik, RA. LEED-AP
NJ. Lic. No. 21A101168800



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ORANGE CITY CLERK'S OFFICE
2023 OCT 17 A 11:50

10/5/23, 12:43 PM

Front_of_home-1.jpg





Daniel W. Dunzik

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August 30, 2023

Roof 1 Load Calculation Criteria

Roof Type:	Composite Shingle
Roof Slope:	34
Attic Access:	Yes
Foundation:	Permanent
Framing type:	Rafter
Framing size:	2"x6"
Framing spacing:	24"
Horizontal Span Max:	9'-4"
Top Chord Length:	11'-6"
Wood Species:	DFL
Wood Fb (psi):	875
Attachment Spacing (In.):	64/48/48
Attachment pattern:	Staggered
Framing upgrade:	No
Sistered:	No
Knee Wall:	No
Remedial Repair:	No

Structural Design Loads per ASCE 7-16

Dead Loads: (Framing and Roofing)	10 psf + 2.6 psf (new solar panels) =
Roof Live Load:	20 psf - (reducible) 0 psf at locations of solar panels
Ground Snow Load/Live Load:	30 psf
Flat Roof Snow Load:	ASCE-7-16-EQ 16.7.3-Pf = $0.7 C_c C_t I_s P_g = 0.7(1)(1)(1)30$ psf = 21 psf
Sloped Roof Snow Load:	Eq. 7.4-1 $P_s = C_s P_f$, Figure 7.4-1, $C_s = 0.58$, $P_s = (21 \text{ psf})(0.58) =$ 12.18 psf Roof Snow Load =
Basic Wind Speed:	120 mph (Risk Category II)
Roof Mean Height:	<30'
Exposure:	B
Topographic Factor, k_{zt} :	1

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August 30, 2023

Roof 2 Load Calculation Criteria

Roof Type:	Composite Shingle
Roof Slope:	19
Attic Access:	Yes
Foundation:	Permanent
Framing type:	Rafter
Framing size:	2"x6"
Framing spacing:	16"
Horizontal Span Max:	7'-7"
Top Chord Length:	9'-3"
Wood Species:	DFL
Wood Fb (psi):	875
Attachment Spacing (In.):	64/48/48
Attachment pattern:	Staggered
Framing upgrade:	No
Sistered:	No
Knee Wall:	No
Remedial Repair:	No

Structural Design Loads per ASCE 7-16

Dead Loads: (Framing and Roofing)	10 psf + 2.6 psf (new solar panels) =
Roof Live Load:	20 psf - (reducible) 0 psf at locations of solar panels
Ground Snow Load/Live Load:	30 psf
Flat Roof Snow Load:	ASCE-7-16-EQ 16.7.3-Pf = 0.7 Cc Ct Is Pg = 0.7(1)(1)(1)30 psf = 21 psf
Sloped Roof Snow Load:	Eq. 7.4-1 Ps = Cs Pf, Figure 7.4-1, Cs = 0.85, Ps = (21 psf)(0.85) = 17.85 psf Roof Snow Load =
Basic Wind Speed:	120 mph (Risk Category II)
Roof Mean Height:	<30'
Exposure:	B
Topographic Factor, kzt:	1

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Roof 3 Load Calculation Criteria

Roof Type:	Composite Shingle
Roof Slope:	19
Attic Access:	Yes
Foundation:	Permanent
Framing type:	Rafter
Framing size:	2"x6"
Framing spacing:	16"
Horizontal Span Max:	7'-7"
Top Chord Length:	9'-3"
Wood Species:	DFL
Wood Fb (psi):	875
Attachment Spacing (In.):	64/48/48
Attachment pattern:	Staggered
Framing upgrade:	No
Sistered:	No
Knee Wall:	No
Remedial Repair:	No

Structural Design Loads per ASCE 7-16

Dead Loads: (Framing and Roofing)	10 psf + 2.6 psf (new solar panels) =
Roof Live Load:	20 psf - (reducible) 0 psf at locations of solar panels
Ground Snow Load/Live Load:	30 psf
Flat Roof Snow Load:	ASCE-7-16-EQ 16.7.3-Pf = $0.7 C_c C_t I_s P_g = 0.7(1)(1)(1)30$ psf = 21 psf
Sloped Roof Snow Load:	Eq. 7.4-1 $P_s = C_s P_f$, Figure 7.4-1, $C_s = 0.85$, $P_s = (21 \text{ psf})(0.85) =$ 17.85 psf Roof Snow Load =
Basic Wind Speed:	120 mph (Risk Category II)
Roof Mean Height:	<30'
Exposure:	B
Topographic Factor, k_{zt} :	1

