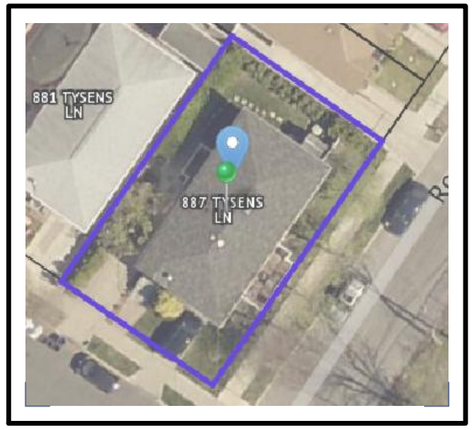
INSTALLATION OF (2) NEW ROOF MOUNTED PV SYSTEMS

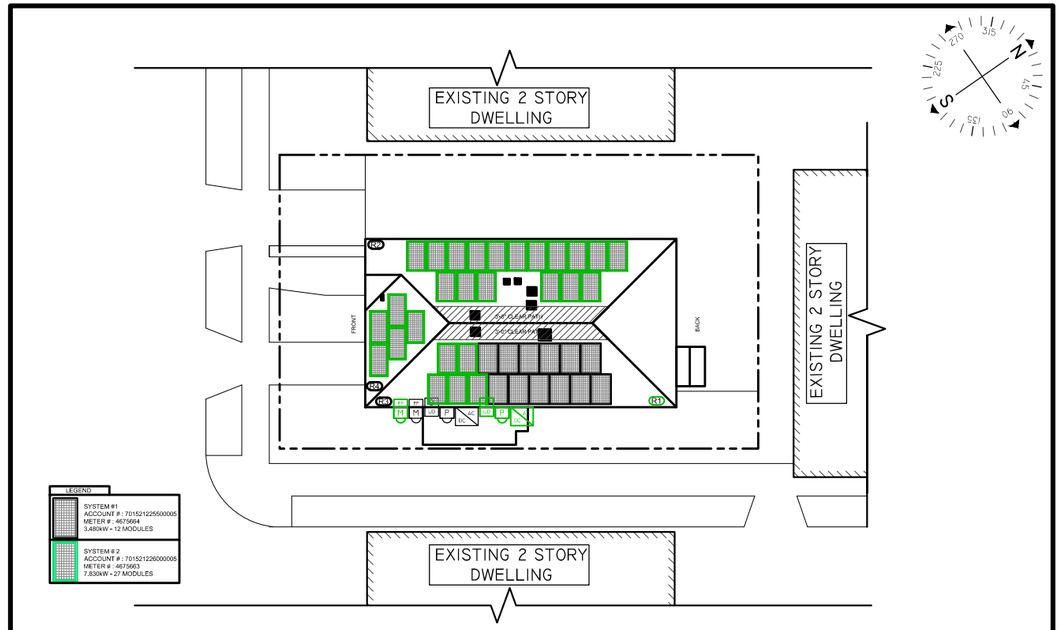
SYSTEM #1 - 3.480kW SYSTEM #2 - 7.830kW

887 TYSENS LANE
STATEN ISLAND, NY 10306
40.558678,-74.106663

VICINITY MAP
SCALE: NTS



SATELLITE VIEW



LOT DIAGRAM
SCALE: 1"=300'

GENERAL NOTES

1. THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EQUIPMENT AND FOLLOWING ALL DIRECTIONS AND INSTRUCTIONS CONTAINED IN THE DRAWING PACKAGE AND INFORMATION RECEIVED FROM TRINITY.
2. THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EQUIPMENT AND FOLLOWING ALL DIRECTIONS AND INSTRUCTION CONTAINED IN THE COMPLETE MANUAL.
3. THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR READING AND UNDERSTANDING ALL DRAWINGS, COMPONENT AND INVERTER MANUALS PRIOR TO INSTALLATION. THE INSTALLATION CONTRACTOR IS ALSO REQUIRED TO HAVE ALL COMPONENT SWITCHES IN THE OFF POSITION AND FUSES REMOVED PRIOR TO THE INSTALLATION OF ALL FUSE BEARING SYSTEM COMPONENTS.
4. ONCE THE PHOTOVOLTAIC MODULES ARE MOUNTED, THE INSTALLATION CONTRACTOR SHOULD HAVE A MINIMUM OF ONE ELECTRICIAN WHO HAS ATTENDED A SOLAR PHOTOVOLTAIC INSTALLATION COURSE ON SITE.
5. FOR SAFETY, IT IS RECOMMENDED THAT THE INSTALLATION CREW ALWAYS HAVE A MINIMUM OF TWO PERSONS WORKING TOGETHER AND THAT EACH OF THE INSTALLATION CREW MEMBERS BE TRAINED IN FIRST AID AND CPR.
6. THIS SOLAR PHOTOVOLTAIC SYSTEM IS TO BE INSTALLED FOLLOWING THE CONVENTIONS OF THE NATIONAL ELECTRICAL CODE. ANY LOCAL CODE WHICH MAY SUPERSEDE THE NEC SHALL GOVERN.
7. ALL SYSTEM COMPONENTS TO BE INSTALLED WITH THIS SYSTEM ARE TO BE "UL" LISTED. ALL EQUIPMENT WILL BE NEMA 3R OUTDOOR RATED UNLESS INDOORS.

GENERAL NOTES CONTINUED

8. THE DC VOLTAGE FROM THE PANELS IS ALWAYS PRESENT AT THE DC DISCONNECT ENCLOSURE AND THE DC TERMINALS OF THE INVERTER DURING DAYLIGHT HOURS. ALL PERSONS WORKING ON OR INVOLVED WITH THE PHOTOVOLTAIC SYSTEM ARE WARNED THAT THE SOLAR MODULES ARE ENERGIZED WHENEVER THEY ARE EXPOSED TO LIGHT.
9. ALL PORTIONS OF THIS SOLAR PHOTOVOLTAIC SYSTEM SHALL BE MARKED CLEARLY IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE ARTICLE 690 & 705.
10. PRIOR TO THE INSTALLATION OF THIS PHOTOVOLTAIC SYSTEM, THE INSTALLATION CONTRACTOR SHALL ATTEND A PRE-INSTALLTION MEETING FOR THE REVIEW OF THE INSTALLATION PROCEDURES, SCHEDULES, SAFETY AND COORDINATION.
11. PRIOR TO THE SYSTEM START UP THE INSTALLATION CONTRACTOR SHALL ASSIST IN PERFORMING ALL INITIAL HARDWARE CHECKS AND DC WIRING CONDUCTIVITY CHECKS.
12. FOR THE PROPER MAINTENANCE AND ISOLATION OF THE INVERTERS REFER TO THE ISOLATION PROCEDURES IN THE OPERATION MANUAL.
13. THE LOCATION OF PROPOSED ELECTRIC AND TELEPHONE UTILITIES ARE SUBJECT TO FINAL APPROVAL OF THE APPROPRIATE UTILITY COMPANIES AND OWNERS.
14. ALL MATERIALS, WORKMANSHIP AND CONSTRUCTION FOR THE SITE IMPROVEMENTS SHOWN HEREIN SHALL BE IN ACCORDANCE WITH:
    A) CURRENT PREVAILING MUNICIPAL AND/OR COUNTY SPECIFICATIONS, STANDARDS AND REQUIREMENTS

GENERAL NOTES CONTINUED

14. B) CURRENT PREVAILING UTILITY COMPANY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS
15 THIS SET OF PLANS HAVE BEEN PREPARED FOR THE PURPOSE OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DRAWINGS UNTIL REVISED TO INDICATE "ISSUED FOR CONSTRUCTION".
16 ALL INFORMATION SHOWN MUST BE CERTIFIED PRIOR TO USE FOR CONSTRUCTION ACTIVITIES.

