INTERCONNECTION APPLICATION SET

PHOTOVOLTAIC SYSTEM DESCRIPTION:

INSTALLATION TYPE:	GROUND
RACK SYSTEM:	25° TILT
INTER CONNECTION:	UTILITY- CON EDISON
AC SYSTEM SIZE:	4.95 MW
DC SYSTEM SIZE:	5.97 MW
SITE ORIENTATION:	
ARRAY AZIMUTH:	180°
PROPOSED EQUIPMENT:	
MODULE:	(12300) 485 WATT MODULE MANUFACTURER: HANWHA MODEL: Q.PEAK DUO XL-G10.3/BFG 485 (485W)
INVERTERS:	(22) 225 KW 3-PHASE STRING INVERTERS MANUFACTURER: YASKAWA SOLECTRIA MODEL: SGI 225-480

PRIMARY 15 KV CONDUCTOR :

OVERHEAD: 4/0 COPPER

UNDERGROUND : COPPER-3 # 3/0 TYPE MV-105 15KV EPR INSULATED SHIELDED, 1#2 G IN 4"RGS

DISTANCE:

DISTANCE BETWEEN CUSTOMER OWNED STEP UP TRANSFORMER AND NEAREST INTERCONNECTION POINT IS APPROXIMATELY 2.5 MILE.

UTILITY INTERCONNECTION POINT LOCATION DETAILS:

FEEDER NOMINAL VOLTAGE: 13 KV

APPLICABLE PROJECT CODES :

2017 NATIONAL ELECTRICAL CODE (NFPA-70)
2020 BUILDING CODE OF NEW YORK STATE
2020 MECHANICAL CODE OF NEW YORK STATE
2020 FIRE CODE OF NEW YORK STATE
ASHRAE / IESNA STANDARD90.1-2007
UL 1741 - PHOTOVOLTAIC INVERTERS
UL 1703 - PHOTOVOLTAIC MODULES

IN ADDITION TO CODES LISTED ABOVE, THE ENTIRE INSTALLATION SHALL MEET THE REQUIREMENT OF THE LOCAL LAW / CODES AND AUTHORITY HAVING JURISDICTION.

PROJECT DRAWING LIST :

SHEET	TITLE
PV-0.1	COVER SHEET
PV-1.0	SITE PLAN
PV-2.0	SINGLE LINE DIAGRAM
PV-2.1	THREE LINE DIAGRAM
PV-3.0	ELECTRICAL SPECIFICATION SHEET
PV-4.0	PV CELL MOUNTING & SECTION DETAILS

ELECTRICAL ABBREVIATION:

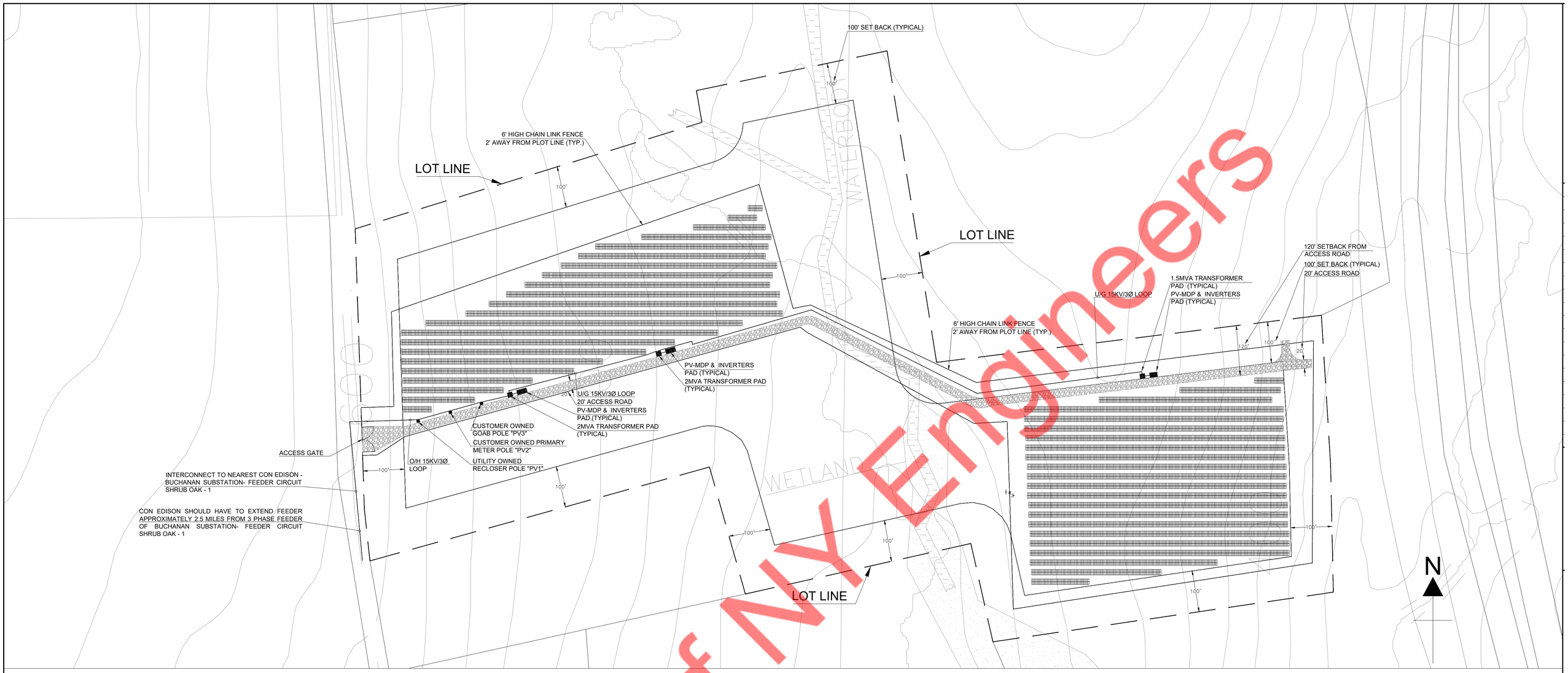
A	AMPERES	°F	DEGREE FAHRENHEIT	PNL	PANEL	PVC	POLYVINYL CHLORIDE
AF	AMPERE FRAME/AMP FUSE	DISC	DISCONNECT	W	WATT	RGS	RIGID GALVANIZED STEEL
AS	AMP SWITCH	DP	DISTRIBUTION PANEL	W	WIRE	SPDT	SINGLE POLE DOUBLE THROW
AIC	AMPS INTERRUPTING CAPACITY	KCMIL	ONE THOUSAND CIRCULAR MILS	E	EXISTING	SPST	SINGLE POLE SINGLE THROW
AT	AMP TRIP	KV	KILOVOLT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR	SPEC	SPECIFICATION
ATS	AUTOMATIC TRANSFER SWITCH	KVA	KILOVOLT-AMPERES	EMT	ELECTRICAL METALLIC TUBING	SW	SWITCH
AUTO	AUTOMATIC	KW	KILOWATTS	EQUIP	EQUIPMENT	TYP	TYPICAL
AWG	AMERICAN WIRE GAUGE	MCB	MAIN CIRCUIT BREAKER	FDR	FEEDER	U.O.N.	UNLESS OTHERWISE NOTED
C	CONDUIT	N	NEUTRAL	G	GROUND	V	VOLT/VOLTAGE
CB	CIRCUIT BREAKER	NIC	NOT IN CONTRACT	GFI	GROUND FAULT INTERRUPTER	VA	VOLT AMPERE
CKT	CIRCUIT	NTS	NOT TO SCALE	HZ	HERTZ	WP	WEATHERPROOF
CT	CURRENT TRANSFORMER	P	POLES	IC	INTERRUPTING CAPACITY	XFMR	TRANSFORMER
°C	DEGREE CELSIUS	Ø	PHASE	PP	POWER PANEL		

ELECTRICAL NOTES

1. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
2. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
3. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAINTIGHT INSTALLATION.

