Pine Mountain Lake Association - Country Club Solar Project

12765 MUELLER DR., GROVELAND, CA 95231

PROJECT CONTACTS:

EXCITE ENERGY
VINCE BOWLES
OWNER / EE
(916) 844-6232
VINCE@EXCITEENERGY.COM

EXCITE ENERGY
HEATH KIRIN
OWNER / EE
(916) 400-1197
HEATH@EXCITEENERGY.COM

PINE MOUNTAIN LAKE ASSOCIATION
KEN SPENCER
CONTROLLER
(209) 962-8606
CONTROLLER@PINEMOUNTAINLAKE.COM

SCOPE OF WORK:

THE PROJECT CONSISTS OF INSTALLING 201.6KW OF PHOTOVOLTAIC SYSTEMS AT THE PINE MOUNTAIN LAKE COUNTRY CLUB.

DURING DAYLIGHT HOURS THE PHOTOVOLTAIC SYSTEM WILL PROVIDE ELECTRICITY IN PARALLEL WITH THE LOCAL UTILITY.

ALL EQUIPMENT WILL BE INSTALLED AS REQUIRED BY APPLICABLE CODES AND THE LOCAL AUTHORITY HAVING JURISDICTION.

VALUATION: $640,188.00

(420) Q CELLS Q.PEAK DUO XL-G10 480W PHOTOVOLTAIC MODULES (COMPLIANT WITH CA RULE 21, UL62109-1, UL 1761, IEEE 1567, AND NEC AND CEC RAPID SHUTDOWN REQUIREMENTS)

(5) SMA SUNNY TRIPOWER CORE1 33-US-41 INVERTERS (COMPLIANT WITH CA RULE 21, UL 1741 SA, IEEE 1547, RULE 14H, AND NEC AND CEC RAPID SHUTDOWN REQUIREMENTS)

PG&E METER # 1006718779

SHEET INDEX:

APPLICABLE CODES:

CALIFORNIA ELECTRICAL CODE, 2019
CALIFORNIA BUILDING CODE, 2019
CALIFORNIA FIRE CODE, 2019
CALIFORNIA ENERGY CODE, 2019

REGISTERED PROFESSIONAL ENGINEER
ROGER L. BLAIR
03-16-22
C 048824
CIVIL
STATE OF CALIFORNIA

FOR ROOF MOUNT
SOLAR ONLY

VICINITY MAP:

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS					
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
	EXCITE ENERGY CLIENT NO: 1018							
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT
COUNTRY CLUB
COVER SHEET

DWG. NO. 1018-01-103
REV 0

GENERAL NOTES:

1. ALL MATERIALS AND INSTALLATIONS SHALL BE DONE IN ACCORDANCE WITH THE 2019 CALIFORNIA ELECTRICAL CODE (CEC) AS WELL AS ANY APPLICABLE CODES AND STANDARDS REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ).
2. COLOR CODING OF POWER CABLES SHALL TO BE AS FOLLOWS :

SINGLE PHASE:	THREE PHASE (120/208V):	THREE PHASE (277/480V):
HOT - BLACK	PHASE A - BLACK	PHASE A - BROWN
NEUTRAL - WHITE	PHASE B - RED	PHASE B - ORANGE
GROUND - GREEN	PHASE C - BLUE	PHASE C - YELLOW
	NEUTRAL - WHITE	NEUTRAL - GRAY
	GROUND - GREEN	GROUND - GREEN

3. LOW VOLTAGE CABLES SHALL HAVE A TEMPERATURE RATING OF 90°C.
4. WIRING FOR LOW VOLTAGE POWER AND CONTROL CIRCUITS SHALL BE TYPE THWN-2 OR XHHW-2.
5. ALL INDIVIDUALLY INSULATED NEUTRAL CONDUCTORS SHALL HAVE WHITE OR GRAY INSULATION AS NOTED ABOVE AND SHALL BE PERMANENTLY IDENTIFIED AS A NEUTRAL CONDUCTOR BY SHRINK-WRAPPING OR TAPING THE EXPOSED INSULATION AT EACH END AND AT EVERY OTHER POINT WHERE THE CONDUCTOR IS ACCESSIBLE AS NOTED IN NEC ARTICLE 200.6. INDIVIDUALLY INSULATED GROUNDING CONDUCTORS SHALL HAVE GREEN INSULATION.
6. ALL WIRING ENTERING FIELD JUNCTION BOXES SHALL BE FORMED, BUNDLED, AND ZIP-TIED IN A NEAT AND ORDERLY FASHION AND LOOPED WHERE POSSIBLE TO ALLOW SUFFICIENT LENGTH FOR RELOCATION FROM ITS DESIGNED TERMINATION POINT TO ANY OTHER TERMINAL WITHIN THE ENCLOSURE.
7. ALL SPARE WIRING NOT DESIGNATED TO TERMINATE ON SPARE TERMINALS SHALL BE FORMED, BUNDLED, AND TAGGED SPARE AND BE OF SUFFICIENT LENGTH TO REACH ANY TERMINAL WITHIN THE ENCLOSURE.
8. ALL WIRING TERMINATIONS SHALL BE IDENTIFIED USING PERMANENT WIRE MARKERS WITH IDENTIFICATION CORRESPONDING TO THAT ON SCHEMATICS, LOOPS, AND WIRING DIAGRAMS.
9. AFTER INSTALLATION, ELECTRICAL CONTRACTOR SHALL PERFORM MEGGER TESTS FOR ALL POWER CABLES AND CONTINUITY TESTS OF ALL CONTROL, AND INSTRUMENTATION CONDUCTORS TO ENSURE CORRECT CABLE CONNECTION. TESTS SHALL BE DOCUMENTED AND PROVIDED TO THE OWNER OR OWNER'S REPRESENTATIVE.
10. LENGTHS OF CABLES SHOWN ON PROJECT DRAWINGS ARE ESTIMATES. ELECTRICAL CONTRACTOR SHALL DETERMINE ACTUAL LENGTHS AND PART NUMBERS PRIOR TO ORDERING AND CUTTING CABLES.
11. ELECTRICAL CONTRACTOR SHALL KEEP WORKING COPIES OF AS-BUILT DRAWINGS FOR SUBMITTAL TO THE OWNER AT THE COMPLETION OF THE PROJECT.

GROUNDING NOTES:

1. ALL GROUNDING MATERIALS SHALL BE UL LISTED AND INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
2. ALL GROUNDING MATERIALS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED ON DRAWINGS.
3. THE LOCATION OF GROUND CABLES AND EQUIPMENT SHOWN ON DRAWINGS IS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE CONSTRUCTION CONTRACTOR IN COORDINATION WITH THE OWNER OR OWNER'S REPRESENTATIVE.
4. ONLY MAJOR GROUNDING IS SHOWN ON GROUNDING PLANS. OTHER GROUNDING (E.G. CONDUIT GROUNDING BUSHINGS, LUGS, ETC.) ARE NOT SHOWN ON PLANS BUT ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
5. GROUND RODS SHALL BE COPPER-COATED STEEL AND AT LEAST 5/8" IN DIAMETER AND 8' LONG.
6. GROUND RODS SHALL NOT BE INSTALLED CLOSER THAN TWICE THE ROD'S LENGTHS FROM ONE ANOTHER.
7. GROUND RODS SHALL BE INSTALLED WITH THE TOPS OF RODS AT A MINIMUM OF 6" BELOW FINISHED GRADE.
8. NEW GROUNDING INSTALLED FOR THE SCOPE OF THIS PROJECT SHALL BE CONNECTED TO THE EXISTING BUILDING GROUND SYSTEM.
9. ALL SURFACES REQUIRING GROUNDING SHALL BE THOROUGHLY CLEANED TO BARE METAL BEFORE ATTACHING GROUNDING DEVICES TO ENSURE GOOD ELECTRICAL CONTACT. WHERE PAINTED SURFACES ARE CLEANED, A TOUCH-UP COATING MATCHING THE ORIGINAL FINISH SHALL BE APPLIED AFTER GROUND CONNECTION IS COMPLETE.
10. CABLE-TO-CABLE CONNECTIONS SHALL BE IRREVERSIBLE COMPRESSION TYPE OR EXOTHERMIC.
11. CABLE-TO-EQUIPMENT CONNECTIONS SHALL BE BOLTED OR SERVIT POST.

CONDUIT NOTES:

1. ALL CONDUIT AND FITTINGS SHALL BE UL LISTED FOR THE INTENDED USE.
2. ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL RACEWAYS AND BULK MATERIALS.
3. ALL ABOVEGROUND CONDUIT SHALL BE EMT. ALL BELOWGROUND CONDUIT SHALL BE SCHEDULE 40 RIGID PVC UNLESS OTHERWISE NOTED ON PROJECT DRAWINGS.
4. REFER TO PLAN DRAWINGS AND ONE LINES FOR CONDUIT SIZES. THE MINIMUM SIZE FOR ALL CONDUIT SYSTEMS SHALL BE 3/4".
5. CONDUIT DRAINS SHALL BE INSTALLED AT ALL LOW POINTS IN CONDUIT SYSTEMS.
6. CRC ZINC-IT (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO COVER ALL WRENCH MARKS AND BREAKS IN GALVANIZED COATINGS TO INHIBIT OXIDATION.
7. ALL SPARE CONDUITS SHALL BE CAPPED OR SEALED TO PREVENT INGRESS OF WATER AND DEBRIS.
8. ALL CONDUIT SUPPORT COMPONENTS SUCH AS BOLTS, NUTS, WASHERS, CLAMPS, THREADED RODS ETC., SHALL BE HOT-DIPPED GALVANIZED STEEL OR CADMIUM PLATED.
9. CONDUIT AND CABLE ROUTING SHOWN ON PLAN DRAWINGS ARE APPROXIMATE. MINOR DEVIATIONS FROM PLAN DRAWINGS, AS REQUIRED BY FIELD CONDITIONS, SHALL BE PERMISSIBLE. COORDINATION WITH THE OWNER'S REPRESENTATIVE OR ENGINEER IS REQUIRED FOR MAJOR DEVIATIONS.
10. ALL WIRE AND CABLES SHALL BE PULLED INTO THEIR RESPECTIVE CONDUITS USING A WIRE PULLING LUBRICANT.
11. SUFFICIENT WIRE SHALL BE LEFT AT ALL OUTLETS FOR CONNECTING FIXTURES AND DEVICES.
12. UNLESS OTHERWISE NOTED ON PROJECT DRAWINGS, UNDERGROUND CONDUIT SHALL BE BURIED TO A MINIMUM OF 18" DEEP TO THE TOP OF CONDUIT WITH 2" OF SAND ABOVE AND BELOW. A WARNING TAPE SHALL BE INSTALLED 12" ABOVE THE CONDUIT FOR THE FULL LENGTH.
13. CONDUIT USED FOR TRANSITION FROM BELOW-GRADE TO ABOVE SHALL EXTEND A MINIMUM OF 6" CONDUIT ABOVE FINAL GRADE.
14. NO INACCESSIBLE BOXES, ENCLOSURES, OR SPLICES SHALL BE INSTALLED.