NOTES

1. PV INSTALLATION TO COMPLY WITH ARTICLE 690 OF THE NEC.
2. PV INSTALLATION TO COMPLY WITH NYSERDA REQUIREMENTS.
3. PV INSTALLATION TO COMPLY WITH NEW YORK STAT STANDARDIZED INTERCONNECTION REQUIREMENTS.

2008 NOTES

1. PV INSTALLATION TO COMPLY WITH NYC ELECTRIC CODE 2011.

PLAN NOTES

1. SCOPE OF WORK IS SOLEY FOR THE INSTALLATION OF THE SOLAR ELECTRONIC GENERATING SYSTEM. ALL OTHER WORK IS NOT TO BE RELIED UPON AS BEING APPROVED AND/OR PERMITTED BY THE DOB

SPECIAL INSPECTIONS:

STRUCTURAL
STABILITY
FIRE STOP

PROGRESS INSPECTIONS:

ENERGY CODE COMPLIANCE
FINAL INSPECTION
VISUAL AIR SEALING

TENANT SAFETY NOTES

1. CONSTRUCTION WORK WILL BE CONFINED TO THE ROOF / OUTSIDE & WILL NOT CREATE DUST, DIRT OR OTHER INCONVENIENCES TO NEIGHBORING PROPERTIES OR APARTMENT UNITS WITHIN THE BUILDING.
2. CONSTRUCTION WORK WILL NOT BLOCK HALLWAYS OR MEANS OF EGRESS FOR NEIGHBORING PROPERTIES OR TENANTS OF THE BUILDING.
3. CONSTRUCTION WORK WILL NOT INVOLVE INTERRUPTION OF HEATING, WATER OR ELECTRIC SERVICES TO NEIGHBORING PROPERTIES OR TENANTS OF THE BUILDING.
4. CONSTRUCTION WORK WILL BE CONFINED TO NORMAL WORKING HOURS, 8AM - 5PM MONDAY THRU FRIDAY EXCEPT LEGAL HOLIDAYS.

TENANT PROTECTION PLAN

SPECIAL PRECAUTION SHALL BE TAKEN BY THE CONTRACTOR SO THAT EQUIPMENT ON THIS APPLICATION AND ITS INSTALLATION WILL NOT AFFECT THE FALLOWING:

A. TENANT EGRESS TO AND FROM THE BUILDING.
B. FIRE SAFETY, OR CREATE A FIRE HAZARD.
C. STRUCTURAL SAFETY OF THE BUILDING
D. ACCUMULATION OF DUST. THE CONTRACTOR SHALL LEAVE THE WORK SITE BROOM CLEAN EACH DAY. IN THE EVENT THAT ASBESTOS IS FOUND ON THE JOBSITE, ITS REMOVAL SHALL TAKE PLACE IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS OF O.S.H.A SECTION 1901.1, INCLUDING STAT AND FEDERAL DUMPING GROUNDS
E. THERE SHALL BE NO CREATION OF NOISE OUTSIDE THE NORMAL HOURS OF 8AM TO 5PM MONDAY THRU FRIDAY EXCEPT LEGAL HOLIDAYS

ABBREVIATIONS

AMP	AMPERE
AC	ALTERNATING CURRENT
AL	ALUMINUM
AF	AMP. FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AWG	AMERICAN WIRE GAUGE
C	CONDUIT (GENERIC TERM OF RACEWAY, PROVIDE AS SPECIFIED)
CB	COMBINER BOX
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DISC	DISCONNECT SWITCH
DWG	DRAWING
EC	ELECTRICAL SYSTEM INSTALLER
EMT	ELECTRICAL METALLIC TUBING
FS	FUSIBLE SWITCH
FU	FUSE
GND	GROUND
GFI	GROUND FAULT INTERRUPTER
HZ	FREQUENCY (CYCLES PER SECOND)

ABBREVIATIONS CONTINUED

JB	JUNCTION BOX
kCMIL	THOUSAND CIRCULAR MILS
kVA	KILO-VOLT AMPERE
kW	KILO-WATT
kWH	KILO-WATT HOUR
L	LINE
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUG ONLY
MTD	MOUNTED
MTG	MOUNTING
N	NEUTRAL
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NO #	NUMBER
NTS	NOT TO SCALE
OCP	OVER CURRENT PROTECTION
P	POLE
PB	PULL BOX
PH ∅	PHASE
PVC	POLY-VINYL CHLORIDE CONDUIT
PWR	POWER
QTY	QUANTITY
RGS	RIGID GALVANIZED STEEL
SN	SOLID NEUTRAL

ABBREVIATIONS CONTINUED

JSWBD	SWITCHBOARD
TYP	TYPICAL
U.O.I.	UNLESS OTHERWISE INDICATED
WP	WEATHERPROOF
XFMR	TRANSFORMER
+72	MOUNT 72 INCHES TO BOTTOM OF ABOVE FINISHED FLOOR OR GRADE

DRAWING INDEX

DEPARTMENT OF BUILDING NOTES

NYC FC504 EXEMPT - PITCH GREATER THAN 5/12
BC 109.3.3
RCNY 5000-01 (H) (IA6) IIA6)
28-116.2.4.2 AND DIRECTIVE 14 OF 1975
RCNY 101-10

PLAN NOTES

1. SCOPE OF WORK IS SOLEY FOR THE INSTALLATION OF THE SOLAR ELECTRONIC GENERATING SYSTEM. ALL OTHER WORK IS NOT TO BE RELIED UPON AS BEING APPROVED AND/OR PERMITTED BY THE DOB

ENERGY ANALYSIS FOR RESIDENTIAL PROPERTY TAX ABATEMENT				
APPLICATION TYPE: ALT-2	SCOPE OF WORK: INSTALL NEW ROOF MOUNTED SOLAR ELECTRICITY (PV-PHOTOVOLTAIC) GENERATING SYSTEM			
CLIMATE ZONE: 4A	NYCECC CHAPTER R4 (RESIDENTIAL ENERGY EFFICIENCY)			
I CERTIFY THAT ANY BUILDING CONSTRUCTION ASSOCIATED WITH THE INSTALLATION OF THE SOLAR ELECTRIC GENERATING SYSTEM, OTHER THAN THAT SHOWN IN THIS ENERGY ANALYSIS, HAS BEEN INCLUDED IN AN ASSOCIATED PLAN APPROVAL AND WORK PERMIT APPLICATION:				
ITEM DESCRIPTION:	PROPOSED VALUE:	PRESCRIPTIVE VALUE AND CITATION:	SUPPORTING DOCUMENTATION:	PROGRESS INSPECTION NUMBER AND DESCRIPTION:
ANCHOR SOLAR ELECTRIC SUPPORTING STRUCTURE TO BUILDING STRUCTURE BY BOLTING TO STRUCTURAL MEMBERS, AND SHOWN ON DRAWINGS	SEALING ALL OPENINGS AND PENETRATIONS AS PRESCRIBED IN SECTION ECC R402.4.2 AND ECC TABLE R402.4.2	CAULKING, GASKETING, WEATHERSTRIPPING OR OTHER MATERIALS IN ACCORDANCE WITH SECTION ECC R402.4.1	S-001.00 SOLAR PANEL ANCHORAGE DETAILS AND NOTES	A6: AIR SEALING- VISUAL INSPECTION OPTION: VISUAL INSPECTION OF OPENINGS AND PENETRATIONS IN THE BUILDING ENVELOPE TO VERIFY THAT THEY ARE PROPERLY SEALED, IN ACCORDANCE WITH ECC TABLE R402.4.2, SECTION ECC R402.4 AND APPROVED DRAWINGS