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Roof 4 Load Calculation Criteria

Roof Type:	Composite Shingle
Roof Slope:	34
Attic Access:	Yes
Foundation:	Permanent
Framing type:	Rafter
Framing size:	2"x6"
Framing spacing:	24"
Horizontal Span Max:	9'-4"
Top Chord Length:	11'-6"
Wood Species:	DFL
Wood Fb (psi):	875
Attachment Spacing (In.):	64/48/48
Attachment pattern:	Staggered
Framing upgrade:	No
Sistered:	No
Knee Wall:	No
Remedial Repair:	No

Structural Design Loads per ASCE 7-16

Dead Loads: (Framing and Roofing)	10 psf + 2.6 psf (new solar panels) =
Roof Live Load:	20 psf - (reducible) 0 psf at locations of solar panels
Ground Snow Load/Live Load:	30 psf
Flat Roof Snow Load:	ASCE-7-16-EQ 16.7.3-Pf = $0.7 C_c C_t I_s P_g = 0.7(1)(1)(1)30$ psf = 21 psf
Sloped Roof Snow Load:	Eq. 7.4-1 $P_s = C_s P_f$, Figure 7.4-1, $C_s = 0.58$, $P_s = (21 \text{ psf})(0.58) = 12.18$ psf Roof Snow Load =
Basic Wind Speed:	120 mph (Risk Category II)
Roof Mean Height:	<30'
Exposure:	B
Topographic Factor, kzt:	1

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908-872-3664

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Wind Load Calculation Criteria

Wind Loads per ASCE 7-16, Ch. 30.4

Zone 1: -26.8 psf

Zone 2: -34.8 psf

Zone 3: -40.2 psf

Per section 2.4.1, ASD combo = D + 0.6W:

Zone 1: 2.6 psf + 0.6 (-26.8 psf) -13.5 psf

Zone 2: 20 psf + 0.6 (-34.8 psf) -18.3 psf

Zone 3: 30 psf + 0.6 (-40.2 psf) -21.5 psf

Check Attachment to Wood Rafter

Fasteners provided by attachment manufacturer into 2 in. wide roof rafter

Attachment Spacing:

Zone 1: 64" o.c. max

Zone 2: 48" o.c. max

Zone 3: 48" o.c. max

Attachment Tributary Area:

Zone 1: (64" o.c. max) ^ 2 / 144 28.44 SF

Zone 2: (48" o.c. max) ^ 2 / 144 16 SF

Zone 3: (48" o.c. max) ^ 2 / 144 16 SF

Attachment Forces:

Zone 1:	13.5 psf x 28.44 SF	383 lb	< W', OK	The attachment forces do not exceed the manufacturers specifications. Refer to product specifications for additional information.
Zone 2:	18.3 psf x 16 SF	292 lb	< W', OK	
Zone 3:	21.5 psf x 16 SF	344 lb	< W', OK	

Allowable withdraw Force for a single 5/16" Lag Penetration 2.5" Into Rafter

W: 235lb/in (Table 12.2A, 2015 NDS)

Cd: 1.6 (Table 2.3.2, 2015 NDS)

Ct: 1 (Table 2.3.3, 2015 NDS)

W': 235 lb/in x 2.5" in. x 1.6 x 1 940 lb

The attachment forces do not exceed the allowable capacity for a single lag attachment with sufficient factor of safety.

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Existing structure is assumed to have been designed and constructed following appropriate codes at time of erection, and assumed to have appropriate permits. The calculations produced are only for the roof framing supporting the proposed PV installation referenced in the stamped plan set and were completed according to generally recognized structural analysis standards and procedures, professional experience, opinions and judgements. Existing deficiencies which are unknown or were not observable during time of inspection are not included in this scope of work. All PV modules, racking, and mounting equipment shall be installed per manufacturer's approved installation specifications. The Design Professional of Record and the consulting firm assume no responsibility for misuse or improper installation. Framing was determined based on information in provided plans and/or photos, along with professional judgement. Prior to commencement of work, the contractor shall verify the framing sizes, spacings, and spans noted in the stamped plans, calculations, and cert letter (where applicable) and notify the Design Professional of Record of any discrepancies prior to starting construction. Contractor shall also verify that there is no damaged framing that was not addressed in stamped plans, calculations, and cert letter (where applicable) and notify the Architect of Record of any concerns prior to starting construction.