SOLARNORCAL, LLC
4970 ROBERT J MATHEWS PKWY
SUITE 160
EL DORADO HILLS, CA 95762
(916) 400-1197

CSLB #1018541
C10 CONTRACTOR

REFERENCE DRAWINGS		REVISIONS					
NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
SOLARNORCAL CLIENT NO: 1018							
(FORMATTED 11"x17") SCALE: NONE		0	01/29/2021	ISSUED FOR PERMIT	JVB	HRK	JVB

SolarNorcal LLC

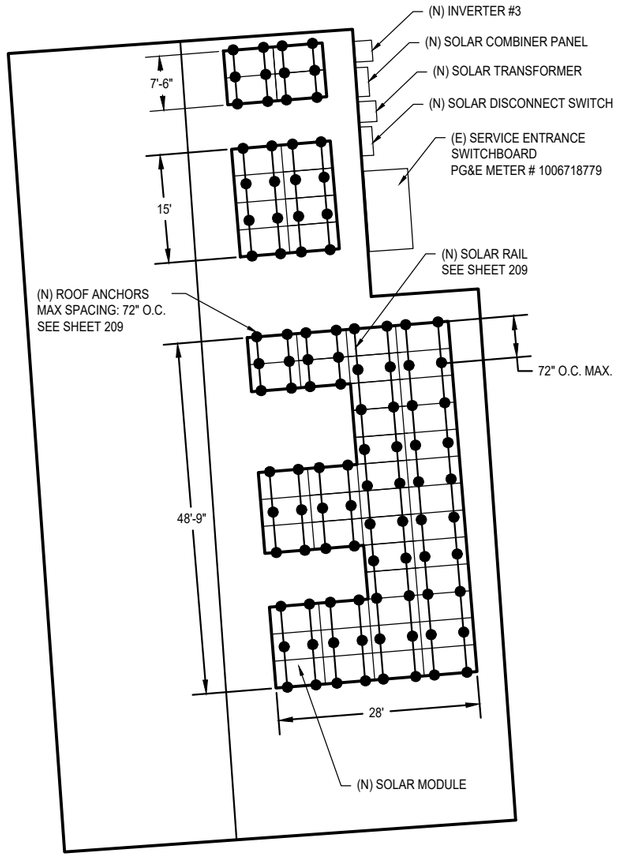
PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

ELECTRICAL NOTES

DWG. NO. 1018-01-104

REV 0

Roof Loading and Point Loading									
	Panel Weight (lb)	Number of Panels	Weight of all Panels (lb)	Number of Stand- Offs	Weight of Racking and Stand-Offs (lb)	Total Weight of Array (lb)	Point Load of Each Stand-Off (lb)	Total Area of Array (ft^2)	Distributed Load (lb/ft^2)
TOTAL	58	54	3154	104	374	3528	34	1344	2.6



DETAIL C — ROOF PLAN
SCALE: 3/64" = 1-0"

NOTES:

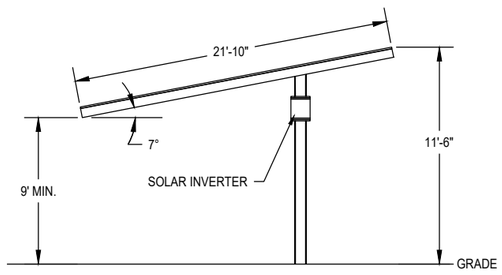
1. THERE SHALL BE NO CHANGES TO THE EXISTING GRADE OR NEW GRADING
2. APPROXIMATELY 38 CUBIC YARDS OF SOIL WILL BE REMOVED FOR THE INSTALLATION OF THE SOLAR CANOPY FOOTING

CUSTOMER AND LOT INFORMATION:

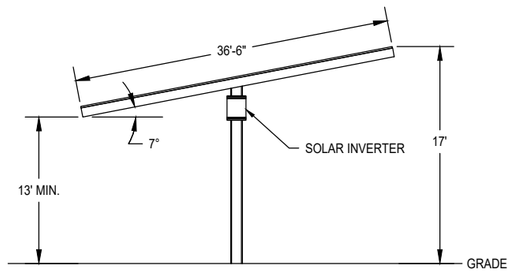
CUSTOMER NAME: PINE MOUNTAIN LAKE ASSOCIATION
ADDRESS: 12765 MUELLER DRIVE, GROVELAND, CA 95231
OWNER PHONE #: KEN SPENCER, (209) 962-8606
APPLICANT PHONE NUMBER: PHILIP HUTH, (916) 807-4259
APN: 090-030-018
PROPERTY ELEVATION: 2,792'
LOT SIZE: 3.554 ACRES

BUILDING INFORMATION:

STRUCTURE TYPE: MAINTENANCE BUILDING
ROOF FRAMING: 2X4, 24" O.C, 5:12 PITCH
ROOF TYPE: METAL, SINGLE STORY
RACKING SECURED TO ROOF USING S5! PROTEABRACKET
SOLAR RAILS SECURED TO ROOF EVERY 6'-0" MIN.
DESIGN SNOW LOAD: 25 PSF
DESIGN WIND SPEED: 110 MPH



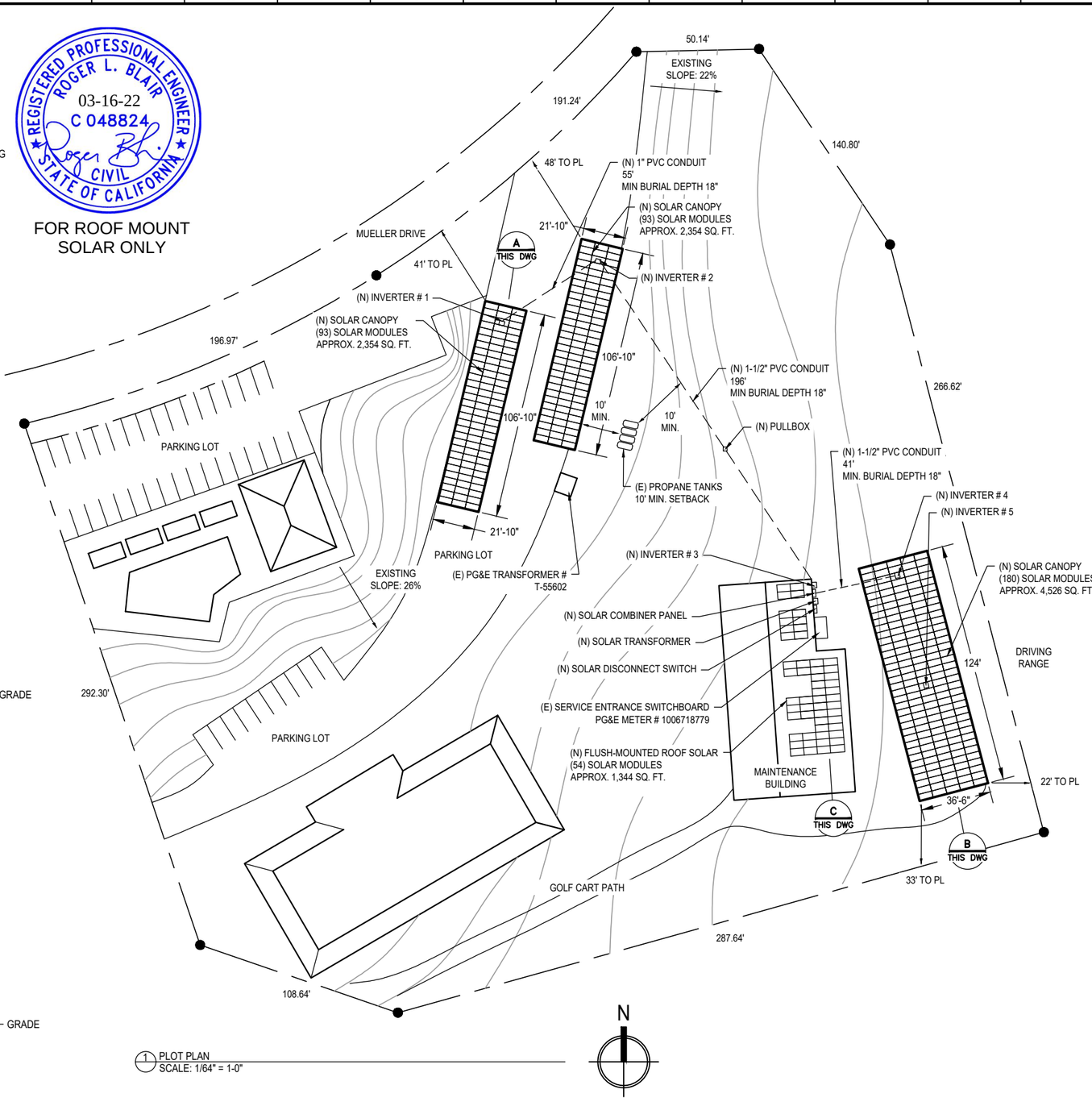
DETAIL A — SECTION VIEW



DETAIL B — SECTION VIEW

REGISTERED PROFESSIONAL ENGINEER
ROGER L. BLAIR
03-16-22
C 048824
CIVIL
STATE OF CALIFORNIA

FOR ROOF MOUNT SOLAR ONLY



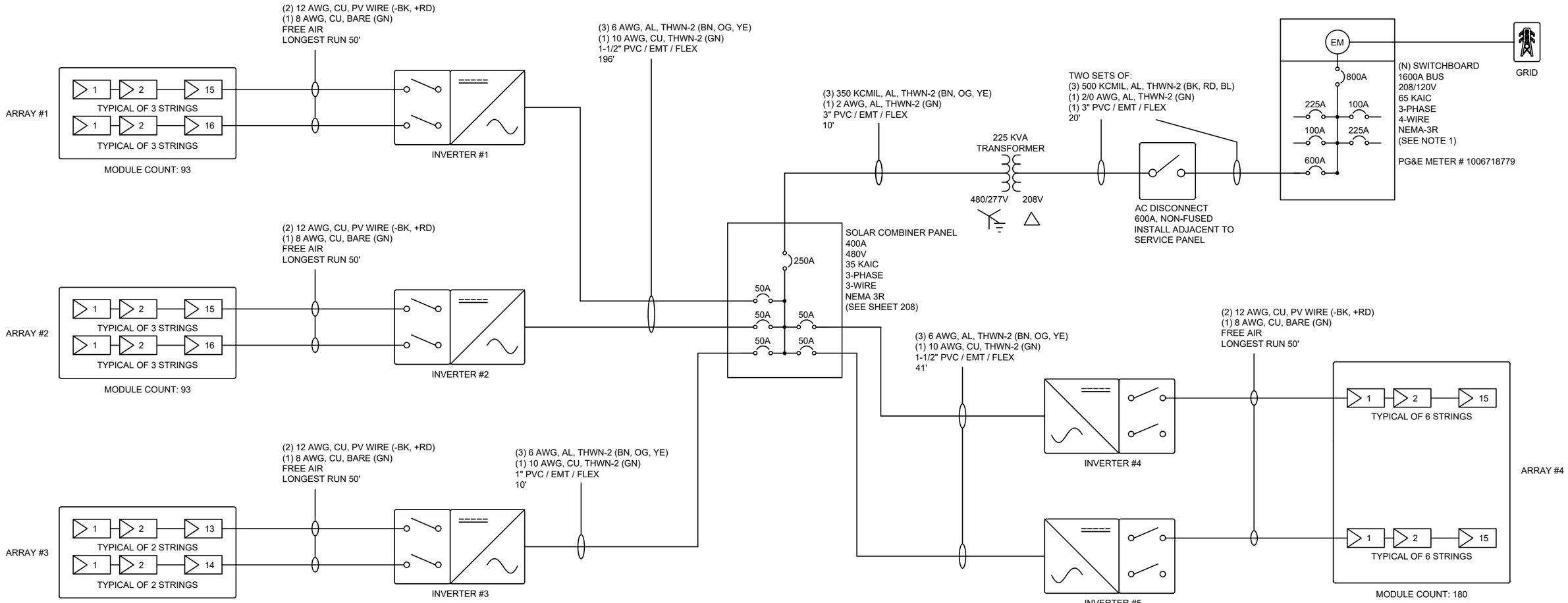
1 PLOT PLAN
SCALE: 1/64" = 1-0"