* THE WORK PROPOSED IN THIS APPLICATION IS COMPLIANT WITH THE ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK CITY
* TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK CITY 2010

NYC DEPT OF BUILDING APPROVAL STAMP

Engineer:

Issued / Revisions

NO.	DESCRIPTION	DATE
P1	ISSUED TO TOWNSHIP FOR PERMIT	11/1/2017

Project Title:
O'BRIEN, WILLIAM AND MARY
TRINITY ACCT #:
2017-10-196879/2017-10-197153

Project Address:
887 TYSENS LANE
STATEN ISLAND, NY 10306
40.558678,-74.106663

Drawing Title:
COVER SHEET

Drawing Information

DRAWING DATE:	11/1/2017
DRAWN BY:	JC / DMR
REVISED BY:	

System Information:

DC SYSTEM SIZE:	11.31kW
AC SYSTEM SIZE:	9kW
TOTAL MODULE COUNT:	39
MODULES USED:	HANWHA 290
MODULE SPEC #:	Q.PEAK-BLK G4.1 290
UTILITY COMPANY:	CON EDISON
UTILITY ACCT #:	SEE LAYOUT
UTILITY METER #:	SEE LAYOUT
DEAL TYPE:	SUNNOVA

DWG No:
T-001.00
PAGE: 1 OF 6

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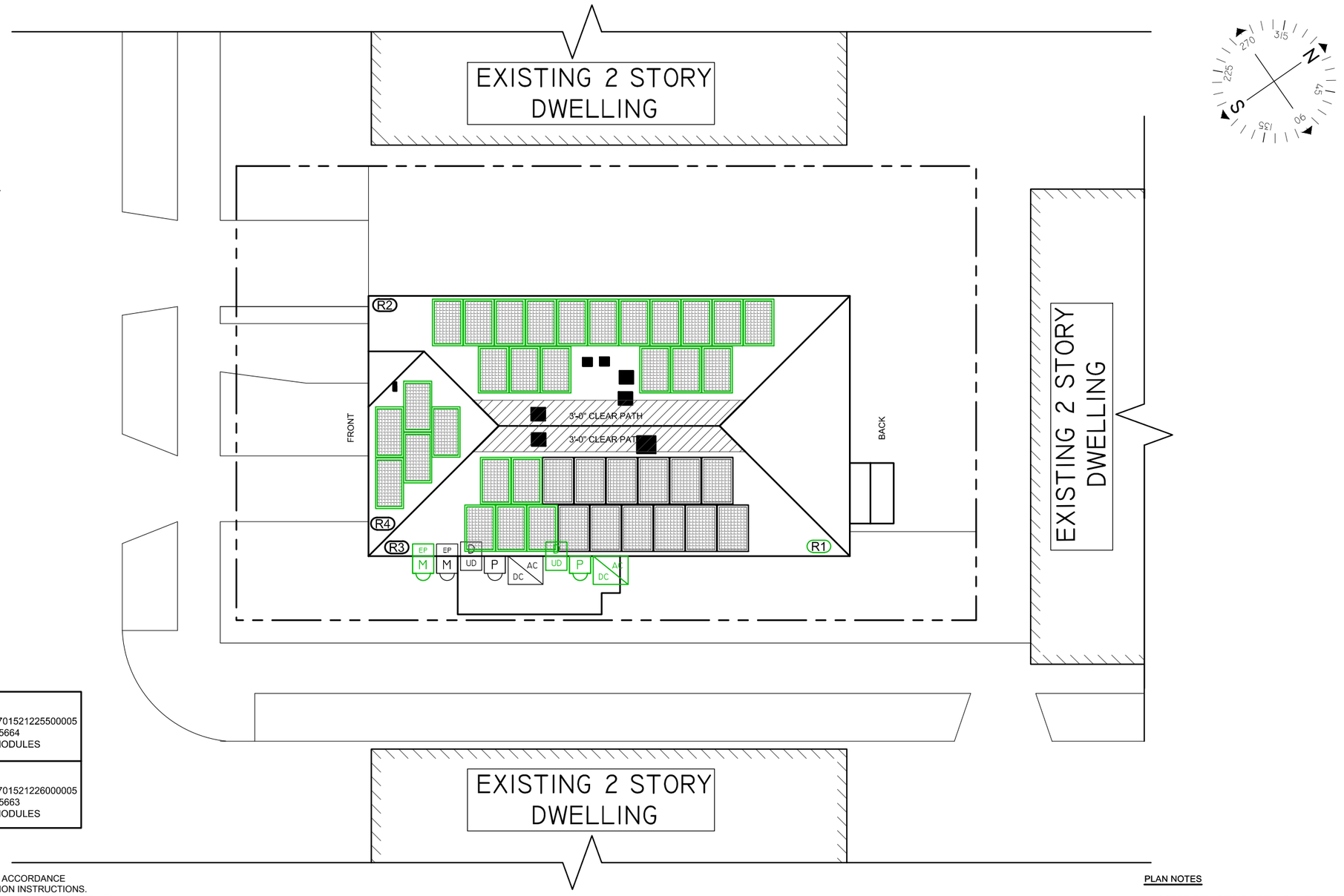
SIZE OF EXISTING RAFTER: 2" x 8"
RAFTER SPACING: 16" o.c.
ROOF PITCH R1: 23 ° (ASPHALT SHINGLE)
ROOF PITCH R2: 23 ° (ASPHALT SHINGLE)
ROOF PITCH R3: 23 ° (ASPHALT SHINGLE)
ROOF PITCH R4: 23 ° (ASPHALT SHINGLE)
ADDITIONAL SUPPORT PROVIDED: NO
THE EXISTING ROOF RAFTERS AT THIS RESIDENCE CAN ADEQUATELY SUPPORT THE PROPOSED SOLAR PV PANEL ASSEMBLY (4.3 LBS. PSF) AND THE SNOW LOADS (16 LBS. PSF). IN ADDITION, THE 3" STAINLESS STEEL LAG SCREWS INSTALLED AT 4' o.c. MEET THE UPLIFT REQUIREMENTS OF 4 SCREW MINIMUM PER ASSEMBLY, 6 SCREWS ARE PROVIDED. THIS INSTALLATION MEETS THE REQUIREMENTS OF THE RESIDENTIAL CODE OF NEW YORK STATE AND HAS BEEN FOUND TO BE ACCEPTABLE BY MY OFFICE.



LEGEND

SYSTEM #1
ACCOUNT # : 701521225500005
METER # : 4675664
3.480kW - 12 MODULES

SYSTEM # 2
ACCOUNT # : 701521226000005
METER # : 4675663
7.830kW - 27 MODULES

NOTES:
1.) ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2.) ARRAY BONDING TO COMPLY WITH MANUFACTURER SPECIFICATION.
3.) ALL LOCATIONS ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION.
4.) AN AC DISCONNECT SHALL BE GROUPED WITH INVERTER (S) NEC 690.13 (E).
5.) ALL OUTDOOR EQUIPMENT SHALL BE RAIN TIGHT WITH MINIMUM NEMA 3R RATING.
6.) ROOFTOP SOLAR INSTALLATION ONLY PV ARRAY SHALL NOT EXTEND BEYOND THE EXISTING ROOF EDGE.

