

Appendix B

Hellman Solar PV Electrical System Drawings

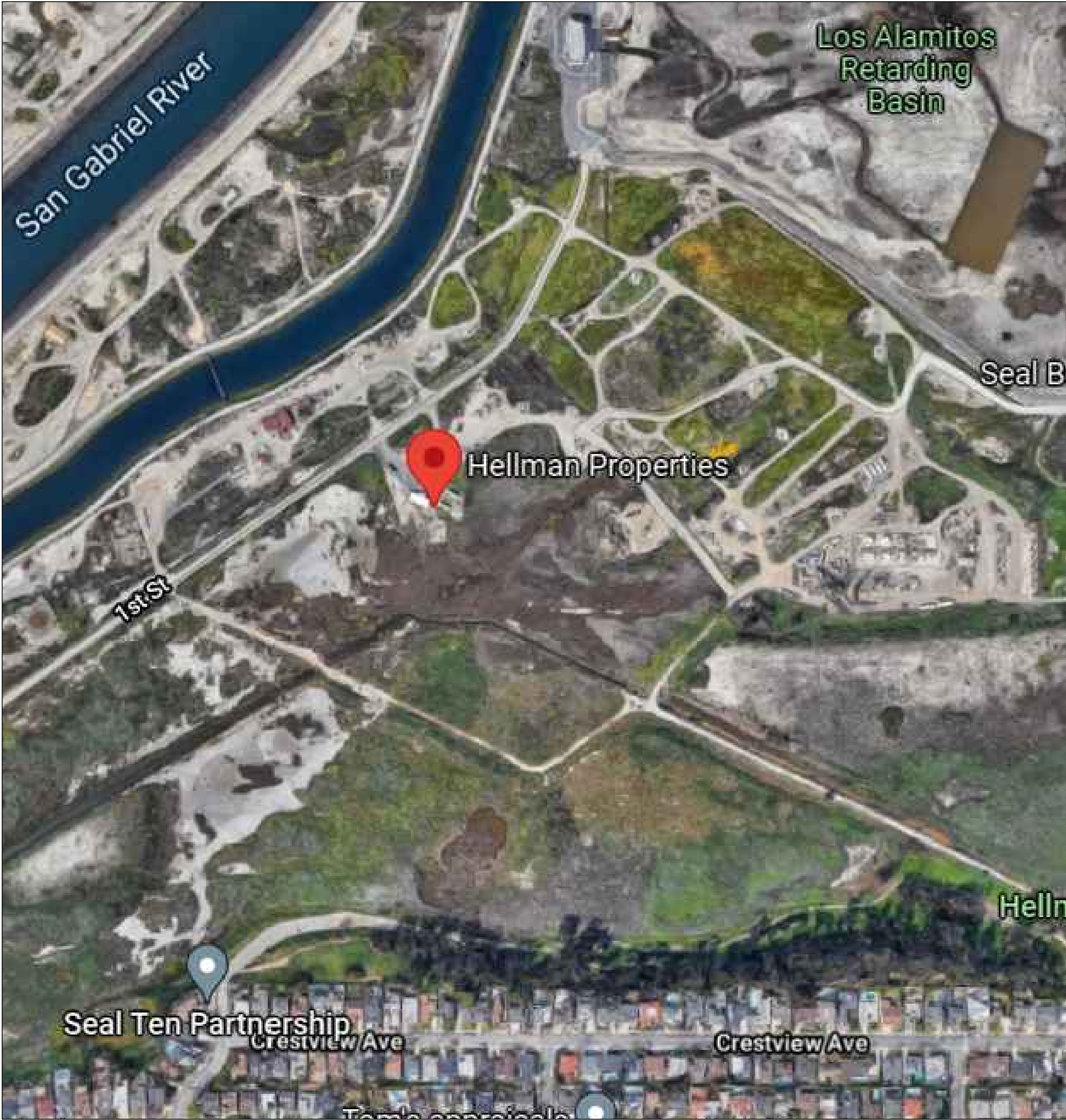
HELLMAN PROPERTIES

SEAL BEACH

SOLAR PV ELECTRICAL SYSTEM

INSTALLATION DRAWINGS

PROJECT SITE



GENERAL NOTES

SCOPE OF WORK:
THE INSTALLATION OF A GROUND MOUNTED SOLAR PHOTOVOLTAIC (PV) PLANT INCLUDING PV MODULES, AND GRID INTERACTIVE INVERTERS, AND RACKING STRUCTURE TO SUPPLY POWER TO THE FACILITY IN PARALLEL WITH THE EXISTING ELECTRIC UTILITY GRID.

PROJECT LOCATION:
711 1ST STREET, SEAL BEACH, CA 90740
APN: 095-010-68

INTERCONNECTION:
THE PV SYSTEM WILL OPERATE IN PARALLEL WITH THE ELECTRIC UTILITY SERVICE PROVIDER. THE INVERTERS PROVIDE ANTI-ISLANDING PROTECTION AS WELL AS HARMONIC LIMITS THAT COMPLY WITH UL 1741, IEEE 1547, AND IEEE 519.

CODE ENFORCED:
CALIFORNIA ELECTRICAL CODE, 2019 EDITION
CALIFORNIA BUILDING CODE, 2019 EDITION
CALIFORNIA FIRE CODE, 2019 EDITION

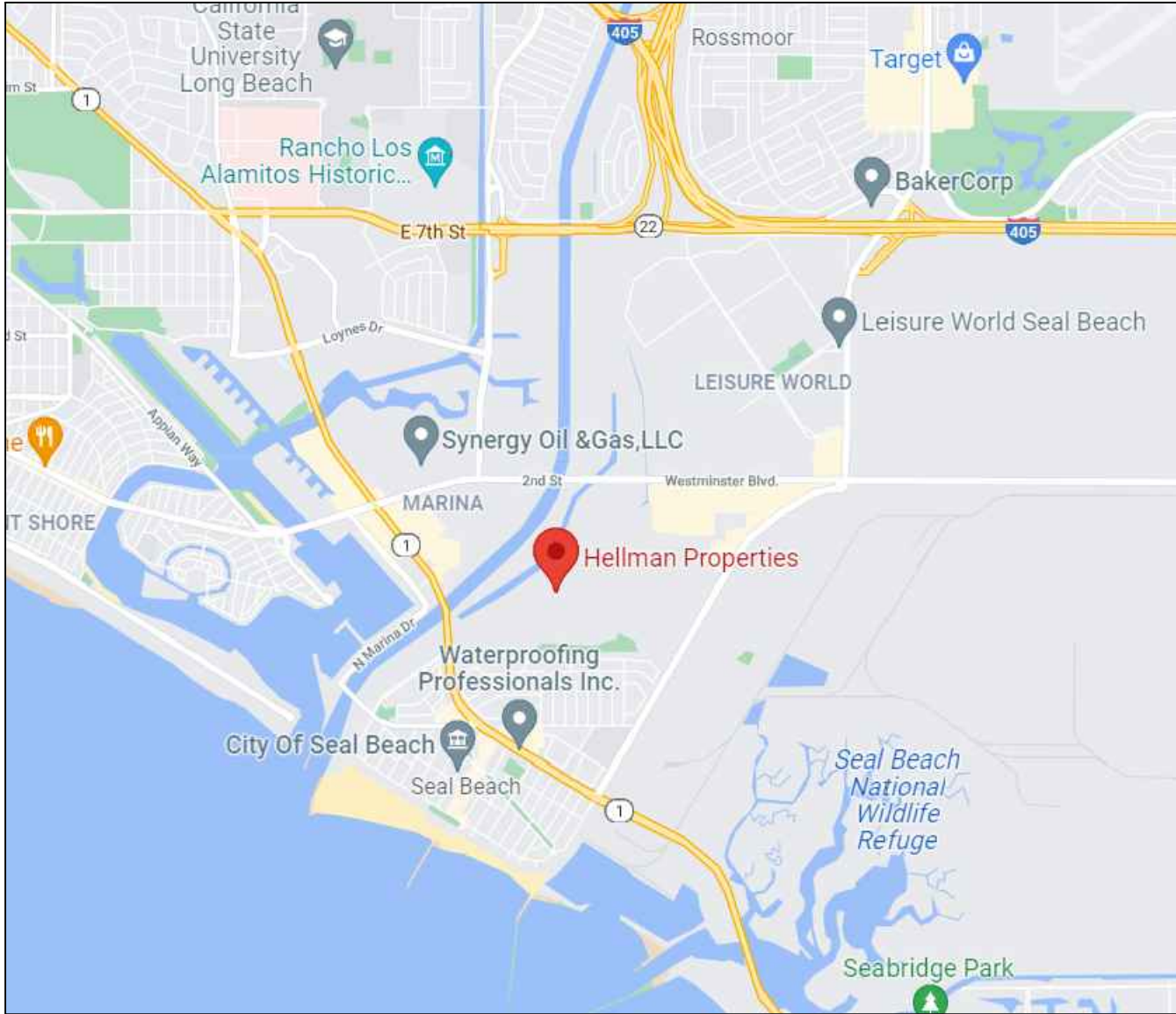
AUTHORITY HAVING JURISDICTION:
SEAL BEACH BUILDING AND SAFETY

ELECTRIC UTILITY SERVICE PROVIDER:
SOUTHERN CALIFORNIA EDISON (SCE)

SHEET INDEX

PV1	COVER SHEET
PV2	PROPERTY SITE PLAN
PV3	SITE PLAN
PV4	RACKING DETAILS
PV5	SINGLE LINE DIAGRAM
PV6	WIRE CHART
PV7	SIGNAGE
PV8	PV SYSTEM EQUIPMENT DATA SHEETS
9-16	RACKING SHOP DRAWINGS

SITE LOCATION



GENERAL NOTES

PV SYSTEM DETAILS	
DC SYSTEM SIZE	1,503.50 kW
AC SYSTEM SIZE	1600.0 kW
DC / AC RATIO	0.94
POCC / POI VOLTAGE	600Y/347V
ROOFTOP PV SYSTEM DETAILS	
ROOFTOP PHOTOVOLTAIC MODULES	
MANUFACTURER	HANWHA Q CELL
MODEL	Q. PEAK DUO XL-G10.2
DC POWER @ STC	485W
TOTAL MODULES	3100
INVERTER	
MANUFACTURER	CHINT POWER SYSTEMS
MODEL	CPS SCH100KTL-DO/US-600
AC POWER RATING	100kW
QUANTITY	16
RACKING	
MANUFACTURER	SOLCOMPONENTS
TYPE	GROUND MOUNT FIXED TILT
TILT / AZIMUTH	10° / 180°
NUMBER OF ARRAYS	56
PV MODULES PER ARRAY	56, (1) ARRAY W/ 20



NEWPORT POWER
205 AVENIDA DEL MAR #1384
SAN CLEMENTE, CA 92674
WWW.NEWPORTPOWER.COM
760-271-6580

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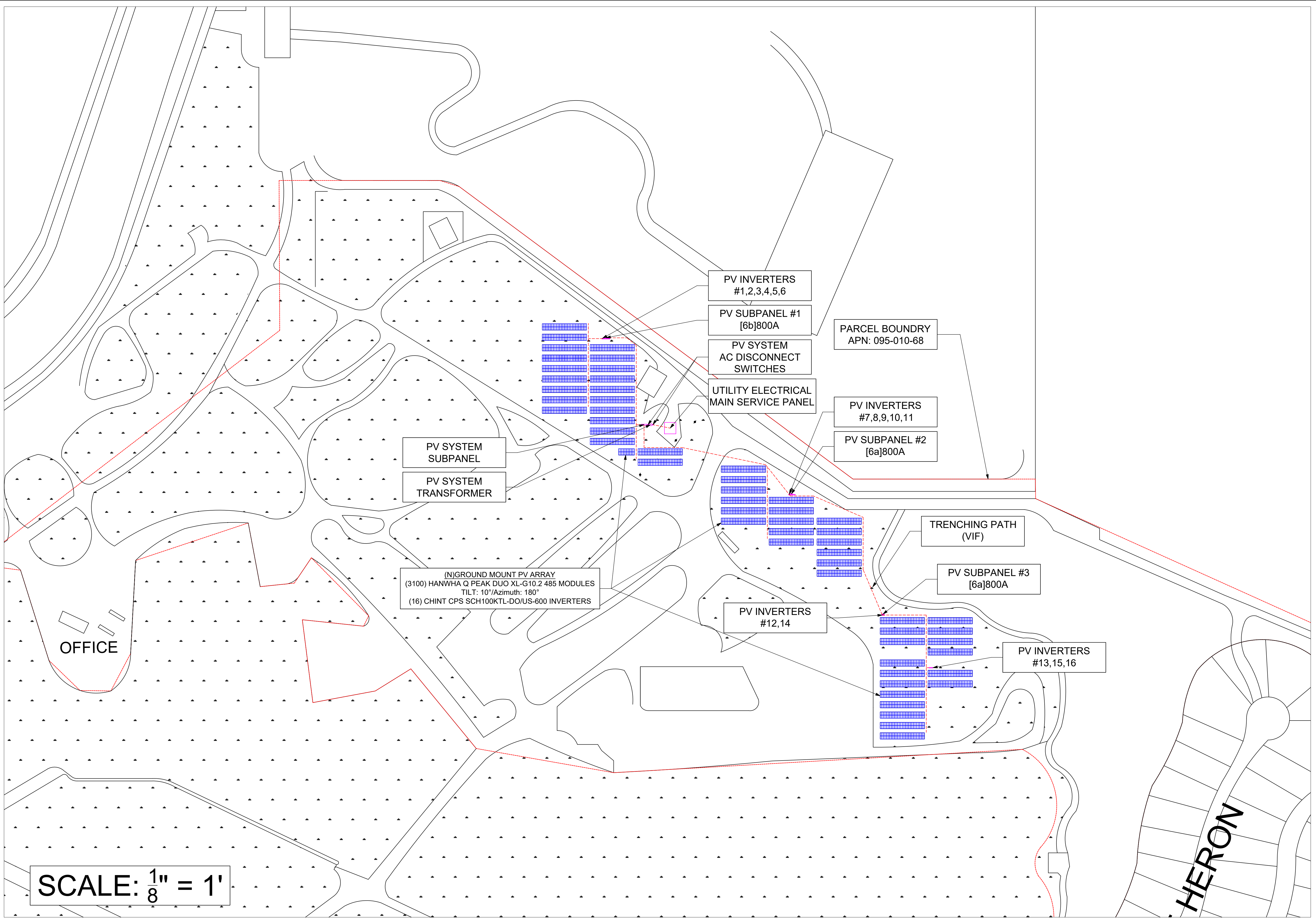
HELLMAN PROPERTY
SITE ADDRESS
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No.	Description	Date

COVER SHEET

PV1

12/06/2022



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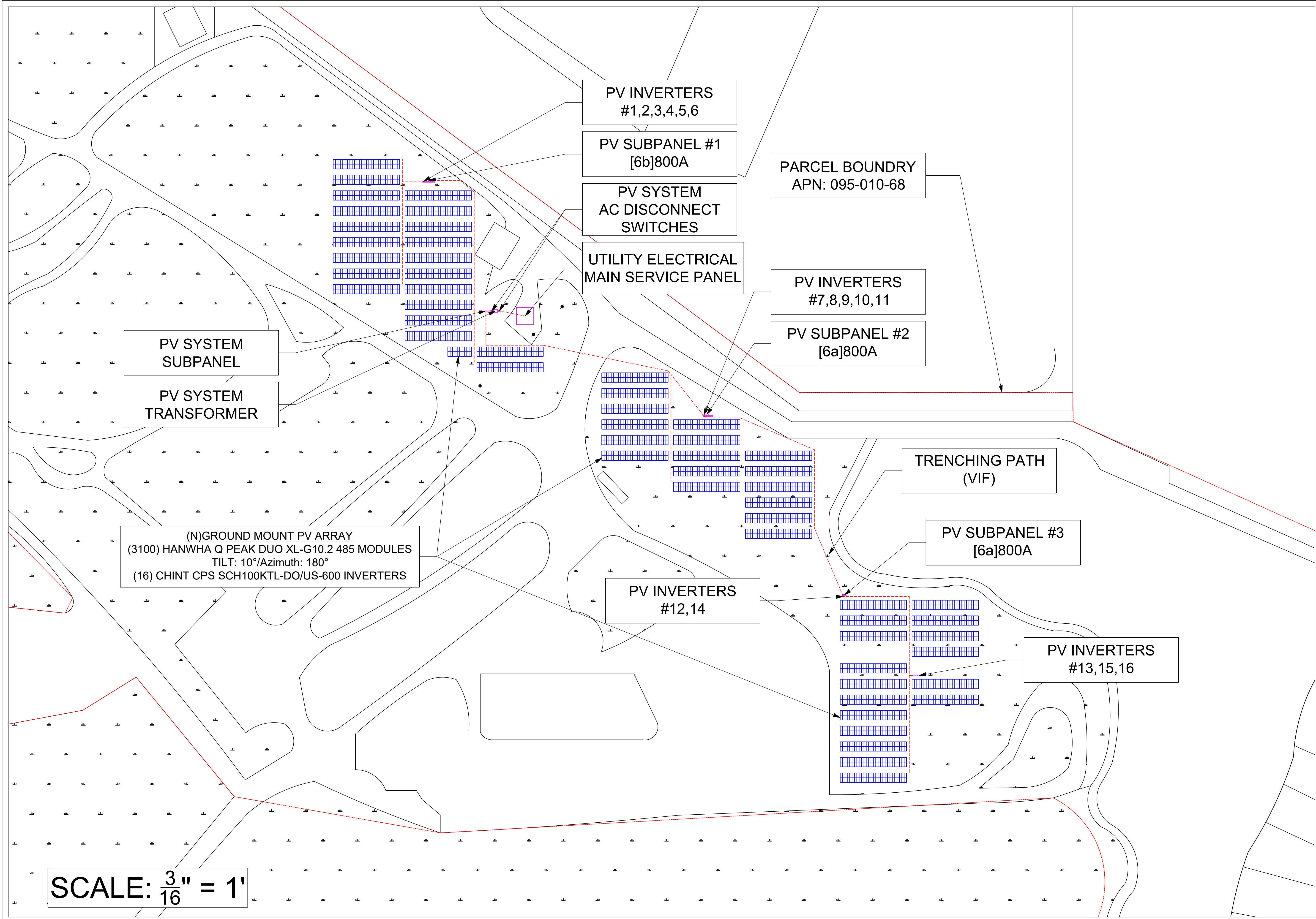
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No.	Description	Date

PROPERTY
SITE PLAN
PV2
12/06/2022



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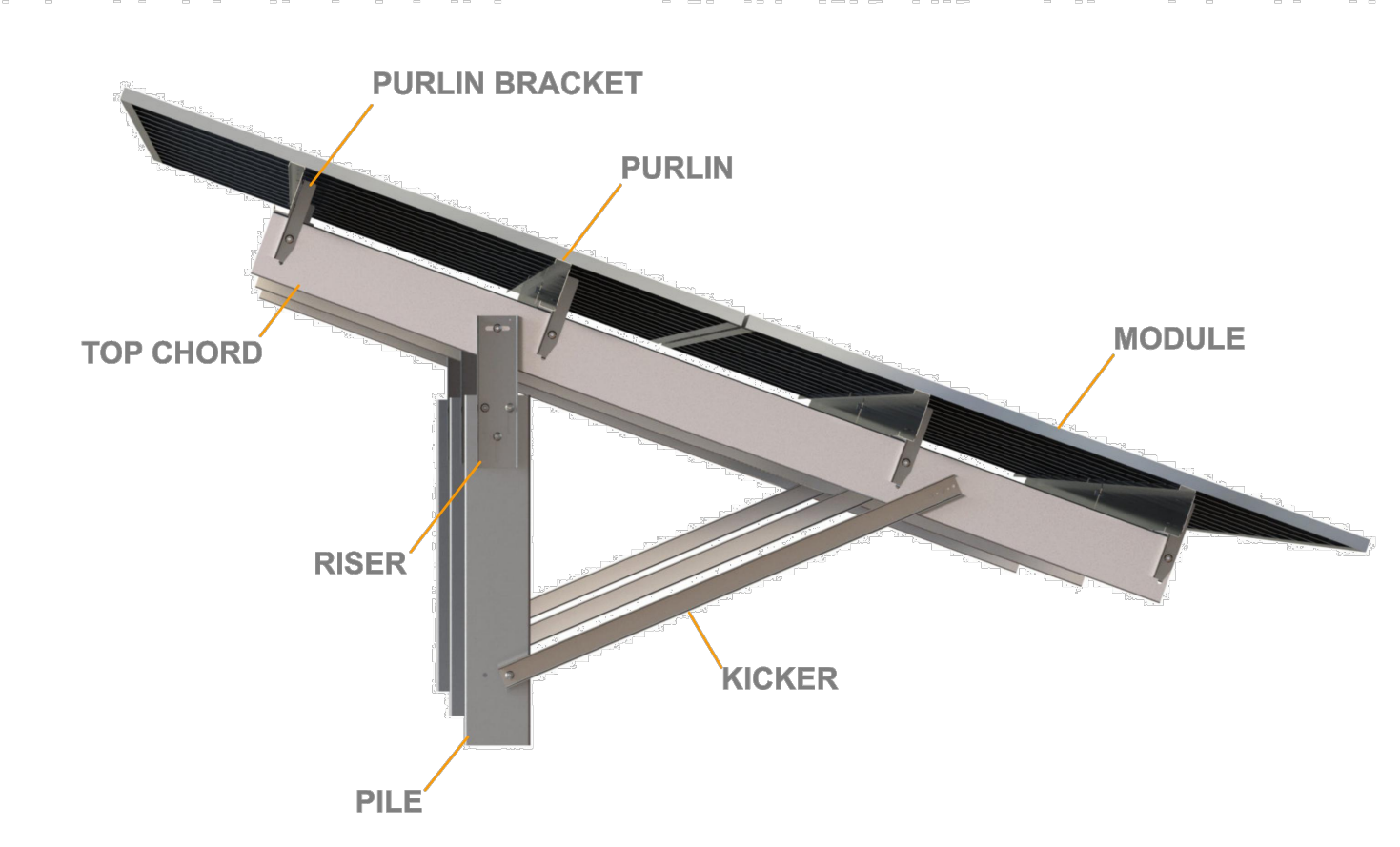
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SEAL BEACH, CA 90740
APN: 095-010-68