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS					
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
	EXCITE ENERGY CLIENT NO: 1018							
	(FORMATTED 11"x17") SCALE: AS NOTED		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT
COUNTRY CLUB
PLOT PLAN

DWG. NO. 1018-01-108
REV 0



(SEE SHEET 202)

MODULE SPECIFICATIONS	
(420) Q CELLS Q.PEAK DUO XL-G10.D 480W	
STC RATING	480 W
PTC RATING	447.1 W
VOLTAGE AT MPP	44.54 V
CURRENT AT MPP	10.66 A
OPEN CIRCUIT VOLTAGE	53.61 V
SHORT CIRCUIT CURRENT	11.26 A

(SEE SHEET 206)

RAPID SHUTDOWN SPECIFICATIONS	
(54) TIGO TS4-A-F OPTIMIZERS (1 MOD PER OPTIMIZER)	
MAX INPUT POWER	500 W
VOLTAGE RANGE	16-90 VDC
MAX INPUT CURRENT	15 ADC

(SEE SHEET 203)

INVERTER SPECIFICATIONS	
(5) SMA SUNNY TRIPOWER CORE1 STP 33-US-41	
MAX DC INPUT POWER (STC)	50 KW
MAX INPUT VOLTAGE	1000 V
MAX AC OUTPUT POWER	33.3 KW
AC OUTPUT VOLTAGE (NOMINAL)	480 V
MAX CONTINUOUS OUTPUT CURRENT	40 A

VOLTAGE DROP CALCULATIONS					
CIRCUIT	LENGTH	AMPS	VOLTAGE	V DROP	% DROP
INVERTER 1 & 2 TO 400A PANELBOARD	196'	40 A	480 VAC	11.0 VAC	2.3 %
INVERTER 3 TO 400A PANELBOARD	10'	40 A	480 VAC	0.4 VAC	0.1 %
INVERTER 4 TO 400A PANELBOARD	41'	40 A	480 VAC	2.3 VAC	0.5 %

NOTES:
1. REPLACE EXISTING 800A SWITCHBOARD / 800A MAIN BREAKER WITH NEW 1600A SWITCHBOARD / 800A MAIN BREAKER.

EXCITE ENERGY, LLC
4970 ROBERT J MATHEWS PKWY
SUITE 160
EL DORADO HILLS, CA 95762
(916) 400-1197

CSLB #1018541
C10 CONTRACTOR

REFERENCE DRAWINGS	
NO.	TITLE
EXCITE ENERGY CLIENT NO: 1018	
(FORMATTED 11"x17") SCALE: NONE	

REVISIONS					
NO.	DATE	DESCRIPTION	BY	CHK.	APP.
0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT
COUNTRY CLUB
ONE LINE DIAGRAM

DWG. NO. 1018-01-113

REV 0

PV LABEL SIGNAGE

* RED BACKGROUND
* WHITE LETTERS
* MINIMUM 3/8" LETTER HEIGHT
* ALL CAPITAL LETTERS
* ARIAL OR SIMILAR FONT, NON-BOLD
* MATERIAL SUITABLE FOR THE ENVIRONMENT (A DURABLE ADHESIVE IS ACCEPTABLE)

* IN COMPLIANCE WITH CEC 705.10, THE FOLLOWING SIGN SHALL BE ATTACHED TO THE FRONT OF THE MAIN SERVICE PANEL:

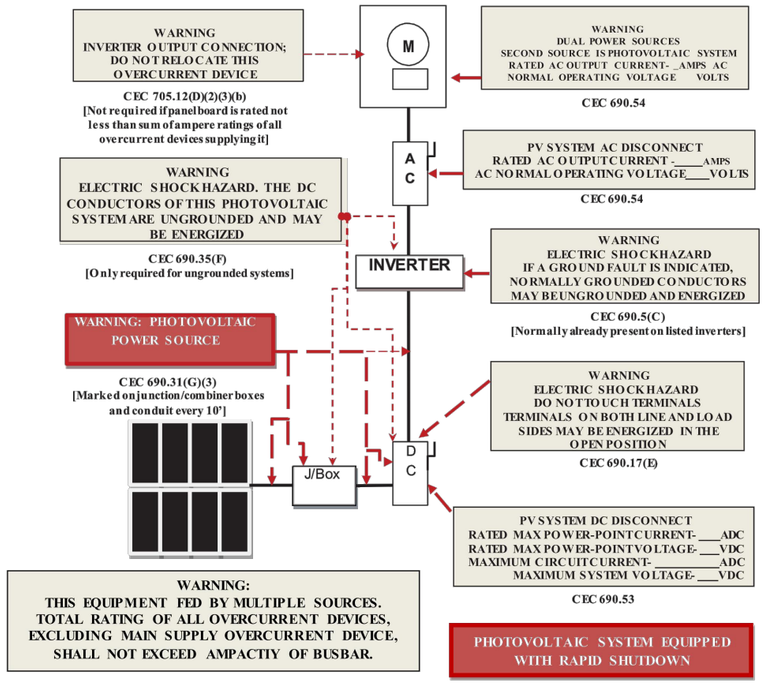
*** WARNING ***
TWO POWER SOURCES:
UTILITY AND PHOTOVOLTAIC

TO INITIATE RAPID SHUTDOWN OF THE PHOTOVOLTAIC SYSTEM, OPEN THE SOLAR DISCONNECT SWITCH OR THE MAIN BREAKER IN THE MAIN SERVICE PANEL.

Solar PV Standard Plan — Simplified
Central/String Inverter Systems for One- and Two-Family Dwellings

Markings

CEC Articles 690 and 705 and CA Residential Code Section R324 require the following labels or markings be installed at these components of the photovoltaic system:



Informational note: ANSI Z535.4-2011 provides guidelines for the design of safety signs and labels for application to products. A phenolic plaque with contrasting colors between the text and background would meet the intent of the code for permanency. No type size is specified, but 20 point (3/8") should be considered the minimum.

CEC 705.12 requires a permanent plaque or directory denoting all electric power sources on or in the premises or rapid fire shutdown equipment.

SOLARNORCAL, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS					
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	SOLARNORCAL CLIENT NO: 1018							
	(FORMATTED 11"x17") SCALE: NONE		0	01/29/2021	ISSUED FOR PERMIT	JVB	HRK	JVB

SolarNorcal LLC

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

LABELS

DWG. NO. 1018-01-116

REV 0

LOW ELECTRICITY GENERATION COSTS
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 20.1 %.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (2400 Pa).

A RELIABLE INVESTMENT
Inclusive 12-year product warranty and 25-year linear performance warranty[2].

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

[1] APT test conditions according to IEC/TS 62804-1:2015, method B (−1500V, 168h)
[2] See data sheet on rear for further information.

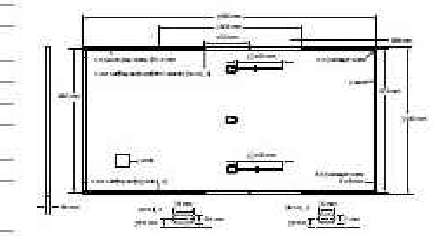
THE IDEAL SOLUTION FOR:
Rooftop arrays on commercial/industrial buildings
Ground-mounted solar power plants

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	2080 mm × 1030 mm × 35 mm (including frame)
Weight	24.5 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 × 24 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥1400 mm, (−) ≥1400 mm
Connector	Stäubli MC4, Hanwha Q CELLS HQC4, Amphenol UTX, Renhe 05-6, Tongling TL-Cable01S, JMTHY JM601; IP68 or Friends PV2e; IP67

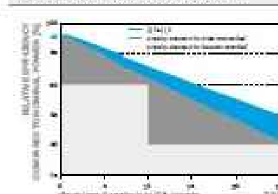


ELECTRICAL CHARACTERISTICS

POWER CLASS			405	410	415	420	425
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5W / −0W)							
Minimum: Power at MPP[1]	P_{MPP}	[W]	405	410	415	420	425
Minimum: Short Circuit Current[1]	I_{SC}	[A]	10.65	10.70	10.74	10.79	10.83
Minimum: Open Circuit Voltage[1]	V_{OC}	[V]	48.14	48.38	48.63	48.88	49.13
Minimum: Current at MPP	I_{MPP}	[A]	10.14	10.18	10.23	10.27	10.32
Minimum: Voltage at MPP	V_{MPP}	[V]	39.95	40.27	40.58	40.89	41.20
Minimum: Efficiency[1]	η	[%]	≥18.9	≥19.1	≥19.4	≥19.6	≥19.8
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum: Power at MPP	P_{MPP}	[W]	303.1	306.9	310.6	314.4	318.1
Minimum: Short Circuit Current	I_{SC}	[A]	8.58	8.62	8.65	8.69	8.73
Minimum: Open Circuit Voltage	V_{OC}	[V]	45.38	45.62	45.86	46.09	46.33
Minimum: Current at MPP	I_{MPP}	[A]	7.98	8.01	8.05	8.09	8.12
Minimum: Voltage at MPP	V_{MPP}	[V]	37.99	38.29	38.58	38.88	39.17

[1] Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2] 800 W/m², NMOT, spectrum AM 1.5

Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 93.1% of nominal power up to 10 years. At least 85% of nominal power up to 25 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]	−0.36	Nominal Module Operating Temperature	NMOT	[°C]	43±3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 1703	C / TYPE 2
Max. Design Load, Push / Pull		[Pa]	3600 / 1600	Permitted Module Temperature on Continuous Duty	−40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 2400		

QUALIFICATIONS AND CERTIFICATES

IEC 61215:2016; IEC 61730:2016;
This data sheet complies with DIN EN 50380.