PLAN NOTES

1. SCOPE OF WORK IS SOLEY FOR THE INSTALLATION OF THE SOLAR ELECTRONIC GENERATING SYSTEM. ALL OTHER WORK IS NOT TO BE RELIED UPON AS BEING APPROVED AND/OR PERMITTED BY THE DOB

ARRAY SCHEDULE
R1 ARRAY ORIENTATION = 125° MODULE PITCH = 23°
R2 ARRAY ORIENTATION = 305° MODULE PITCH = 23°
R3 ARRAY ORIENTATION = 125° MODULE PITCH = 23°
R4 ARRAY ORIENTATION = 215° MODULE PITCH = 23°

SYMBOL LEGEND			
R1	INDICATES ROOF DESIGNATION . REFER TO ARRAY SCHEDULE FOR MORE INFORMATION	UD	INDICATES NEW UTILITY DISCONNECT TO BE INSTALLED OUTSIDE
M	INDICATES EXISTING METER LOCATION		INDICATES NEW PV SOLAR MODULE. RED MODULES INDICATE PANELS THAT USE MICRO INVERTERS. REFER TO EQUIPMENT SCHEDULE FOR SPECS.
EP	INDICATES EXISTING ELECTRICAL PANEL LOCATION: IN GARAGE	P	INDICATES NEW PRODUCTION METER TO BE INSTALLED OUTSIDE.
D	INDICATES NEW MAIN DISCONNECT	DC / AC	INDICATES NEW INVERTER TO BE INSTALLED OUTSIDE. REFER TO EQUIPMENT SCHEDULE FOR SPECS.

PLUMBING SCHEDULE

EQUIPMENT SCHEDULE	
QTY	SPEC #
39	HANWHA 290 (Q.PEAK-BLK G4.1 290)
1	SE3000H-US000NNC2
1	SE6000H-US000NNC2

NYC DEPT OF BUILDING APPROVAL STAMP

Engineer:

Issued / Revisions

NO.	DESCRIPTION	DATE
P1	ISSUED TO TOWNSHIP FOR PERMIT	11/1/2017

Project Title:
O'BRIEN, WILLIAM AND MARY
TRINITY ACCT #:
2017-10-196879/2017-10-197153

Project Address:
887 TYSENS LANE
STATEN ISLAND, NY 10306
40.558678,-74.106663

Drawing Title:
ROOF LAYOUT

Drawing Information

DRAWING DATE:	11/1/2017
DRAWN BY:	JC / DMR
REVISED BY:	

System Information:

DC SYSTEM SIZE:	11.31kW
AC SYSTEM SIZE:	9kW
TOTAL MODULE COUNT:	39
MODULES USED:	HANWHA 290
MODULE SPEC #:	Q.PEAK-BLK G4.1 290
UTILITY COMPANY:	CON EDISON
UTILITY ACCT #:	SEE LAYOUT
UTILITY METER #:	SEE LAYOUT
DEAL TYPE:	SUNNOVA

DWG No.
S-001.00
PAGE: 2 OF 6

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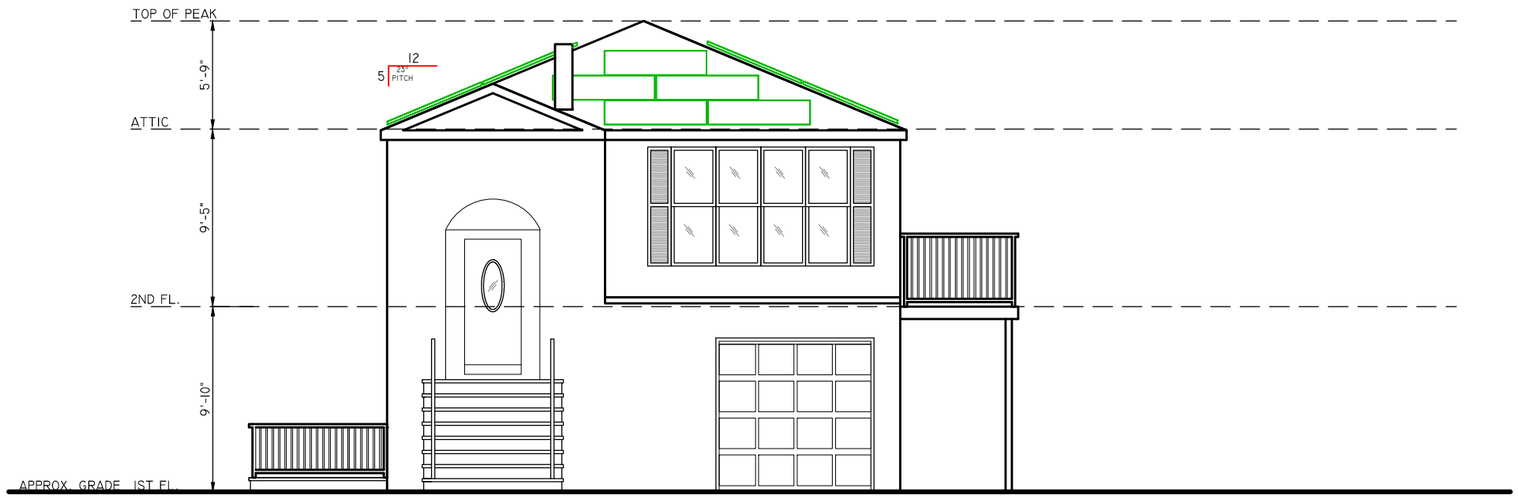
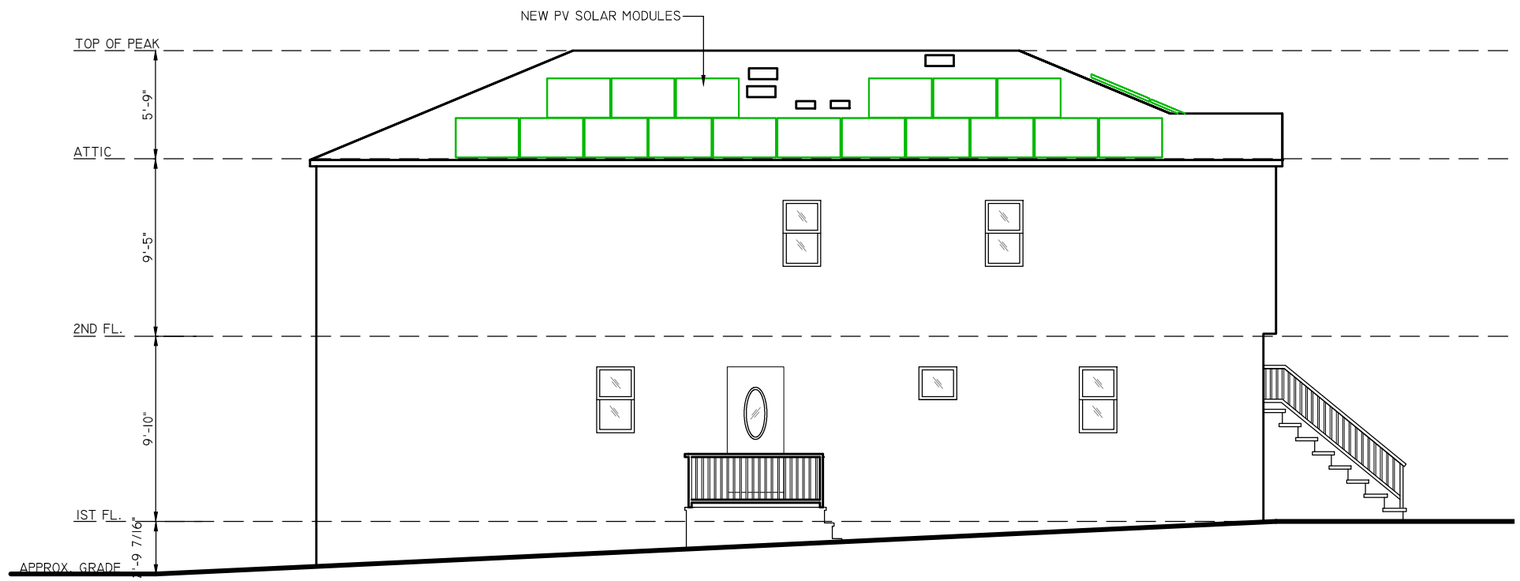