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INVERTER SPECIFICATIONS	
MANUFACTURER	ENPHASE
MODEL NO.	IQ8PLUS-72-2-US
MAX DC INPUT VOLTAGE	60 V
MAX CONTINUOUS OUTPUT POWER	290 VA
PEAK OUTPUT POWER	300 VA
NOMINAL AC OUTPUT VOLTAGE	240 V
MAX CONTINUOUS OUTPUT CURRENT	1.21 A

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	CANADIANSOLAR CS6R-400MS-HL
VMP	30.08 V
IMP	12.99 A
VOC	36.8 V
ISC	13.85 A

TEMPERATURE DETAILS	
RECORD LOW TEMP	-15°
AMBIENT TEMP (HIGH TEMP 2%)	34°

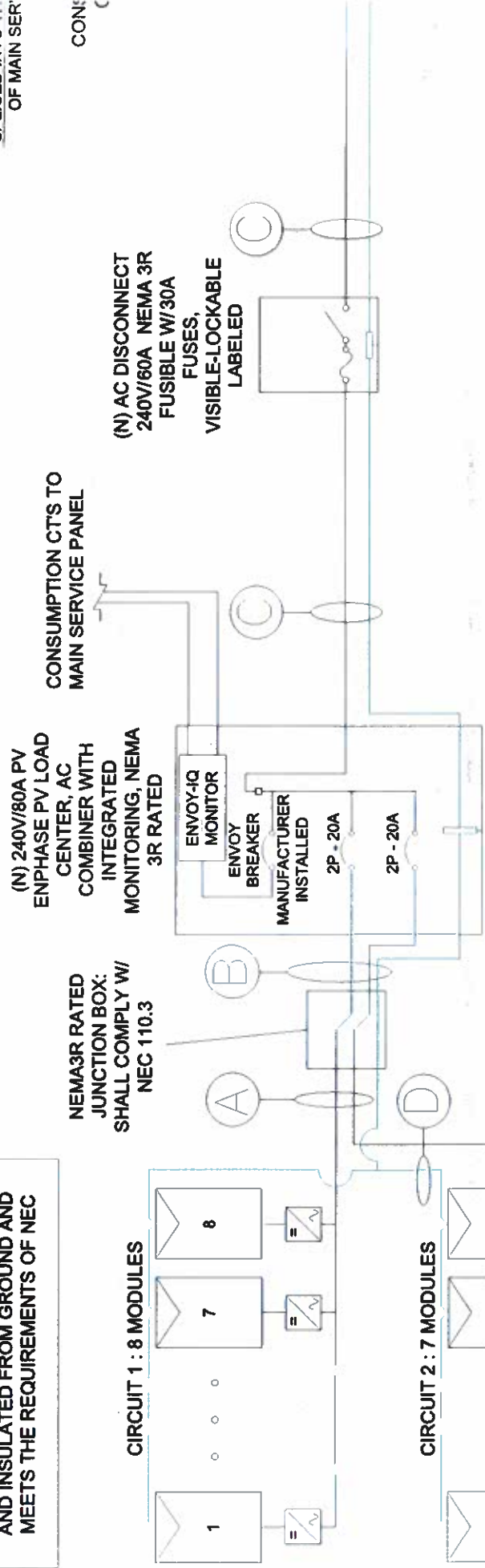
PROPOSED SYSTEM SPECIFICATION

SYSTEM SIZE DC	6 KWP
SYSTEM SIZE AC	300 VA PEAK POWER = 4.5 KWP
SYSTEM SIZE AC	290 VA MAX. CONT. POWER = 4.35 KWP
MODULES USED	(15) CANDIANSOLAR CS6R-400MS-HL
INVERTER USED	(15) ENPHASE IQ8PLUS-72-2-US
BRANCH CIRCUIT	1 CIRCUIT OF 8 MODULES
	1 CIRCUIT OF 7 MODULES
RACKING	ECOFASTEN ROCKIT + DECKMOUNT