PACKAGING INFORMATION

Number of Modules per Pallet	30
Number of Pallets per Trailer (24 t)	24
Number of Pallets per 40' HC-Container (26 t)	22
Pallet Dimensions (L × W × H)	2131 × 1130 × 1200 mm
Pallet Weight	788 kg

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 GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | TEL +49 (0)3494 66 99-23444 | FAX +49 (0)3494 66 99-23000 | EMAIL sales@q-cells.com | WEB www.q-cells.com

Engineered in Germany

Q CELLS

SOLARNORCAL, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197	REFERENCE DRAWINGS		REVISIONS					SolarNorcal LLC
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
CSLB #1018541	SOLARNORCAL CLIENT NO: 1018							PINE MOUNTAIN LAKE ASSOCIATION SOLAR PROJECT MODULE DATASHEET
C10 CONTRACTOR	(FORMATTED 11"x17") SCALE: NONE		0	01/29/2021	ISSUED FOR PERMIT	JVB	HRK	JVB

DWG. NO. 1018-01-202 REV 0

SUNNY TRIPOWER CORE1 33-US / 50-US / 62-US

Fully integrated

- Innovative design requires no additional racking for rooftop installation
- Integrated DC and AC disconnects and overvoltage protection
- 12 direct string inputs for reduced labor and material costs

Increased power, flexibility

- Multiple power ratings for small to large scale commercial PV installions
- Six MPP trackers for flexible stringing and maximum power production
- ShadeFix, SMA's proprietary shade management solution, optimizes at the string level

Enhanced safety, reliability

- Integrated SunSpec PLC signal for module-level rapid shutdown compliance to 2017 NEC
- Next-gen DC AFCI arc-fault protection certified to new Standard UL 1699B Ed. 1

Smart monitoring, control, service

- Advanced smart inverter grid support capabilities
- Increased ROI with SMA ennexOS cross sector energy management platform
- SMA Smart Connected proactive O&M solution reduces time spent diagnosing and servicing in the field

SUNNY TRIPOWER CORE1 33-US / 50-US / 62-US

It stands on its own

The Sunny Tripower CORE1 is the world's first free-standing PV inverter for commercial rooftops, carports, ground mount and repowering legacy solar projects. From distribution to construction to operation, the Sunny Tripower CORE1 enables logistical, material, labor and service cost reductions, and is the most versatile, cost-effective commercial solution available. Integrated SunSpec PLC for rapid shutdown and enhanced DC AFCI arc-fault protection ensure compliance to the latest safety codes and standards. With Sunny Tripower CORE1 and SMA's ennexOS cross sector energy management platform, system integrators can deliver comprehensive commercial energy solutions for increased ROI.

www.SMA-America.com

Technical data	Sunny Tripower CORE1 33-US	Sunny Tripower CORE1 50-US	Sunny Tripower CORE1 62-US
Input (DC)			
Maximum array power	50000 Wp STC	75000 Wp STC	93750 Wp STC
Maximum system voltage		1000 V	
Rated MPP voltage range	330 V … 800 V	500 V … 800 V	550 V … 800 V
MPPT operating voltage range		150 V … 1000 V	
Minimum DC voltage / start voltage		150 V / 188 V	
MPP trackers / strings per MPP input		6 / 2	
Maximum operating input current / per MPP tracker		120 A / 20 A	
Maximum short circuit current per MPPT / per string input		30 A / 30 A	
Output (AC)			
AC nominal power	33300 W	50000 W	62500 W
Maximum apparent power	33300 VA	53000 VA	66000 VA
Output phases / line connections		3 / 3-(N)-PE	
Nominal AC voltage		480 V / 277 V WYE	
AC voltage range		244 V … 305 V	
Maximum output current	40 A	64 A	80 A
Rated grid frequency		60 Hz	
Grid frequency / range		50 Hz, 60 Hz / -6 Hz … +6Hz	
Power factor at rated power / adjustable displacement		1 / 0.0 leading … 0.0 lagging	
Harmonics THD		<3 %	
Efficiency			
CEC efficiency	97.5%	97.5%	97.5%
Protection and safety features			
Load rated DC disconnect		●	
Load rated AC disconnect		●	
Ground fault monitoring: Riso / Differential current		● / ●	
DC AFCI arc-fault protection		●	
SunSpec PLC signal for rapid shutdown		●	
DC reverse polarity protection		●	
AC short circuit protection		●	
DC surge protection: Type 2 / Type 1+2		O / O	
AC surge protection: Type 2 / Type 1+2		O / O	
Protection class / overvoltage category (as per UL 840)		I / IV	
General data			
Device dimensions (W / H / D)		621 mm / 733 mm / 569 mm (24.4 in x 28.8 in x 22.4 in)	
Device weight		84 kg (185 lbs)	
Operating temperature range		-25 °C … +60 °C (-13 °F … +140 °F)	
Storage temperature range		-40 °C … +70 °C (-40 °F … +158 °F)	
Audible noise emissions (full power @ 1m and 25 °C)		65 dB(A)	
Internal consumption at night		5 W	
Topology		Transformerless	
Cooling concept		OptiCool (forced convection, variable speed fans)	
Enclosure protection rating		Type 4X, 3SX (as per UL 50E)	
Maximum permissible relative humidity (non-condensing)		100%	
Additional information			
Mounting		Free-standing with included mounting feet	
DC connection		Amphenol UTX PV connectors	
AC connection		Screw terminals - 4 AWG to 4/0 AWG CU/AL	
LED indicators (Status / Fault / Communication)		●	
Network interfaces: Ethernet / WLAN / RS485		● (2 ports) / ● / O	
Data protocols: SMA Modbus / SunSpec Modbus / Webconnect		● / ● / ●	
Multifunction relay		●	
ShadeFix technology for string level optimization		●	
Integrated Plant Control / Q on Demand 24/7		● / ●	
Off-Grid capable / SMA Fuel Save Controller compatible		● / ●	
SMA Smart Connected (proactive monitoring and service support)		●	
Certifications			
Certifications and approvals		UL 1741, UL 1699B Ed. 1, UL 1998, CSA 22.2 107-1, PV Rapid Shutdown System Equipment	
FCC compliance		FCC Part 15 Class A	
Grid interconnection standards		IEEE 1547, UL 1741 SA - CA Rule 21, HECO Rule 14H	
Advanced grid support capabilities		L/HFRT, L/HVRT, Volt-VAr, Volt-Watt, Frequency-Watt, Ramp Rate Control, Fixed Power Factor	
Warranty			
Standard		10 years	
Optional extensions		15 / 20 years	
O Optional features ● Standard features – Not available			
Type designation	STP 33-US-41	STP 50-US-41	STP 62-US-41

Accessories

SMA Data Manager M
EDMM-US-10

SMA Sensor Module
MD.SEN-US-40

Universal Mounting System
UMS_KIT-10

AC Surge Protection Module Kit
AC_SPD_KIT1-10, AC_SPD_KIT2_T1T2
DC Surge Protection Module Kit
DC_SPD_KIT4-10, DC_SPD_KIT5_T1T2

Toll Free +1 888 4 SMA USA
www.SMA-America.com

SMA America, LLC

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS					
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
	EXCITE ENERGY CLIENT NO: 1018							
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

INVERTER DATASHEET

DWG. NO. 1018-01-203

REV 0

Tigo® Flex MLPE

TS4-A-F

PV Module Advanced Add-On

The TS4-A-F (Fire Safety) is the advanced add-on rapid shutdown solution that brings smart module functionality to standard PV modules for higher reliability. Ensure safety by upgrading existing PV systems or by adding safety features to new installations.

The TS4-A-F complies with NEC 2017 690.12 Rapid Shutdown specifications when installed with the Tigo RSS Transmitter or an inverter with built-in Tigo certified transmitter.

Included Features

Fire Safety

Enhanced **safety** for NEC 690.12 rapid shutdown compliance

Easy Installation

Snap to standard module frame or remove brackets for rack mounting

PLC Signaling

Control rapid shutdown with the Tigo RSS Transmitter

Automatic Shutdown

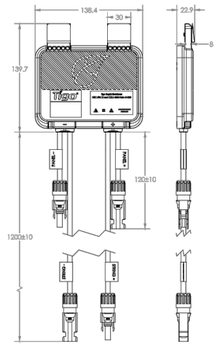
PV array enters rapid shutdown in event of AC grid loss

02/28/20

TS4-A-F SPECIFICATIONS

Environmental	
Operating Temperature Range	-40°C to +85°C (-40°F to +185°F)
Outdoor Rating	IP68, NEMA 3R
Mechanical	
Dimensions	138.4mm x 139.7mm x 22.9mm
Weight	490g
Electrical	
Voltage Range	16 - 90V
Maximum Current	15A
Maximum Power	500W
Output Cable Length	1.2m (standard)
Connectors	MC4 (standard)
Communication Type	PLC
Rapid Shutdown UL Listed (NEC 2014 & 2017 690.12)	Yes

Rapid shutdown activation of TS4-A-F requires RSS Transmitter.



ORDERING INFORMATION

Standard	
458-00252-32	1500V UL / 1000V TÜV, 1.2m cable, MC4
Options	
458-00257-12	1000V UL / TÜV, 1.2m cable, MC4 comparable
458-00261-32	1500V UL / TÜV, 1.2m cable, EVO2

FC IC c UL us LISTED E469960 Photovoltaic Rapid Shutdown System Equipment, QIJW

For sales info:
sales@tigoenergy.com or 1.408.402.0802

For product info:
Visit tigoenergy.com/products

For technical info:
Visit support.tigoenergy.com

For additional info and product selection assistance, use Tigo's online design tool at tigoenergy.com/design

Tigo®

Tigo Energy, Inc. 655 Campbell Technology Pkwy Suite 150, Campbell, California 95008 USA
www.tigoenergy.com P: +1.408.402.0802 F:+1.408.358.6279 | sales@tigoenergy.com

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS					
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
	EXCITE ENERGY CLIENT NO: 1018							
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

RAPID SHUTDOWN DATASHEET

DWG. NO. 1018-01-206

REV 0

1HD362NF

600 Vac Heavy-Duty, Non-Fusible, Single-Throw, 277/480–600V—Type 1, 3R

System	Ampere Rating	Maximum Horsepower Ratings Single-Phase AC 240V	480V	600V	Three-Phase AC 240V	480V	600V	DC 250V	600V	Type 1 Enclosure Indoor Catalogue Number	Type 3R① Enclosure Rainproof Catalogue Number
Two-Pole—480 Vac—600 Vac or Vdc ②											
	30	3	7-1/2	10	—	—	—	—	15	**1HD261NF**	**3HD261NF**
	60	10	20	25	—	—	—	—	25	**1HD262NF**	**3HD262NF**
	100	20	30	40	—	—	—	20	25	**1HD263NF**	**3HD263NF**
	200	15	50	50	—	—	—	—	50	**1HD264NF**	**3HD264NF**
	400	—	—	—	—	—	—	50	—	**1HD265NF**	**3HD265NF**
	600	—	—	—	—	—	—	—	—	**1HD266NF**	**3HD266NF**
	800	—	—	—	—	—	—	—	—	**1HD267NF** ②	**3HD267NF** ②
	1200	—	—	—	—	—	—	—	—	③	③
Three-Pole—480 Vac—600 Vac, 250 Vdc											
	30	3	7-1/2	10	10	20	30	5	—	**1HD361NF**	**3HD361NF**
	60	10	20	25	20	50	60	10	—	**1HD362NF**	**3HD362NF**
	100	20	40	50	40	75	100	20	—	**1HD363NF**	**3HD363NF**
	200	15	50	50	60	125	150	40	—	**1HD364NF**	**3HD364NF**
	40	—	—	—	125	250	350	50	—	**1HD365NF**	**3HD365NF**
	600	—	—	—	200	400	500	—	—	**1HD366NF**	**3HD366NF**
	800	—	—	—	—	500	500	—	—	**1HD367NF**	**3HD367NF**
	1200	—	—	—	—	500	500	—	—	**1HD368NF**	**3HD368NF**
Four-Pole—480 Vac—600 Vac, 250 Vdc											
	30	10④	20④	25④	10	20	30	5	—	**1HD461NF**	**3HD461NF**
	60	20④	40④	50④	20	50	60	10	—	**1HD462NF**	**3HD462NF**
	100	40④	50④	50④	40	75	100	20	—	**1HD463NF**	**3HD463NF**
	200	50④	50④	50④	60	125	150	40	—	**1HD464NF**	**3HD464NF**
	400	50④	—	—	125	250	350	50	—	**1HD465NF**	③
	600	—	—	—	200	400	500	—	—	**1HD466NF**	③
	800	—	—	—	—	—	—	—	—	②⑤	②③

Notes
① Type 12 enclosures (30–1200A) can be field modified to meet Type 3R rainproof requirements when a factory provided drain hole is opened.
② DC rating for 800A switches is 250V.
③ Contact Customer Support (1-800-268-3578) for availability of this product.
④ Ratings are for two-phase AC.
⑤ Type 4X stainless steel enclosure.
⑥ Type 4 painted steel enclosure.