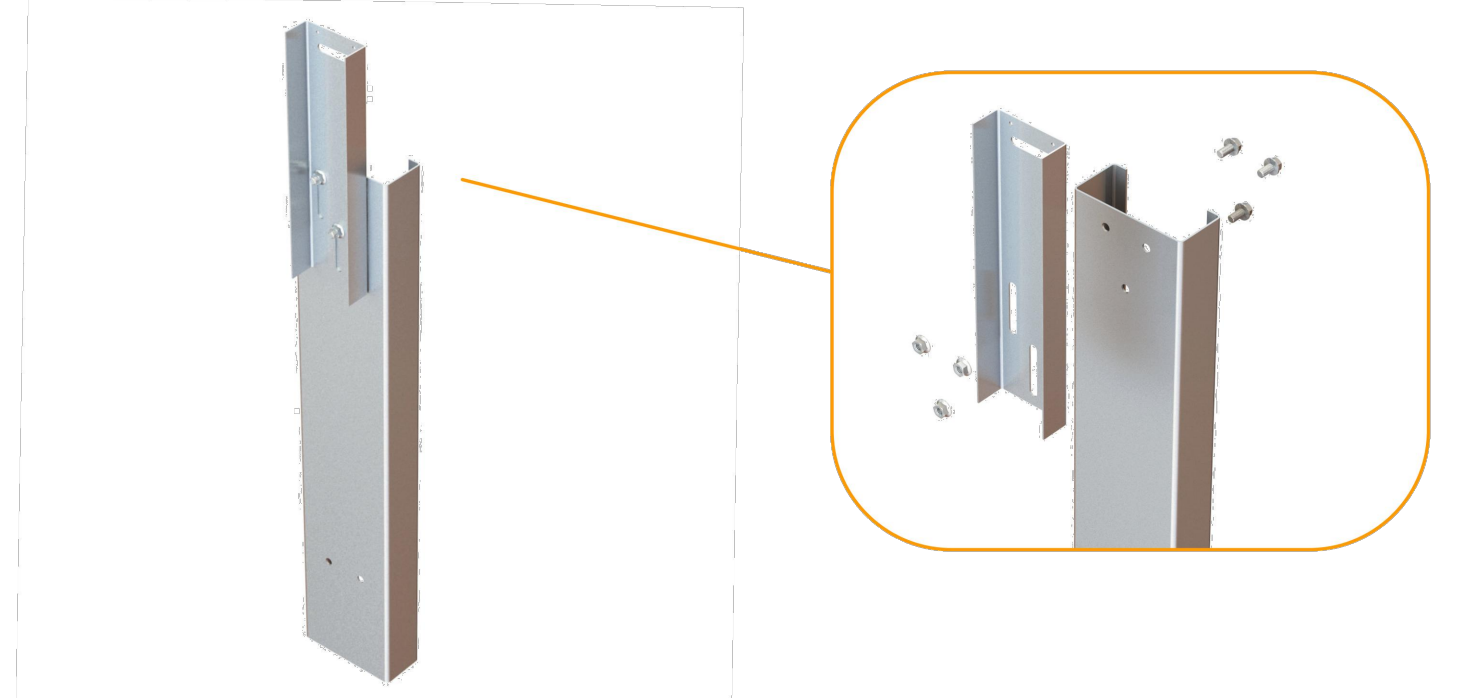
No.	Description	Date

SITE PLAN
PV3
12/06/2022

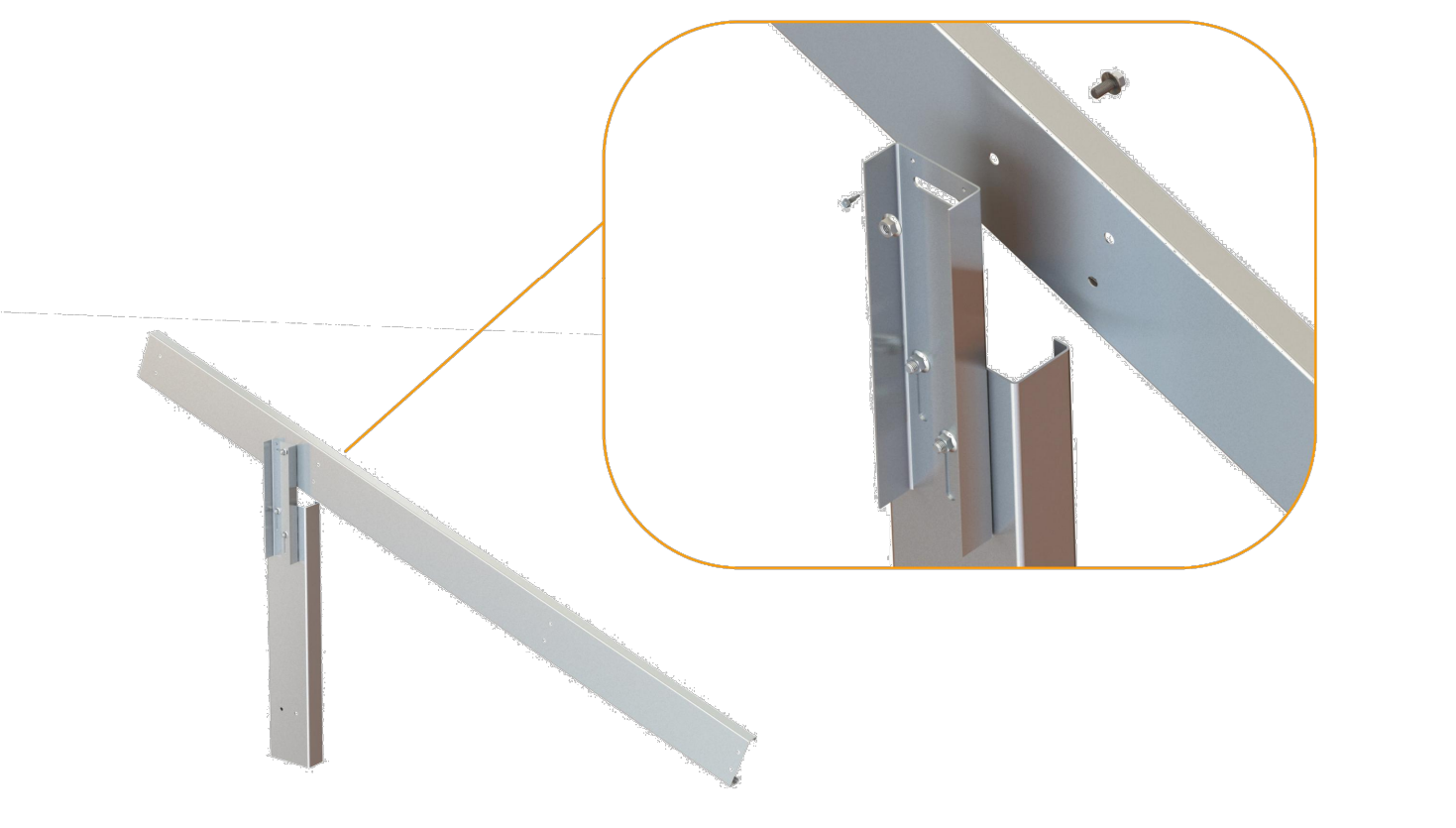
SYSTEM OVERVIEW



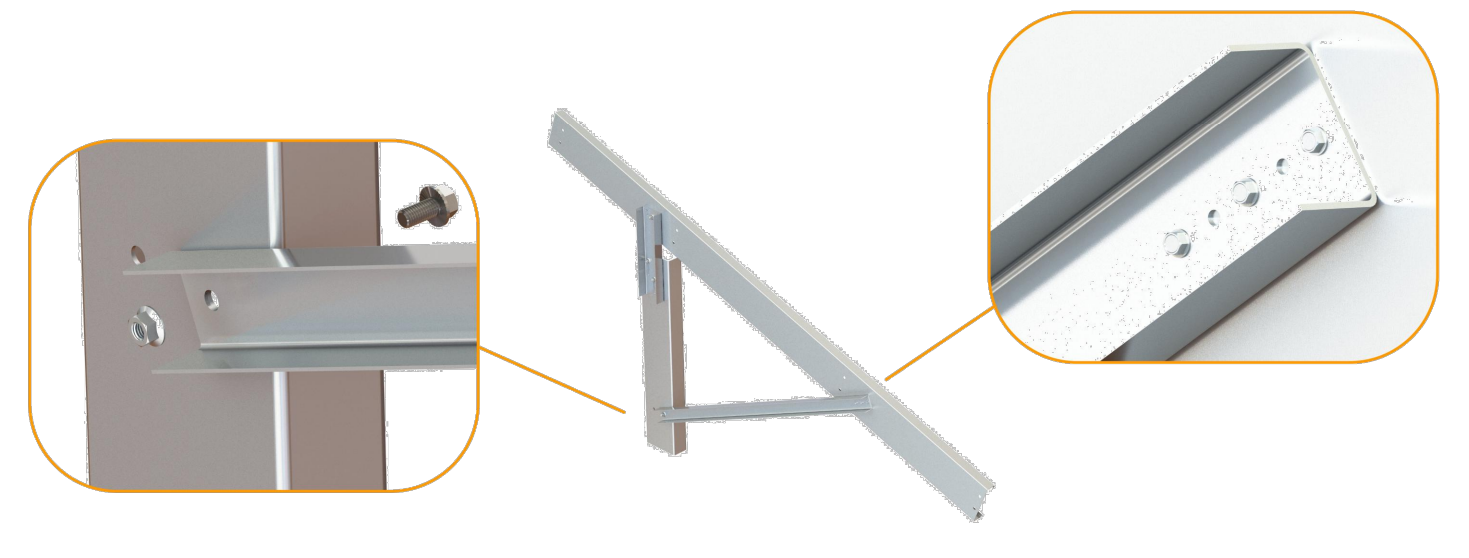
RISER INSTALLATION



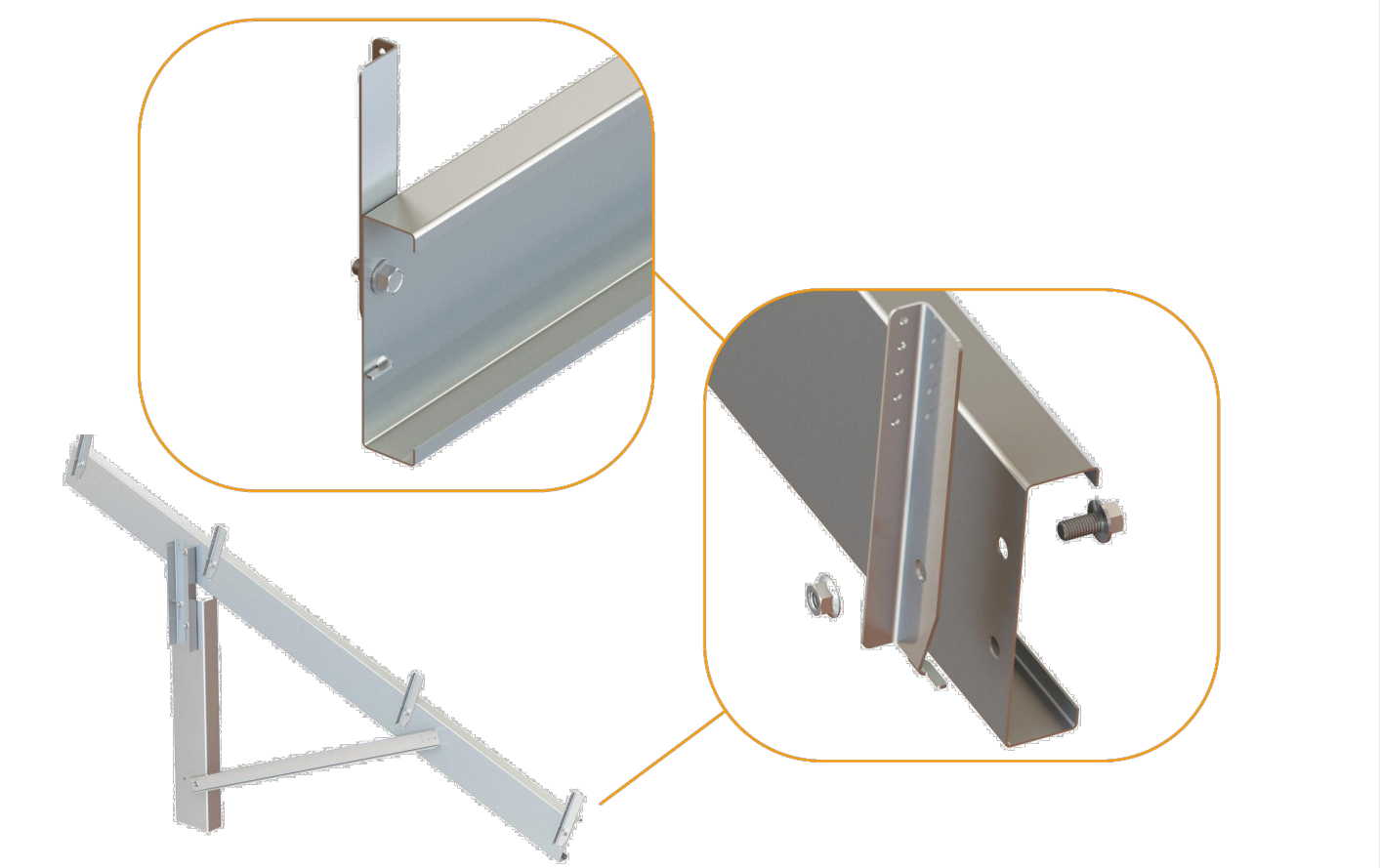
TOP CHORD INSTALLATION



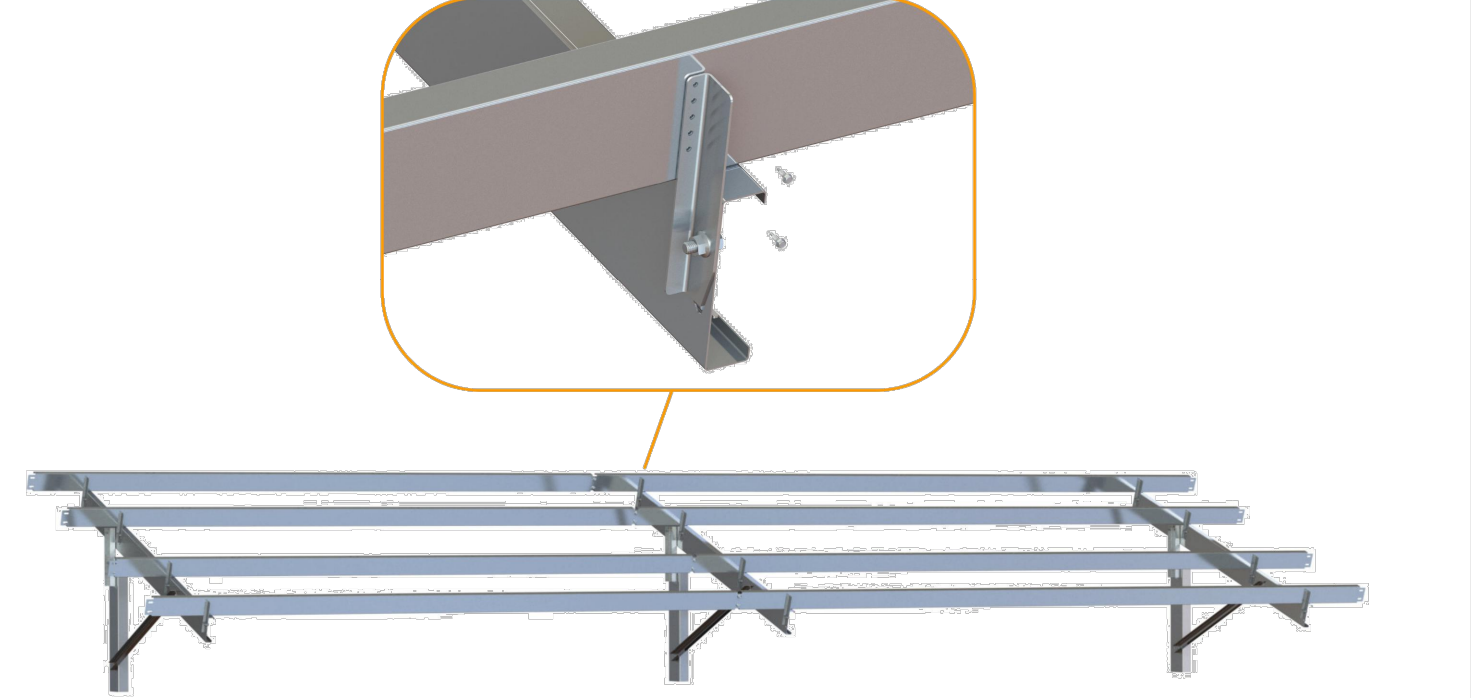
KICKER INSTALLATION



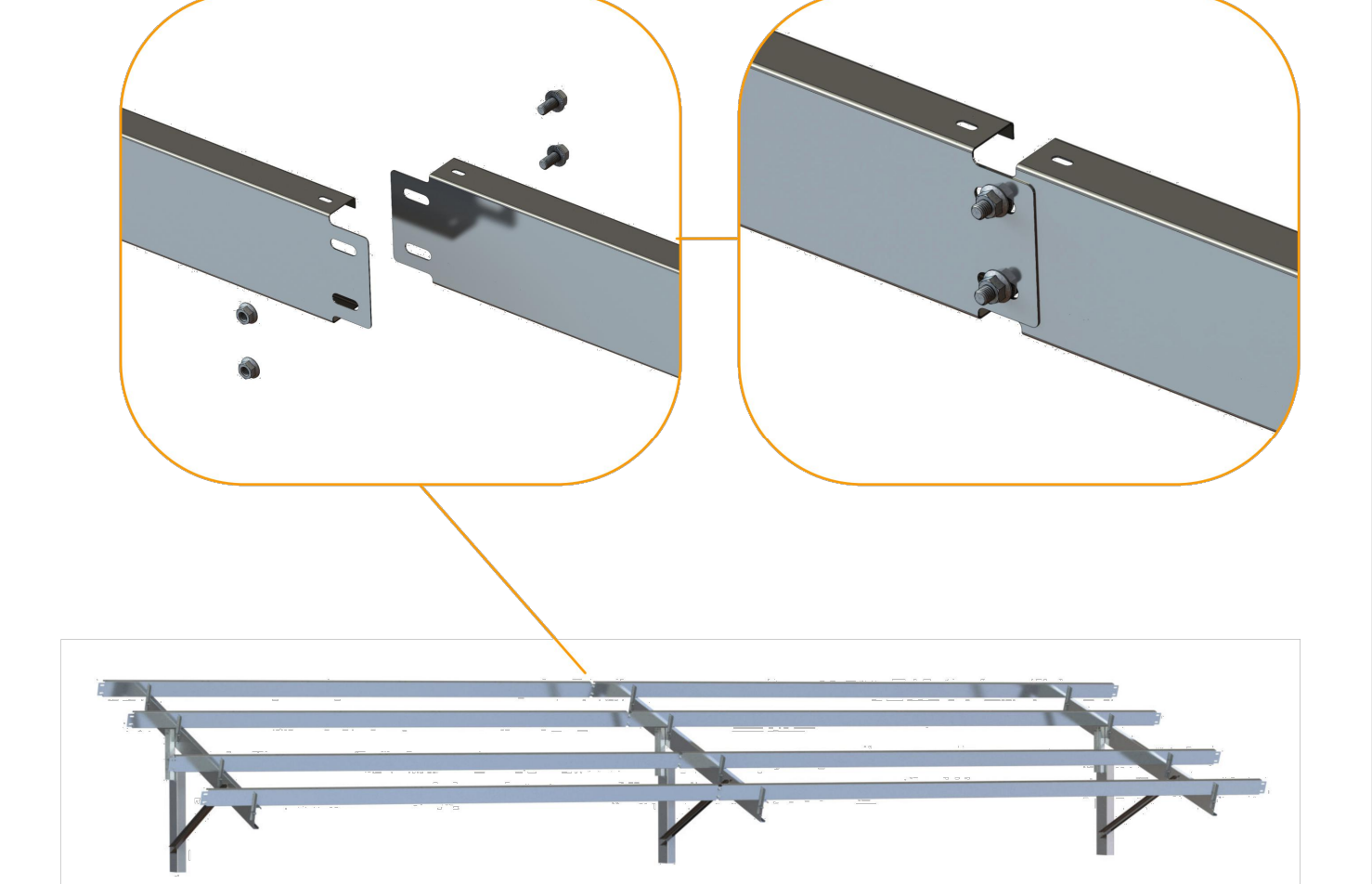
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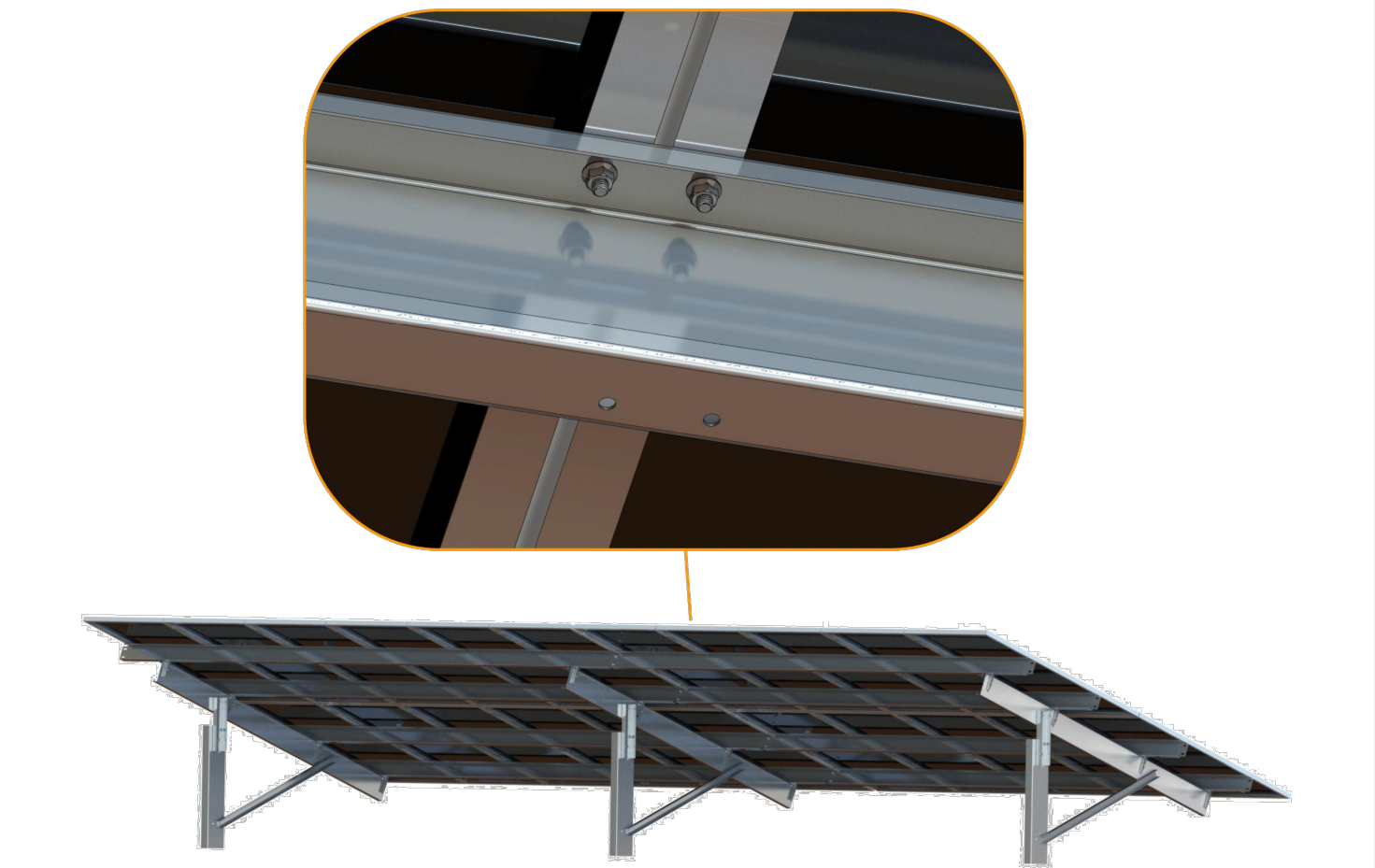
PURLIN INSTALLATION



COPED PURLIN SPLICE INSTALLATION



MODULE INSTALLATION



PURLIN SPLICE BRACKET INSTALLATION

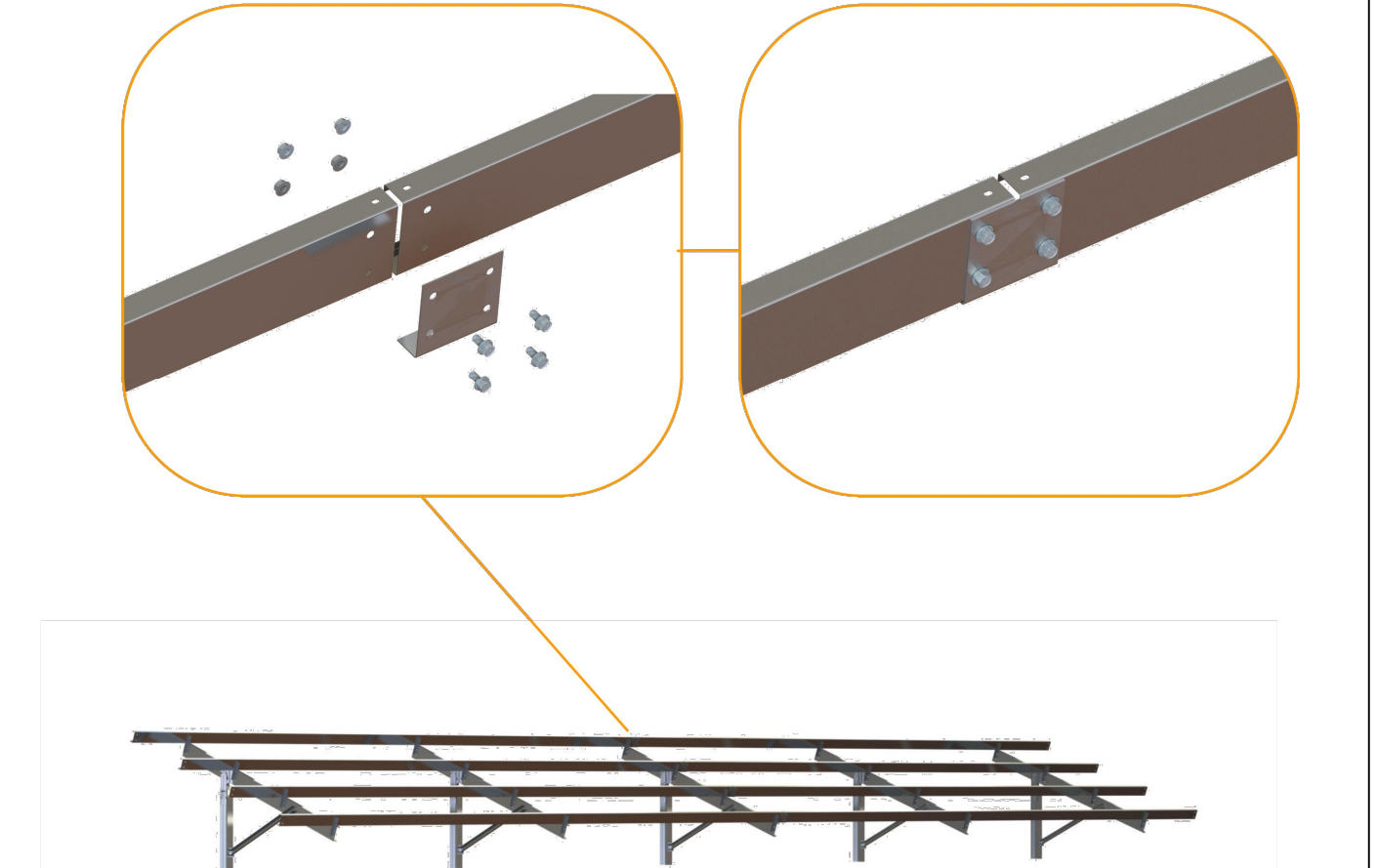