ELECTRICAL SYMBOL LIST

Y / Y	TRANSFORMER, RATING AS INDICATED
	CIRCUIT BREAKER, RATING AS INDICATED
	INVERTER, RATING AS INDICATED
	DISCONNECT SWITCH, RATING AS INDICATED
M	ENERGY METER
	CURRENT TRANSFORMER
	MAJOR ELECTRICAL COMPONENT OR DEVICE. RATING AS INDICATED
X	KEYED NOTE REFERENCE
	UNDERGROUND WIRING SYSTEM
	OVERHEAD WIRING SYSTEM
	FUSE, SIZE AS INDICATED



1 ELECTRICAL SITE PLAN
SCALE: 1/128" = 1'-0"

PHOTOVOLTAIC SYSTEM DESCRIPTION:

INSTALLATION TYPE:	GROUND
RACK SYSTEM:	25° TILT
INTER CONNECTION:	UTILITY- CON EDISON
AC SYSTEM SIZE:	4.95 MW
DC SYSTEM SIZE:	5.97 MW
SITE ORIENTATION:	
ARRAY AZIMUTH:	180°
PROPOSED EQUIPMENT:	
MODULE:	(12300) 485 WATT MODULE MANUFACTURER: HANWHA MODEL: Q.PEAK DUO XL-G10.3/BFG 485 (485W)
INVERTERS:	(22) 225 KW 3-PHASE STRING INVERTERS MANUFACTURER: YASKAWA SOLECTRIA MODEL: SGI 225-480

PRIMARY 15 KV CONDUCTOR :

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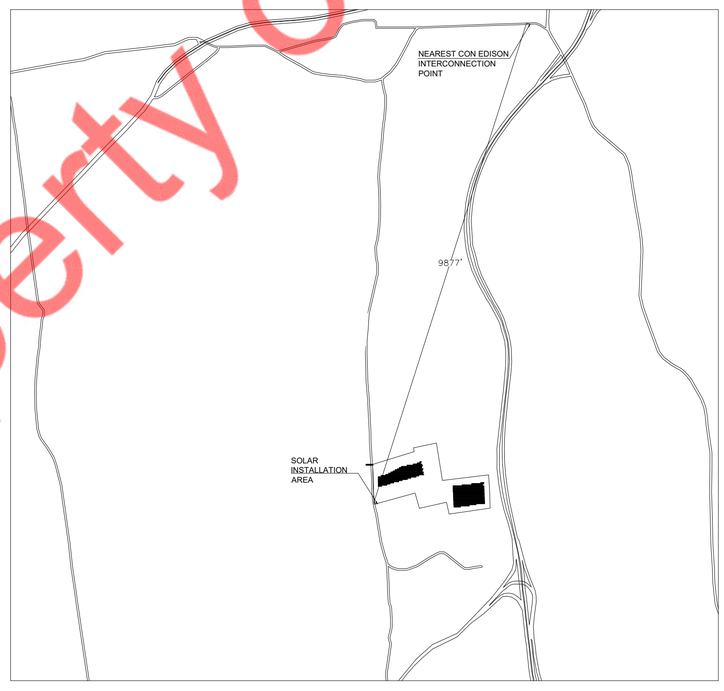
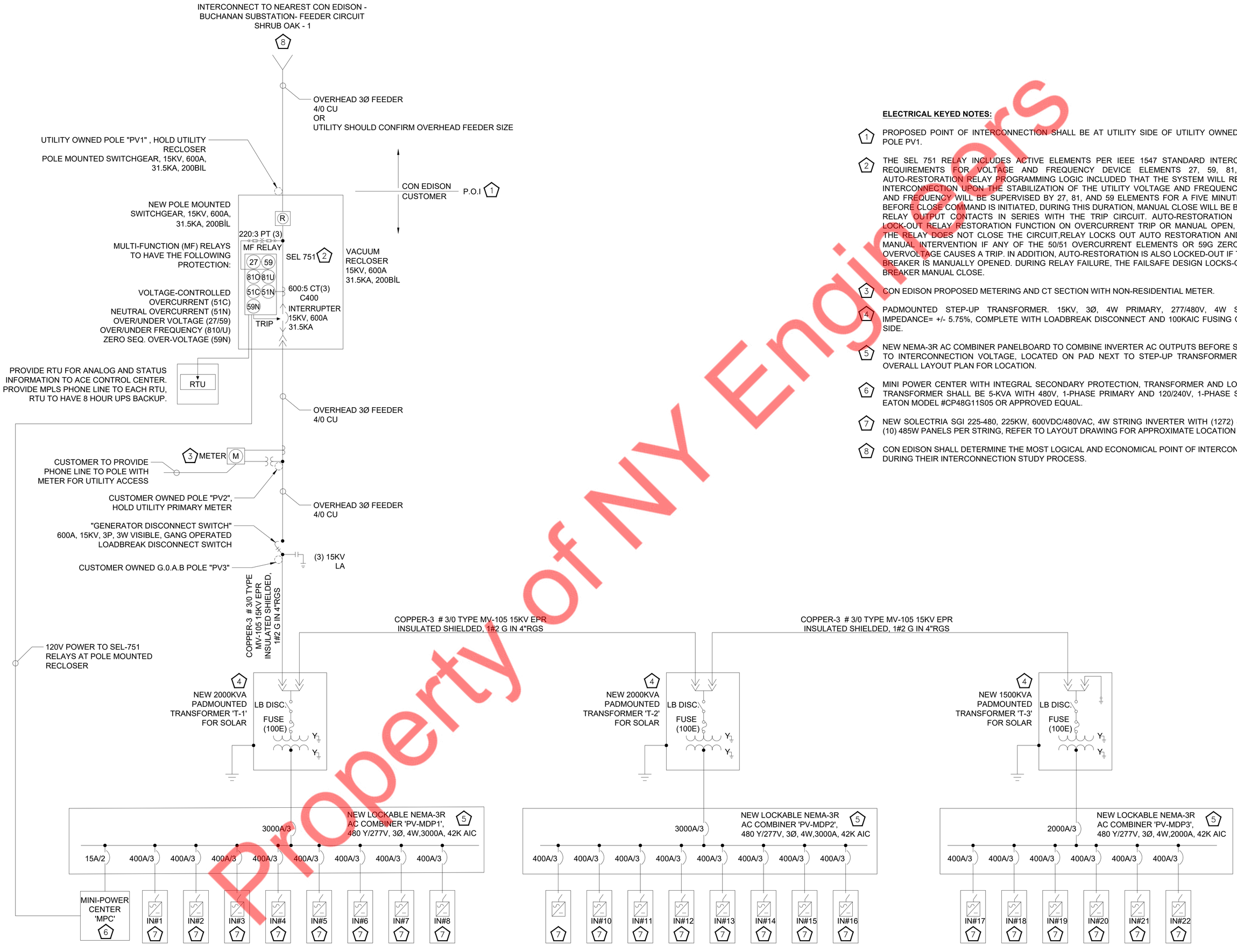
DISTANCE BETWEEN CUSTOMER OWNED STEP UP TRANSFORMER AND NEAREST INTERCONNECTION POINT IS APPROXIMATELY 2.5 MILE.