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS						ExciteEnergy PINE MOUNTAIN LAKE ASSOCIATION SOLAR PROJECT 600A DISCONNECT DATASHEET
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.	
	EXCITE ENERGY CLIENT NO: 1018								DWG. NO. 1018-01-207 REV 0
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB	

Pow-R-Line 2a

Pow-R-Line 2a

General Description

Panelboard Ratings

Voltage

- 240 Vac maximum
- 480Y/277 Vac maximum

Note: PRL2a panelboards are suitable for use on three-phase, three-wire applications when derived from a three-phase, four-wire 480Y/277 Vac service where the neutral is not brought to the panelboard. For three-phase, three-wire 480 Vac Delta services use a PRL3a panelboard.

- 250 Vdc maximum

Main Lugs

- 100–600 A

Main Breakers

- 100–600 A

Branch Breakers

- 15–100 A (bolt-on)

Short-Circuit Current Ratings (Symmetrical)

- 240 Vac: 65 kA fully rated
- 240 Vac: 100–200 kA series rated
- 480Y/277 Vac: 14 kA fully rated
- 480Y/277 Vac: 22–150 kA series rated
- 250 Vdc: 10 kA and 14 kA fully rated

Service

- Three-phase, four-wire 208Y/120 V and 240/120 V Delta and 480Y/277 V
- Single-phase, three-wire 120/240 V
- Single-phase, two-wire 120 V
- Three-phase, three-wire 208 and 240 V
- Two-wire 125 Vdc
- Two-wire 250 Vdc

Suitable for service entrance applications when specified.

Mains

For available mains, refer to **Table 22.2-1**.

The GHB main breaker is horizontally mounted, same as branch breakers. All other main breakers are vertically mounted.

Branch Circuits

For available branch devices, refer to **Table 22.2-2**.

Main Lugs Only

The short-circuit rating of the MLO assembled panelboard will be fully rated based upon the lowest rated branch device or may be series rated with an approved upstream device.

Main lugs only ampere ratings: 100, 225 and 400.

Main Circuit Breakers

The short-circuit rating shown is that of the main breaker only. The short circuit rating of the assembled panelboard is the rating of the lowest fully rated main or branch device or the rating of an approved series rated combination.

Table 22.2-1. Main Circuit Breakers

Breaker Frame (Amperes)	Breaker Type	Interrupting Rating (kA Symmetrical)		
		240 Vac	480Y/277 Vac	125/250 Vdc
100	GHB ①	65	14	14
100	EHD	18	14	10
150	FDB	18	14	10
225	FD, FDE	65	35	10
225	HFD, HFDE	100	65	22
225	FDC, FDCE	200	100	22
225	ED	65	—	—
250	EDH	100	—	—
250	EDC	200	—	—
250	JD	65	35	10
250	HJD	100	65	22
250	JDC	200	100	22
400	DK	65	—	10
400	KD	65	35	10
400	HKD	100	65	22
400	LHH	100	65	—
400	KDC	200	100	22
600	LGE	65	35	22
600	LGS	65	50	22
600	LGH	100	65	42
600	LGC, LGU	200	100	42

① For use on 480Y/277 Vac systems only.

Table 22.2-2. Branch Circuit Breakers

Breaker Type	Ampere Rating	Number of Poles	Interrupting Rating (kA Symmetrical)				
			120 Vac	240 Vac	277 Vac	480Y/277 Vac	125/250 Vdc
GHB ②	15–100	1	65	—	14	—	14
GHB ②	15–100	2, 3	—	65	—	14	14
GHQ	15–20	1	65	—	14	—	—
HGHB	15–30	1	65	—	25	—	—
GHQRSP ②③	15–20	1, 2	65	65	14	14	—
GHBGFEP	15–60	1	—	—	14	—	—

② For use on 480Y/277 Vac systems only.
③ Solenoid operated breaker.

Series Rated Combinations

Refer to series rating tables beginning on **Page 22.0-14** for the approved series rated combinations available for the branch circuit breakers listed in **Table 22.2-2**.

EXCITE ENERGY, LLC	REFERENCE DRAWINGS		REVISIONS						ExciteEnergy
4970 ROBERT J MATHEWS PKWY	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.	
SUITE 160									PINE MOUNTAIN LAKE ASSOCIATION
EL DORADO HILLS, CA 95762									SOLAR PROJECT
(916) 400-1197									400A COMBINER PANEL DATASHEET
CSLB #1018541	EXCITE ENERGY CLIENT NO: 1018								DWG. NO. 1018-01-208 REV 0
C10 CONTRACTOR	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB	

DESCRIPTION:

SNAPNRACK, UR-60 RAIL

PART NUMBER(S):

232-02481, 232-02482, 232-02483

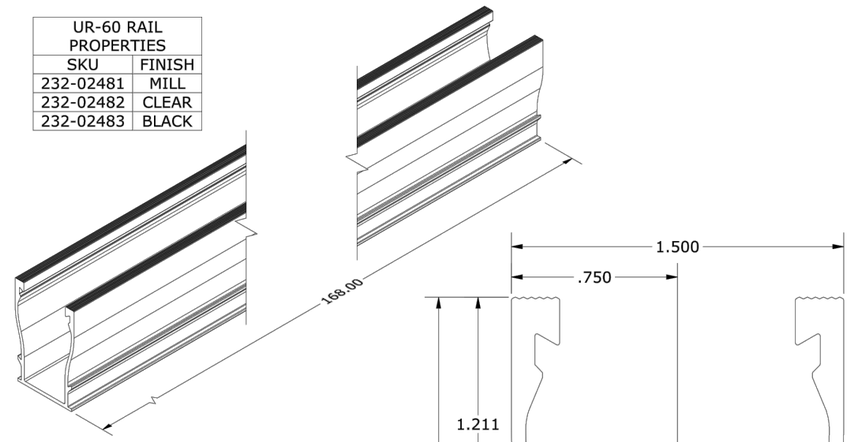
DRAWN BY: mwatkins

REVISION: A

SnapNrack™ Solar Mounting Solutions

595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902

UR-60 RAIL PROPERTIES	
SKU	FINISH
232-02481	MILL
232-02482	CLEAR
232-02483	BLACK



EQUIVALENT PROPERTIES	
A	0.515 in²
Ixx	0.327 in⁴
Iyy	0.181 in⁴
Sx (TOP)	0.270 in³
Sx (BOT)	0.315 in³
Sy (LEFT)	0.242 in³
Sy (RIGHT)	0.242 in³

ALL DIMENSIONS IN INCHES

MATERIALS:	6000 SERIES ALUMINUM	OPTIONS:
DESIGN LOAD (LBS):	N/A	CLEAR / BLACK ANODIZED
ULTIMATE LOAD (LBS):	N/A	MILL FINISH
TORQUE SPECIFICATION:	N/A LB-FT	BUNDLES OF 120
CERTIFICATION:	UL 2703, FILE E359313	BOXES OF 8
WEIGHT (LBS):	8.46	

S-5!® The Right Way!™

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal rib, exposed-fastened metal roof profiles!

ProteaBracket™ is compatible with common metal roofing materials and comes with a pre-applied EPDM gasket on the base.

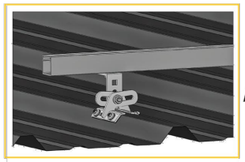
Note: All four pre-punched holes must be used to achieve tested strength. Fasteners are provided.

For design assistance, ask your distributor, or visit **www.S-5.com** for the independent lab test data that can be used for load-critical designs and applications. Also, please visit our website for more information including metallurgical compatibilities and specifications.

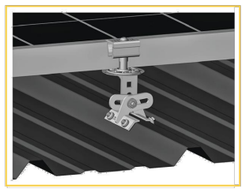
S-5!® holding strength is unmatched in the industry.

Multiple Attachment Options:

Side Mount Rail



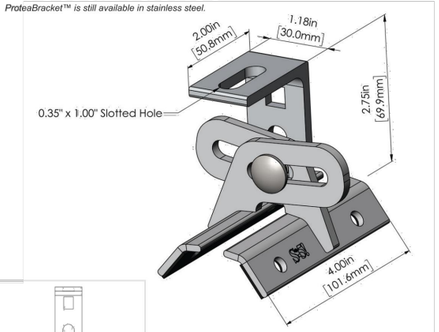
Bottom Mount Rail

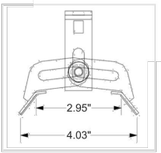


w/ S-5! PVKIT™ (rail-less)

ProteaBracket™

ProteaBracket™ is still available in stainless steel.

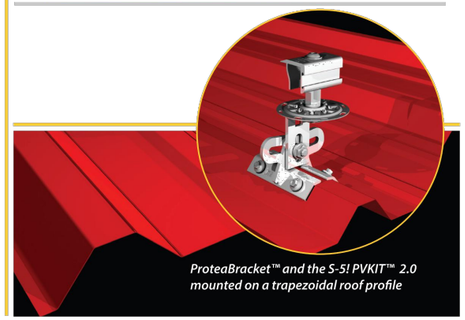




ProteaBracket fits profiles up to 3 inches

INSTALLATION:

No surface preparation needed. (1) Wipe away excess oil and debris. **(2)** Peel off adhesive release paper. **(3)** Align and mount bracket directly onto crown of panel. **(4)** Secure ProteaBracket through pre-punched holes, using piercing-point S-5! screws.



ProteaBracket™ and the S-5! PVKIT™ 2.0 mounted on a trapezoidal roof profile

S-5!® Warning! Please use this product responsibly!

Products are protected by multiple U.S. and foreign patents. For published data regarding holding strength, bolt torque, patents, and trademarks, visit the S-5! website at www.S-5.com.

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EXCITE ENERGY, LLC
4970 ROBERT J MATHEWS PKWY
SUITE 160
EL DORADO HILLS, CA 95762
(916) 400-1197

CSLB #1018541
C10 CONTRACTOR

REFERENCE DRAWINGS		REVISIONS					
NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
EXCITE ENERGY CLIENT NO: 1018							
(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

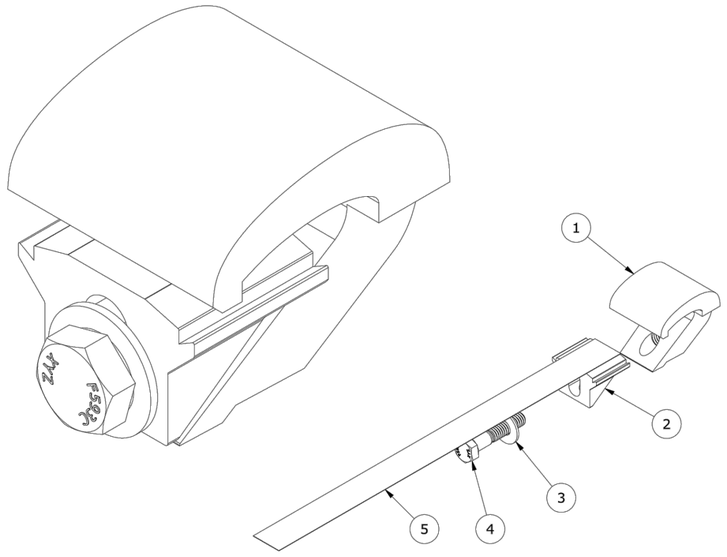
PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