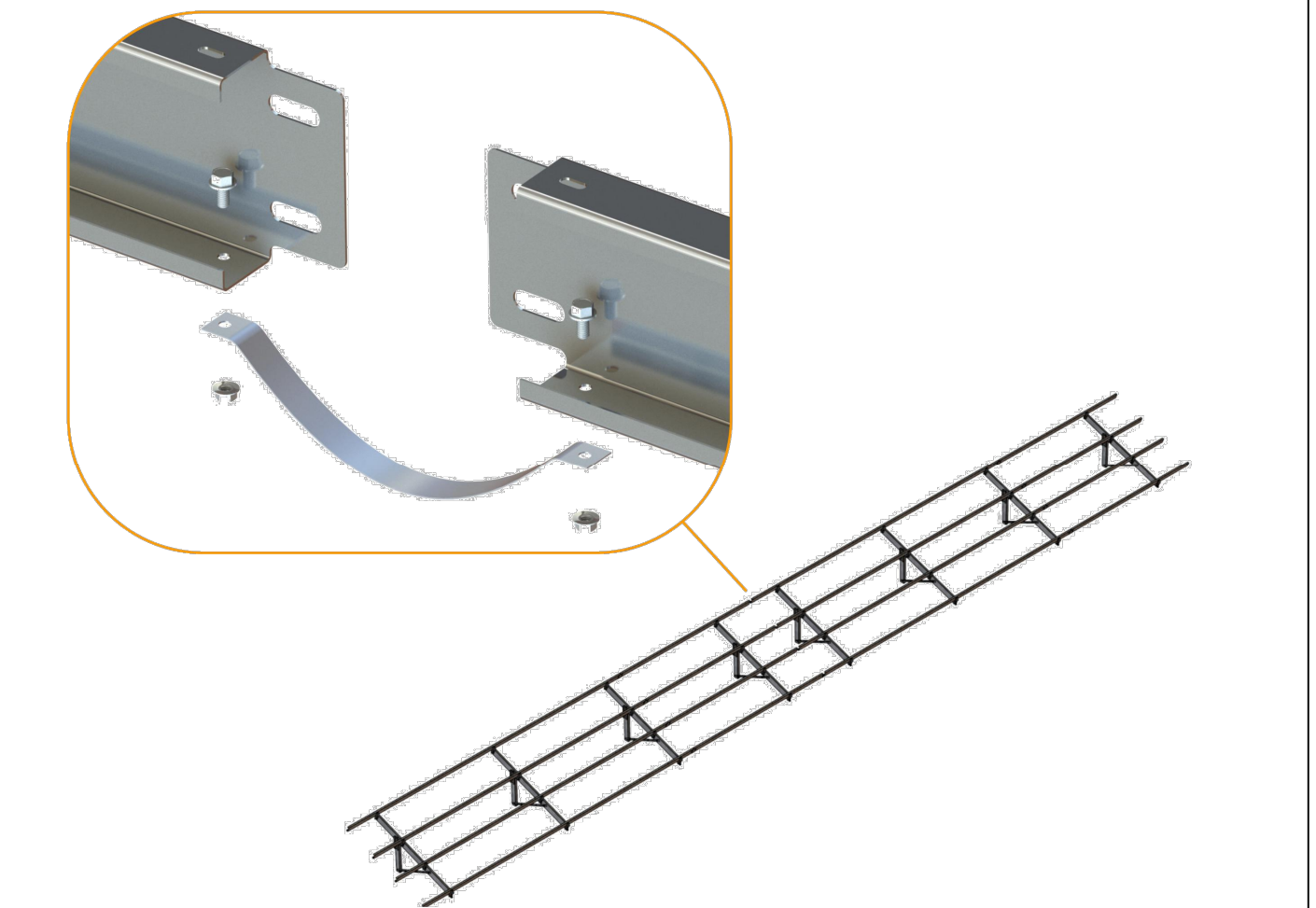
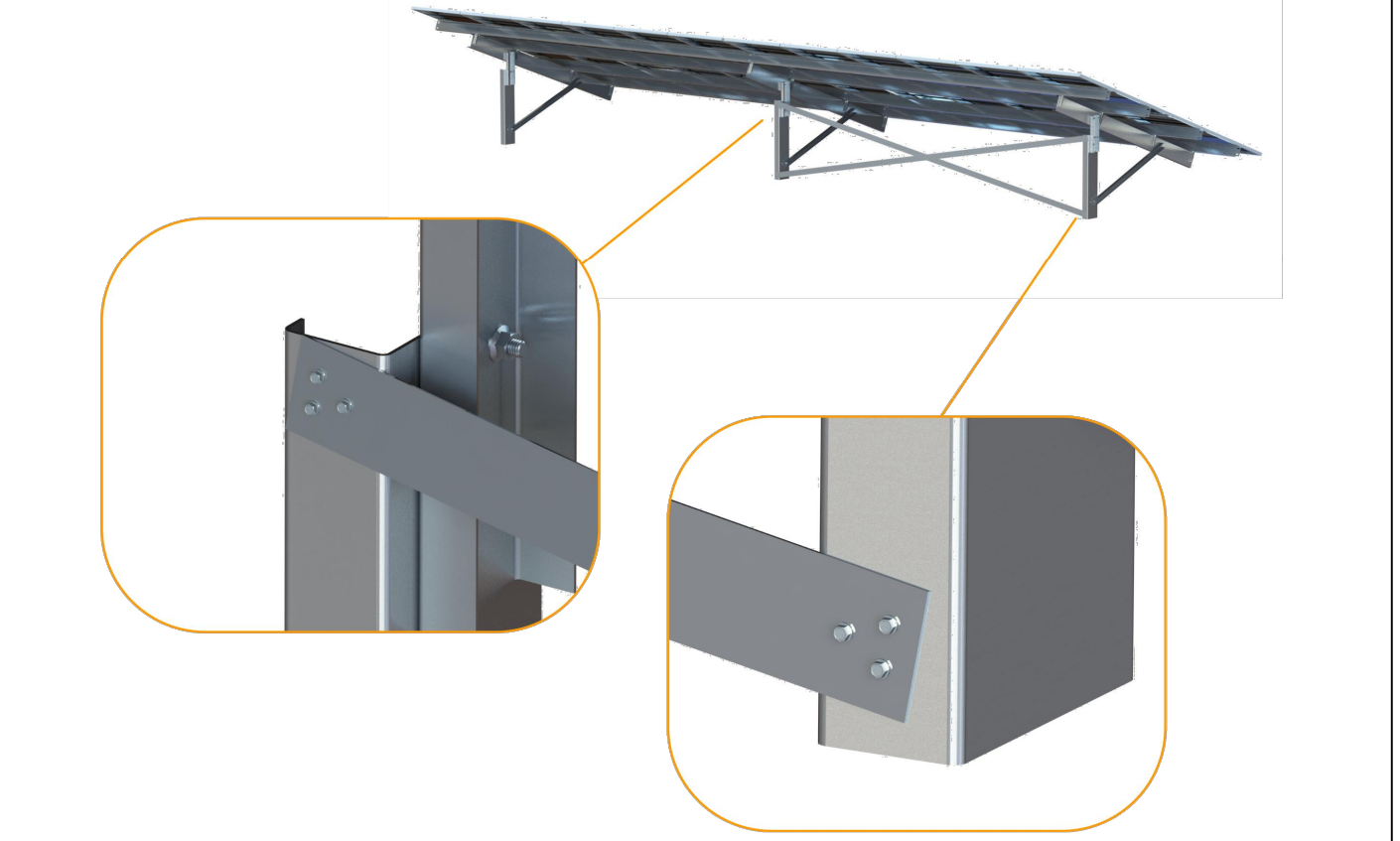


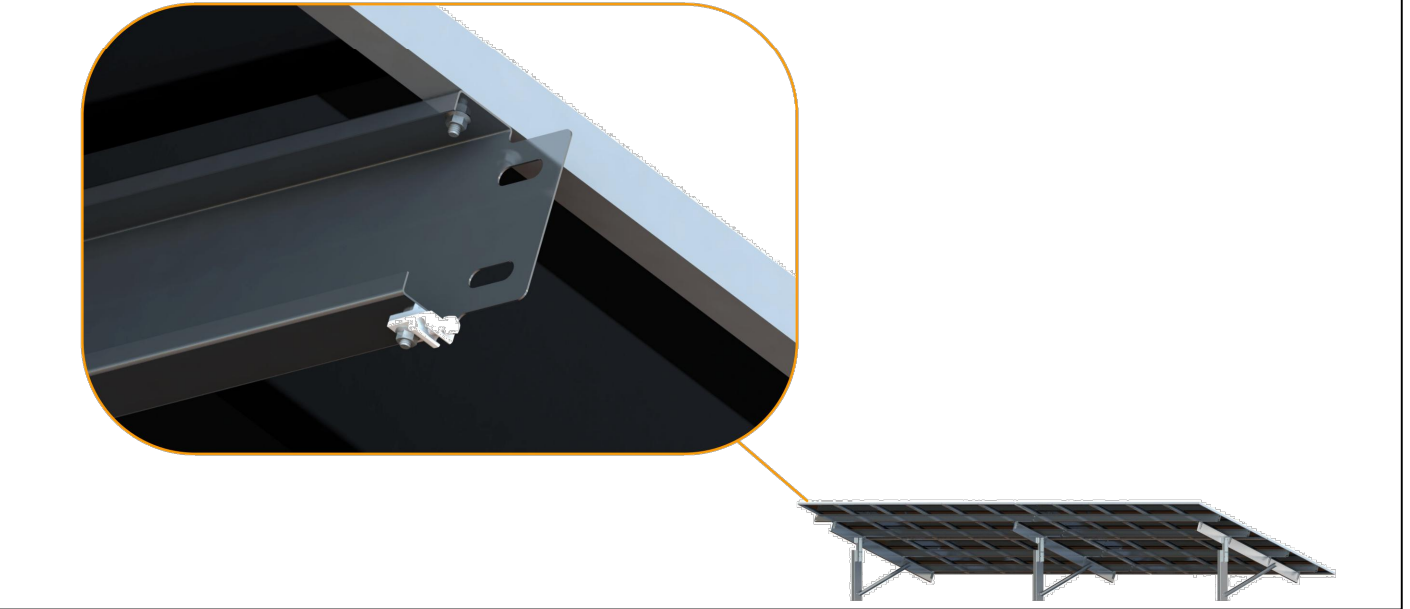
TABLE SPLICE INSTALLATION



OPTIONAL LATERAL BRACING INSTALLATION



SYSTEM BONDING AND GROUNDING



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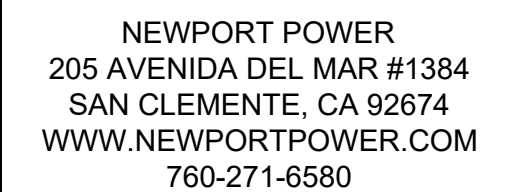
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HELLMAN PROPERTY
SITE ADDRESS
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APN: 095-010-68

No.	Description	Date

RACKING
DETAILS
PV4
12/06/2022



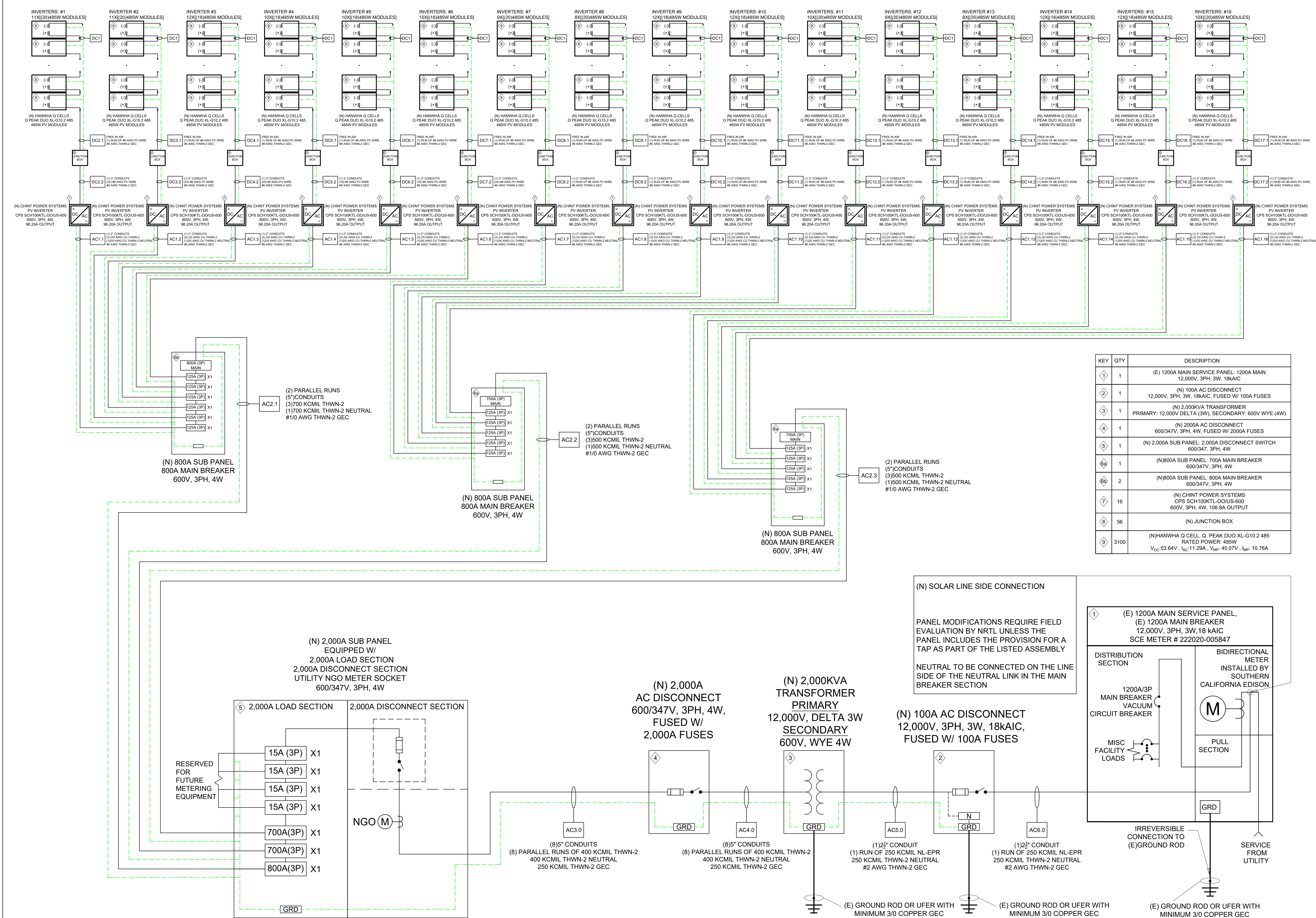
Newport Power
LIC # 939960
EXP: 11/30/2023