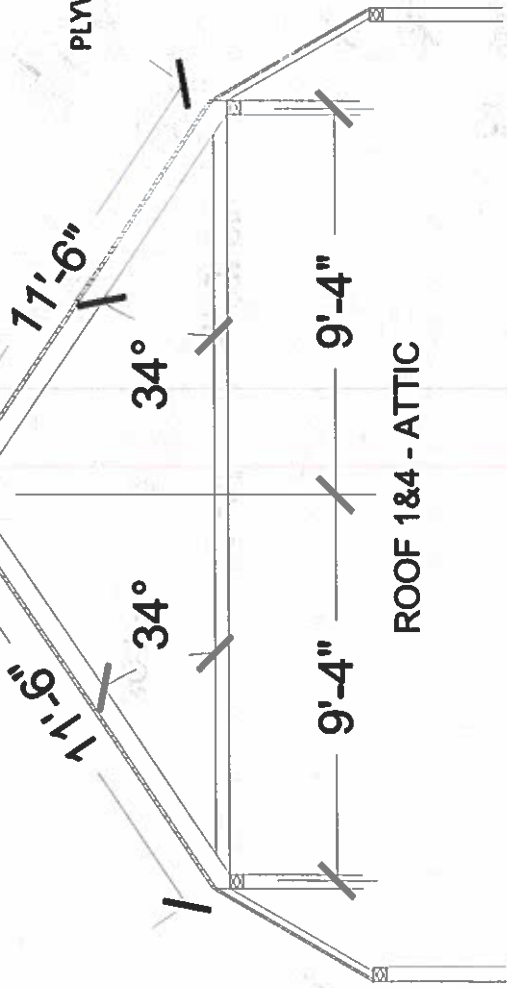
ELECTRICAL SPECIFICATION

SERVICE PANEL	100A MCB WITH 125A BUSBAR
INTERCONNECTION	LINE SIDE TAP
PV OCPD	60A AC DISCONNECT WITH 30A FUSES
WIND SPEED	120 MPH
SNOW LOAD	30 LB/SQ.FT.

THE ENPHASE MICRO-INVERTERS HAVE INTEGRATED GROUND AND DOUBLE INSULATION, SO NO GEC OR EGC IS REQUIRED. THE DC CIRCUIT IS ISOLATED AND INSULATED FROM GROUND AND MEETS THE REQUIREMENTS OF NEC