RACKING DATASHEET

DWG. NO. 1018-01-209

REV 0

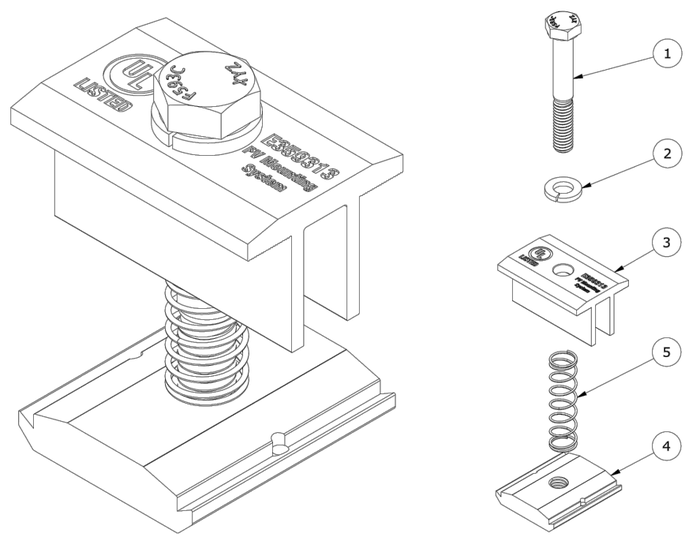
DESCRIPTION:	DRAWN BY:	SnapNrack™ Solar Mounting Solutions
SNAPNRACK, UNIVERSAL END CLAMP	D.Ryan	
PART NUMBER(S):	REVISION:	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902
242-02215	A	THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	SNAPNRACK END CLAMP UNIVERSAL WAVE
2	1	SNAPNRACK, UNIVERSAL END CLAMP WEDGE
3	1	5/16IN X 3/4IN SS FLAT WASHER
4	1	BOLT, HEX CAP, 5/16IN-18 X 1-1/2IN, SS
5	1	SNAPNRACK UEC PULL STRAP

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL	OPTIONS:
DESIGN LOAD (LBS):	800	
ULTIMATE LOAD (LBS):	2400	
TORQUE SPECIFICATION:	10+ LB-FT	
CERTIFICATION:	UL 2703, FILE E359313	
WEIGHT (LBS):	0.24	

DESCRIPTION:	DRAWN BY:	SnapNrack™ Solar Mounting Solutions
SNAPNRACK, BONDING MID CLAMP	D.Ryan	
PART NUMBER(S):	REVISION:	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902
242-02050, 242-02051, 242-02052, 242-02053, 242-02054, 242-02055, 242-02056, 242-02057	A	THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	5/16IN-18 SS HCS BOLT, LENGTH VARIES, CLEAR / BLACK
2	1	5/16IN SS SPLIT LOCK WASHER, CLEAR / BLACK
3	1	SNAPNRACK, BONDING MID CLAMP, CLEAR / BLACK
4	1	SNAPNRACK, BONDING CHANNEL NUT
5	1	SNAPNRACK, MID CLAMP SPRING, SS

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL	OPTIONS:
DESIGN LOAD (LBS):	800	CLEAR / BLACK ANODIZED
ULTIMATE LOAD (LBS):	2400	
TORQUE SPECIFICATION:	10+ LB-FT	
CERTIFICATION:	UL 2703, FILE E359313	
WEIGHT (LBS):	0.16 - 0.18	

EXCITE ENERGY, LLC
4970 ROBERT J MATHEWS PKWY
SUITE 160
EL DORADO HILLS, CA 95762
(916) 400-1197

CSLB #1018541
C10 CONTRACTOR

REFERENCE DRAWINGS		REVISIONS					
NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
EXCITE ENERGY CLIENT NO: 1018							
(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

RACKING DATASHEET

DWG. NO. 1018-01-210

REV 0

Maximum Rail Spans (Inches)				SnapNrack UR-60 Rail Flush-Mount on 0 to 30 Foot Roof -- Bin 1 -- 72-Cell						
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed ->	110 mph	115 mph	120 mph	125 mph	130 mph	135 mph	140 mph
			Roof Zone ->	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3
25 psf	B	0 to 7	All Mounts	68 / 68 / 68	68 / 68 / 68	68 / 68 / 68	68 / 68 / 68	68 / 68 / 68	68 / 68 / 68	68 / 68 / 66
		7 to 27	All Mounts	80 / 80 / 80	80 / 80 / 80	80 / 80 / 80	80 / 80 / 80	80 / 80 / 80	80 / 80 / 76	80 / 80 / 71
		27 to 45	All Mounts	98 / 98 / 98	98 / 98 / 98	98 / 98 / 98	98 / 98 / 98	98 / 98 / 98	96 / 96 / 96	94 / 94 / 94
		45 to 90	All Mounts	108 / 108 / 108	108 / 108 / 108	108 / 108 / 108	106 / 105 / 105	102 / 102 / 102	99 / 99 / 99	95 / 95 / 95
	C	0 to 7	All Mounts	68 / 68 / 68	68 / 68 / 68	68 / 68 / 64	68 / 68 / 58	68 / 68 / 54	68 / 68 / 50	68 / 68 / 46
		7 to 27	All Mounts	80 / 80 / 80	80 / 80 / 75	80 / 80 / 68	80 / 80 / 63	80 / 80 / 58	80 / 80 / 53	80 / 77 / 50
		27 to 45	All Mounts	98 / 98 / 98	95 / 95 / 95	93 / 93 / 93	91 / 91 / 91	88 / 88 / 88	86 / 86 / 86	84 / 84 / 84
		45 to 90	All Mounts	102 / 102 / 102	98 / 98 / 98	94 / 94 / 94	91 / 91 / 91	88 / 88 / 88	85 / 85 / 85	82 / 82 / 82
	D	0 to 7	All Mounts	68 / 68 / 64	68 / 68 / 58	68 / 68 / 53	68 / 68 / 49	68 / 68 / 45	68 / 66 / 42	68 / 61 / 39
		7 to 27	All Mounts	82 / 82 / 69	82 / 82 / 63	82 / 82 / 57	82 / 82 / 53	82 / 76 / 49	82 / 70 / 45	81 / 65 / 42
		27 to 45	All Mounts	94 / 94 / 94	92 / 92 / 92	89 / 89 / 89	87 / 87 / 87	84 / 84 / 84	81 / 81 / 81	78 / 78 / 78
		45 to 90	All Mounts	95 / 95 / 95	91 / 91 / 91	87 / 87 / 87	84 / 84 / 84	81 / 81 / 81	78 / 78 / 78	76 / 76 / 76

THIS FIGURE IS COPIED FROM PAGE 30 OF THE SNAPNRACK ENGINEERING CERTIFICATION LISTED AT RIGHT UR60 RAILED SYSTEM REPORT #2018-11940.03

PER THE RACKING MANUFACTURER, FOR A SNOW LOAD OF 25 PSF AND WIND SPEED OF 110 MPH, THE MAXIMUM RAIL SUPPORT SPAN IS 80". PER TABLE 1 OF THE CA SOLAR PERMITTING GUIDEBOOK, THE MAXIMUM SPAN FOR THE SAME ROOF IS 72". THE SHORTER OF THE TWO, A MAXIMUM SPAN OF 72", WILL BE USED FOR THIS PROJECT.

PZSE structural ENGINEERS

January 7, 2020

SnapNrack
775 Fiero Lane, Ste. 200
San Luis Obispo, CA 93401
TEL: (877) 732-2860

Attn.: SnapNrack - Engineering Department

Re: SnapNrack pre-engineered PV racking systems:

- RL Universal System (Report # 2019-02916A.01 and B.01)
- S200 Ground Mount System (Report # 2017-00240-D.02)
- UR40 Railed System (Report # 2017-03227.11)
- UR60 Railed System (Report # 2018-11940.03)

Subject: Engineering certification for the State of California.

PZSE, Inc. - Structural Engineers has provided engineering and span tables as presented in the above referenced reports. All information, data, and analysis therein are based on, and comply with, the following building codes and typical specifications:

Building Codes:

1. ASCE/SEI 7-10 & 7-16, Minimum Design Loads for Buildings and Other Structures, by American Society of Civil Engineers
2. 2016 & 2019 California Building Code, by California Building Standards Commission
3. 2016 & 2019 California Residential Code, by California Building Standards Commission
4. AC428 Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012, by ICC-ES
5. Aluminum Design manual 2015, by The Aluminum Association, Inc.
6. ANSI/AWC NDS-2018, National Design Specification for Wood Construction, by the American Wood Council

This letter certifies that the design criteria and design methodology for the SnapNrack product span tables are in compliance with the above codes. Please refer to the system specific Engineering Certification Reports (listed above) for system specific design criteria and limitations.

If you have any questions on the above, do not hesitate to call.

REGISTERED PROFESSIONAL ENGINEER
JAKE KENNETH ZACHER
No. S3878
Exp. 3-31-23
STRUCTURAL
STATE OF CALIFORNIA

Prepared by:
PZSE, Inc. – Structural Engineers
Roseville, CA

1478 Stone Point Drive, Suite 190, Roseville, CA 95661
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Experience | Integrity | Empowerment

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CSLB #1018541
C10 CONTRACTOR

REFERENCE DRAWINGS		REVISIONS					
NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
EXCITE ENERGY CLIENT NO: 1018							
(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

RACKING DATASHEET

DWG. NO. 1018-01-212

REV 0

Fire

The Ultra Rail system has been evaluated for a Class A System Fire Classification for a Steep-Sloped Roof (≥ 2:12 pitch) using Type 1 and Type 2 modules. In order to maintain the System Classification, modules are clamped to the mounting rails between 0 and 12 inches from the top and bottom edges of the module.

The Ultra Rail system has been evaluated for a Class A System Fire Classification for a Low-Sloped Roof (< 2:12 pitch) using Type 1 and Type 2 modules. In order to maintain the System Classification, modules are clamped to the mounting rails between 0 and 16.3 inches from the top and bottom edges of the module.

The optional Array Skirt accessory has also been evaluated and the Ultra Rail system will maintain the Class A System Fire Classification detailed above if installed with the Skirt.

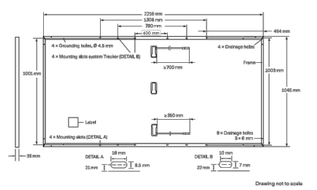
Because the system was tested at 5 inches above the test roof fixture Ultra Rail can be installed without any height restrictions and will maintain the Class A System Fire Classification. See Rail Installation section for potential module-specific height restrictions due to module temperature.

NOTE: THE MODULES USED FOR THIS PROJECT HAVE A TYPE 1 FIRE RATING. PER THE ABOVE INFORMATION FROM THE RACKING MANUFACTURER, THE COMBINED SYSTEM HAS A CLASS A FIRE CLASSIFICATION.

MECHANICAL SPECIFICATION

Format	2216 mm × 1045 mm × 35 mm (including frame)
Weight	26.0 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 700 mm, (–) ≥ 350 mm*
Connector	Stäubli MC4-Evo2, Hanwha Q CELLS HQC4; IP68

*Long cables (+) ≥ 1450 mm, (–) ≥ 1450 mm for landscape installation are available upon request.