HELLMAN PROPERTY
SITE ADDRESS
711 1ST STREET,
SEAL BEACH, CA 90740
APN: 095-010-68

[illegible]

PV5

12/06/2022



			WIRING CHART												WIRE RATING CHART										TERMINATION		VOLTAGE DROP				
			CALL OUT	AMPS Ise	NEC MULTIPLIER	AMPS MAX	PARALLEL RUNS	# OF CONDUCTORS	CONDUCTOR SIZE	CONDUCTOR MATERIAL	CONDUCTOR INSULATION	NEUTRAL SIZE	GROUND SIZE	CONDUIT QUANTITY	CONDUIT SIZE	WIRE TEMPERATURE RATING	WIRE AMBIENT TEMPERATURE °C	CURRENT CARRYING CONDUCTORS	WIRE AMP RATING	WIRE TEMPERATURE DERATE	WIRE CONDUCTOR DERATE	DERATED WIRE RATING >= AMPS MAX	TERMINATION TEMPERATURE RATING	TERMINATION AMP RATING >= AMPS MAX	Vdrop AMPS Imp	Vdrop VOLTAGE Vmp	Vdrop DISTANCE	Vdrop PERCENT			
DC1	11.29	1.56	17.61	1	2	#10 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	40	0.91	1	(40 A)X(0.91)X(1)=36.4>=17.61	60	30>=17.61	10.76	45.07	3.5	0.207							
SUBPANEL #1	INVERTER #1	DC2.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	901.40	50	0.093					
		DC2.2	11.29	1.56	17.61	1	22	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	22	55	0.91	0.45	(55 A)X(0.91)X(0.45)=22.52>=17.61	60	40>=17.61	10.76	901.40	185	0.344				
		AC1.1	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
	INVERTER #2	DC3.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	901.40	50	0.093					
		DC3.2	11.29	1.56	17.61	1	22	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	22	55	0.91	0.45	(55 A)X(0.91)X(0.45)=22.52>=17.61	60	40>=17.61	10.76	901.40	335	0.622				
		AC1.2	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
	INVERTER #3	DC4.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	811.26	50	0.103					
		DC4.2	11.29	1.56	17.61	1	24	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	24	55	0.91	0.45	(55 A)X(0.91)X(0.45)=22.52>=17.61	60	40>=17.61	10.76	811.26	125	0.258				
		AC1.3	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
	INVERTER #4	DC5.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	811.26	50	0.103					
		DC5.2	11.29	1.56	17.61	1	20	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	22	55	0.91	0.50	(55 A)X(0.91)X(0.50)=25.03>=17.61	60	40>=17.61	10.76	811.26	140	0.289				
		AC1.4	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
	INVERTER #5	DC6.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	811.26	50	0.103					
		DC6.2	11.29	1.56	17.61	1	20	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	22	55	0.91	0.50	(55 A)X(0.91)X(0.50)=25.03>=17.61	60	40>=17.61	10.76	811.26	185	0.382				
		AC1.5	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
	INVERTER #6	DC7.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	811.26	50	0.103					
		DC7.2	11.29	1.56	17.61	1	20	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	22	55	0.91	0.50	(55 A)X(0.91)X(0.50)=25.03>=17.61	60	40>=17.61	10.76	811.26	335	0.691				
		AC1.6	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
	SUB#1 OUTPUT	AC2.1	577.20	1.25	721.50	2	4	700 KCMIL	CU	THWN-2	700 KCMIL	#1 AWG	2	5"	90	40	3	520	0.91	1	(520 A)X(0.91)X(1)=473.20>=360.25	60	385>=360.25	288.60	600	275	0.679				
	SUBPANEL #2	INVERTER #7	DC8.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	901.40	50	0.093				
			DC8.2	11.29	1.56	17.61	1	18	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	18	55	0.91	0.50	(55 A)X(0.91)X(0.50)=25.03>=17.61	60	40>=17.61	10.76	901.40	190	0.353			
			AC1.7	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039			
		INVERTER #8	DC9.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	901.40	50	0.093				
			DC9.2	11.29	1.56	17.61	1	16	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	16	55	0.91	0.50	(55 A)X(0.91)X(0.50)=25.03>=17.61	60	40>=17.61	10.76	901.40	290	0.539			
AC1.8			96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
INVERTER #9		DC10.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	811.26	50	0.103					
		DC10.2	11.29	1.56	17.61	1	24	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	24	55	0.91	0.45	(55 A)X(0.91)X(0.45)=22.52>=17.61	60	40>=17.61	10.76	811.26	190	0.392				
		AC1.9	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
INVERTER #10		DC11.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	811.26	50	0.103					
		DC11.2	11.29	1.56	17.61	1	24	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	24	55	0.91	0.45	(55 A)X(0.91)X(0.45)=22.52>=17.61	60	40>=17.61	10.76	811.26	290	0.599				
		AC1.10	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
INVERTER #11		DC12.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	901.40	50	0.093					
		DC12.2	11.29	1.56	17.61	1	20	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	22	55	0.91	0.50	(55 A)X(0.91)X(0.50)=25.03>=17.61	60	40>=17.61	10.76	901.40	230	0.427				
		AC1.11	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
SUB#2 OUTPUT		AC2.2	481.00	1.25	601.25	2	4	500 KCMIL	CU	THWN-2	500 KCMIL	#1 AWG	2	5"	90	40	3	430	0.91	1	(430 A)X(0.91)X(1)=391.30>=300.63	60	320>= 300.63	240.50	600	400	0.877				
SUBPANEL #3		INVERTER #12	DC13.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	901.40	50	0.093				
			DC13.2	11.29	1.56	17.61	1	18	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	18	55	0.91	0.50	(55 A)X(0.91)X(0.50)=25.03>=17.61	60	40>=17.61	10.76	901.40	225	0.418			
			AC1.12	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	#2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039			
		INVERTER #13	DC14.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	901.40	50	0.093				
			DC14.2	11.29	1.56	17.61	1	16	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	16	55	0.91	0.50	(55 A)X(0.91)X(0.50)=25.03>=17.61	60	40>=17.61	10.76	901.40	150	0.279			
			AC1.13	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	#2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	220	0.423			
		INVERTER #14	DC15.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	811.26	50	0.103				
			DC15.2	11.29	1.56	17.61	1	24	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	24	55	0.91	0.45	(55 A)X(0.91)X(0.45)=22.52>=17.61	60	40>=17.61	10.76	811.26	150	0.310			
	AC1.14		96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	#2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	20	0.039				
	INVERTER #15	DC16.1	11.29	1.56	17.61	1	2	#8 AWG	CU	PV WIRE	N/A	#6 BARE	FREE IN AIR	90	40	2	55	0.91	1	(55 A)X(0.91)X(1)=50.05>=17.61	60	40>=17.61	10.76	811.26	50	0.103					
		DC16.2	11.29	1.56	17.61	1	24	#8 AWG	CU	PV WIRE	N/A	#6 BARE	1	3"	90	40	24	55	0.91	0.45	(55 A)X(0.91)X(0.45)=22.52>=17.61	60	40>=17.61	10.76	811.26	150	0.310				
		AC1.15	96.20	1.25	120.25	1	4	2/0 AWG	CU	THWN-2	#2/0 AWG	#6 AWG	1	2"	90	40	3	195	0.91	1	(145 A)X(0.91)X(1)=177.45>=120.25	60	145>=120.25	96.20	600	220	0.423				
	INVERTER #16	DC17.																													

KEY	QTY	DESCRIPTION
1	1	(E) 1200A MAIN SERVICE PANEL: 1200A MAIN 12,000V, 3PH, 3W, 18kAIC
2	1	(N) 100A AC DISCONNECT 12,000V, 3PH, 3W, 18kAIC, FUSED W/ 100A FUSES
3	1	(N) 2,000KVA TRANSFORMER PRIMARY: 12,000V DELTA (3W), SECONDARY: 600V WYE (4W)
4	1	(N) 2000A AC DISCONNECT 600/347V, 3PH, 4W, FUSED W/ 2000A FUSES
5	1	(N) 2,000A SUB PANEL: 2,000A DISCONNECT SWITCH 600/347, 3PH, 4W
6a	1	(N)800A SUB PANEL: 700A MAIN BREAKER 600/347V, 3PH, 4W
6b	2	(N)800A SUB PANEL: 800A MAIN BREAKER 600/347V, 3PH, 4W
7	16	(N) CHINT POWER SYSTEMS CPS SCH100KTL-DO/US-600 600V, 3PH, 4W, 106.8A OUTPUT
8	56	(N) JUNCTION BOX
9	3100	(N)HANWHA Q CELL, Q. PEAK DUO XL-G10.2 485 RATED POWER: 485W V _{OC} :53.64V , I _{SC} :11.29A , V _{MP} : 45.07V , I _{MP} : 10.76A

SYSTEM DC STC NAME PLATE RATING

(3100) x (485W) = 1,503,500W

STRING MAX VOLTAGE

(20)Q CELL Q PEAK DUO XL-G10.2 485: 1142.317V

(18)Q CELL Q PEAK DUO XL-G10.2 485: 1028.086V

STRING MAX POWER POINT VOLTAGE

(20)Q CELL Q PEAK DUO XL-G10.2 485: 901.40V

(18)Q CELL Q PEAK DUO XL-G10.2 485: 811.26V

NOTE:
ALL PHOTOVOLTAIC OUTPUT CIRCUITS SHALL BE GUARDED OR INSTALLED IN A RACEWAY OR TYPE MC CABLE PER ARTICLE 690.31

 NEWPORTPOWER <i>Delivering the Power of the Sun</i>																																
NEWPORT POWER 205 AVENIDA DEL MAR #1384 SAN CLEMENTE, CA 92674 WWW.NEWPORTPOWER.COM 760-271-6580																																
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Newport Power LIC # 939960 EXP: 11/30/2023 × <i>James Reeve</i>																																
HELLMAN PROPERTY SITE ADDRESS 711 1ST STREET, SEAL BEACH, CA 90740 APN: 095-010-68																																
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No.	Description	Date																														
WIRE CHART																																
PV6																																
12/06/2022																																

1

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WARNING

ELECTRIC SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

ORANGE WARNING AREA, 690.13(B)

2

!

WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

ORANGE WARNING AREA, 110.27(C)

3

!

WARNING

ELECTRICAL SHOCK HAZARD

DO NOT TOUCH TERMINALS TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

PHOTOVOLTAIC MODULES PRODUCE DC VOLTAGE WHENEVER THEY ARE EXPOSED TO SUNLIGHT

ORANGE WARNING AREA, 690.13(B)

4

!

WARNING

PHOTOVOLTAIC DC DISCONNECT

690.13(B)

INVERTER # 1,2

5

!

WARNING

PHOTOVOLTAIC SYSTEM DC DISCONNECT

OPERATING VOLTAGE 901.40 VDC

OPERATING CURRENT 118.36 A

MAX SYSTEM VOLTAGE 1142.317 VDC

SHORT CIRCUIT CURRENT 124.19 A

690.13(B)

INVERTER # 3,9,10,14,15

5

!

WARNING

PHOTOVOLTAIC SYSTEM DC DISCONNECT

OPERATING VOLTAGE 811.26 VDC

OPERATING CURRENT 129.12 A

MAX SYSTEM VOLTAGE 1028.086 VDC

SHORT CIRCUIT CURRENT 135.48 A

690.13(B)

INVERTER # 4,5,6,16

5

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WARNING

PHOTOVOLTAIC SYSTEM DC DISCONNECT

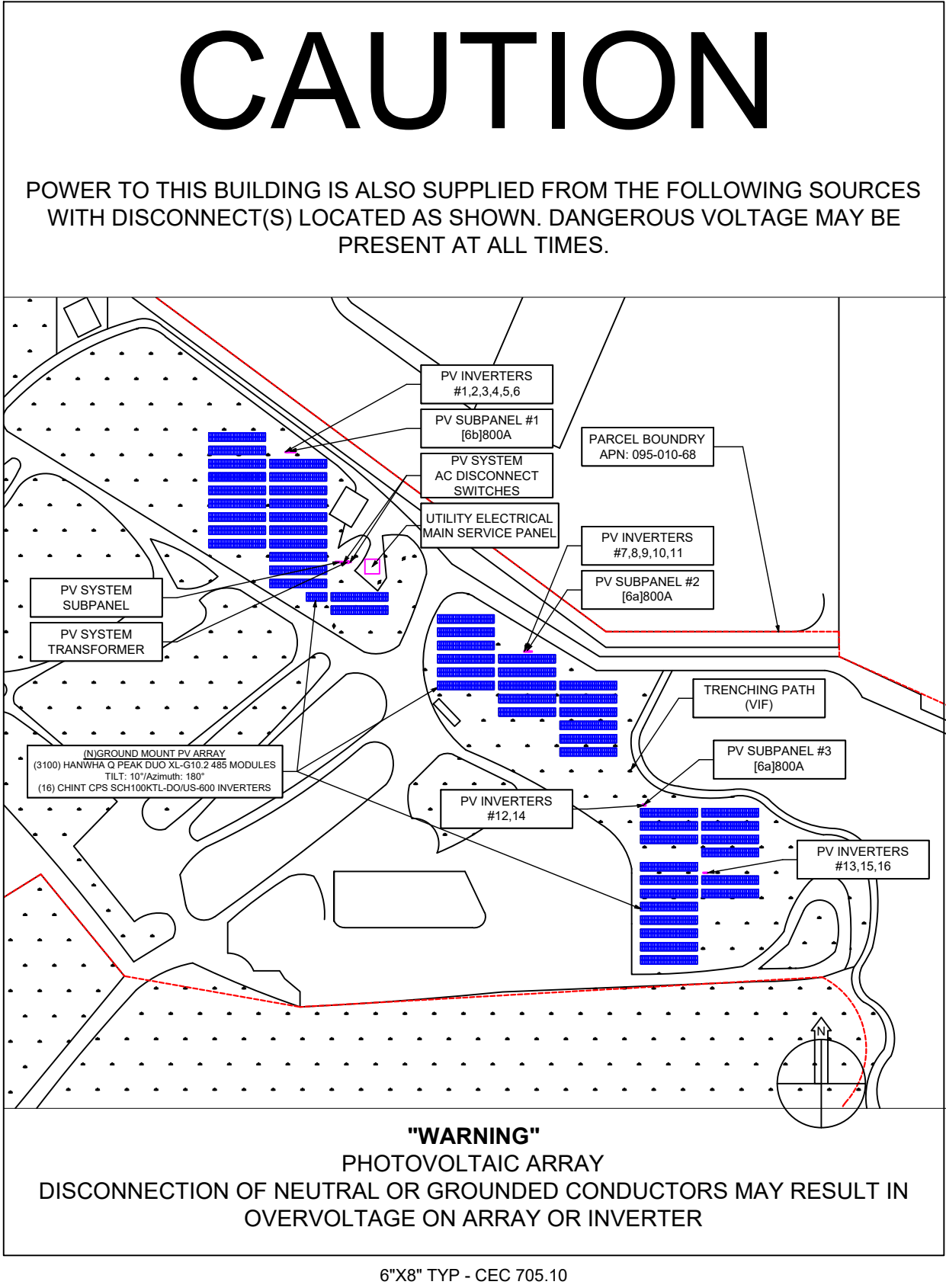
OPERATING VOLTAGE 811.26 VDC

OPERATING CURRENT 107.6 A

MAX SYSTEM VOLTAGE 1028.086 VDC

SHORT CIRCUIT CURRENT 112.9 A

690.13(B)



5

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WARNING

PHOTOVOLTAIC SYSTEM DC DISCONNECT

OPERATING VOLTAGE 901.40 VDC

OPERATING CURRENT 96.84 A

MAX SYSTEM VOLTAGE 1142.317 VDC

SHORT CIRCUIT CURRENT 101.61 A

690.13(B)

INVERTER # 7,12

5

!

WARNING

PHOTOVOLTAIC SYSTEM DC DISCONNECT

OPERATING VOLTAGE 901.40 VDC

OPERATING CURRENT 86.08 A

MAX SYSTEM VOLTAGE 1142.317 VDC

SHORT CIRCUIT CURRENT 90.32 A

690.13(B)

INVERTER # 8,13

5

!

WARNING

PHOTOVOLTAIC SYSTEM DC DISCONNECT

OPERATING VOLTAGE 901.40 VDC

OPERATING CURRENT 107.6 A

MAX SYSTEM VOLTAGE 1142.317 VDC

SHORT CIRCUIT CURRENT 112.9 A

690.13(B)

6

!

WARNING

WARNING: PHOTOVOLTAIC POWER SOURCE

REFLECTIVE STICKER, 690.31(G)(3)(4)

7

!

WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

ORANGE WARNING AREA, 705.12(B)(2)(3)(b)

8

!

WARNING

PHOTOVOLTAIC SYSTEM AC DISCONNECT

RATED AC OUTPUT CURRENT 96.20 A

NOMINAL OPERATING AC VOLTAGE 600 V

690.13(B), 690.54

9

!

WARNING

POWER SOURCE OUTPUT CONNECTION. DON NOT RELOCATE THIS OVERCURRENT DEVICE

ORANGE WARNING AREA, 705.12(B)(2)(3)(b)

10

!

WARNING

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE 'OFF' POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY

690.56(C)(1)(a)

11

!

WARNING

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

REFLECTIVE STICKER, 690.56(C)(3)

12

!

WARNING

PHOTOVOLTAIC SYSTEM AC DISCONNECT

RATED AC OUTPUT CURRENT 1539.20 A

NOMINAL OPERATING AC VOLTAGE 600 V

690.13(B), 690.54

13

!

WARNING

PHOTOVOLTAIC SYSTEM AC DISCONNECT

RATED AC OUTPUT CURRENT 76.96 A

NOMINAL OPERATING AC VOLTAGE 600 V

690.13(B), 690.54

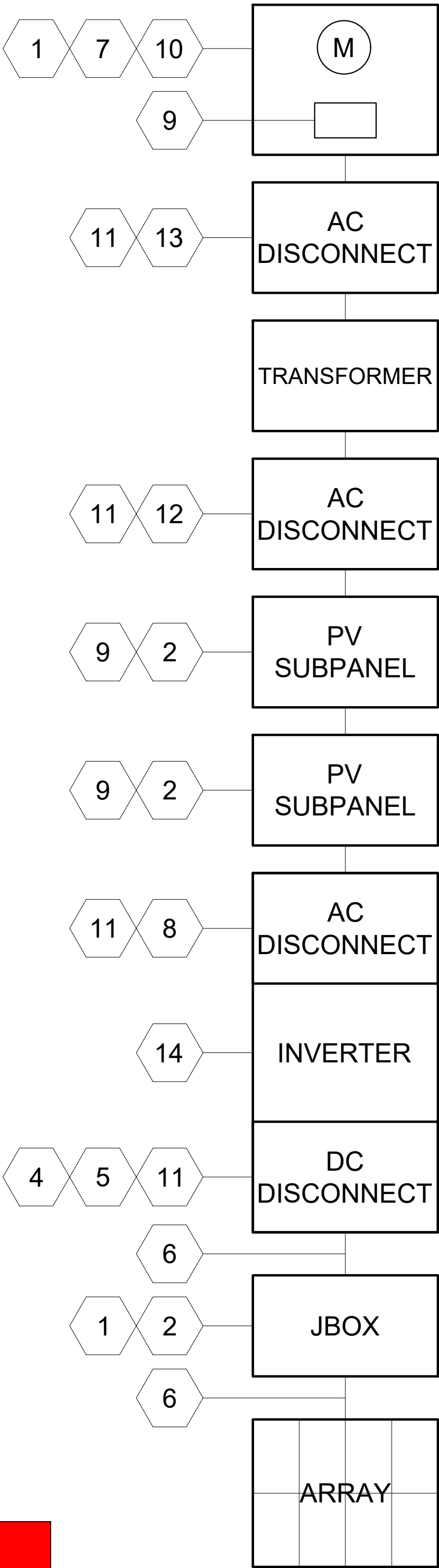
14

!