SOUTH ELEVATION
SCALE: 1/8"=1'-0"



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

PLAN NOTES

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NYC DEPT OF BUILDING APPROVAL STAMP

Engineer:

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TRINITY ACCT #:
2017-10-196879/2017-10-197153

Project Address:

887 TYSENS LANE
STATEN ISLAND, NY 10306
40.558678,-74.106663

Drawing Title:

ELEVATION DRAWING

Drawing Information

DRAWING DATE:	11/1/2017
DRAWN BY:	JC / DMR
REVISED BY:	

System Information:

DC SYSTEM SIZE:	11.31kW
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MODULE SPEC #:	Q.PEAK-BLK G4.1 290
UTILITY COMPANY:	CON EDISON
UTILITY ACCT #:	SEE LAYOUT
UTILITY METER #:	SEE LAYOUT
DEAL TYPE:	SUNNOVA

DWG No.

S-002.00

PAGE: 3 OF 6

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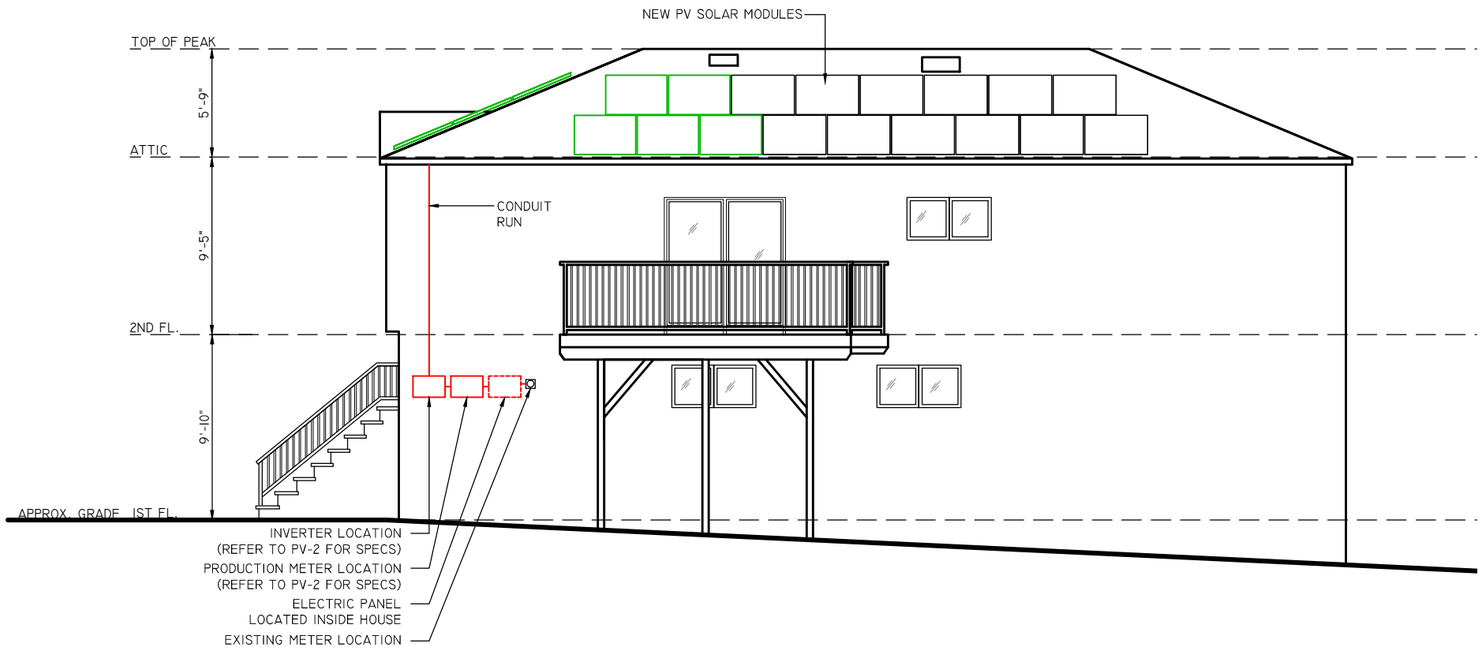
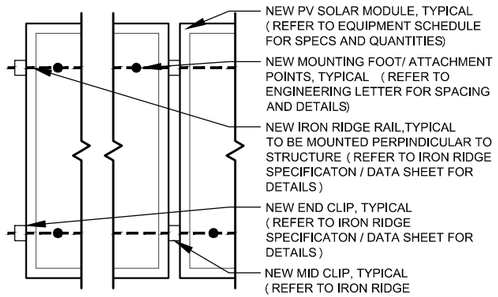
ZR 23-62 (m) - PANEL PLACEMENT COMPLIES WITH ALL SECTIONS OF ZR 23-62 (m)

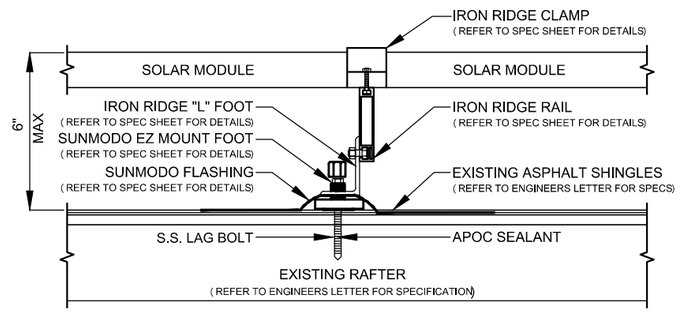


EAST ELEVATION
SCALE: 1/8"=1'-0"

NOTES : *REFER TO MODULE SPECS FOR MODULE DIMENSIONS
*DEPICTED MODULES MAY BE PORTRAIT OR LANDSCAPE



ATTACHMENT & CLIP DETAIL
SCALE: NOT TO SCALE



PV MODULE ATTACHMENT ON ASPHALT SHINGLE ROOF
SCALE: NOT TO SCALE

PLAN NOTES

1. SCOPE OF WORK IS SOLEY FOR THE INSTALLATION OF THE SOLAR ELECTRONIC GENERATING SYSTEM. ALL OTHER WORK IS NOT TO BE RELIED UPON AS BEING APPROVED AND/OR PERMITTED BY THE DOB

NYC DEPT OF BUILDING APPROVAL STAMP

Engineer:

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TRINITY ACCT #:
2017-10-196879/2017-10-197153

Project Address:

887 TYSENS LANE
STATEN ISLAND, NY 10306
40.558678,-74.106663

Drawing Title:

ELEVATION DRAWING

Drawing Information

DRAWING DATE:	11/1/2017
DRAWN BY:	JC / DMR
REVISED BY:	

System Information:

DC SYSTEM SIZE:	11.31kW
AC SYSTEM SIZE:	9kW
TOTAL MODULE COUNT:	39
MODULES USED:	HANWHA 290
MODULE SPEC #:	Q.PEAK-BLK G4.1 290
UTILITY COMPANY:	CON EDISON
UTILITY ACCT #:	SEE LAYOUT
UTILITY METER #:	SEE LAYOUT
DEAL TYPE:	SUNNOVA

DWG No.