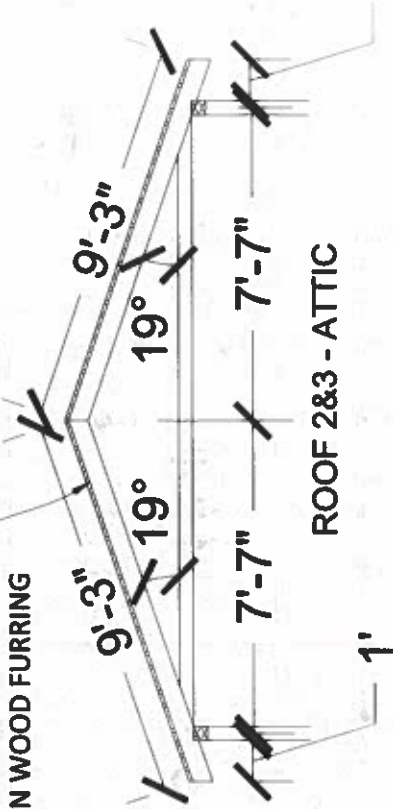


ASPHALT COMPOSITION
SHINGLES OVER 1/2"
PLYWOOD ON WOOD FURRING



ROOF 1&4 - ATTIC

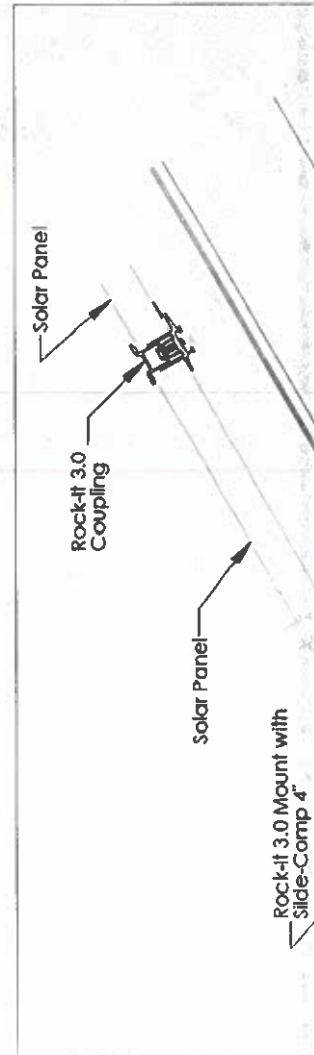
ASPHALT COMPOSITION