WARNING

INVERTER #1

INVERTER LABEL INVERTERS #1-16



- NOTES
1. ARTICLES 690 AND 705 MARKINGS SHOWN HEREON
2. ALL MARKINGS SHALL CONSIST OF THE FOLLOWING:

A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING

B. RED BACKGROUND COLOR WITH WHITE TEXT AND LINE WORK UON

C. ARIAL FONT
3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATIONS SPECIFIED.
4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT USING PERMANENT ADHESIVE, POP-RIVETS, OR SCREWS



NEWPORT POWER
205 AVENIDA DEL MAR #1384
SAN CLEMENTE, CA 92674
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760-271-6580

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Newport Power
LIC # 939960
EXP: 11/30/2023

X *James Reeve*

HELLMAN PROPERTY
SITE ADDRESS
711 1ST STREET,
SEAL BEACH, CA 90740
APN: 095-010-68

No.	Description	Date

SIGNAGE
PV7
12/06/2022

MECHANICAL SPECIFICATION

Format	87.2mm × 41.1mm × 1.38in (including frame) (228mm × 1045mm × 35mm)
Weight	58.4 lbs (26.5 kg)
Front Cover	0.13in (3.2mm) thermally pre-stressed glass with anti-aliasing technology
Back Cover	Composite film
Frame	Anodized aluminum
Cell	6 × 26 monocrystalline q-ANTUM solar half cells
Junction Box	2.08-3.98in × 2.86-3.9in × 0.59-0.71in (53-101mm × 72-99mm × 15-18mm), IP67, with bypass diodes
Cable	4mm ² Solar cable, (p) ±27.6in (700mm), (+) ±13.8in (350mm)*
Connector	Stäubli MCA, Stäubli MCA-Evo2, Hanwha G-CELLS HGC4, IP68

*Long cables (p) ±57.1in (1450mm), (+) ±57.1in (1450mm) for endtoedge installation are available upon request.

ELECTRICAL CHARACTERISTICS

POWER CLASS	470	475	480	485	490	495
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC* (POWER TOLERANCE ±0.5% (+/-0.5W))						
Power at MPP	P_{MPP} [W]	470	475	480	485	490
Short Circuit Current	I_{SC} [A]	11.21	11.24	11.26	11.29	11.31
Open Circuit Voltage ¹	V_{OC} [V]	53.64	53.58	53.61	53.64	53.68
Current at MPP	I_{MPP} [A]	10.62	10.66	10.71	10.76	10.81
Voltage at MPP	V_{MPP} [V]	44.27	44.54	44.81	45.07	45.33
Efficiency ²	η [%]	±20.3	±20.5	±20.7	±20.9	±21.2
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ³						
Power at MPP	P_{MPP} [W]	352.6	356.4	360.1	363.9	367.6
Short Circuit Current	I_{SC} [A]	9.03	9.05	9.07	9.09	9.12
Open Circuit Voltage	V_{OC} [V]	50.49	50.53	50.56	50.59	50.62
Current at MPP	I_{MPP} [A]	8.34	8.39	8.43	8.47	8.52
Voltage at MPP	V_{MPP} [V]	42.26	42.49	42.72	42.94	43.17

*Measurement tolerances P_{MPP} ±3%, I_{SC} ±0.5%, V_{OC} ±10%, V_{MPP} ±2.5%, η ±1.5%. According to IEC 60904-3 + B000W/m², NMOT, spectrum AM 1.5

Q-CELLS PERFORMANCE WARRANTY

At least 95% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 82.5% of nominal power up to 10 years. At least 85% of nominal power up to 25 years.

All data within measurement tolerance. Full warranty in accordance with the warranty terms of the Q-CELLS sales organization of your respective country.

PERFORMANCE AT LOW IRRADIANCE

Typical module performance under low irradiance conditions in comparison to STC conditions (25°C, 1000W/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]	109±5.4 (43±3)*

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{MPP} [V]	1500 (EC2) / 1500 (UL)	PV module classification	Class I
Maximum Series Fuse Rating [A DC]	20	Fuse Rating based on ANSI / UL 61730	Type II
Max. Design Load, Pull / Push ¹ [lbs/ft²]	75 (3000Pa) / 42 (2000Pa)	Permitted Module Temperature on Continuous Duty	-40°F up to +185°F (-40°C up to +85°C)
Max. Tens Load, Pull / Push ¹ [lbs/ft²]	113 (4500Pa) / 63 (3000Pa)		

*See Installation Manual

QUALIFICATIONS AND CERTIFICATES

UL 61730, CE-compact,
IEC 61215-2:2016,
IEC 61730-2:2016,
ISO 9001, ISO 14001,
Paver Code: S993.215
Solar Panel

PACKAGING INFORMATION

	Horizontal	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Size	89.4in	43.3in	47.6in	1800W	22	20	69
Weight	2727mm	1107mm	1210mm	857kg	palettes	palettes	modules

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 400, Irvine, CA 92614, USA | TEL: +1 949 748 59 96 | EMAIL: inquiry@us-qcells.com | WEB: www.us-qcells.com

Declaration subject to technical specifications of Q-CELLS: 2017-01-0

		Technical Data	
		CPS SCH100KTL-DOUS-600	CPS SCH129KTL-DOUS-600
DC Input			
Max. PV Power		187.5kW	
Max. DC Input Voltage		1600V	
Operating DC Input Voltage / Range		860-1450Vdc	
Start-up DC Input Voltage / Power		900V / 250W	
Number of MPP Trackers		1	
MPP1 Voltage Range ¹⁾		870-1300Vdc	
Max. PV Input Current (Isc x1.25)		275A	
Number of DC Inputs		20 PV inputs (circuits, pos. & neg. fused (Standard Wire-box)	
DC Disconnection Type		1 PV output circuit, -1.2 terminations per pole, non-fused (Centralized Wire-box)	
DC Surge Protection		Load-rated DC switch	
AC Output		Type II MOV (with indicator/remote signaling), Up=2.5kV, In=20kA (8/20uS)	
Rated AC Output Power		100kW	125kW
Max. AC Output Power ²⁾		100kVA (111kVA @ PF=0.9)	125kVA (132kVA @ PF=0.95)
Rated Output Voltage		600Vac	
Output Voltage Range ³⁾		528-660Vac	
Grid Connection Type ⁴⁾		3ø / PE / N (Neutral optional)	
Max. AC Output Current (860VAc)		96.2/106.8A	120.3/127.0A
Rated Output Frequency		60Hz	
Output Frequency Range ⁵⁾		57-63Hz	
Power Factor		>0.99 (±0.8 adjustable)	>0.99 (±0.8 adjustable)
Current THD		<3%	
Max. Fault Current Contribution (1-cycle RMS)		41.47A	
Max. OCPD Rating		200A	
AC Disconnection Type		Load-rated AC switch	
AC Surge Protection		Type II MOV (with indicator/remote signaling), Up=2.5kV, In=20kA (8/20uS)	
System			
Topology		Transformers	
Max. Efficiency		98.1%	
CEC Efficiency		98.5%	
Stand-by / Night Consumption		<4W	
Environment			
Enclosure Protection Degree		NEMA Type 4X	
Cooling Method		Variable speed cooling fans	
Operating Temperature Range		-22°F to +140°F / -30°C to +60°C (derating from +108°F / +42°C)	
Non-Operating Temperature Range ⁶⁾		-40°F to +158°F / -40°C to 70°C maximum	
Operating Humidity		0-100%	
Operating Altitude		8020ft / 2500m (no derating)	
Audible Noise		<65dBA@1m and 25°C	
Display and Communication			
User Interface and Display		LED Indicators, WiFi + APP	
Inverter Monitoring		Modbus RS485	
Site Level Monitoring		CPS FlexCOM Gateway (1 per 32 inverters)	
Modbus Data Mapping		SunSpec/CPS	
Remote Diagnostics / FW Upgrade Functions		Standard / with FlexCOM Gateway	
Mechanical			
Dimensions (WxHxD)		45.28x24.25x6.84in (1156x612x250mm) with Standard Wire-box 38.27x24.25x6.84in (1000x612x250mm) with Centralized Wire-box	
Weight		Inverter: 121lb / 55kg; Wire-box: 55lb / 25kg (Standard Wire-box); 33lb / 15kg (Centralized Wire-box)	
Mounting / Installation Angle		15 - 90 degrees from horizontal (vertical or angled)	
AC Termination		M10 Stud Type Terminal [3ø] (Wire range: 10AWG - 50kcmil CU/AL, Lugs not supplied) Screw Clamp Terminal Block [N (#12 - 10AWG CU/AL)]	
DC Termination		Screw Clamp Fuse Holder (Wire range: #12 - #6AWG CU) - Standard Wire-box Busbar, M10 Bolts (Wire range: #10AWG - 50kcmil CU/AL, 1 termination per pole) #1AWG - 30kcmil CU/AL (2 terminations per pole); Lugs not supplied) - Centralized Wire-box	
Fused String Inputs		20A fuses provided (Fuse value up to 30A acceptable)	
Safety			
Safety and EMC Standard		UL1741-SA-2016, CSA-C22.2 NO 107.1-01, IEEE1547-04A; FCC PART15	
Selectable Grid Standard		IEEE 1547a-2014, CA Rule 21, ISO-ENE	
Smart-Grid Features		Volt-Ride/Thru, Freq.Ride/Thru, Ramp-Rate, Specified-PF, Volt-VAR, Freq.Watt, Volt-Watt	
Warranty			
Standard ⁷⁾		5 years	
Extended Terms		10 and 20 years	

1) The user manual for further information regarding MPPT Voltage Range when operating at non-unity PF

2) Max. AC Apparent Power rating valid within MPPT voltage range and temperature range of -30°F to +40°C (-22°F to +104°F) for 100kW (PF=0.9) and 125kW (PF=0.95)

3) The "Output Voltage Range" and "Output Frequency Range" may differ according to the specific grid standard.

4) The user manual for further requirements regarding non-operating conditions.

5) 60 Hz warranty effective for units purchased after October 1st, 2016.



SOL Components
A CEMCO AFFILIATE

www.solcomponents.com

STANDARD CONFIGURATION

- Intuitive and low-cost design using standard profiles.
- Fewest components and fasteners for speedy construction.
- Generous vertical, N/S, and E/W adjustability.
- Integrated wire-management.

MAX-LOAD CONFIGURATION

- Dual-support design for maximum wind and snow loads.
- High-strength and lightweight materials.
- Ideal for hurricane and heavy snow environments.

SHARED-RAIL CONFIGURATION

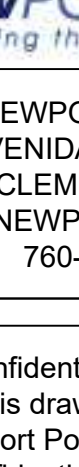
- 3-purlin design with shared clamping.
- Ergonomic stainless steel mid-clamp assemblies.
- 25% reduction in module mounting bolts.
- Up to 2,000 man-hours saved per 100MW.

STRUCTURAL AND MECHANICAL SPECIFICATIONS

Inclination Range	5-35 Degrees
Foundations	Roll-Formed C or W-Section Piles
Modules Supported	All Standard Framed and First Solar Series 6
Module Orientation	2-Portrait
Module Attachment	Direct-Bolt to Purlin Standard, Clamp Configurable
Structure Material	ASTM A653 Grade 50 Steel
Hardware	Galvanized and Stainless Serrated Flange, No Washers
Corrosion Protection	G90-G360 Pre-galvanized and Hot-Dip Galvanized
Grade Change	20% Continuous E/W
Max Wind Speed	Any
Max Snow Load	Any
Wind Tunnel Testing	CPP Third Party Testing Laboratory
Bonding and Grounding	Intertek Listed UL2703, No Bonding Plates or Star Washers
Warranty	20 Years Standard, Extensions Available

1775 Tribute Rd. Suite A
 Sacramento, CA 95815
855.278.3444

STRUCTURAL SOLAR SOLUTIONS

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No.	Description	Date																																
DATA SHEETS																																		
PV8																																		
12/06/2022																																		

GENERAL NOTES

1. ALL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE GOVERNING CODE - SEE "CODE INFORMATION".
2. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AT JOB SITE BEFORE STARTING WORK. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER PRIOR TO COMMENCEMENT OF WORK.
3. CONNECTIONS AND IMPLIED CONSTRUCTION ASSEMBLIES THAT ARE NOT SPECIFICALLY DESCRIBED OR DETAILED SHALL BE CONSTRUCTED USING STANDARD CONSTRUCTION PRACTICES IN COMPLIANCE WITH GOVERNING CODES AND ORDINANCES.
4. WRITTEN INFORMATION AND DIMENSIONS SHALL TAKE PRECEDENCE OVER GRAPHIC INFORMATION. DO NOT SCALE DRAWINGS. RESOLVE ANY CONFLICTS ON THE PLANS WITH ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.
5. WHEN DETAILS LABELED "TYPICAL" OR "SIMILAR" ARE GIVEN ON DRAWINGS, THE CONTRACTOR SHALL APPLY THE INTENT OF THE DETAIL TO THAT SPECIFIC CONDITION.
6. THE CONTRACTOR SHALL PROVIDE ADEQUATE AND PROPER SHORING AND BRACING TO MAINTAIN SAFE CONDITIONS AT ALL TIMES UNTIL STRUCTURAL ELEMENTS ARE PERMANENTLY ATTACHED. DRAWINGS INDICATE STRUCTURE IN FINAL FORM CAPABLE OF SUPPORTING DESIGN LOADINGS. SOL COMPONENTS SHALL BE IMMEDIATELY NOTIFIED OF ANY MATERIAL WHICH ARRIVES DAMAGED OR OUT OF SPECIFICATION.
8. FOUNDATION DESIGN IS BASED OFF OF CUSTOMER SUPPLIED GEOTECHNICAL REPORTS, PULL TEST DATA, AND/OR SOILS INFORMATION AVAILABLE THROUGH THE NATURAL RESOURCES CONSERVATION SERVICE. NATURAL VARIATIONS IN GROUND CONDITIONS WILL OCCUR BETWEEN EXPLORATION POINT LOCATIONS OR DUE TO THE MODIFYING EFFECTS OF CONSTRUCTION OR WEATHER AND CAN RESULT IN PILE REFUSAL. THE NATURE AND EXTENT OF SUCH VARIATIONS MAY NOT BECOME EVIDENT UNTIL DURING OR AFTER CONSTRUCTION. SOL COMPONENTS IS NOT LIABLE FOR PILE REFUSAL AND HAS PROVIDED A DRIVEN PILE REFUSAL MITIGATION GUIDELINES DOCUMENT TO AID ON FIELD REMEDIATION.
9. FIELD DRILLED HOLES SHALL BE SPACED NOT LESS THAN 3X DIA. FOR HOLE TO HOLE SPACING OR 1.5X DIA. HOLE TO EDGE SPACING. BRACES AND PURLINS MAY BE ADJUSTED ONCE WITHOUT REMEDIATION SO LONG AS THE FOREMENTIONED HOLE SPACING REQUIREMENTS ARE MET. ANY ADDITIONAL FIELD ADJUSTMENTS SHALL BE SUBMITTED TO SOL COMPONENTS FOR REVIEW.

STRUCTURAL SPECIFICATION

1. STEEL GRADES:
C SHAPES, L SHAPES & PLATES _____ A1003 GRADE AS NOTED BELOW
MACHINE BOLTS (MB) _____ SAE J429 GRADE 5 OR 304SH
STAINLESS STEEL
NUTS _____ SAE J995 GRADE 5 OR 304SH STAINLESS STEEL
2. ALL BOLTS GREATER THAN 1/2" DIAMETER SHALL BE HIGH STRENGTH BOLTS, UNO.
3. BOLT HOLES SHALL BE 1/16" LARGER IN DIAMETER THAN THE BOLT FOR BOLTS 1/2" DIAMETER OR GREATER. BOLT HOLES SHALL BE 1/32" LARGER IN DIAMETER THAN THE BOLT FOR BOLTS LESS THAN 1/2" DIAMETER.
4. SELF-DRILLING SCREWS SHALL BE ELCO EDB741 PER ICC-ES ESR-3294

COLD-FORMED STEEL MATERIALS AND INSTALLATION

1. ITEMS SPECIFIED AS COLD-FORMED STEEL FRAMING SHALL BE DESIGNED, DETAILED AND FABRICATED IN ACCORDANCE WITH A.I.S.I. SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, 2012 EDITION.
2. COLD-FORMED MEMBER SIZES ARE GIVEN IN MILS TO REFLECT THE CURRENT INDUSTRY TREND. FOR INFORMATIONAL PURPOSES, EQUIVALENT GAGE SIZES ARE GIVEN AS FOLLOWS.
20 GAGE = 33 MIL 14 GAGE = 68 MIL
18 GAGE = 43 MIL 12 GAGE = 97 MIL
16 GAGE = 54 MIL 10 GAGE = 118 MIL
3. COLD-FORMED STEEL MEMBERS SHALL BE OF THE TYPE AND SIZE AS SHOWN ON THE DRAWINGS AND SPECIFICATIONS.
4. ALL 118, 97, 68, AND 54 MIL ITEMS SHALL BE FORMED FROM STEEL MEETING THE MINIMUM REQUIREMENTS OF ASTM A-1003 ST GRADE 50H.
5. COLD-FORMED STEEL MEMBERS, SHALL BE GALVANIZED G90 COATING UNLESS NOTED OTHERWISE. FOUNDATIONS SHALL BE GALVANIZED G210 COATING MINIMUM.
6. CUTTING, NOTCHING OR BORING OF STEEL FLANGES SHALL NOT BE PERMITTED UNLESS OTHERWISE NOTED.
7. LIGHT GAUGE COLD FORMED STEEL INCLUDES SHEARED EDGES WHICH ARE UNCOATED AND WILL SHOW SACRIFICIAL CORROSION. THE EXPOSURE OF THE UNDERLYING STEEL CAUSED BY COATING DAMAGE OR A CUT EDGE WILL NOT RESULT IN CORROSION OF THE STEEL AND THUS WILL NOT AFFECT THE PERFORMANCE OF THE COATING OR THE STEEL STRUCTURE.
8. ALL PLIES OF METAL SHALL BE FULLY SEATED AND FLUSH, AND FASTENERS COMPLETELY ENGAGED

HOT-FORMED STEEL MATERIALS

1. HOT-FORMED FOUNDATIONS SHALL BE ASTM A992 GR. 50.
2. HOT-FORMED FOUNDATIONS SHALL BE HOT-DIP GALVANIZED ASTM A123.

CODE INFORMATION

GOVERNING CODES, STANDARDS AND SPECIFICATIONS:

D) 2019 CALIFORNIA BUILDING CODE

E) ASCE STANDARD [ASCE/SEI 7-16], MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

F) AISI S100 "SPECIFICATIONS FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS", 2016 EDITION.