UTILITY INTERCONNECTION POINT LOCATION DETAILS:

FEEDER NOMINAL VOLTAGE: 13 KV



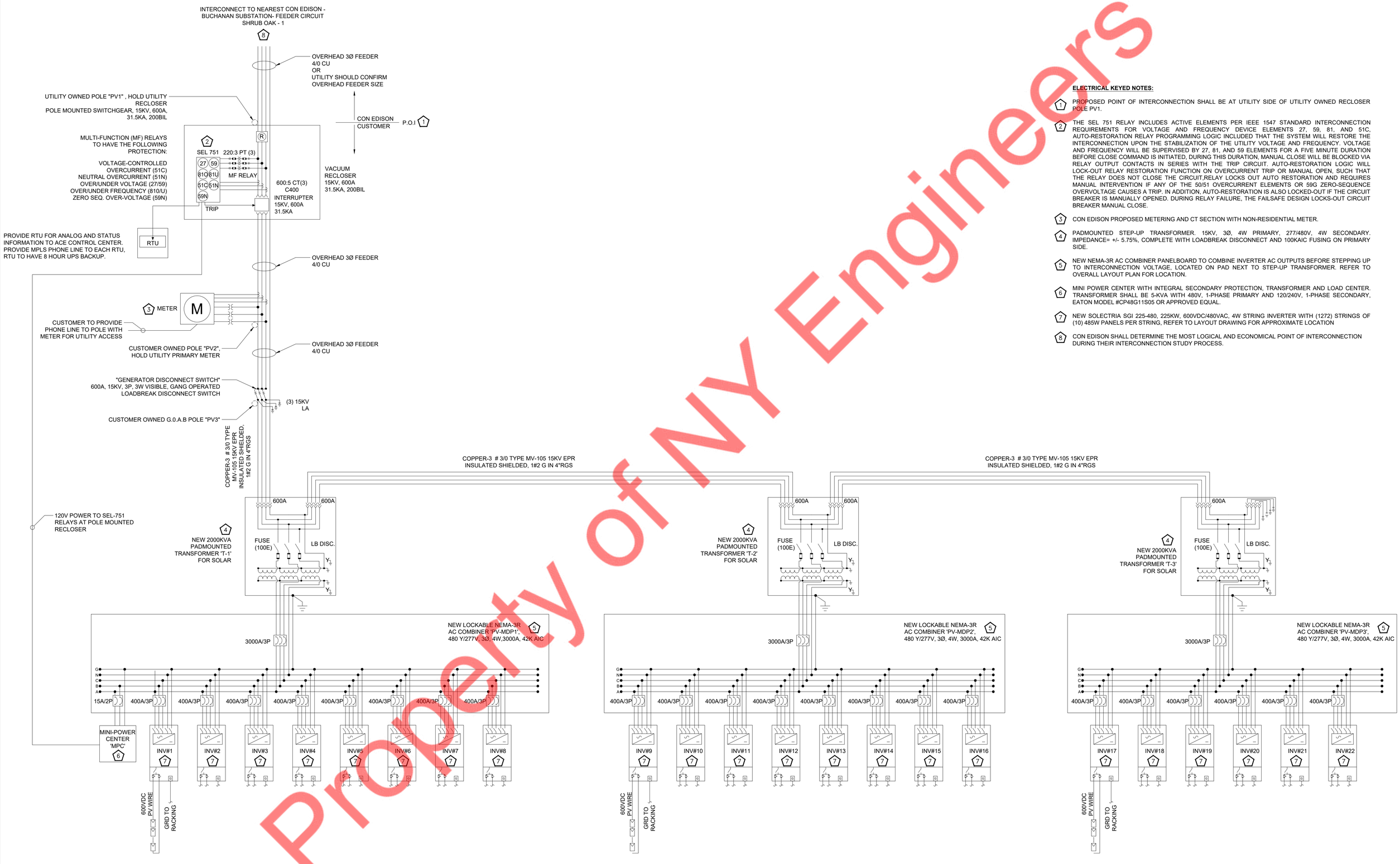
2 SITE KYE PLAN
SCALE: NTS



1 SINGLE LINE DIAGRAM
SCALE: NTS

ELECTRICAL KEYED NOTES:

1. PROPOSED POINT OF INTERCONNECTION SHALL BE AT UTILITY SIDE OF UTILITY OWNED RECLOSER POLE PV1.
2. THE SEL 751 RELAY INCLUDES ACTIVE ELEMENTS PER IEEE 1547 STANDARD INTERCONNECTION REQUIREMENTS FOR VOLTAGE AND FREQUENCY DEVICE ELEMENTS 27, 59, 81, AND 51C, AUTO-RESTORATION RELAY PROGRAMMING LOGIC INCLUDED THAT THE SYSTEM WILL RESTORE THE INTERCONNECTION UPON THE STABILIZATION OF THE UTILITY VOLTAGE AND FREQUENCY. VOLTAGE AND FREQUENCY WILL BE SUPERVISED BY 27, 81, AND 59 ELEMENTS FOR A FIVE MINUTE DURATION BEFORE CLOSE COMMAND IS INITIATED, DURING THIS DURATION, MANUAL CLOSE WILL BE BLOCKED VIA RELAY OUTPUT CONTACTS IN SERIES WITH THE TRIP CIRCUIT. AUTO-RESTORATION LOGIC WILL LOCK-OUT RELAY RESTORATION FUNCTION ON OVERCURRENT TRIP OR MANUAL OPEN, SUCH THAT THE RELAY DOES NOT CLOSE THE CIRCUIT,RELAY LOCKS OUT AUTO RESTORATION AND REQUIRES MANUAL INTERVENTION IF ANY OF THE 50/51 OVERCURRENT ELEMENTS OR 59G ZERO-SEQUENCE OVERVOLTAGE CAUSES A TRIP. IN ADDITION, AUTO-RESTORATION IS ALSO LOCKED-OUT IF THE CIRCUIT BREAKER IS MANUALLY OPENED. DURING RELAY FAILURE, THE FAILSAFE DESIGN LOCKS-OUT CIRCUIT BREAKER MANUAL CLOSE.
3. CON EDISON PROPOSED METERING AND CT SECTION WITH NON-RESIDENTIAL METER.
4. PADMOUNTED STEP-UP TRANSFORMER. 15KV, 3Ø, 4W PRIMARY, 277/480V, 4W SECONDARY. IMPEDANCE= +/- 5.75%, COMPLETE WITH LOADBREAK DISCONNECT AND 100KAIC FUSING ON PRIMARY SIDE.
5. NEW NEMA-3R AC COMBINER PANELBOARD TO COMBINE INVERTER AC OUTPUTS BEFORE STEPPING UP TO INTERCONNECTION VOLTAGE, LOCATED ON PAD NEXT TO STEP-UP TRANSFORMER. REFER TO OVERALL LAYOUT PLAN FOR LOCATION.
6. MINI POWER CENTER WITH INTEGRAL SECONDARY PROTECTION, TRANSFORMER AND LOAD CENTER. TRANSFORMER SHALL BE 5-KVA WITH 480V, 1-PHASE PRIMARY AND 120/240V, 1-PHASE SECONDARY, EATON MODEL #CP48G11S05 OR APPROVED EQUAL.
7. NEW SOLECTRIA SGI 225-480, 225KW, 600VDC/480VAC, 4W STRING INVERTER WITH (1272) STRINGS OF (10) 485W PANELS PER STRING, REFER TO LAYOUT DRAWING FOR APPROXIMATE LOCATION
8. CON EDISON SHALL DETERMINE THE MOST LOGICAL AND ECONOMICAL POINT OF INTERCONNECTION DURING THEIR INTERCONNECTION STUDY PROCESS.