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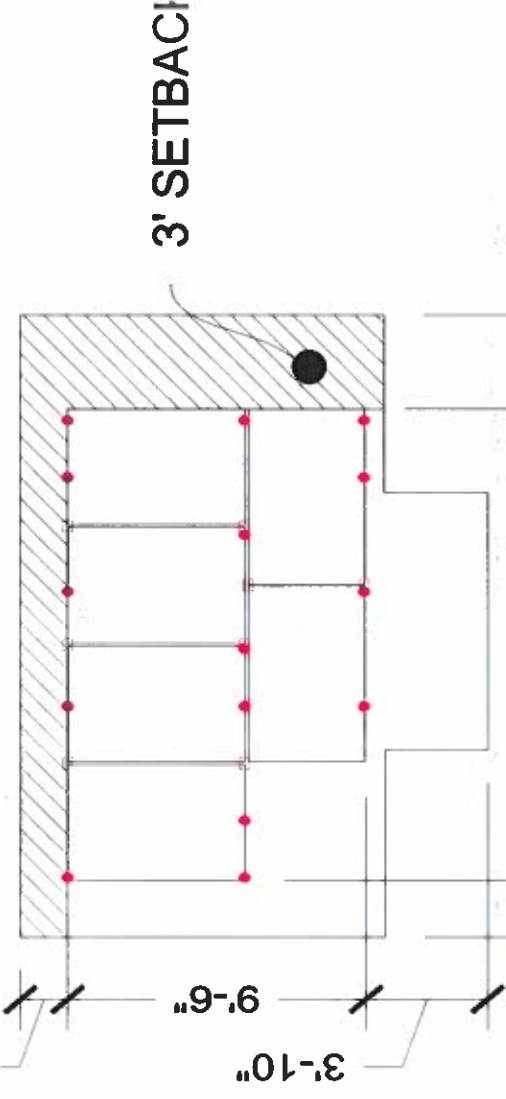
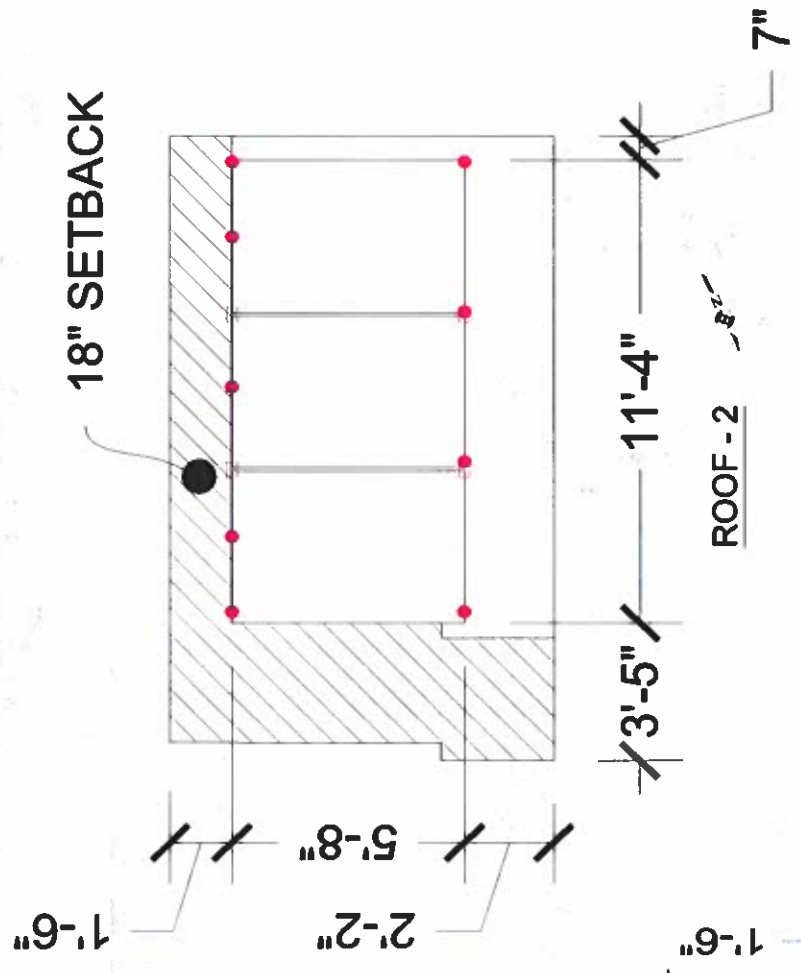
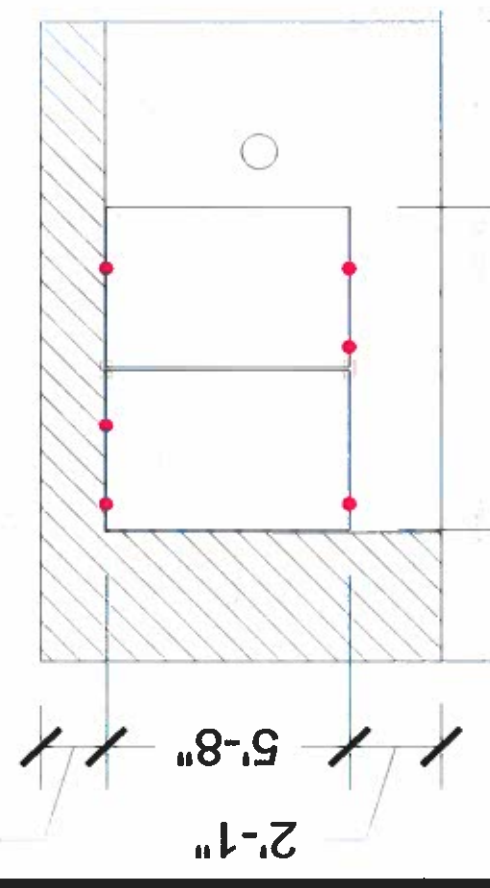
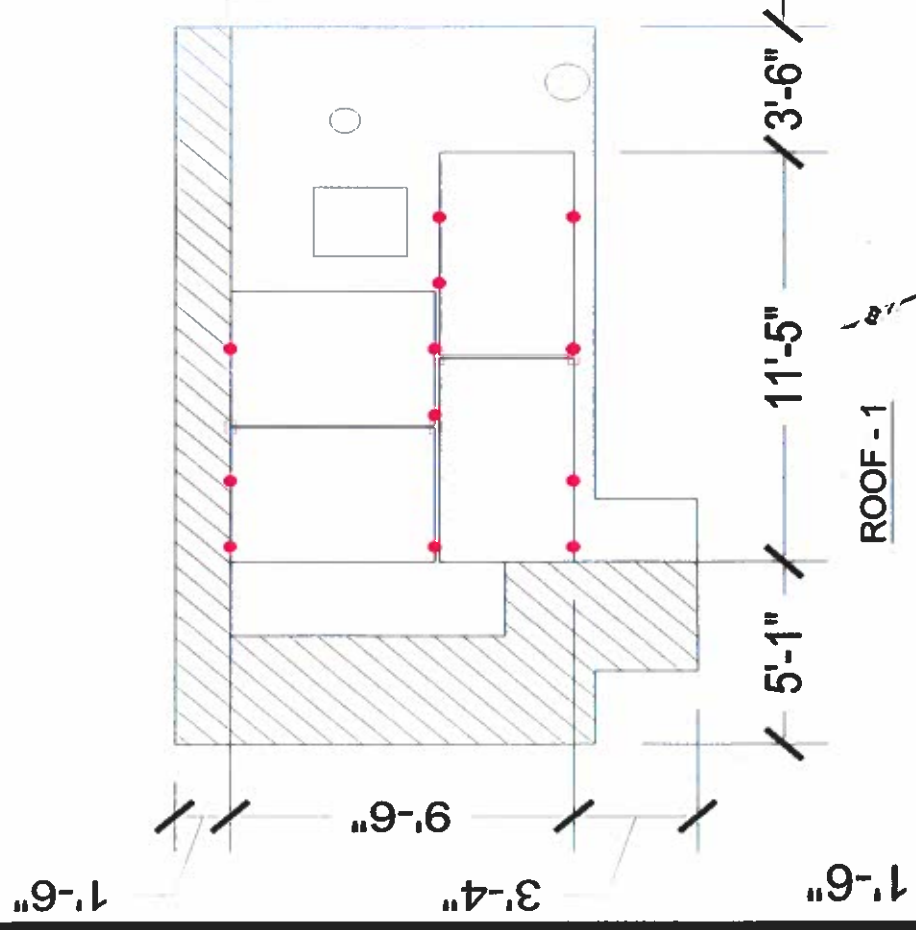