S-003.00

PAGE: 4 OF 6

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ARRAY CIRCUIT WIRING NOTES

1.) LICENSED ELECTRICIAN ASSUMES ALL RESPONSIBILITY FOR DETERMINING ONSITE CONDITIONS AND EXECUTING INSTALLATION IN ACCORDANCE WITH NEC 2014

2.) LOWEST EXPECTED AMBIENT TEMPERATURE BASED ON ASHRAE MINIMUM MEAN EXTREME DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. LOWEST EXPECTED AMBIENT TEMP = **-16°C**

3.) HIGHEST CONTINUOUS AMBIENT TEMPERATURE BASED ON ASHRAE HIGHEST MONTH 2% DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. HIGHEST CONTINUOUS TEMP = **33°C**

4.) 2005 ASHRAE FUNDAMENTALS 2% DESIGN TEMPERATURES DO NOT EXCEED 47°C IN THE UNITED STATES (PALM SPRINGS, CA IS 44.1°C). FOR LESS THAN 9 CURRENT-CARRYING CONDUCTORS IN A 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)

5.) PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION THAT CONTROLS SPECIFIC CONDUCTORS IN ACCORDANCE WITH NEC 690.12(1) THROUGH (5)

6.) PHOTOVOLTAIC POWER SYSTEMS SHALL BE PERMITTED TO OPERATE WITH UNGROUNDED PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUIT AS PER **NEC 690.35**

7.) UNGROUNDED DC CIRCUIT CONDUCTORS SHALL BE IDENTIFIED WITH THE FOLLOWING OUTER FINISH:
POSITIVE CONDUCTORS = RED
NEGATIVE CONDUCTORS = BLACK
NEC 210.5(C)(2)

8.) ARRAY AND SUB ARRAY CONDUCTORS SHALL BE #10 PV WIRE TYPE RHW-2 OR EQUIVELANT AND SHALL BE PROTECTED BY CONDUIT WHERE EXPOSED TO DIRECT SUNLIGHT. SUB ARRAY CONDUIT LONGER THAN 24" SHALL CONTAIN ≤ 20 CURRENT CARYING CONDUCTORS AND WHERE EXPOSED TO DIRECT SUNLIGHT SHALL CONTAIN ≤ 9 CURRENT CARRYING CONDUCTORS.

9.) ALL WIRE LENGTHS SHALL BE LESS THAN 100' UNLESS OTHERWISE NOTED

10.) FLEXIBLE CONDUIT SHALL NOT BE INSTALLED ON ROOFTOP AND SHALL BE LIMITED TO 12" IF USED OUTDOORS

11.)OVERCURRENT PROTECTION FOR CONDUCTORS CONNECTED TO THE SUPPLY SIDE OF A SERVICE SHALL BE LOCATED WITHIN 10' OF THE POINT OF CONNECTION NEC 705.31

12.) WHERE TWO SOURCES FEED A BUSSBAR, ONE A UTILITY AND THE OTHER AN INVERTER, PV BACKFEED BREAKER(S) SHALL BE LOCATED OPPOSITE FROM UTILITY **NEC 705.12(D)(2)(3)(b)**

13.) ALL SOLAR SYSTEM LOAD CENTERS TO CONTAIN ONLY GENERATION CIRCUITS AND NO UNUSED POSITIONS OR LOADS

14.) ALL EQUIPMENT INSTALLED OUTDOORS SHALL HAVE A **NEMA 3R** RATING

CALCULATIONS FOR CURRENT CARRYING CONDUCTORS
REQUIRED CONDUCTOR AMPACITY PER STRING
[**NEC 690.8(B)(1)**]: (10.00*1.25)1 = 18.75A

AWG #10, DERATED AMPACITY
AMBIENT TEMP: 33°C, TEMP DERATING FACTOR: .96
RACEWAY DERATING = 2 CCC: 1.00
(40*.96)1.00 = 38.40A

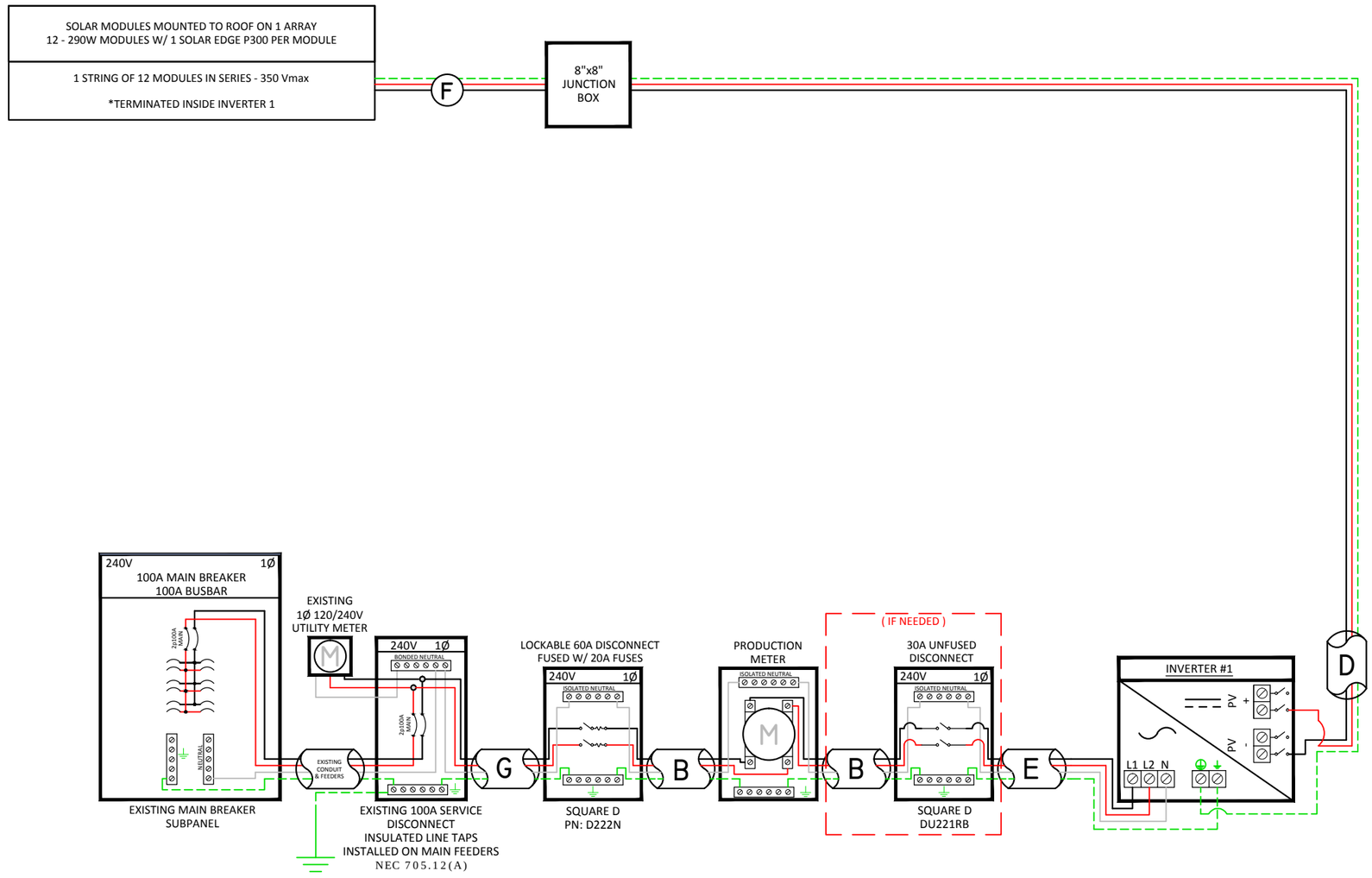
38.40A ≥ 18.75A, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY
12.50A*1.25 = 15.63A