1 THREE LINE DIAGRAM
SCALE: NTS

ELECTRICAL KEYED NOTES:

1. PROPOSED POINT OF INTERCONNECTION SHALL BE AT UTILITY SIDE OF UTILITY OWNED RECLOSER POLE PV1.
2. THE SEL 751 RELAY INCLUDES ACTIVE ELEMENTS PER IEEE 1547 STANDARD INTERCONNECTION REQUIREMENTS FOR VOLTAGE AND FREQUENCY DEVICE ELEMENTS 27, 59, 81, AND 51C, AUTO-RESTORATION RELAY PROGRAMMING LOGIC INCLUDED THAT THE SYSTEM WILL RESTORE THE INTERCONNECTION UPON THE STABILIZATION OF THE UTILITY VOLTAGE AND FREQUENCY. VOLTAGE AND FREQUENCY WILL BE SUPERVISED BY 27, 81, AND 59 ELEMENTS FOR A FIVE MINUTE DURATION BEFORE CLOSE COMMAND IS INITIATED, DURING THIS DURATION, MANUAL CLOSE WILL BE BLOCKED VIA RELAY OUTPUT CONTACTS IN SERIES WITH THE TRIP CIRCUIT. AUTO-RESTORATION LOGIC WILL LOCK-OUT RELAY RESTORATION FUNCTION ON OVERCURRENT TRIP OR MANUAL OPEN, SUCH THAT THE RELAY DOES NOT CLOSE THE CIRCUIT,RELAY LOCKS OUT AUTO RESTORATION AND REQUIRES MANUAL INTERVENTION IF ANY OF THE 50/51 OVERCURRENT ELEMENTS OR 59G ZERO-SEQUENCE OVERVOLTAGE CAUSES A TRIP. IN ADDITION, AUTO-RESTORATION IS ALSO LOCKED-OUT IF THE CIRCUIT BREAKER IS MANUALLY OPENED. DURING RELAY FAILURE, THE FAILSAFE DESIGN LOCKS-OUT CIRCUIT BREAKER MANUAL CLOSE.
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5. NEW NEMA-3R AC COMBINER PANELBOARD TO COMBINE INVERTER AC OUTPUTS BEFORE STEPPING UP TO INTERCONNECTION VOLTAGE, LOCATED ON PAD NEXT TO STEP-UP TRANSFORMER. REFER TO OVERALL LAYOUT PLAN FOR LOCATION.
6. MINI POWER CENTER WITH INTEGRAL SECONDARY PROTECTION, TRANSFORMER AND LOAD CENTER. TRANSFORMER SHALL BE 5-KVA WITH 480V, 1-PHASE PRIMARY AND 120/240V, 1-PHASE SECONDARY, EATON MODEL #CP48G11S05 OR APPROVED EQUAL.
7. NEW SOLECTRIA SGI 225-480, 225KW, 600VDC/480VAC, 4W STRING INVERTER WITH (1272) STRINGS OF (10) 485W PANELS PER STRING, REFER TO LAYOUT DRAWING FOR APPROXIMATE LOCATION
8. CON EDISON SHALL DETERMINE THE MOST LOGICAL AND ECONOMICAL POINT OF INTERCONNECTION DURING THEIR INTERCONNECTION STUDY PROCESS.

SPECIFICATIONS		SGI 225	SGI 250	SGI 266	SGI 300	SGI 500	SGI 500PE
DC Input							
Absolute Maximum Input Voltage		600 VDC					
Max Power Input Voltage Range (MPPT)*		300-500 VDC					
Maximum Operating Input Current		768 A	853 A	908 A	1026 A	1721 A	1712 A
Maximum PV Power		331.5 kW	325 kW	345.8 kW	390 kW	650 kW	
Strike Voltage		390 V					
AC Output							
Nominal Output Voltage		480 VAC, 3ø+/PE					
AC Voltage Range		-12%/+10%					
Continuous Output Power		225 kW	250 kW	266 kW	300 kW	500 kW	
Continuous Output Current	480 VAC	271 A	301 A	320 A	360 A	602 A	
	600 VAC	—	240 A	—	—	—	—
Maximum Backfeed Current		0 A					
Nominal Output Frequency		60 Hz					
Output Frequency Range		57-60.5 Hz					
Power Factor		Adjustable 0.9 leading / 0.9 lagging, factory set at 1					
Fault Current Contribution (1 Cycle RMS)		325.2 A	361.2 A	384 A	432 A	722 A	
Total Harmonic Distortion (THD) @ Rated Load		< 3%					
Performance							
Peak Efficiency		98.0%				97.9%	98.3%
CEC Efficiency (480 VAC)		97.5%				97.0%	97.5%
Tare Loss		28 W				32 W	
Ambient Temperature Range (full power)		-40°F to +122°F (-40°C to +50°C)					
Storage Temperature Range		-40°F to +158°F (-40°C to +70°C)					
Relative Humidity (non-condensing)		5-95%					
Audible Noise		< 60 dBA @ 5 m					
Safety Listings & Certifications		UL 1741/IEEE 1547, CSA C22.2#107.1, FCC part 15 B					
Maintenance Outage Factor		0.1					
Testing Agency		ETL					
Mechanical							
Transformer		Standard, fully-integrated					
AC Breaker/DC Disconnect		Fully-integrated					
Dimensions (H x W x D)		79 in. x 109 in. x 41 in. (2007 mm x 2769 mm x 1042 mm)					
Shading Set Back		137 in. (3480 mm) at 30° solar elevation					
Weight		5170 lbs (2346 kg)	5650 lbs (2563 kg)			6980 lbs (3167 kg)	7107 lbs (3224 kg)
Enclosure Rating		Type 3R					
Enclosure Finish		Polyester powder coated steel; optional 316 stainless steel					
Subcombiner Options							
Fuses or Breakers			6 positions, 225-400 A			8 positions, 225-400 A	
			12 positions, 110-200 A			16 positions, 110-200 A	
Fuses Only			24 positions, 70-100 A			32 positions, 70-100 A	
Communication							
Data Logger Hardware		Standard, Integrated					
SolrenView™ Monitoring Service		Optional					
Optional Revenue Grade Monitoring (Integrated)		400 A				800 A	
Optional SolZone™ Sub-Array Monitoring (DC Current)		6 zones				8 zones	
Optional Cellular Communication		SolrenView AIR					
Communication Interface		RS-485 SunSpec Modbus RTU					
Warranty							
Standard		5 year					
Optional		10, 15, 20 year; extended service agreement; uptime guarantee					