ROOF 2&3 - ATTIC

ATTIC DETAILS

SCALE: NTS





18" SETBACK

3' SETBACK

ROOF - 2

ROOF - 1



ARGYLE AVE

VALLEY ST

WALKWAY

(E) MAIN SERVICE
PANEL (INSIDE)

(E) UTILITY METER
(OUTSIDE)

(N) MAIN SOLAR
FUDED AC
DISCONNECT

(N) ENPHASE IQ
COMBINER PANEL

(N) NEMA 3R RATED
TRNSITION BOX

ROOF 4
ARRAY 4

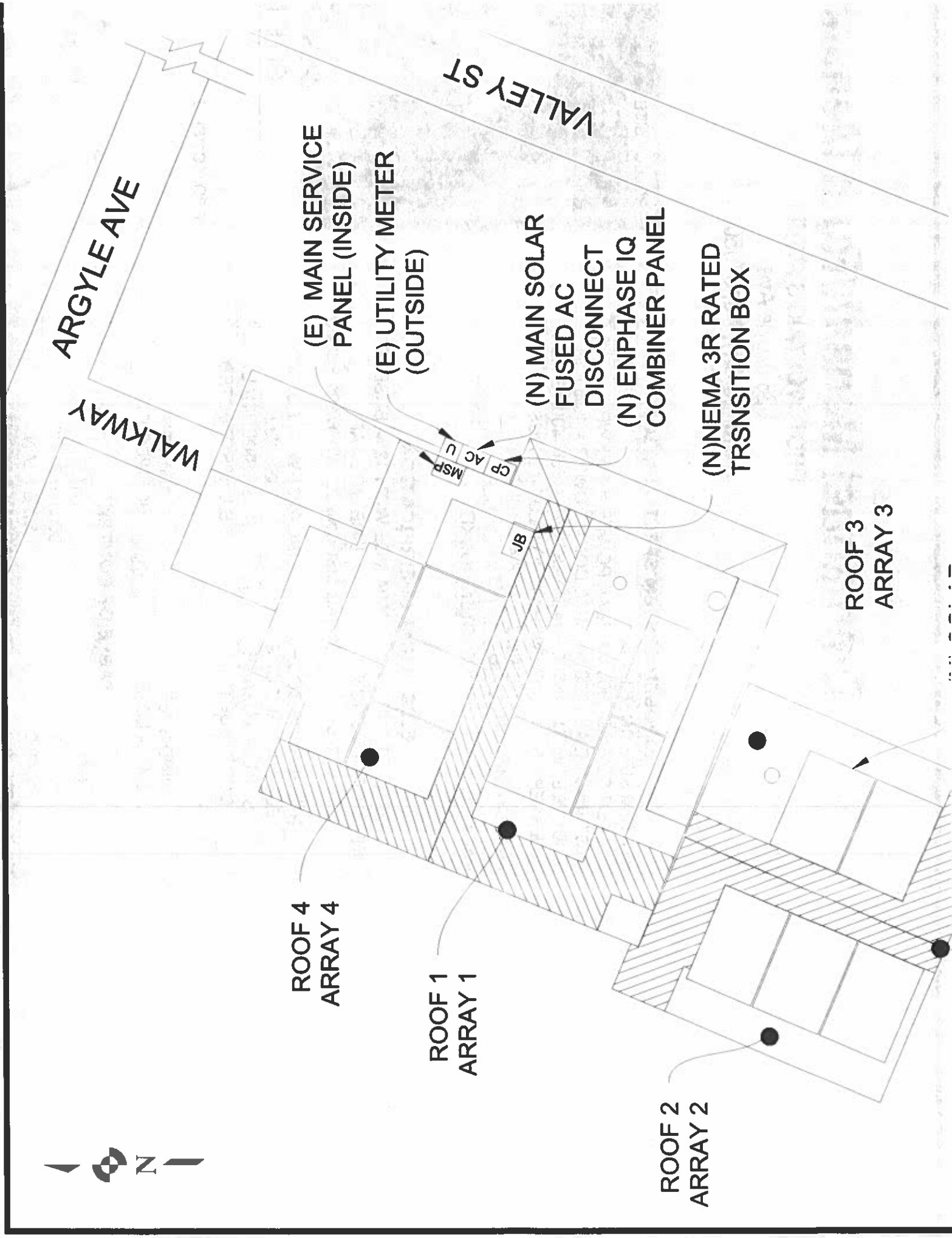
ROOF 1
ARRAY 1

ROOF 2
ARRAY 2

ROOF 3
ARRAY 3

MSP
CP AC U

JB



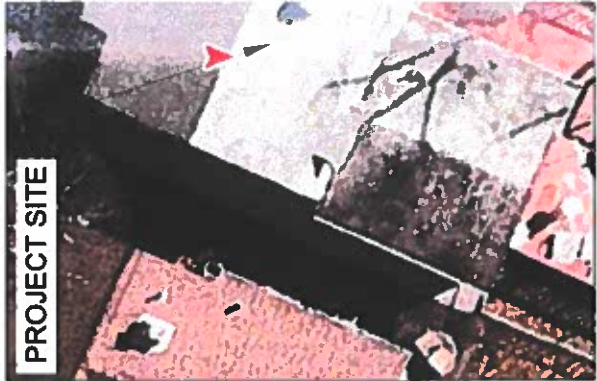
Emmanuel Mensah/Ruth Mensah

PHOTOVOLTAIC SYSTEM

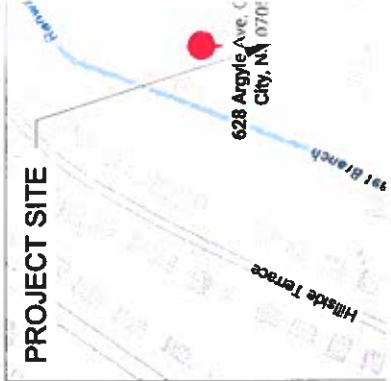
628 Argyle Ave

Orange City, NJ, 07050

PROPOSED SYSTEM SPECIFICATION	
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INVERTER USED	(15) ENPHASE IQ8PLUS-72-2-US
BRANCH CIRCUIT	1 CIRCUIT OF 8 MODULES
	1 CIRCUIT OF 7 MODULES
RACKING	ECOFASTEN ROCKIT



SITE N



ELECTRICAL SPECIFICATION	
SERVICE PANEL	100A MCB WITH 125A BUSBAR