SOL COMPONENTS
GROUND FIXED-TILT PHOTOVOLTAIC SUPPORT SYSTEM

DESIGN CRITERIA

DESIGN DEAD LOADS:	
MODEL/FRAME	2.30 PSF

WIND DESIGN CRITERIA:

WIND SPEED	115 MPH
RISK CATEGORY	I
WIND EXPOSURE FACTOR	C

SNOW DESIGN CRITERIA:

GROUND SNOW LOAD	0 PSF
RISK CATEGORY	I

SEISMIC DESIGN CRITERIA:

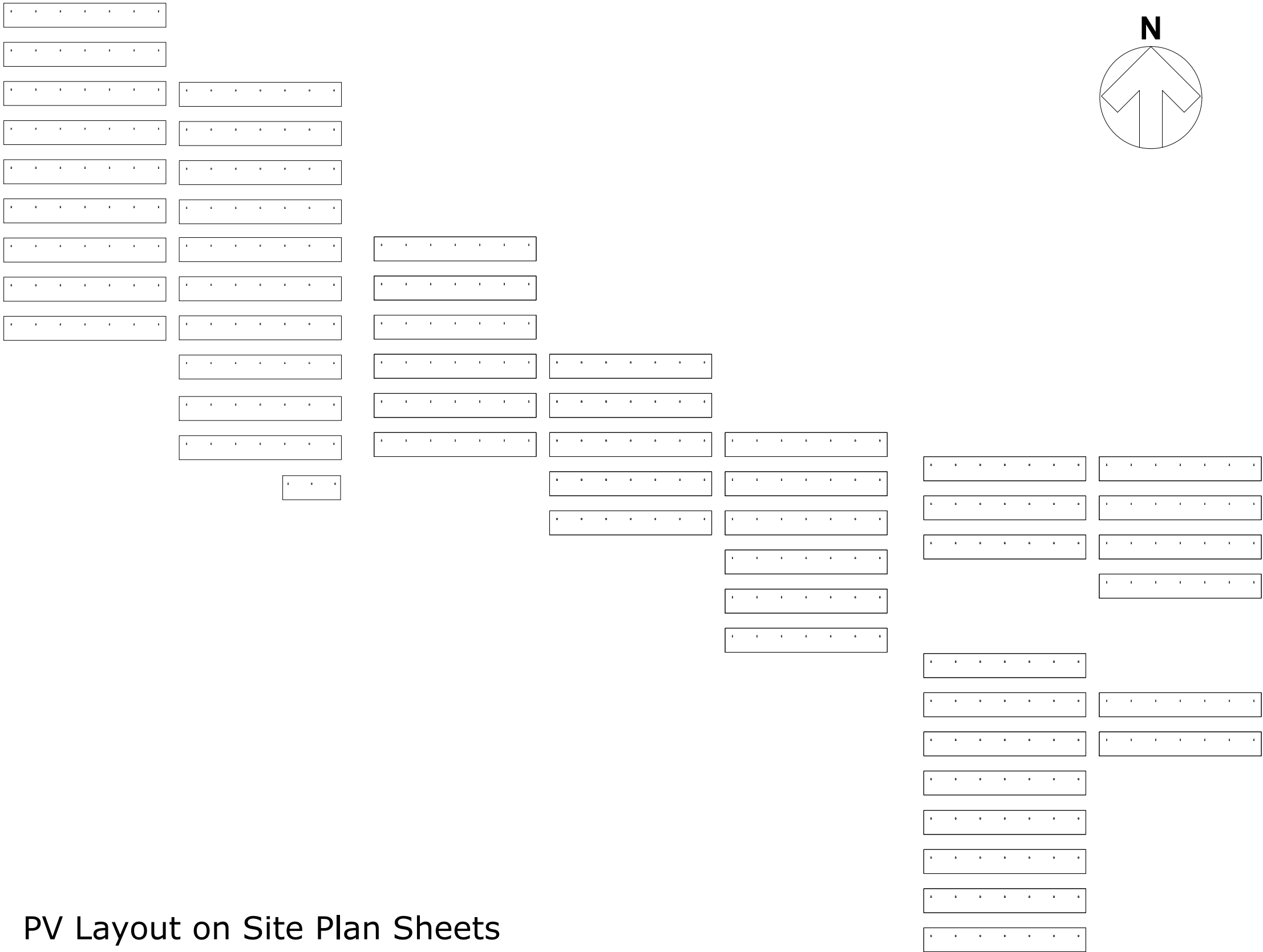
RISK CATEGORY	I
S _s	1.563g
S ₁	0.585g
S _{DS}	1.042g
S _{D1}	0.585g
SITE CLASS	D
SEISMIC DESIGN CATEGORY	D

FOUNDATION DESIGN:
PER GEOTECHNICAL REPORT # IR18166880
CONDUCTED BY WOOD ENVIRONMENT &
INFRASTRUCTURE SOLUTIONS INC. ON
7-9-2018

PROJECT SUMMARY

MODULE TYPE	Q.PEAK DUO XL-G10.d 485W
DESIGN MODULE E/W GAP	3/8"
MODULE DIMENSIONS	2216mm x 1045mm x 35mm
PROJECT SIZE	1.5 MW DC
MODULE COUNT	3,100
TABLE SIZES	2x28 & 2x10
TILT ANGLE	10 DEGREES
ASIMUTH ANGLE	180 DEGREES
NOMINAL PILE REVEAL	SEE 8/SC4.0
GROUND CLEARANCE	18 IN.
FASTENER TORQUE [AS APPLICABLE]	60±6 FT.-LBS. [1/2"-13] 13±1 FT.-LBS. [5/16"-18] 10±1 FT.-LBS. [1/4"-20]

NOTE:
THE PHOTO VOLTAIC (PV) MODEL SUPPORT DESIGN ONLY APPLIES IF THE FOLLOWING CODES AND SPECIFICATIONS, DEAD LOADS, WIND LOAD CRITERIA AND SOIL MATERIAL CLASS LISTED UNDER THE DESIGN CRITERIA ARE MET. THE MODEL SUPPORT DESIGN SYSTEM SHALL NOT BE USED IN AREAS THAT DO NOT MEET THESE DESIGN CRITERIA.



PV Layout on Site Plan Sheets

SPECIAL INSPECTION REQUIREMENTS:

2019 CBC TABLE 1705A.6 REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS				2019 CBC TABLE 1705A.7 REQUIRED SPECIAL INSPECTIONS AND TESTS OF DRIVEN DEEP FOUNDATION ELEMENTS			
TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION		TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-	X		1. VERIFY ELEMENT MATERIALS, SIZES, AND LENGTHS COMPLY WITH THE REQUIREMENTS.	X	-	
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	-	X		2. DETERMINE CAPACITIES OF TEST ELEMENTS AND CONDUCT ADDITIONAL LOAD TESTS, AS REQUIRED.	X	-	
3. PERFORM CLASSIFICATION & TESTING OF COMPACTED FILL MATERIALS.	-	X		3. INSPECT DRIVING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT.	X	-	
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-		4. VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM TYPE AND SIZE OF HAMMER, RECORD NUMBER OF BLOWS PER FOOT OF PENETRATION, DETERMINE REQUIRED PENETRATIONS TO ACHIEVE DESIGN CAPACITY, RECORD TIP AND BUTT ELEVATIONS AND DOCUMENT ANY DAMAGE TO FOUNDATION ELEMENT.	X	-	
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X		5. FOR STEEL ELEMENTS, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1705.2.	-	-	
				6. FOR CONCRETE ELEMENTS AND CONCRETE-FILLED ELEMENTS, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1705.3.	-	-	
				7. FOR SPECIALTY ELEMENTS, PERFORM ADDITIONAL INSPECTIONS AS DETERMINED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.	-	-	

SYSTEM TOLERANCES

PILE:	± 1" MAX VERTICAL TOLERANCE BETWEEN PILES ± 2 DEGREES PLUMB NORTH-SOUTH & EAST-WEST ± 1" EAST-WEST SPACING ± 1" NORTH-SOUTH SPACING ± 6 DEGREES TWIST/YAW - SEE SC 4.0 FOR MAXIMUM PILE REVEAL
SYSTEM TILT:	± 1 DEGREES STRUCTURALLY ACCEPTABLE ± 0.25° RECOMMENDED FOR AESTHETICS
TABLE GAP:	NOMINAL DESIGN +1", 2" MINIMUM
FAULTING:	± 2" VERTICAL TABLE GAP
PURLIN CANTILEVER :	± 3"

SHEET INDEX

COVER SHEET.....SC 0.0

BILL OF MATERIALS.....SC 1.0

SITE ARRAY LAYOUT.....SC 2.0

TABLE-TO-TABLE PILE SPACING.....SC 2.1

2x28 TABLE DETAILS.....SC 3.0

2x10 TABLE DETAILS.....SC 3.1

TYPICAL DETAILS.....SC 4.0

TRENCH CLEARANCE TO PILE DETAIL.....SC 4.1

REVISION	DATE	DESCRIPTION

CLIENT:

NEWPORT
POWER



1775 TRIBUTE ROAD, STE A.
SACRAMENTO, CA 95815

IFP SUBMITTAL



PROJECT:

1.5 MW
HELLMAN SOLAR

SITE LOCATION:

SEAL BEACH, CA
33.755, -118.096

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DRAWN BY: / DATE:

DJ 02/28/22

CHECKED BY: / DATE:

JEJA 03/07/22

SCALE:

As Noted

PROJECT NO.:

SC22-001

SHEET NO.:

COVER SHEET

SC 0.0

Full BOM Details

Description	Part Number	Revision	Part Length (in.)	Part Weight (lbs.)	2x28 Table	2x10 Table	Total Nominal Qty.
Pile, SC22-001 Hellman Solar, C6x3.0, 10GA, 10 Deg, 89 in Length	FND-0201-89	A	89.00	40.27	385	3	388
Top Chord, Q.PEAK DUO XL-G10.d, C8x2.0, 14GA, Grade 50, G235	TCH-0060	A	143.12	36.85	385	3	388
Purlin, Q.PEAK DUO XL-G10.d, C6.0 x 2.0, 0.625 Return, 16GA, Grade 50, 10 Module, G235	PUR-0161	A	414.79	72.24	440	4	444
Purlin, Q.PEAK DUO XL-G10.d, C6.0 x 2.0, 0.625 Return, 16GA, Grade 50, 8 Module, G235	PUR-0162	A	331.76	57.78	220	0	220
Angle Brace, SDS, L2.5x2.5, 12GA, Commercial Inventory	ANG-0022-60	A	60.00	8.19	385	3	388
Riser, T5x2.0, 12GA	ACC-0041	B	18.50	4.56	385	3	388
Purlin Bracket, SDS, 12GA, No Tab G235	ACC-0105	A	11.25	1.14	1,540	12	1,552
Purlin Splice, L6x2.0, 12GA	ACC-0053	B	6.00	1.45	440	0	440
Table Splice	ACC-0005	C	15.00	0.09	-	-	56
Serrated Hex Flange Bolt, Grade 5, HDG, 1/2-13 Thread, 1 in Length	FAS-0001-HDG	A	-	-	6,765	39	6,804
Serrated Hex Flange Nut, Grade 5, HDG, Blue Wax, 1/2-13 Thread	FAS-0002-HDG	A	-	-	6,765	39	6,804
Hex Head Self-Drilling Screw, #12, #3 Tip, 1000 Hour Salt Spray, 3/4 in Length	FAS-0009-ZNC	A	-	-	6,160	48	6,208
Serrated Hex Flange Bolt, 304 SST, 5/16-18 Thread, 5/8 in Length	FAS-0005-SST	A	-	-	12,320	80	12,512
Serrated Hex Flange Nut, 304 SST, 5/16-18 Thread	FAS-0006-SST	A	-	-	12,320	80	12,512
Purlin Squaring Appliance, Q.PEAK DUO XL-G10.d	ACC-0151	A	-	-	-	-	2

REVISION	DATE	DESCRIPTION

CLIENT:

NEWPORT
POWER



1775 TRIBUTE ROAD, STE A.
SACRAMENTO, CA 95815

IFP SUBMITTAL



PROJECT:

1.5 MW
HELLMAN SOLAR

SITE LOCATION:

SEAL BEACH, CA
33.755, -118.096

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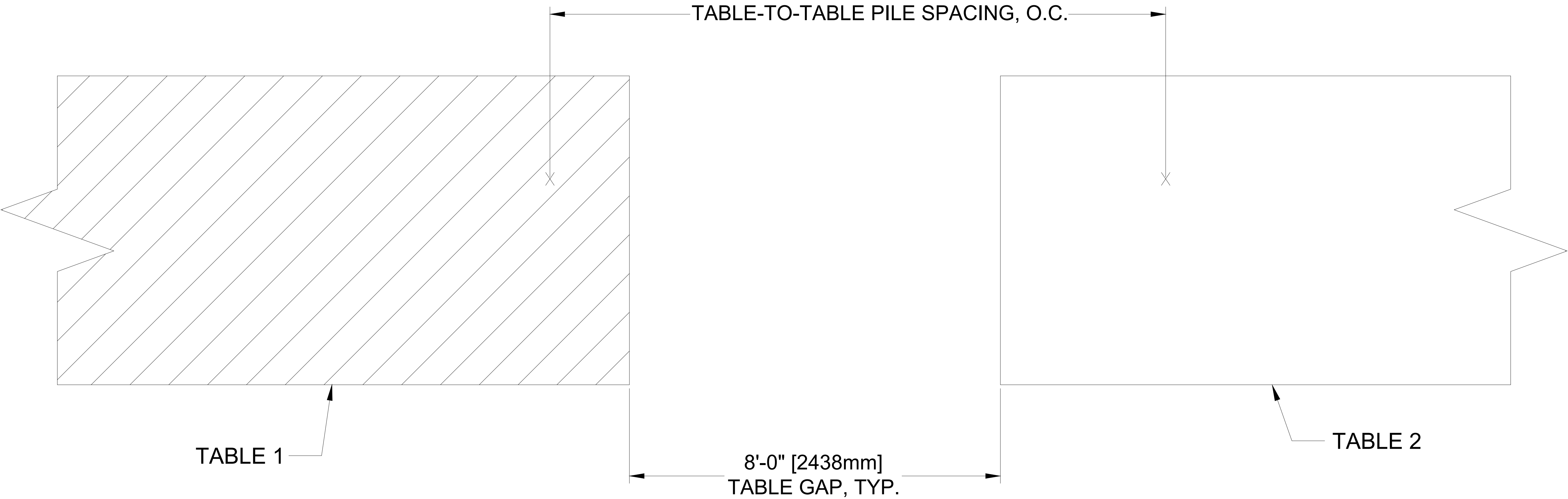
PROJECT NO.:
SC22-001

SHEET NO.:
BILL OF MATERIALS

SC 1.0

TABLE 1	TABLE 2	TYP. TABLE-TO-TABLE PILE SPACING
2X28 TABLE	2X28 TABLE	16'-4 ¹ / ₈ " [4981mm]
2X10 TABLE	2X28 TABLE	15'-5 ⁷ / ₁₆ " [4710mm]

- NOTES:
- 1. PILE SPACING VALUES IDENTICAL FOR INVERTED TABLE 1 & 2 DESIGNATION.
 - 2. AISLE REFERS TO EITHER LEFT OR RIGHT AISLE TABLES.
 - 3. ONLY APPLIES FOR TABLES IN CONTINUOUS ROW WITH SPECIFIED TABLE GAP.



REVISION	DATE	DESCRIPTION

CLIENT:

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1775 TRIBUTE ROAD, STE A.
SACRAMENTO, CA 95815

IFP SUBMITTAL



PROJECT:

1.5 MW
HELLMAN SOLAR

SITE LOCATION:

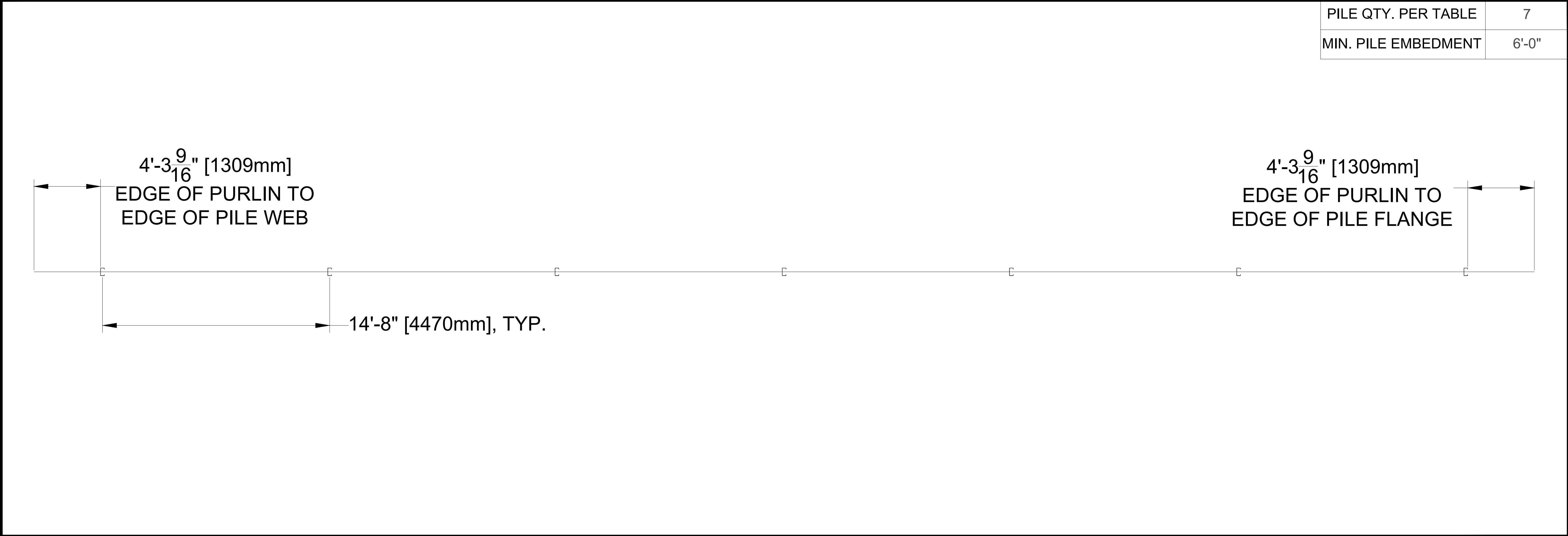
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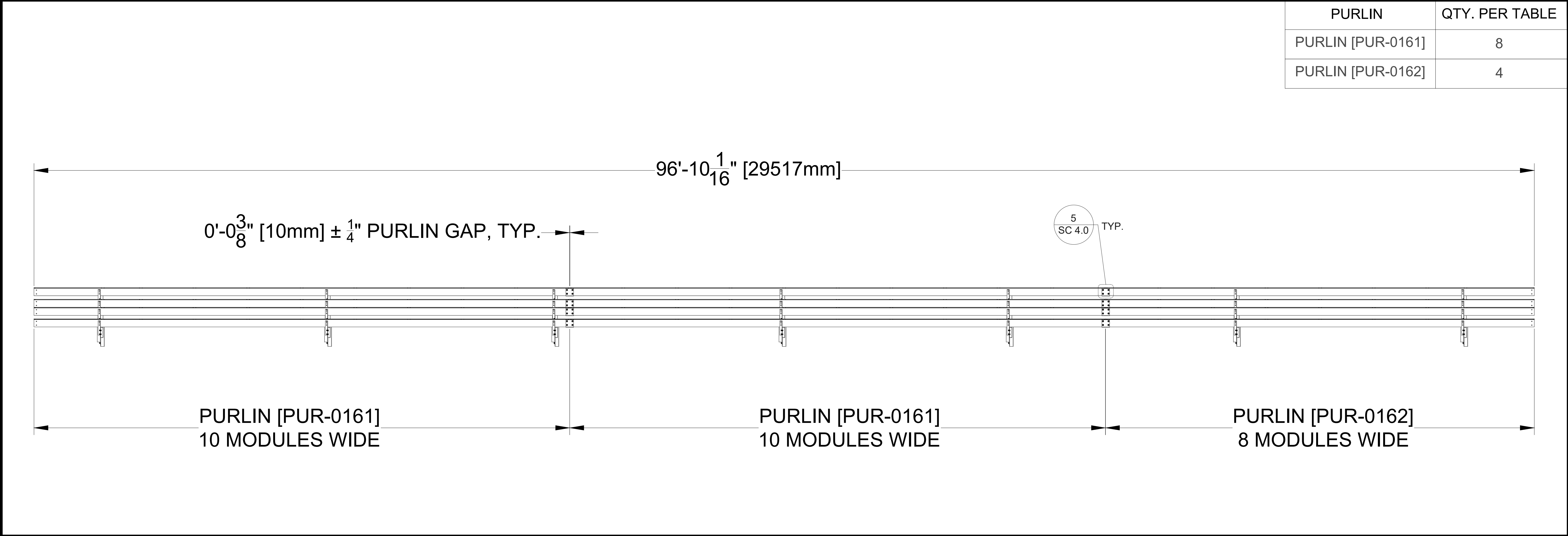
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PROJECT NO.:	SC22-001
SHEET NO.:	TABLE-TO-TABLE PILE SPACING SC 2.1



1

2x28 TABLE PILE SPACING
SCALE: N.T.S.



2

2x28 TABLE PURLIN SPACING
SCALE: N.T.S.