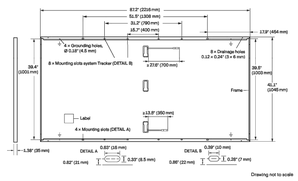
*At nominal AC voltage

YASKAWA SOLECTRIA SOLAR www.solectria.com | inverters@solectria.com | 978.683.9700

MADE IN THE USA

MECHANICAL SPECIFICATION

Format	87.2 in × 41.1 in × 1.38 in (including frame) (2216 mm × 1045 mm × 35 mm)
Weight	64.2 lbs (29.1 kg)
Front Cover	0.08 in (2.0 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	0.08 in (2.0 mm) semi-tempered glass
Frame	Anodized aluminum
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 27.6 in (700 mm), (-) ≥ 13.8 in (350 mm)
Connector	Stäubli MC4-Evo2, Hanwha Q CELLS HQC4, IP68



ELECTRICAL CHARACTERISTICS

POWER CLASS				470		475		480		485	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[2] AND BSTC[3] (POWER TOLERANCE +5 W / −0 W)					BSTC*		BSTC*		BSTC*		BSTC*
Minimum	Power at MPP[1]	P_{MPP}	[W]	470	514.1	475	519.6	480	525.0	485	530.5
	Short Circuit Current[1]	I_{SC}	[A]	11.04	12.08	11.08	12.12	11.12	12.17	11.16	12.21
	Open Circuit Voltage[1]	V_{OC}	[V]	52.91	53.10	53.15	53.34	53.39	53.58	53.63	53.82
	Current at MPP	I_{MPP}	[A]	10.51	11.50	10.55	11.54	10.59	11.58	10.63	11.63
	Voltage at MPP	V_{MPP}	[V]	44.73	44.72	45.03	45.02	45.33	45.32	45.63	45.62
	Efficiency[1]	η	[%]	≥20.3	≥22.2	≥20.5	≥22.4	≥20.7	≥22.7	≥20.9	≥22.9

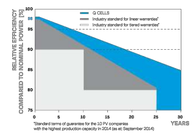
Bifaciality of P_{MPP} and I_{SC} 70 % ± 5 % • Bifaciality given for rear side irradiation on top of STC (front side) • According to IEC 60904-1-2

[1] Measurement tolerances P_{MPP} ± 3 %; I_{SC}; V_{OC} ± 5 % at STC: 1000 W/m²; [2] at STC: 1000 W/m² + φ × 135 W/m², φ = 70 % ± 5 %, 25 ± 2 °C, AM 1.5 according to IEC 60904-3

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP}	[W]	353.8	357.6	361.4	365.1
	Short Circuit Current	I_{SC}	[A]	8.89	8.92	8.96	8.99
	Open Circuit Voltage	V_{OC}	[V]	50.04	50.27	50.49	50.72
	Current at MPP	I_{MPP}	[A]	8.27	8.30	8.34	8.37
	Voltage at MPP	V_{MPP}	[V]	42.77	43.06	43.35	43.63

[2] 800 W/m², NMOT, spectrum AM 1.5

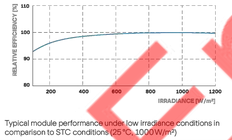
Q CELLS PERFORMANCE WARRANTY



At least 98 % of nominal power during first year. Thereafter max. 0.45 % degradation per year. At least 93.95 % of nominal power up to 10 years. At least 84.95 % of nominal power up to 30 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²)

TEMPERATURE COEFFICIENTS							
Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°F]	108 ± 5.4 (42 ± 3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 29*
Max. Design Load, Push / Pull[3]	[lbs/ft²]	75 (3600 Pa) / 33 (1600 Pa)	Permitted Module Temperature on Continuous Duty	−40 °F up to +185 °F (−40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]	[lbs/ft²]	113 (5400 Pa) / 50 (2400 Pa)		

[3] See Installation Manual

*New Type is similar to Type 3 but with metallic frame

QUALIFICATIONS AND CERTIFICATES

UL 61730, CE-compliant, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells); Certification in process.

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS America Inc.
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | **TEL** +1 949 748 59 99 | **EMAIL** inquiry@us.q-cells.com | **WEB** www.q-cells.us

Three-Phase Pad-Mounted Transformers

Typical Pad-Mounted Transformer

Ratings

- 45–10,000 kVA
- High voltages (primary):

4160 Grd. Y/2400 through 43,800 GY/25,300 Grd. Y/19,920	2400Δ through 46,000Δ

- HV Taps: 2–2-1/2% above and below normal, or 4–2-1/2% below normal
- Standard BIL levels:

kV Class	BIL (kV)
1.2	30
2.5	45
5.0	60
8.7	75
15.0	95
25.0 Grd. Y Only	125
25.0	150
34.5 Grd. Y Only	150
34.5	150
46	250

Design Impedances

Impedances are supplied to meet IEEE C57.12.34 standards. Customer-specified impedances are available. (Subject to IEEE/ANSI ±7.5% impedance tolerance.)

- Nominal impedance per IEEE C57.12.34:

kVA	%Z
45	2.70–5.75
75	2.7–5.75
112-1/2	3.1–5.75
150	3.1–5.75
225	3.1–5.75
300	3.1–5.75
500	4.35–5.75
750	5.75
1000	5.75
1500	5.75
2000	5.75
2500	5.75
3000	5.75
3750	5.75
5000–10,000	6.0–6.5

Note: Subject to NEMA/IEEE ±7.5% impedance tolerance.

Note: Non-standard design impedance may be obtained by contacting Eaton.

Layout Dimensions

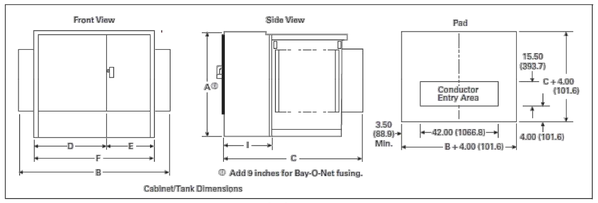


Figure 17.0-12. Pad-Mounted Transformer—Dimensions in Inches (mm)

Table 17.0-13. Dimensions with DOE Efficiency at 65 Degree AWR

kVA	A	B	C	D	E	F	I	Gallons	Approximate Weight	DOE 2016 Efficiency
45	50	68	39	42	26	68	20	115	2150	98.92%
75	50	68	39	42	26	68	20	125	2350	99.03%
112.5	50	68	39	42	26	68	20	135	2600	99.11%
150	50	68	49	42	26	68	20	150	2900	99.16%
225	50	72	53	42	30	72	20	170	3400	99.23%
300	50	72	55	42	30	72	20	190	3950	99.27%
500	50	72	61	42	30	72	20	240	5300	99.35%
750	64	72	63	42	30	72	20	300	7150	99.40%
1000	64	72	64	42	30	72	20	350	8950	99.43%
1500	73	89	71	42	30	72	24	400	11,450	99.48%
2000	73	101	75	42	30	72	24	525	13,800	99.51%
2500	73	101	99	42	30	72	24	600	16,750	99.53%

Note: The reference dimensions in this table cover the following: livefront and deadfront configurations, loop feed and radial feed, mineral oil and FR3 filled units.