AWG #10, DERATED AMPACITY
AMBIENT TEMP: 30°C, TEMP DERATING: 1.0
RACEWAY DERATING ≤ 3 CCC: N/A
40A*1.0 = 40A

40A ≥ 15.63A, THEREFORE AC WIRE SIZE IS VALID

CALCULATION FOR PV OVERCURRENT PROTECTION
TOTAL INVERTER CURRENT: 12.50A
12.50A*1.25 = 15.63A
--> 20A OVERCURRENT PROTECTION IS VALID



PV MODULE SPECIFICATIONS	
HANWHA 290 (Q.PEAK-BLK G4.1 290)	
Imp	9.07
Vmp	31.96
Voc	39.19
Isc	9.56

INVERTER #1 - SE3000H-US000NNC2			
DC		AC	
Imp	8.5	Pout	3000
Vmp	380	Imax	12.5
Voc	480	OCPDmin	15.625
Isc	15	Vnom	240

FC 504.4.7 - ALL CONDUITS AND PIPING INSTALLATIONS SHALL BE COLOR-CODED WITH CONTINUOUS, DURABLE, AND WEATHERPROOF REFLECTIVE OR LUMINESCENT MARKINGS AS FOLLOWS, AND FOR CONDUIT AND PIPING INSTALLED AFTER JULY 1, 2014, SHALL BE CONTINUOUSLY LABELED IN AN APPROVED MANNER TO INDICATES ITS CONTENTS:

1. HIGH VOLTAGE WIRING - RED
2. LOW VOLTAGE WIRING - ORANGE
3. NATURAL GAS PIPING - YELLOW

FC 512.4.2 - INDOOR AND OUTDOOR DIRECT CURRENT CONDUIT, ENCLOSURE, RACEWAYS, CABLE ASSEMBLIES, JUNCTION BOXES, COMBINER BOXES, AND MAIN SERVICE AND OTHER DISCONNECTS SHALL HAVE DURABLE, RETOREFLECTIVE, AND, IF OUTDOORS, WEATHERPROOF, MARKINGS, IN WHITE CAPITAL LETTERS WITH A HEIGHT OF NOT LESS THAN 3/8 INCH (9.5 MM) ON A RED BACKGROUND, READING "WARNING: PHOTOVOLTAIC POWER SOURCE."

NOTE: CONDUIT TYPE SHALL BE CHOSEN BY THE INSTALLATION CONTRACTOR TO MEET OR EXCEED NEC AND LOCAL AHJD REQUIREMENTS

A	#6 THWN-2 GEC TO EXISTING GROUND ROD
B	1" CONDUIT W/ 3-#10 THWN-2, 1-#10 THWN-2 GROUND
C	1" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2 GROUND
D	1" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2 GROUND
E	1" CONDUIT W/ 3-#10 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
F	#10 PV WIRE (FREE AIR) W/ #6 BARE COPPER BOND TO ARRAY
G	1" CONDUIT W/ 3-#6 THWN-2, 1-#8 THWN-2 GROUND

PLAN NOTES

1. SCOPE OF WORK IS SOLEY FOR THE INSTALLATION OF THE SOLAR ELECTRONIC GENERATING SYSTEM. ALL OTHER WORK IS NOT TO BE RELIED UPON AS BEING APPROVED AND/OR PERMITTED BY THE DOB

NYC DEPT OF BUILDING APPROVAL STAMP

Engineer:

Issued / Revisions

NO.	DESCRIPTION	DATE
P1	ISSUED TO TOWNSHIP FOR PERMIT	11/1/2017

Project Title:

O'BRIEN, WILLIAM AND MARY

TRINITY ACCT #: 2017-10-196879

Project Address:

887 TYSENS LANE
STATEN ISLAND, NY 10306
40.558678,-74.106663

Drawing Title:

ELECTRICAL 3-LINE DRAWING

Drawing Information

DRAWING DATE:	11/1/2017
DRAWN BY:	JC / DMR
REVISED BY:	

System Information:

DC SYSTEM SIZE:	3.48kW
AC SYSTEM SIZE:	3kW
TOTAL MODULE COUNT:	12
MODULES USED:	HANWHA 290
MODULE SPEC #:	Q.PEAK-BLK G4.1 290
UTILITY COMPANY:	CON EDISON
UTILITY ACCT #:	7015 2122 550 0005
UTILITY METER #:	4675664
DEAL TYPE:	SUNNOVA

DWG No.

E-001.00

PAGE: 5 OF 6

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2211 Allenwood Road
Wall, New Jersey 07719
877-797-2978
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ARRAY CIRCUIT WIRING NOTES

1.) LICENSED ELECTRICIAN ASSUMES ALL RESPONSIBILITY FOR DETERMINING ONSITE CONDITIONS AND EXECUTING INSTALLATION IN ACCORDANCE WITH NEC 2014

2.) LOWEST EXPECTED AMBIENT TEMPERATURE BASED ON ASHRAE MINIMUM MEAN EXTREME DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. LOWEST EXPECTED AMBIENT TEMP = **-16°C**

3.) HIGHEST CONTINUOUS AMBIENT TEMPERATURE BASED ON ASHRAE HIGHEST MONTH 2% DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. HIGHEST CONTINUOUS TEMP = **33°C**

4.) 2005 ASHRAE FUNDAMENTALS 2% DESIGN TEMPERATURES DO NOT EXCEED 47°C IN THE UNITED STATES (PALM SPRINGS, CA IS 44.1°C). FOR LESS THAN 9 CURRENT-CARRYING CONDUCTORS IN A 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)

5.) PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION THAT CONTROLS SPECIFIC CONDUCTORS IN ACCORDANCE WITH NEC 690.12(1) THROUGH (5)

6.) PHOTOVOLTAIC POWER SYSTEMS SHALL BE PERMITTED TO OPERATE WITH UNGROUNDED PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUIT AS PER **NEC 690.35**

7.) UNGROUNDED DC CIRCUIT CONDUCTORS SHALL BE IDENTIFIED WITH THE FOLLOWING OUTER FINISH:
POSITIVE CONDUCTORS = RED
NEGATIVE CONDUCTORS = BLACK
NEC 210.5(C)(2)

8.) ARRAY AND SUB ARRAY CONDUCTORS SHALL BE #10 PV WIRE TYPE RHW-2 OR EQUIVELANT AND SHALL BE PROTECTED BY CONDUIT WHERE EXPOSED TO DIRECT SUNLIGHT. SUB ARRAY CONDUIT LONGER THAN 24" SHALL CONTAIN ≤ 20 CURRENT CARYING CONDUCTORS AND WHERE EXPOSED TO DIRECT SUNLIGHT SHALL CONTAIN ≤ 9 CURRENT CARRYING CONDUCTORS.