REVISION	DATE	DESCRIPTION

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NEWPORT
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1775 TRIBUTE ROAD, STE A.
SACRAMENTO, CA 95815

IFP SUBMITTAL



PROJECT:

1.5 MW
HELLMAN SOLAR

SITE LOCATION:

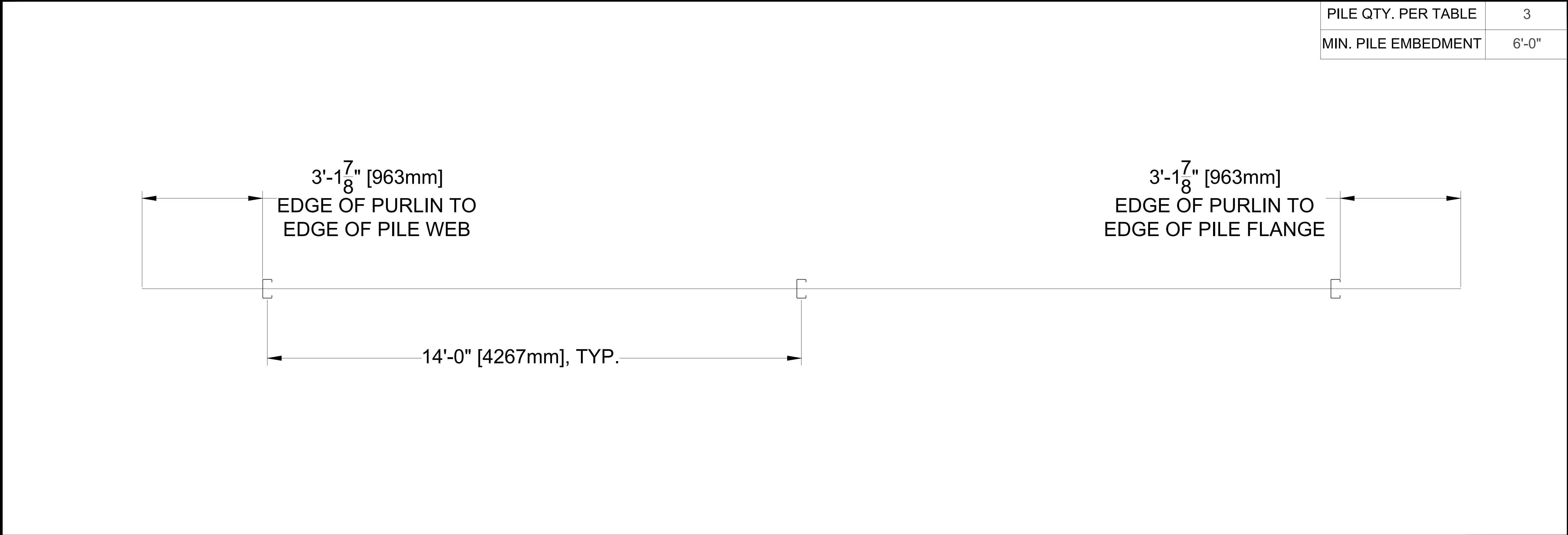
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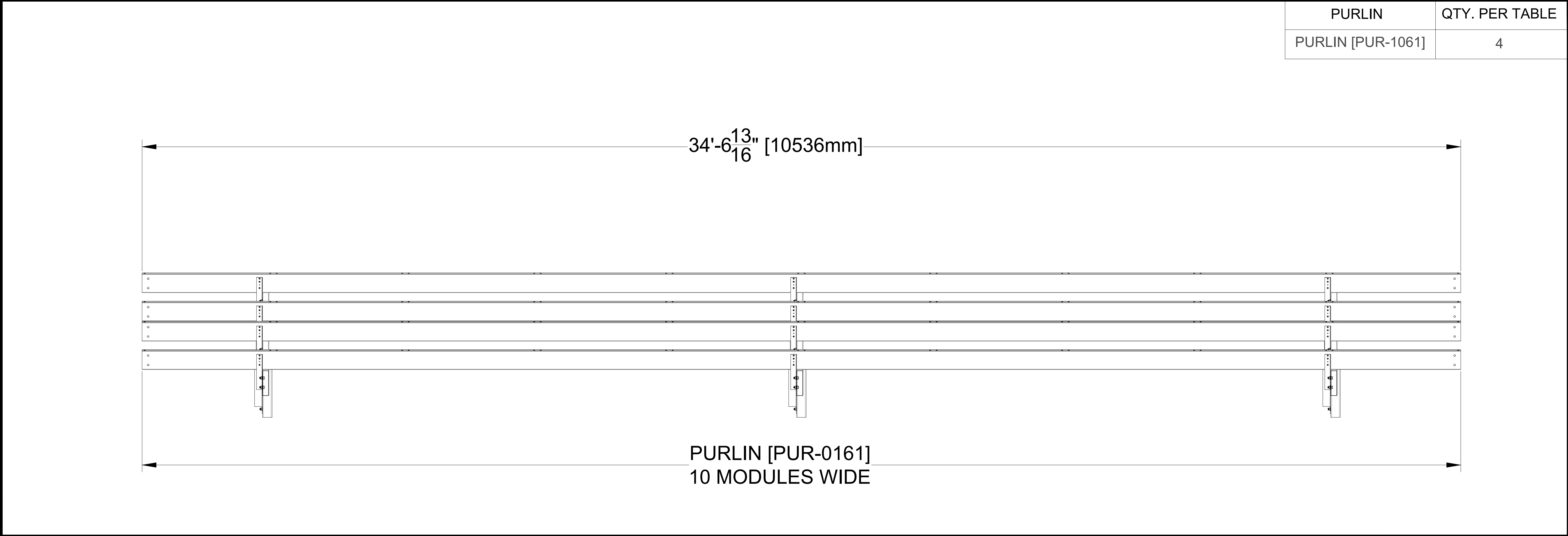
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SCALE:	As Noted
PROJECT NO.:	SC22-001
SHEET NO.:	2x28 TABLE
SC 3.0	



1

2x10 TABLE PILE SPACING
SCALE: N.T.S.



2

2x10 TABLE PURLIN SPACING
SCALE: N.T.S.

REVISION	DATE	DESCRIPTION

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POWER



1775 TRIBUTE ROAD, STE A.
SACRAMENTO, CA 95815

IFP SUBMITTAL



PROJECT:

1.5 MW
HELLMAN SOLAR

SITE LOCATION:

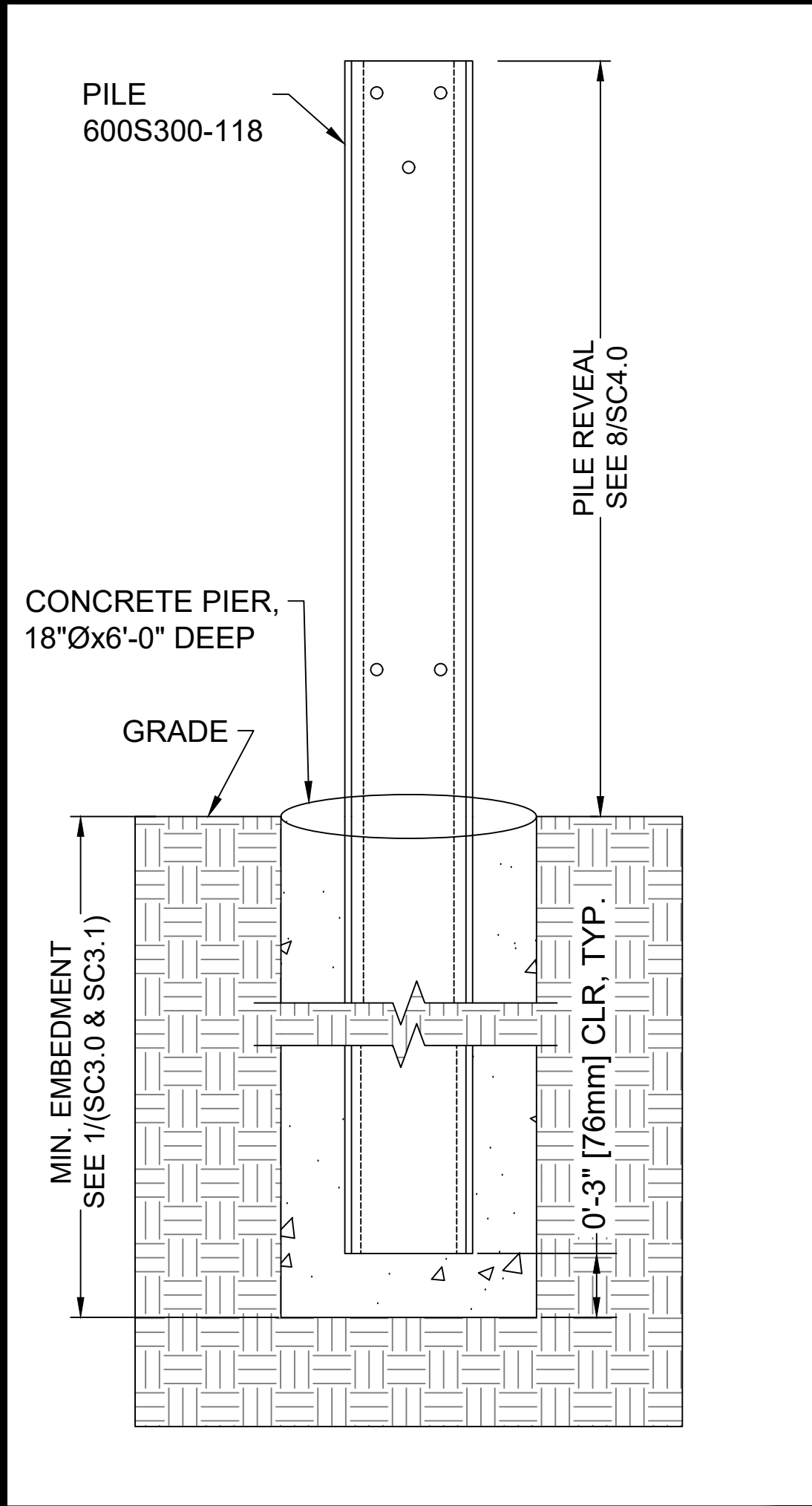
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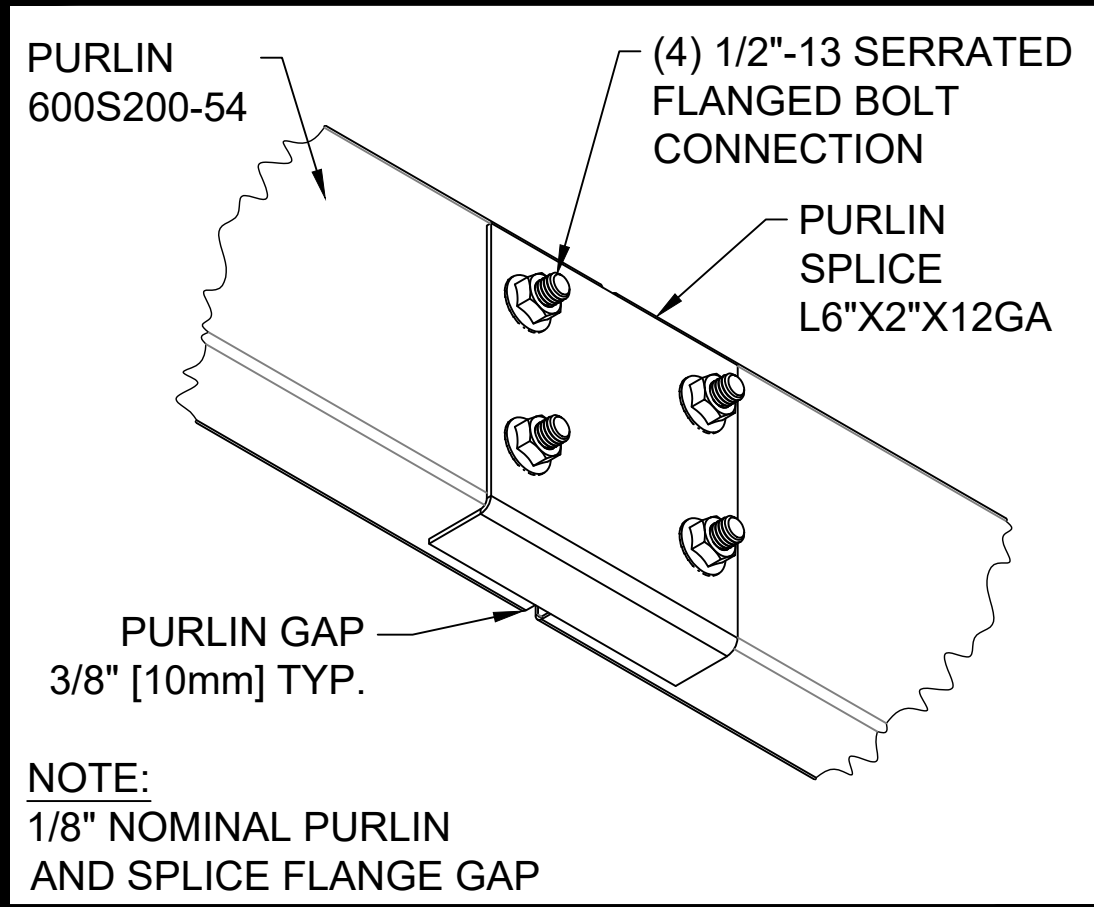
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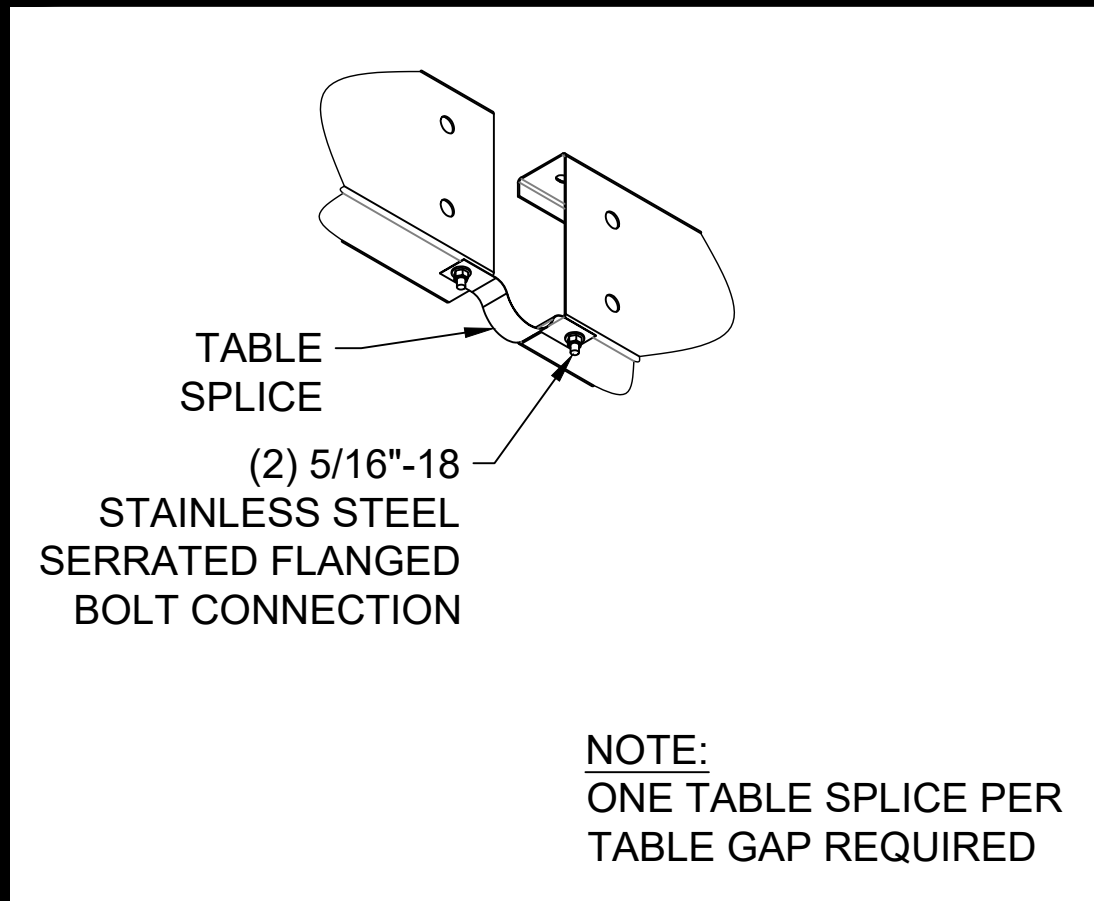
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SCALE:	As Noted
PROJECT NO.:	SC22-001
SHEET NO.:	2x10 TABLE
SC 3.1	



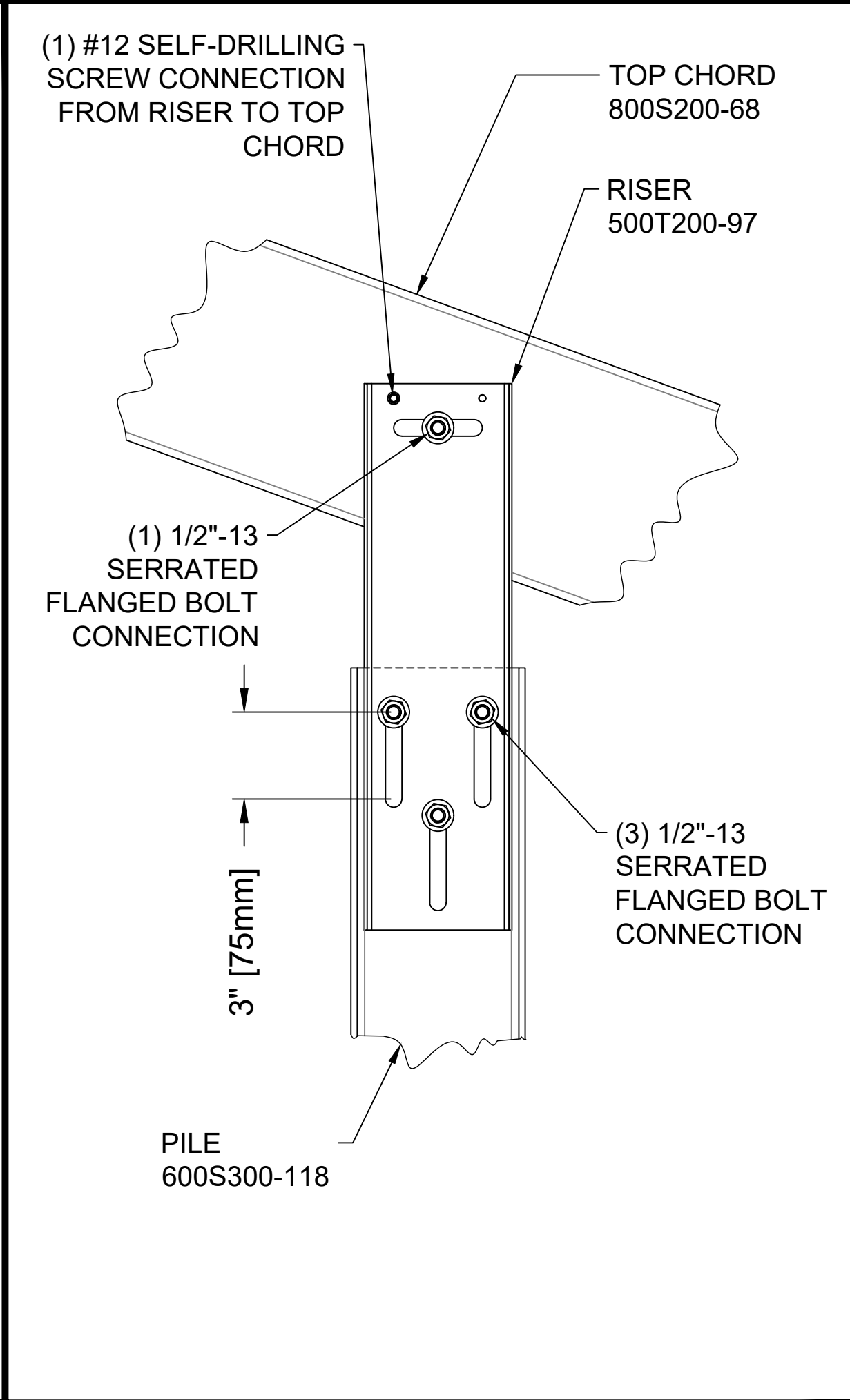
1 PILE FOUNDATION
SCALE: N.T.S.



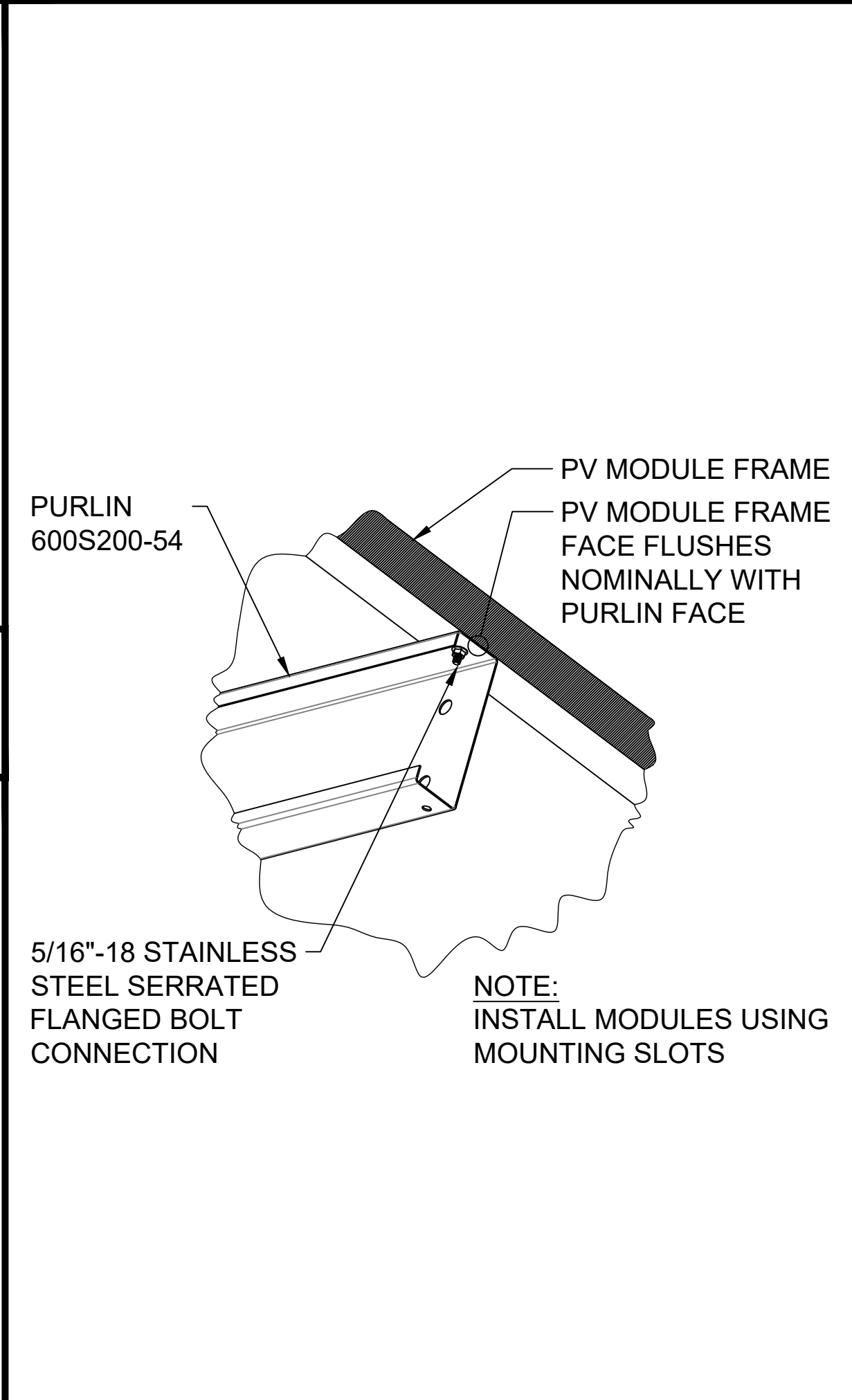
2 TOP CHORD TO PILE CONNECTION
SCALE: N.T.S.