Dimensional Variations

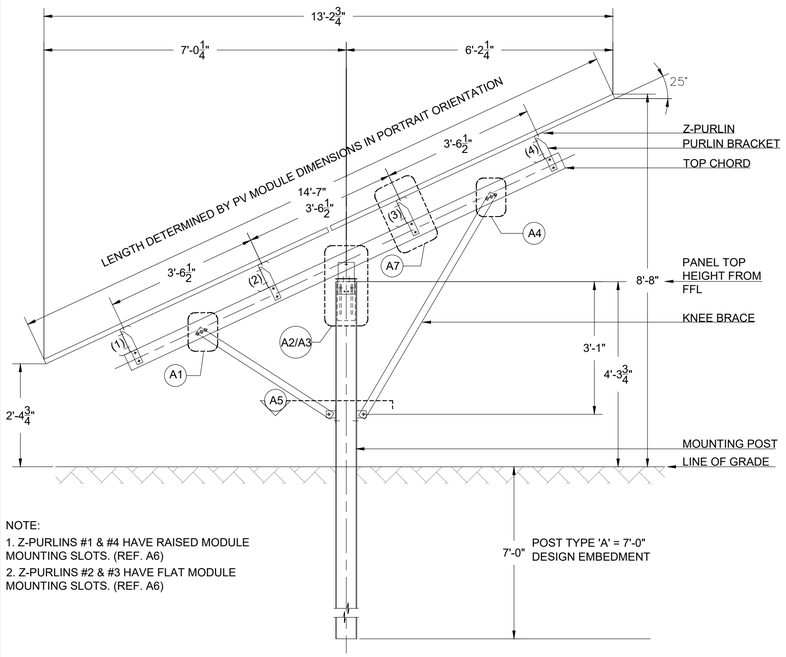
Height Variations

1. Add 9.00 inches (228.6 mm) to the height when using bayonet fusing on all kVA ratings.
2. Less flammable natural esther fluid requires deeper tanks on some transformer ratings.
   a. Add 2.00 inches (50.8 mm) to the depth of kVA ratings 75–1500. Add 8.00 inches (203.2 mm) to the depth of kVA ratings 2000 and 2500.

1 THREE PHASE STRING INVERTER SPECIFICATION
SCALE: NTS

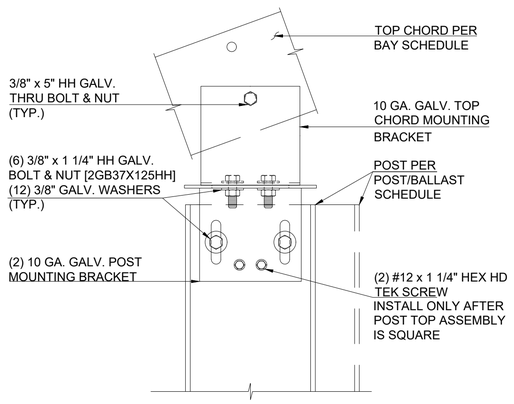
2 485W PV MODULE SPECIFICATION
SCALE: NTS

3 PAD MOUNTED TRANSFORMER SPECIFICATION
SCALE: NTS

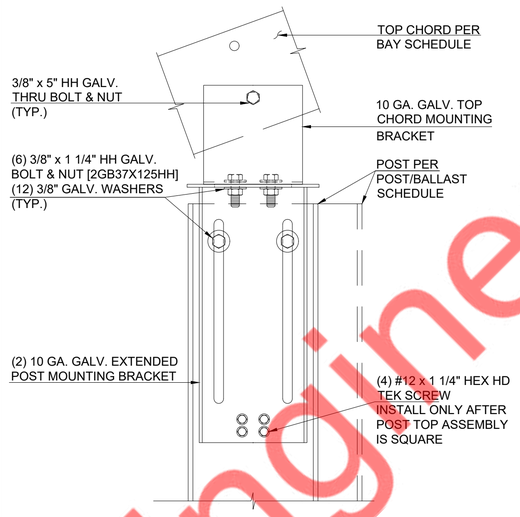


NOTE:
1. Z-PURLINS #1 & #4 HAVE RAISED MODULE MOUNTING SLOTS. (REF. A6)
2. Z-PURLINS #2 & #3 HAVE FLAT MODULE MOUNTING SLOTS. (REF. A6)

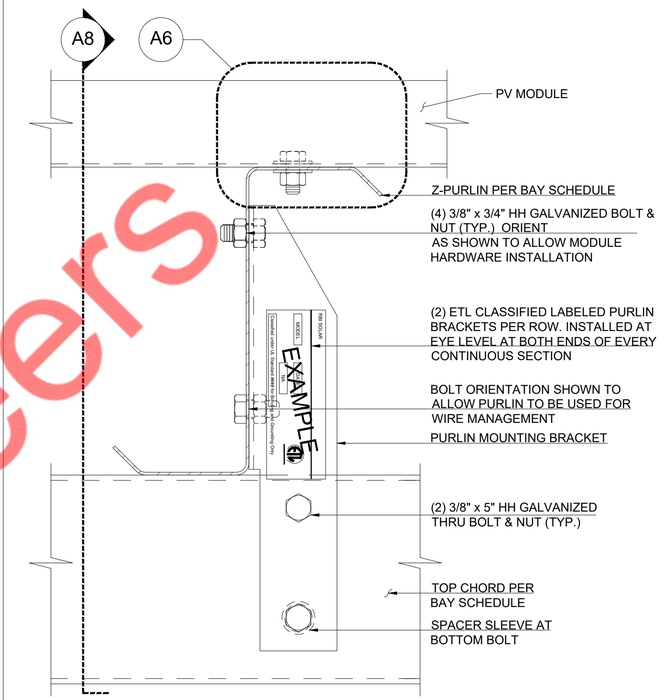
1 DESIGN RACK SECTION
SCALE: 1/2" = 1'-0"



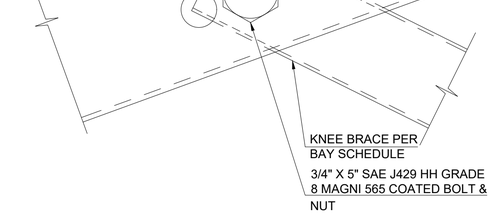
A2 TOP CHORD TO POST CONN. DETAIL
SCALE: NTS



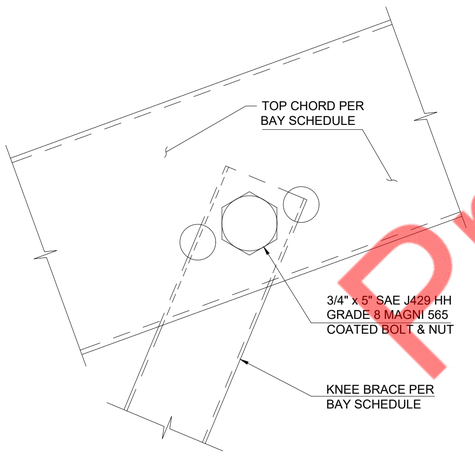
A3 TOP CHORD CONN. DETAIL (EXTENDED)
SCALE: NTS



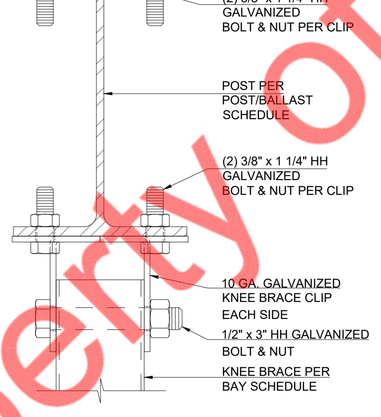
A7 TRANSVERSE PURLIN CONN. DETAIL
SCALE: NTS