9.) ALL WIRE LENGTHS SHALL BE LESS THAN 100' UNLESS OTHERWISE NOTED

10.) FLEXIBLE CONDUIT SHALL NOT BE INSTALLED ON ROOFTOP AND SHALL BE LIMITED TO 12" IF USED OUTDOORS

11.)OVERCURRENT PROTECTION FOR CONDUCTORS CONNECTED TO THE SUPPLY SIDE OF A SERVICE SHALL BE LOCATED WITHIN 10' OF THE POINT OF CONNECTION NEC 705.31

12.) WHERE TWO SOURCES FEED A BUSSBAR, ONE A UTILITY AND THE OTHER AN INVERTER, PV BACKFEED BREAKER(S) SHALL BE LOCATED OPPOSITE FROM UTILITY **NEC 705.12(D)(2)(3)(b)**

13.) ALL SOLAR SYSTEM LOAD CENTERS TO CONTAIN ONLY GENERATION CIRCUITS AND NO UNUSED POSITIONS OR LOADS

14.) ALL EQUIPMENT INSTALLED OUTDOORS SHALL HAVE A **NEMA 3R** RATING

CALCULATIONS FOR CURRENT CARRYING CONDUCTORS
REQUIRED CONDUCTOR AMPACITY PER STRING
[**NEC 690.8(B)(1)**]: (15.00*1.25)1 = 18.75A

AWG #10, DERATED AMPACITY
AMBIENT TEMP: 33°C, TEMP DERATING FACTOR: .96
RACEWAY DERATING = 4 CCC: 0.80
(40*.96)0.80 = 30.72A

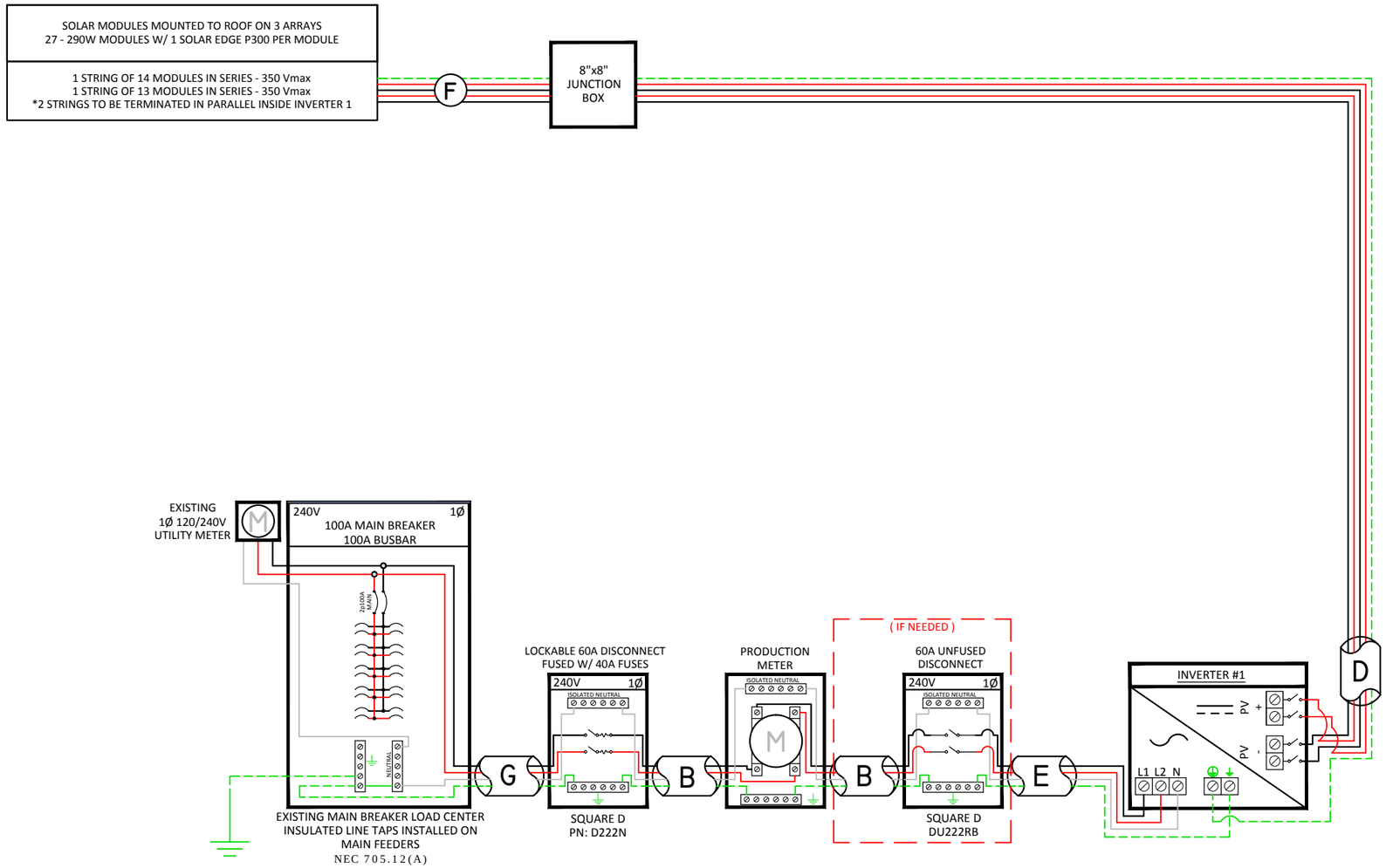
30.72A ≥ 18.75A, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY
25.00A*1.25 = 31.25A

AWG #8, DERATED AMPACITY
AMBIENT TEMP: 30°C, TEMP DERATING: 1.0
RACEWAY DERATING ≤ 3 CCC: N/A
55A*1.0 = 55A

55A ≥ 31.25A, THEREFORE AC WIRE SIZE IS VALID

CALCULATION FOR PV OVERCURRENT PROTECTION
TOTAL INVERTER CURRENT: 25.00A
25.00A*1.25 = 31.25A
--> 40A OVERCURRENT PROTECTION IS VALID



PV MODULE SPECIFICATIONS	
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Vmp	31.96
Voc	39.19
Isc	9.56

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Isc	30	Vnom	240

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Engineer:

Issued / Revisions

NO.	DESCRIPTION	DATE
P1	ISSUED TO TOWNSHIP FOR PERMIT	11/1/2017

Project Title:
O'BRIEN, WILLIAM AND MARY
TRINITY ACCT #: 2017-10-197153

Project Address:
887 TYSENS LANE
STATEN ISLAND, NY 10306
40.558678,-74.106663

Drawing Title:
ELECTRICAL 3-LINE DRAWING

Drawing Information

DRAWING DATE:	11/1/2017
DRAWN BY:	JC / DMR
REVISED BY:	

System Information:

DC SYSTEM SIZE:	7.83kW
AC SYSTEM SIZE:	6kW
TOTAL MODULE COUNT:	27
MODULES USED:	HANWHA 290
MODULE SPEC #:	Q.PEAK-BLK G4.1 290
UTILITY COMPANY:	CON EDISON
UTILITY ACCT #:	7015 2122 600 0005
UTILITY METER #:	4675663
DEAL TYPE:	SUNNOVA

DWG No.
E-002.00
PAGE: 6 OF 6

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