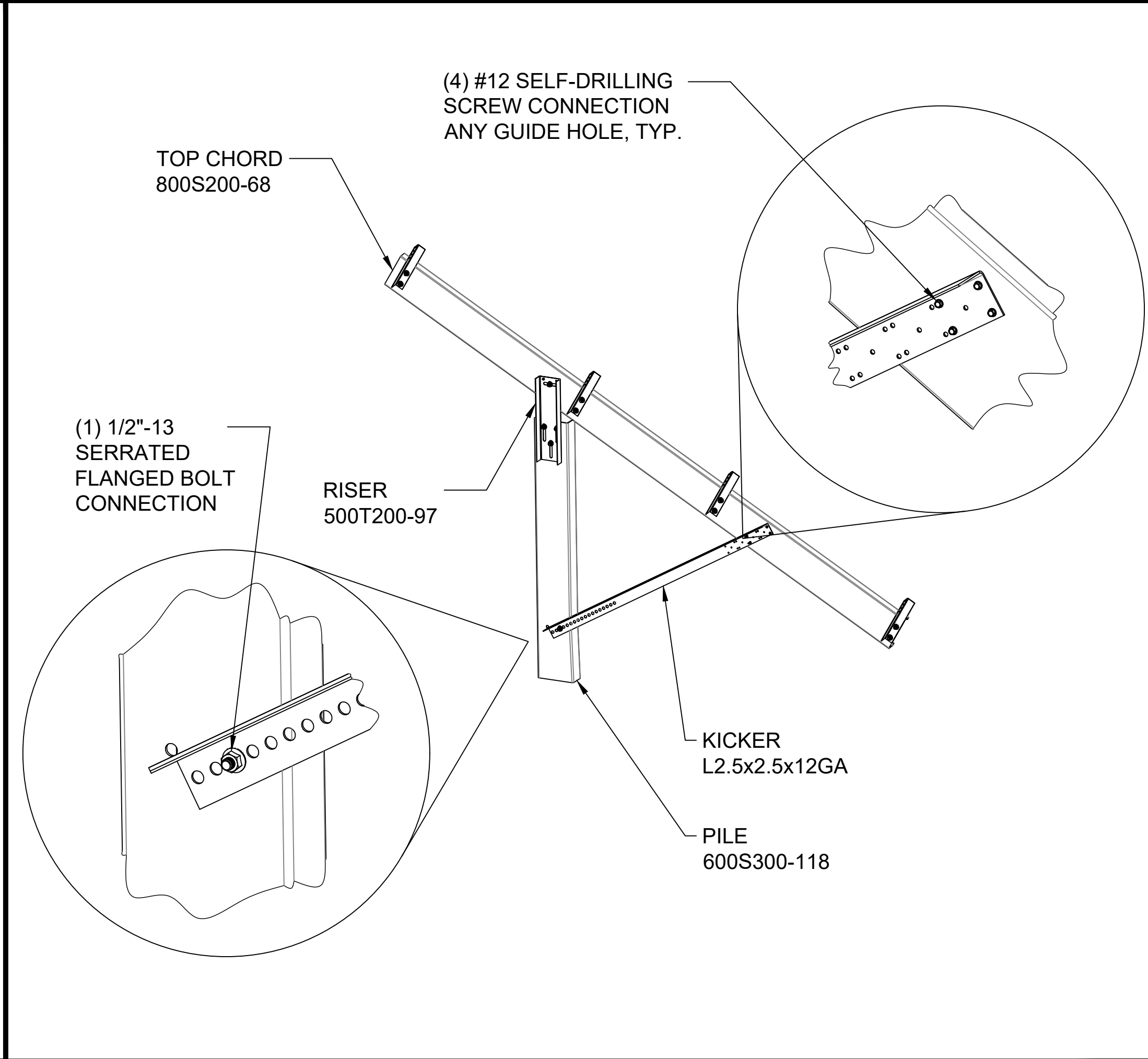
3 ANGLE BRACE TO PILE AND TOP CHORD CONNECTIONS
SCALE: N.T.S.



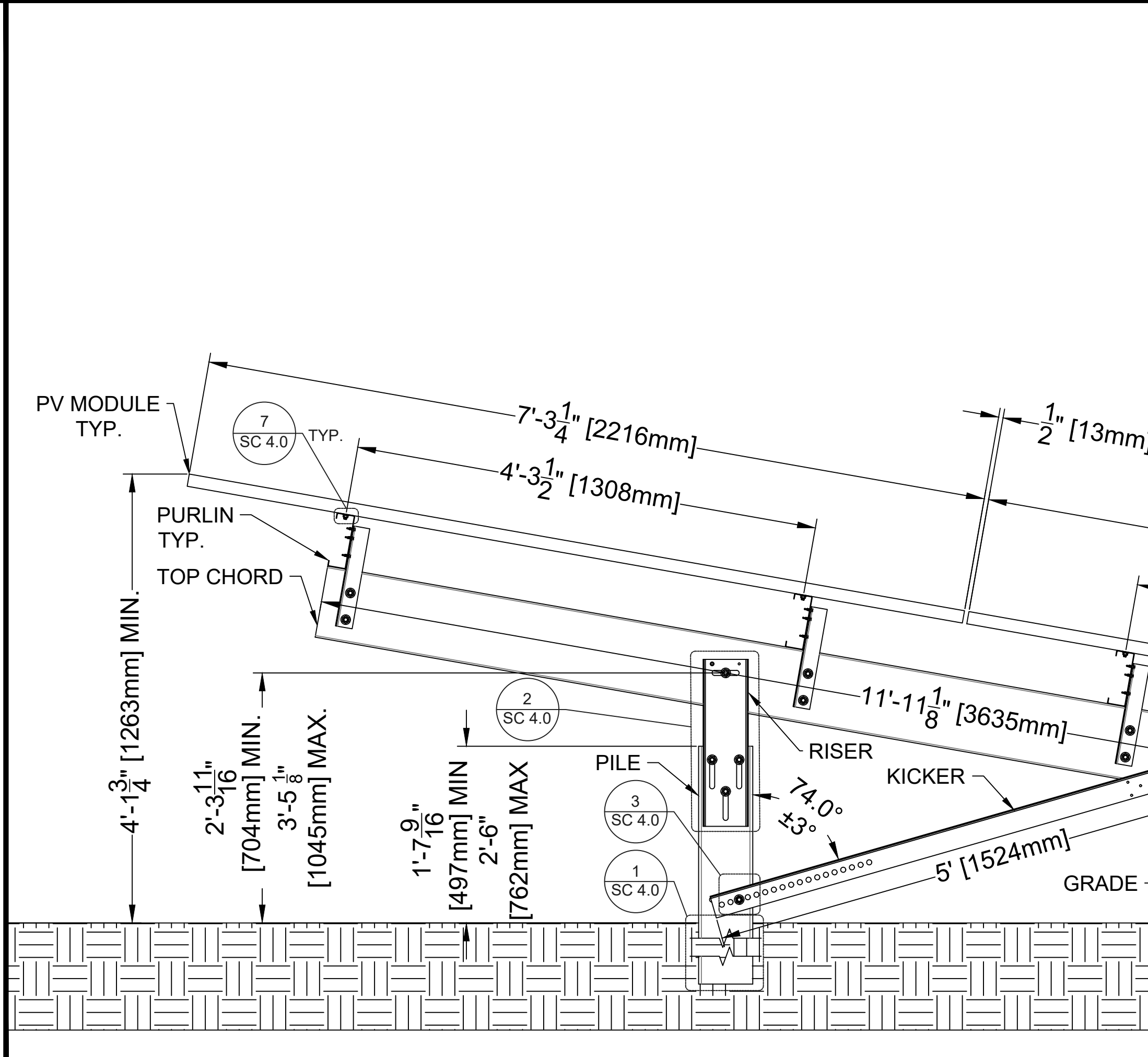
4 PURLIN TO TOP CHORD CONNECTION
SCALE: N.T.S.



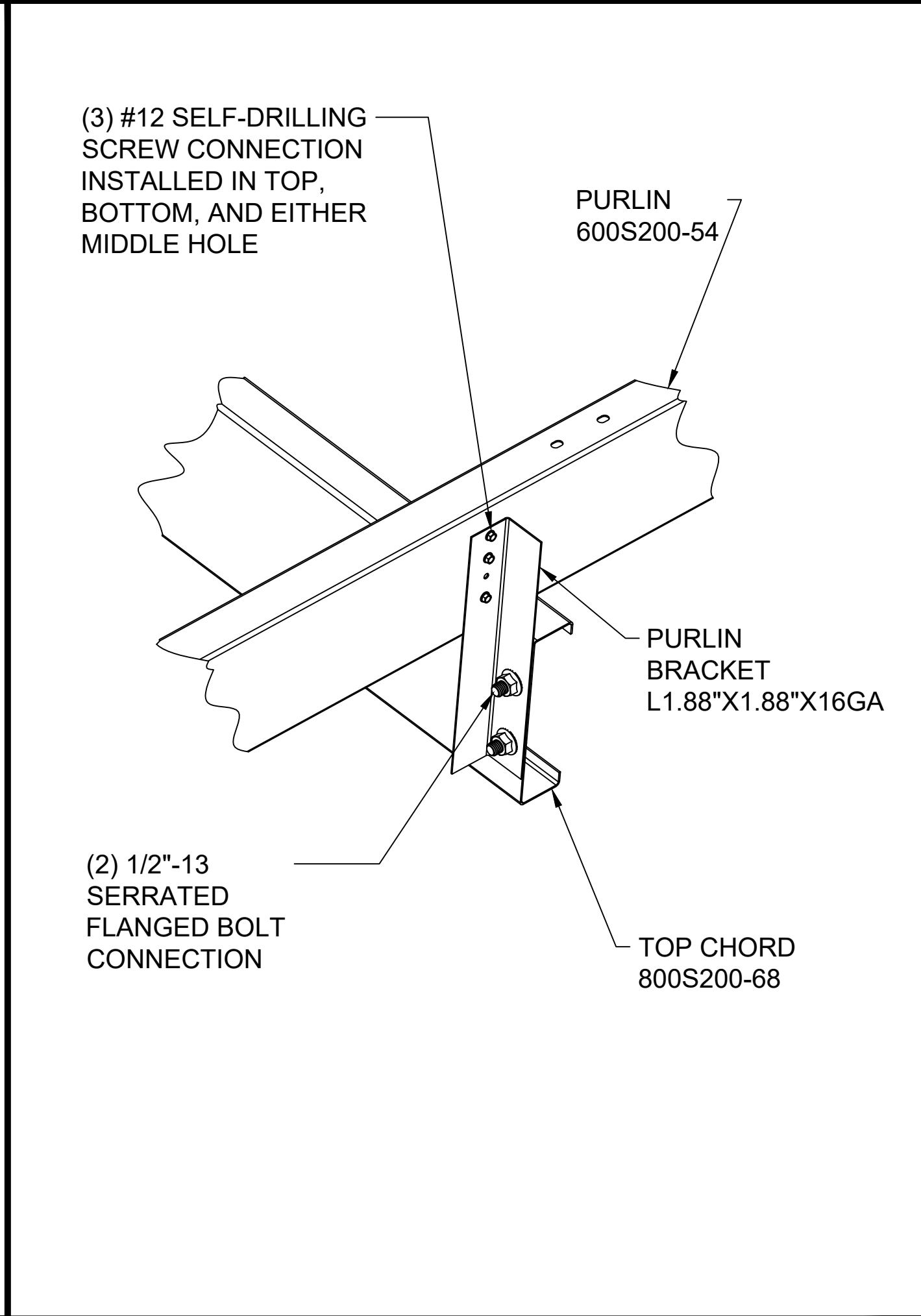
5 PURLIN SPLICE CONNECTION
SCALE: N.T.S.



6 TABLE SPLICE CONNECTION
SCALE: N.T.S.



7 PV MODULE TO PURLIN CONN.
SCALE: N.T.S.



8 FRAMING SECTION - TWO ROWS OF MODULES IN PORTRAIT ORIENTATION
SCALE: N.T.S.

REVISION	DATE	DESCRIPTION

CLIENT:

NEWPORT POWER



1775 TRIBUTE ROAD, STE A.
SACRAMENTO, CA 95815

IFP SUBMITTAL



PROJECT:

**1.5 MW
HELLMAN SOLAR**

SITE LOCATION:

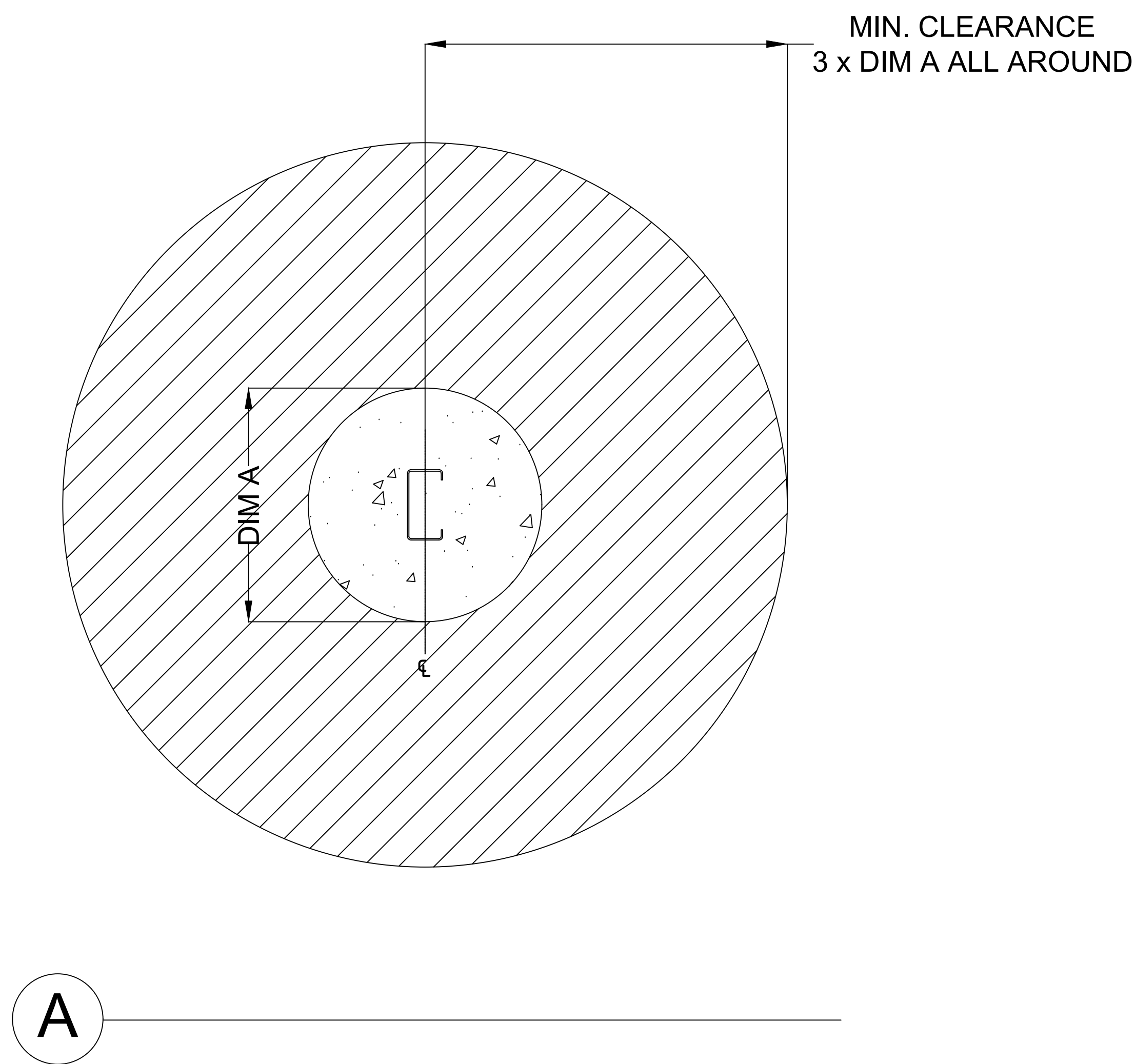
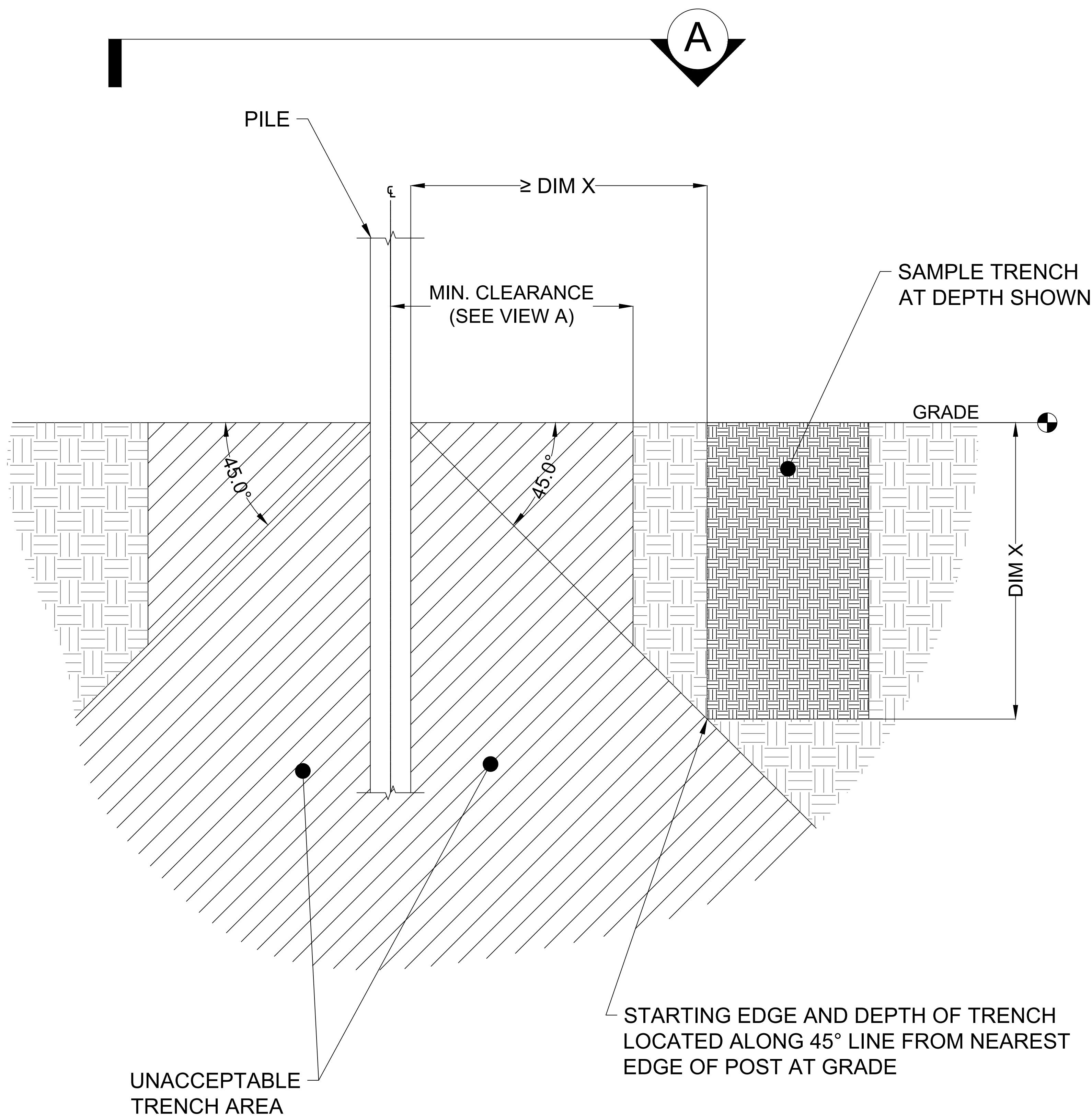
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SCALE:	As Noted
PROJECT NO.:	SC22-001
SHEET NO.:	TYPICAL DETAILS
SC 4.0	



REVISION	DATE	DESCRIPTION

CLIENT:

NEWPORT
POWER



1775 TRIBUTE ROAD, STE A.
SACRAMENTO, CA 95815

IFP SUBMITTAL



PROJECT:

1.5 MW
HELLMAN SOLAR

SITE LOCATION:

SEAL BEACH, CA
33.755, -118.096

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SCALE:	As Noted
PROJECT NO.:	SC22-001
SHEET NO.:	TRENCH CLEARANCE TO PILE DETAIL
	SC 4.1

CONSTRUCTION WORK ZONES
SOIL POTENTIALLY IMPACTED
ROUGHLY 20' AROUND EACH
FUTURE ARRAY

TRENCHING PATH
SOIL POTENTIALLY IMPACTED
ROUGHLY 10' ON EITHER
SIDE OF TRENCH PATH

CONSTRUCTION WORK ZONES
SOIL POTENTIALLY IMPACTED
ROUGHLY 20' AROUND EACH
FUTURE ARRAY

TRENCHING PATH
SOIL POTENTIALLY IMPACTED
ROUGHLY 10' ON EITHER
SIDE OF TRENCH PATH

STAGING AREA

BUFFER ZONE

ARCHAEOLOGICAL ZONE

CONSTRUCTION WORK ZONES
SOIL POTENTIALLY IMPACTED
ROUGHLY 20' AROUND EACH
FUTURE ARRAY