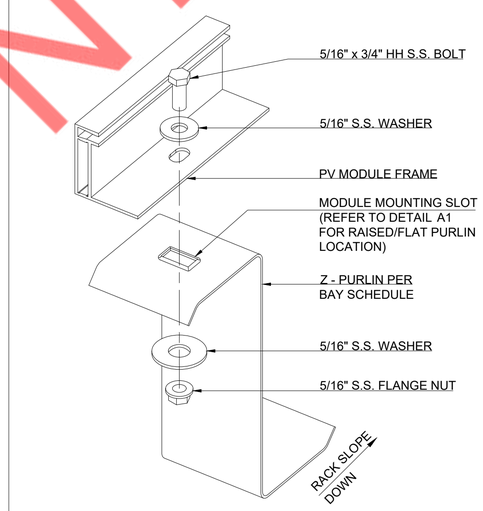
A1 LOWER KNEE BRACE TO TOP CHORD CONN. DETAIL
SCALE: NTS



A4 UPPER KNEE BRACE TO TOP CHORD CONN. DETAIL
SCALE: NTS

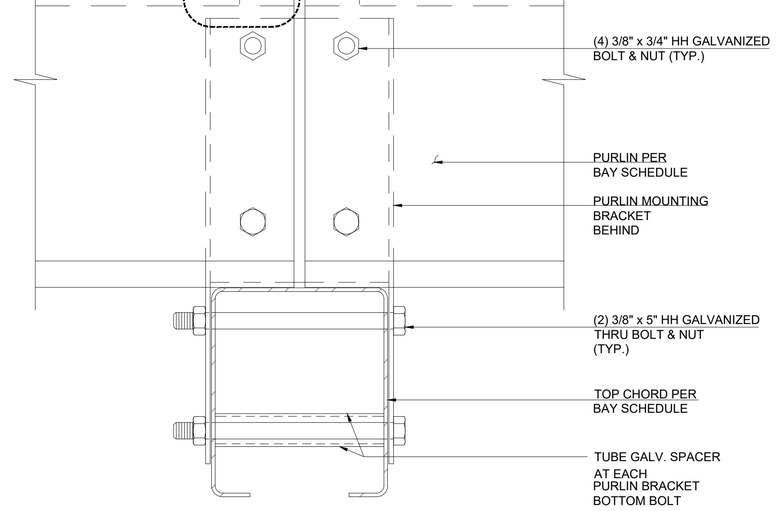


A5 KNEE BRACE TO POST CONN. DETAIL
SCALE: NTS

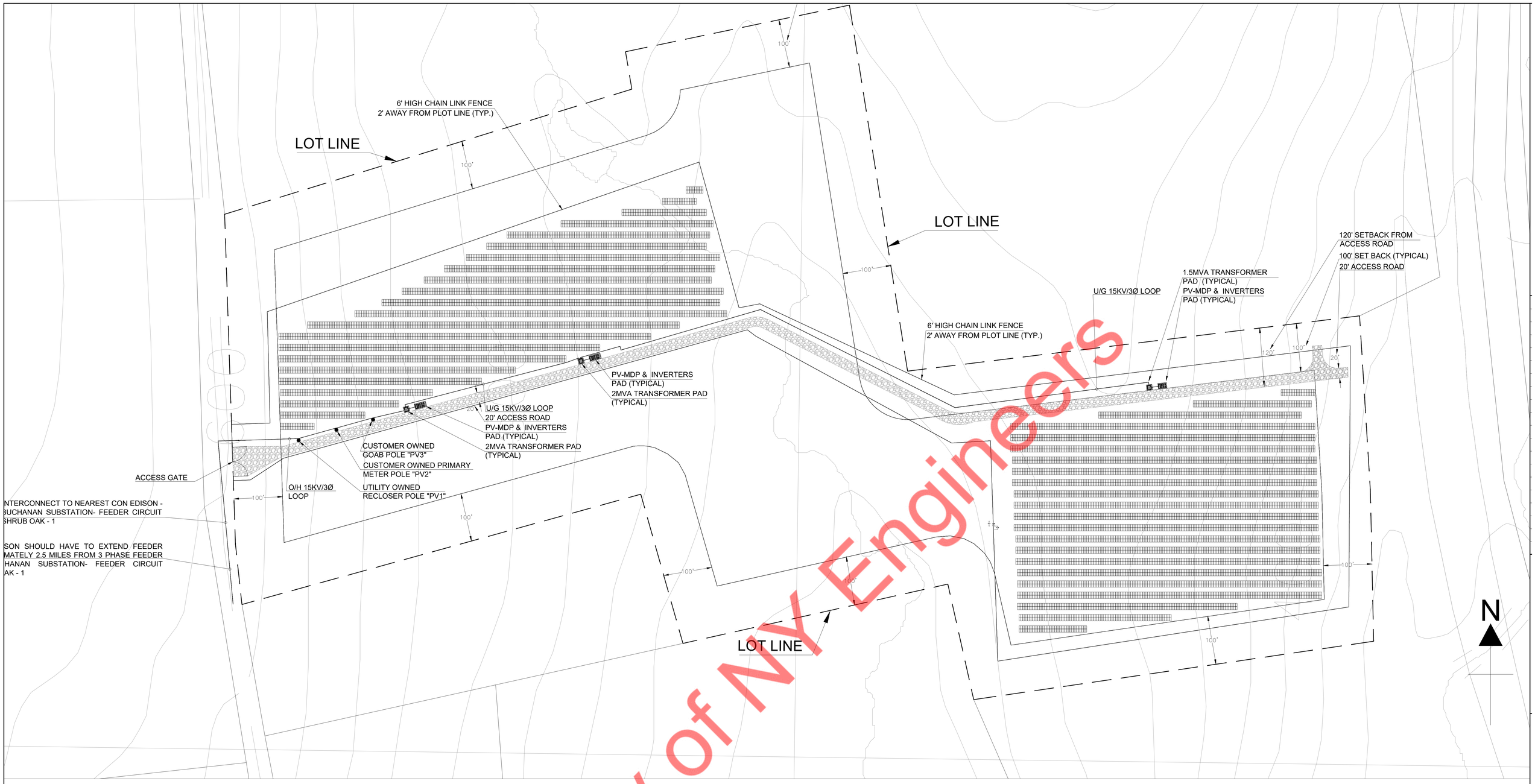


NOTE: TORQUE TO THE HIGHER OF 10 ft-lb OR THE PV MODULE MANUFACTURER'S REQUIRED TORQUE VALUE

A6 PV MODULE TO PURLIN CONN. DETAIL
SCALE: NTS



A8 LONGITUDINAL PURLIN CONN. DETAIL
SCALE: NTS



1 SITE PLAN
SCALE: 1" = 80'-0"

GENERAL KEYED NOTES:

TOTAL AREA OF SUBJECT PARCEL: 24.84 ACRES. (INCLUDING 6.69 ACRES 200' STREET FRONTAGE ROAD AREA)

TOTAL AREA OF SUBJECT PARCEL: 18.15 ACRES. (EXCLUDING 6.69 ACRES 200' STREET FRONTAGE ROAD AREA)

THE PROPOSED SOLAR FACILITY WILL PRODUCE 3.83 MW AC.