INTERCONNECTION	LINE SIDE TAP
PV OCPD	60A AC DISCONNECT WITH 30A FUSES

REFERENCE CODES	IRC-2021-W/NJ EDITION
ELECTRICAL CODE	NEC-2020
BUILDING USAGE	R - RESIDENTIAL
CONSTRUCTION	5-B UNPROTECTED

WIND SPEED	120 MPH
SNOW LOAD	30 LB/SQ.FT.

TABLE OF CONTENT	
NO.	TITLE
PV - 1.0	COVER PAGE
PV - 2.0	SITE PLAN
PV - 3.0	ARRAY LAYOUT

SOLAR AC DISCONNECT LABELS

AC DISCONNECT

**RAPID SHUTDOWN
SWITCH FOR
SOLAR PV SYSTEM**

UTILITY METER

! WARNING
 DUAL POWER SUPPLY
 SOURCES: UTILITY GRID
 AND PV SOLAR
 ELECTRIC SYSTEM

CONDUIT LABELS

**WARNING: PHOTOVOLTAIC
POWER SOURCE**

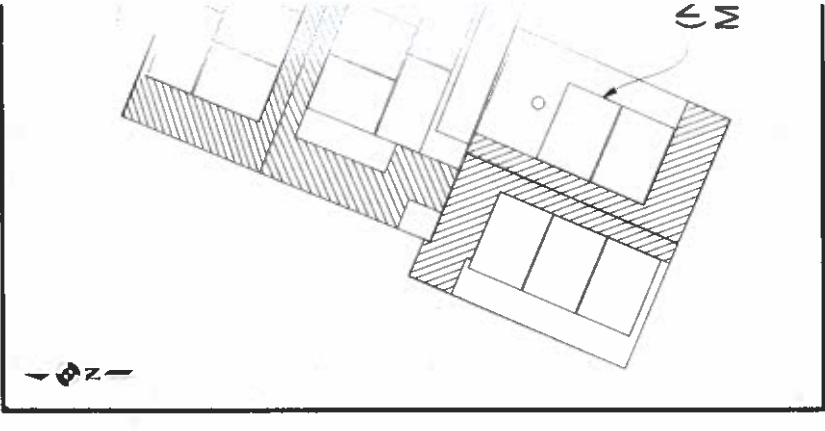
AC COMBINER LABELS

**SOLAR PV SYSTEM
EQUIPPED WITH
RAPID SHUTDOWN**

! WARNING

ELECTRIC SHOCK DANGER

**CAUTION: MULTIPLE
POWER TO THIS BUS
THE FOLLOWING SOURCE**



DIRECTORY LABEL

SERVICE PANEL

PHOTOVOLTAIC
AC DISCONNECT

! WARN