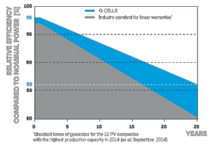


ELECTRICAL CHARACTERISTICS

POWER CLASS			475	480	485	490	495
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)							
Minimum	Power at MPP[1]	P_{MPP} [W]	475	480	485	490	495
Minimum	Short Circuit Current[1]	I_{SC} [A]	11.24	11.26	11.29	11.31	11.34
Minimum	Open Circuit Voltage[1]	V_{OC} [V]	53.58	53.61	53.64	53.68	53.71
Minimum	Current at MPP	I_{MPP} [A]	10.66	10.71	10.76	10.81	10.86
Minimum	Voltage at MPP	V_{MPP} [V]	44.54	44.81	45.07	45.33	45.59
Minimum	Efficiency[1]	η [%]	≥20.5	≥20.7	≥20.9	≥21.2	≥21.4
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP} [W]	356.4	360.1	363.9	367.6	371.4
Minimum	Short Circuit Current	I_{SC} [A]	9.05	9.07	9.09	9.12	9.14
Minimum	Open Circuit Voltage	V_{OC} [V]	50.53	50.56	50.59	50.62	50.65
Minimum	Current at MPP	I_{MPP} [A]	8.39	8.43	8.47	8.52	8.56
Minimum	Voltage at MPP	V_{MPP} [V]	42.49	42.72	42.94	43.17	43.39

[1]Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

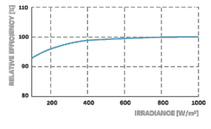
Q CELLS PERFORMANCE WARRANTY



At least 98 % of nominal power during first year. Thereafter max. 0.5 % degradation per year. At least 93.5 % of nominal power up to 10 years. At least 86 % of nominal power up to 25 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	[°C]	43±3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1500	PV module classification		Class II
Maximum Reverse Current	I_R	[A]	20	Fire Rating based on ANSI / UL 61730		C / TYPE 1
Max. Design Load, Push / Pull		[Pa]	3600 / 2000	Permitted Module Temperature on Continuous Duty		–40 °C - +85 °C
Max. Test Load, Push / Pull		[Pa]	5400 / 3000			

QUALIFICATIONS AND CERTIFICATES

IEC 61215:2016;
IEC 61730:2016.
This data sheet complies with DIN EN 50380.

Certification in process.

PACKAGING INFORMATION

Horizontal packaging	2270 mm	1100 mm	1210 mm	807 kg	22 pallets	20 pallets	29 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 GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | **TEL** +49 (0)3494 66 99-23444 | **FAX** +49 (0)3494 66 99-23000 | **EMAIL** sales@q-cells.com | **WEB** www.q-cells.com

Engineered in Germany

EXCITE ENERGY, LLC 4970 ROBERT J MATHEWS PKWY SUITE 160 EL DORADO HILLS, CA 95762 (916) 400-1197 CSLB #1018541 C10 CONTRACTOR	REFERENCE DRAWINGS		REVISIONS					
	NO.	TITLE	NO.	DATE	DESCRIPTION	BY	CHK.	APP.
	EXCITE ENERGY CLIENT NO: 1018							
	(FORMATTED 11"x17") SCALE: NONE		0	02/16/2022	ISSUED FOR PERMIT	JVB	HRK	JVB

ExciteEnergy

PINE MOUNTAIN LAKE ASSOCIATION
SOLAR PROJECT

EQUIPMENT FIRE RATING

DWG. NO. 1018-01-213

REV 0

TERMS AND ABBREVIATIONS

ABBRV	TERM
(#)	NUMERICAL QUANTITIES WHEN ENCLOSED IN PARENTHESES
A\E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT
ABC	AGGREGATE BASE COURSE
ARCH	ARCHITECT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
CBC	CALIFORNIA BUILDING CODE
CIP	CAST-IN-PLACE
CD	CONTRACT DOCUMENTS
CJ	CONSTRUCTION JOINT CONTROL JOINT
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
D	DEPTH
DIA	DIAMETER
DIM	DIMENSION
DL	DEAD LOAD
EA	EACH
EL	ELEVATION
EQ	EQUAL
EXT	EXTERIOR
EW	EACH WAY
(F)	FUTURE
FF	FINISH FLOOR ELEVATION
FLR	FLOOR
FT	FEET
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GSN	GENERAL STRUCTURAL NOTES
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
I	MOMENT OF INERTIA
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
KIP, K	ONE THOUSAND POUNDS
KLF	KIP PER LINEAR FOOT
L	STEEL ANGLE
LB	POUND
LL	LIVE LOAD
LLBB	LONG LEG BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LSH	LONG SIDE HORIZONTAL
LSV	LONG SIDE VERTICAL
MCJ	MASONRY CONTROL JOINTS
MECH	MECHANICAL
MFR	MANUFACTURER
NA	NOT APPLICABLE
NTS	NOT TO SCALE
OC	ON CENTER
PERP	PERPENDICULAR
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
REINF	REINFORCING
REQD	REQUIRED
RFI	REQUEST FOR INFORMATION
SF	SQUARE FOOT
SIM	SIMILAR
SPEC	SPECIFICATION
STD	STANDARD
T&B	TOP AND BOTTOM
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W/C	WATER TO CEMENT RATIO
W/O	WITHOUT
WL	WINDLOAD

CODE:

2019 EDITION OF THE CALIFORNIA BUILDING CODE (CBC)

DESIGN LOADS:

1. ROOF:
   - LIVE LOAD(UNREDUCIBLE)_____12 PSF
   - DEAD LOAD_____8 PSF
2. WIND LOAD:
   - RISK CATEGORY_____I
   - BASIC WIND SPEED, V :_____88 MPH
   - EXPOSURE CATEGORY:_____C
   - IMPORTANCE FACTOR, Iw:_____1.0
   - MEAN ROOF HEIGHT:_____15 FT
   - G:_____0.85
   - Kd:_____0.85
   - Kzt:_____1.0
   - Kz:_____0.85
   - ENCLOSURE CLASSIFICATION: _____OPEN BUILDING
3. SEISMIC LOADS:
   - RISK CATEGORY_____I
   - IMPORTANCE FACTOR, Ie :_____1.0
   - SEISMIC SITE CLASS:_____D
   - Ss:_____0.381
   - S1:_____0.183
   - SDS:_____0.380
   - SD1:_____0.273
   - SEISMIC DESIGN CATEGORY:_____D
   - BASIC SEISMIC FORCE RESISTING SYSTEM: STEEL ORDINARY CANTILEVER COLUMN SYSTEMS
   - R:_____1.25
   - Ω:_____1.25
   - Cd:_____1.25
   - Cs:_____0.304
   - BASE SHEAR, V:_____0.304W
4. SNOW LOAD:
   - RISK CATEGORY_____I
   - GROUND SNOW LOAD, Pg:_____25.0 PSF
   - IMPORTANCE FACTOR, Is:_____0.8
   - THERMAL FACTOR, Ct:_____1.2
   - EXPOSURE:_____C
   - EXPOSURE FACTOR:_____1.0
   - FLAT ROOF SNOW LOAD, Pf:_____15.1 PSF
   - MINIMUM SNOW LOAD, Pm:_____16.0 PSF
   - SLOPED ROOF FACTOR, Cs:_____1.0
   - DESIGN ROOF SNOW LOAD, Ps:_____16.0 PSF

GENERAL:

1. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES.
2. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK THAT CONFORMS TO THE REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) SAFETY AND HEALTH STANDARDS FOR THE CONSTRUCTION INDUSTRY.
3. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDUM.
4. OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE. HE SHALL BE RESPONSIBLE FOR ALL CHANGES NECESSARY IF HE CHOOSES AN OPTION AND HE SHALL COORDINATE ALL DETAILS.
5. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO SPECIFIC DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT.
6. TYPICAL DETAILS ARE NOT CUT ON DRAWINGS, BUT APPLY UNLESS NOTED OTHERWISE.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS WITH ACTUAL SITE CONDITIONS AND GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION. ALL DIMENSIONS SHOWN ON STRUCTURAL DRAWINGS ARE TO ASSIST CONTRACTOR IN VERIFICATION. DO NOT SCALE DIMENSIONS FROM DRAWINGS.
8. ITEMS SHOWN BY OTHER DISCIPLINES WITH REFERENCE TO STRUCTURAL DRAWINGS BUT NOT SHOWN ON THESE STRUCTURAL DRAWINGS SHALL BE CONSIDERED DESIGN BUILD ITEMS. CONTRACTOR SHALL SUBMIT DESIGN BY OTHERS FOR REVIEW

FOUNDATIONS:

1. GEOTECHNICAL CONSULTANT: CTE CAL, INC.
2. REPORT NUMBER: 25-1175G
3. REPORT DATE: NOVEMBER 15, 2021
4. SPREAD FOOTINGS SHALL BEAR ON COMPACTED FILL. FOR FILL REQUIREMENTS, SEE SOIL REPORT. DESIGN SOIL BEARING VALUE 2,000 PSF. BOTTOM OF FOOTINGS TO BE 2'-0" MINIMUM BELOW FINISHED GRADE. FINISHED GRADE IS DEFINED AS TOP OF SLAB FOR INTERIOR FOOTINGS AND LOWEST ADJACENT FINISHED GRADE WITHIN 5 FEET FOR PERIMETER FOOTINGS. FOUNDATION EXCAVATIONS SHALL BE INSPECTED BY GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF CONCRETE.
5. DRILLED POLE FOUNDATIONS SHALL BEAR ON MACHINE CLEANED, INSPECTED SOIL STRATA. DESIGN LATERAL SOIL BEARING VALUE OF 250 PSF/FT WAS USED IN DESIGN. POLE FOUNDATIONS WERE DESIGNED IN ACCORDANCE WITH THE PRESCRIPTIVE METHOD OF IBC/CBC SECTION 1807.3.2. FOR TOP OF POLE FOUNDATION ELEVATIONS, SEE FOUNDATION PLANS AND SECTIONS. IF WATER IS ENCOUNTERED DURING DRILLING, STOP AND CONSULT STRUCTURAL ENGINEER OR GEOTECHNICAL ENGINEER FOR RESOLUTION.

SHOP DRAWINGS:

1. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS AND ITEMS REQUIRED BY ARCHITECTURAL SPECIFICATIONS. UNITED STRUCTURAL DESIGN, LLC. ASSUMES NO RESPONSIBILITY FOR THE FAILURE OF THE CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR REVIEW.
2. ITEMS NOT IN ACCORDANCE WITH CONTRACT DOCUMENTS SHALL BE FLAGGED UPON CONTRACTORS REVIEW
3. THE CONSTRUCTION DOCUMENTS MAY NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS.
4. ELECTRONIC FILES OF CONSTRUCTION DOCUMENTS WILL NOT BE MADE AVAILABLE FOR USE AS SHOP DRAWINGS.
5. FIELD VERIFY ALL DIMENSIONS AND FINISHED GRADE PRIOR TO CONSTRUCTION AND PRIOR TO BEGINNING SHOP DRAWINGS.
6. THE ENGINEER OF RECORD HAS THE RIGHT TO APPROVE OR DISAPPROVE ANY CHANGES TO CONTRACT DOCUMENTS AT ANYTIME BEFORE OR AFTER SHOP DRAWING REVIEW.
7. ITEMS OMITTED OR SHOWN INCORRECTLY AND ARE NOT FLAGGED BY THE STRUCTURAL ENGINEER OR ARCHITECT SHALL NOT BE CONSIDERED CHANGES TO THE CONTRACT DOCUMENTS.
8. SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. REVIEWING IS INTENDED ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE ALL ITEMS ARE CONSTRUCTED ACCORDING TO THE CONTRACT DOCUMENTS.