BULK REQUIREMENTS:

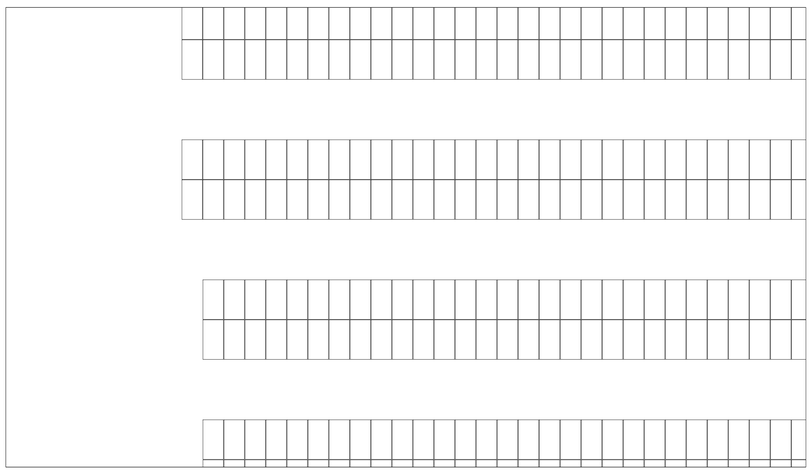
§300-81.4- SOLAR POWER GENERATION SYSTEM AND FACILITIES .

MINIMUM BUILDING REQUIREMENTS	REQUIRED	PROPOSED
SETBACK:	100 FEET	100 FEET
LOT SIZE:	5 ACRES	18.15 ACRES
MAXIMUM ALLOWABLE		
LOT COVERAGE:	9.07 ACRES	5.03 ACRES (Note-1)

NOTE-1

ONE SOLAR PANEL AREA = 22.33 SQ. FEET
TOTAL #9820 SOLAR PANEL COVERAGE AREA=219280.6 SQ.FEET = 5.03 ACRES

LOT TOTAL AREA= 18.15 ACRES
TOTAL SOLAR PANEL COVERAGE AREA= 4.61 ACRES = 27.71% PLOT COVER BY SOLAR PANELS.



3 ENLARGE VIEW OF PV CELL INSTALLTION
SCALE: 3/32" = 1'-0"

1 SITE PLAN
SCALE: 1" = 80'-0"

GENERAL KEYED NOTES:

TOTAL AREA OF SUBJECT PARCEL: 24.84 ACRES. (INCLUDING 6.69 ACRES 200' STREET FRONTAGE ROAD AREA)

TOTAL AREA OF SUBJECT PARCEL: 18.15 ACRES. (EXCLUDING 6.69 ACRES 200' STREET FRONTAGE ROAD AREA)

THE PROPOSED SOLAR FACILITY WILL PRODUCE 3.83 MW AC.

BULK REQUIREMENTS:

§300-81.4- SOLAR POWER GENERATION SYSTEM AND FACILITIES .

MINIMUM BUILDING REQUIREMENTS	REQUIRED	PROPOSED
SETBACK:	100 FEET	100 FEET
LOT SIZE:	5 ACRES	18.15 ACRES
MAXIMUM ALLOWABLE LOT COVERAGE:	9.07 ACRES	5.03 ACRES (Note-1)

NOTE-1

ONE SOLAR PANEL AREA = 22.33 SQ. FEET
TOTAL #9820 SOLAR PANEL COVERAGE AREA=219280.6 SQ.FEET = 5.03 ACRES

LOT TOTAL AREA= 18.15 ACRES
TOTAL SOLAR PANEL COVERAGE AREA= 4.61 ACRES = 27.71% PLOT COVER BY SOLAR PANELS.

TOTAL OPEN PLOT AREA = 13.12 ACRES

TOTAL SOLAR SYSTEM COVERAGE AREA = 5.03 ACRES

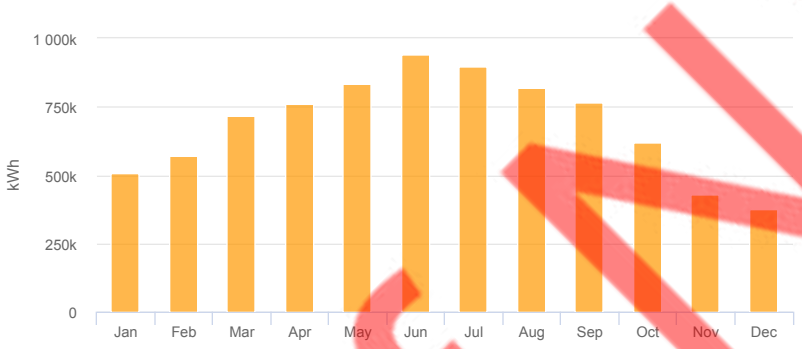
Helioscope Generation Report

System Metrics

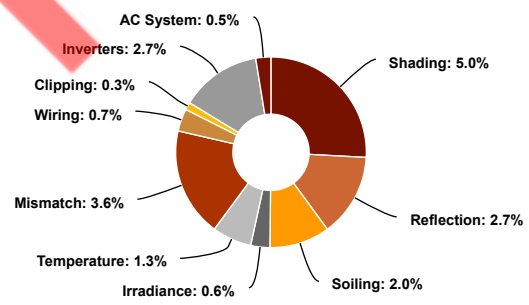
Design	Design
Module DC Nameplate	5.97 MW
Inverter AC Nameplate	4.95 MW Load Ratio: 1.21
Annual Production	8.242 GWh
Performance Ratio	82.0%
kWh/kWp	1,381.6
Weather Dataset	TMY, 10km grid (41.35,-73.85), NREL (prospector)
Simulator Version	8f373217c8-0c909ef297-e20c5c47cf-ae10c5cdd0

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,445.8	
	POA Irradiance	1,684.3	16.5%
	Shaded Irradiance	1,599.3	-5.0%
	Irradiance after Reflection	1,555.4	-2.7%
	Irradiance after Soiling	1,524.3	-2.0%
	Total Collector Irradiance	**1,524.3**	**0.0%**
Energy (kWh)	Nameplate	9,093,804.0	
	Output at Irradiance Levels	9,036,269.8	-0.6%
	Output at Cell Temperature Derate	8,918,503.0	-1.3%
	Output After Mismatch	8,596,634.4	-3.6%
	Optimal DC Output	8,532,990.2	-0.7%
	Constrained DC Output	8,511,490.6	-0.3%
	Inverter Output	8,283,625.0	-2.7%
	Energy to Grid	**8,242,206.7**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		12.7 °C
	Avg. Operating Cell Temp		20.5 °C
Simulation Metrics			
	Operating Hours		4693
	Solved Hours		4693

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km grid (41.35,-73.85), NREL (prospector)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Module Characterizations

Module	Uploaded By	Characterization
Q.Peak DUO XL-G10.3/BFG 485 (Hanwha Q Cells)	HelioScope	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization

Components

Component	Name	Count
Inverters	SGI 225-480 (Solectria)	22 (4.95 MW)
Strings	10 AWG (Copper)	1,272 (600,406.3 ft)
Module	Hanwha Q Cells, Q.Peak DUO XL-G10.3/BFG 485 (485W)	12,300 (5.97 MW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	7-10	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 2	Fixed Tilt	Portrait (Vertical)	25°	180°	10.0 ft	2x10	615	12,300	5.97 MW

Detailed Layout