CONCRETE:

1. CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF ACI 301, "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE" AND ACI 318, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".
2. ADDITION OF WATER TO THE BATCH FOR MATERIAL WITH INSUFFICIENT SLUMP WILL NOT BE PERMITTED, UNLESS THE SUPPLIER HAS SPECIFICALLY WITHHELD WATER FROM THE BATCH AT THE PLANT. IN SUCH CASE THE MIX DESIGN AND TRUCK TICKET MUST CLEARLY STATE THE MAXIMUM AMOUNT OF WATER THAT CAN BE ADDED TO THE BATCH ON SITE. IN NO CASE SHALL THE DESIGN WATER TO CEMENTITIOUS MATERIAL RATIO BE EXCEEDED.
3. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED, EXCEPT THAT SLABS ON GRADE NEED BE VIBRATED ONLY AROUND SLAB EDGES, REINFORCING, AND COLUMNS. MECHANICALLY VIBRATE ONLY THE TOP 5 FEET OF DRILLED PIER CONCRETE. REVIBRATE TOP OF DRILLED PIER 15 MINUTES AFTER PLACING CONCRETE.
4. TEST DATA FOR CONCRETE SUBMITTALS SHALL BE SUBMITTED FOR REVIEW PRIOR TO PLACEMENT OF CONCRETE. REFERENCE ACI 318 CHAPTER 5, TABLE R5.3 FOR SPECIFIC REQUIREMENTS.
5. DRILLED PIER CONCRETE SHALL BE CHANNELED TO FREE FALL DOWN THE SHAFT WITHOUT STRIKING THE REINFORCING OR THE SIDES OF THE SHAFT. MAXIMUM HEIGHT OF FREE-FALL IS 15'-0".
6. CONCRETE PROPERTIES:

CONCRETE USE	MINIMUM 28 DAY COMPRESSIVE STRENGTH
UNLESS NOTED OTHERWISE ALL CONCRETE SHALL BE	3,000 PSI

PHOTOVOLTAIC PANELS:

1. THE PANEL MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE PANELS AND THE DESIGN OF THE PANEL CONNECTIONS TO THE STRUCTURE INCLUDING ALL COMPONENTS REQUIRED TO MAKE THE CONNECTIONS. PHOTOVOLTAIC PANELS, COMPONENTS AND CONNECTIONS SHALL BE DESIGNED TO SUPPORT PANEL WEIGHT PLUS SNOW, WIND, OR SEISMIC LOADING, WHICHEVER COMBINATION PRODUCES THE MOST SEVERE CONDITION IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE.
2. OWNER TO PROVIDE PANEL CAPABLE OF SUPPORTING IN MANOR IN WHICH IS INTENDED BY THESE DRAWINGS (I.E. SUPPORTED BY SHORT END, DUAL SUPPORTS, ETC). SUBMIT PANEL SPEC SHEETS FOR REVIEW PRIOR TO PURCHASING PANELS.
3. CONTRACTOR TO VERIFY PV PANELS WITH OWNER PRIOR TO FABRICATION.
4. THIS IS A DEFERRED SUBMITTAL ITEM.

STRUCTURAL STEEL:

1. LATEST AISC AND AWS CODES APPLY. THE WORD APPROVED INSPECTION 4.4 OF THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES IS REDEFINED AS REVIEWED.
2. STEEL SHALL BE FINISHED AT LOCATIONS EXPOSED TO WEATHER WITH A CORROSION RESISTANT COATING APPLICABLE TO WEATHER AND EXPOSURE CONDITIONS OF PROJECT LOCATION.
3. WHEN STRUCTURAL STEEL IS FURNISHED TO A SPECIFIED MINIMUM YIELD POINT GREATER THAN 36 KSI, THE ASTM OR OTHER SPECIFICATION DESIGNATION SHALL BE INCLUDED NEAR THE ERECTION MARK ON EACH SHIPPING ASSEMBLY OR IMPORTANT CONSTRUCTION COMPONENT OVER ANY SHOP COAT OF PAINT PRIOR TO SHIPMENT FROM THE FABRICATORS PLANT.
4. IF IT IS NECESSARY TO SPLICE ANY MEMBER, SPLICE LOCATIONS ARE SUBJECT TO REVIEW BY STRUCTURAL ENGINEER. SPLICES SHALL BE FULL PENETRATION WELDED AND TESTED PER THIS SECTION. INDICATE ALL SPLICE LOCATIONS, AND WELDING PROCEDURES ON SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION.
5. ALL BEAMS SHALL BE ERECTED WITH THE NATURAL CAMBER UPWARDS.
6. ALL BOLTS SHALL BE INSTALLED WITH STEEL WASHERS.
7. ALL WELDING BY WELDERS HOLDING VALID CERTIFICATES AND HAVING CURRENT EXPERIENCE IN TYPE OF WELD SHOWN ON THE DRAWINGS OR NOTES, CERTIFICATES SHALL BE THOSE ISSUED BY AN INDEPENDENT TESTING AGENCY.
8. ALL WELDING DONE BY E70 SERIES LOW HYDROGEN RODS. USE E90 SERIES FOR ASTM A706 REINFORCING BARS.
9. ALL WELDING PER AMERICAN WELDING SOCIETY STANDARDS. ALL WELDS ON DRAWINGS ARE SHOWN AS SHOP WELDS. CONTRACTOR MAY SHOP WELD OR FIELD WELD AT THEIR DISCRETION. SHOP WELDS OR FIELD WELDS SHALL BE SHOWN ON SHOP DRAWINGS.
10. SLAG SHALL BE REMOVED FROM ALL COMPLETED WELDS, AND THE WELD AND ADJACENT BASE METAL SHALL BE CLEANED BY BRUSHING OR OTHER SUITABLE MEANS. WELDED JOINTS SHALL NOT BE PAINTED UNTIL AFTER WELDING HAS BEEN COMPLETED AND THE WELD ACCEPTED.
11. ALL STRUCTURAL STEEL SHALL BE FABRICATED BY A FABRICATOR WITH ANY ONE OF THE FOLLOWING MINIMUM QUALIFICATIONS. QUALIFICATIONS SHALL BE IN EFFECT AT TIME OF BID.
12. AISC CERTIFIED FABRICATOR (STD).
13. STEEL PROPERTIES
    - WIDE FLANGE COLUMNS, BEAMS AND TEES: ASTM A992 (Fy = 50 KSI)
    - STEEL PLATES: ASTM A572 (Fy = 50 KSI)
    - CHANNELS AND ANGLES: ASTM A36 (Fy = 36 KSI)
    - HSS RECTANGULAR STEEL: ASTM A500 Gr. B (Fy = 46 KSI)
    - BOLTS: ASTM A325 OR ASTM A F1852 TWIST-OFF TYPE
    - ANCHOR RODS: ASTM F1554 Gr. 55 (Fy = 55 KSI)
14. STEEL BOLTS SHALL BE PRETENSIONED UNLESS OTHERWISE NOTED AS A SNUG-TIGHT CONNECTION ON THE DRAWINGS OR DETAILS. ONE OF THE FOLLOWING METHODS SHALL BE USED TO ASSURE ADEQUATE PRETENSIONING IS ACHIEVED:
    - TURN-OF-NUT METHOD
    - DIRECT TENSION INDICATOR WASHERS
    - CALIBRATED WRENCH
    - TWIST-OFF TYPE BOLT

STEEL REINFORCING:

1. ALL BARS PER CRSI SPECIFICATIONS AND HANDBOOK. LATEST ACI CODE AND DETAILING MANUAL APPLY. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE. REINFORCING BAR SPACING GIVEN ARE MAXIMUM ON CENTERS.
2. ALL REINFORCING TO BE WELDED SHALL BE WELDED IN ACCORDANCE WITH AWS D1.4. NO TACK WELDING OF REINFORCING BARS IS ALLOWED WITHOUT PRIOR REVIEW OF PROCEDURE BY STRUCTURAL ENGINEER.
3. REINFORCING LAP SPLICES IN CONCRETE SHALL BE PER TYPICAL DETAIL UNLESS NOTED OTHERWISE. ALL SPLICE LOCATIONS ARE SUBJECT TO APPROVAL. PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZONTAL BARS AT CORNERS AND INTERSECTIONS OF FOOTINGS AND WALLS.
4. TYPICAL REINFORCING BAR STRENGTHS
5. REINFORCING (WELDABLE): ASTM A706, DEFORMED, Fy = 60 KSI
6. TYPICAL CLEAR CONCRETE COVERAGE
   - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
   - FORMED CONCRETE EXPOSED TO EARTH OR WEATHER:
     #6 AND LARGER: 2"
     #5 AND SMALLER: 1 1/2"

ALL OTHERS PER LATEST EDITION OF ACI 318.

COLD-FORMED STEEL FRAMING:

1. ALL COLD-FORMED STEEL FRAMING SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS BY THE AMERICAN IRON AND STEEL INSTITUTE AND THE STEEL STUD MANUFACTURERS ASSOCIATION AND I.C.C. ESR-3064P).
2. STEEL FOR ALL MEMBERS AND FOR ALL STRAPS SHALL HAVE A MINIMUM YIELD STRENGTH OF 55,000 PSI.
3. STEEL SHALL BE GALVANIZED AT LOCATIONS EXPOSED TO WEATHER AND WHENEVER NOTED ON THE DRAWINGS.
4. ALL MEMBERS SHALL BE SECURELY SEATED FOR FULL BEARING UNLESS NOTED OTHERWISE.
5. ALL WELDING SHALL BE PERFORMED BY WELDERS EXPERIENCED IN LIGHT GAGE STEEL FRAMING WORK.
6. ALL SCREWS REFERENCED IN THE DRAWINGS FOR LIGHT GAUGE CONNECTIONS SHALL BE DRIL-FLEX BY HILTI OR APPROVED EQUIVALENT (I.C.C. ESR-3332).
7. STEEL STUD SIZES ARE AS INDICATED IN PLANS AND KEYNOTES. THICKNESS REFERENCED IN THE DRAWINGS ARE AS FOLLOWS:

- 16 GAUGE MATERIAL - 0.059 INCHES
- 14 GAUGE MATERIAL - 0.075 INCHES
- 12 GAUGE MATERIAL - 0.105 INCHES
- 10 GAUGE MATERIAL - 0.134 INCHES

NOTE: THE UNCOATED MINIMUM STEEL THICKNESS OF THE COLD-FORMED STEEL PRODUCTS AS DELIVERED TO THE JOB SITE SHALL NOT AT ANY LOCATION BE LESS THAN 95 PERCENT OF THE DESIGN THICKNESS INDICATED ABOVE.

1704.2.5 SPECIAL INSPECTION OF FABRICATORS:

SPECIAL INSPECTION OF FABRICATION OF STRUCTURAL STEEL BEING PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP IS REQUIRED.

EXCEPTION: SPECIAL INSPECTIONS OF FABRICATORS WITH ONE OF THE FOLLOWING QUALIFICATIONS IS NOT REQUIRED.
- INTERNATIONAL ACCREDITATION SERVICE, INC. (IAS)APPROVED FABRICATOR.
- AISC CERTIFIED FABRICATOR (STD).

THE SPECIAL INSPECTOR SHALL VERIFY THAT THE FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES THAT PROVIDE A BASIS FOR INSPECTION CONTROL OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS. THE SPECIAL INSPECTOR SHALL REVIEW THE PROCEDURES FOR COMPLETENESS AND ADEQUACY RELATIVE TO THE CODE REQUIREMENTS FOR THE FABRICATOR'S SCOPE OF WORK.

SPECIAL STRUCTURAL INSPECTIONS:

PER IBC/CBC SECTION 1704 AND 1705 SPECIAL INSPECTIONS ARE IN ADDITION TO THE REQUIRED INSPECTION CONDUCTED BY THE BUILDING JURISDICTION PER IBC/CBC SECTION 110.
THE TYPES OF WORK LISTED BELOW SHALL BE INSPECTED BY A SPECIAL INSPECTOR.

1. ALL SPECIAL INSPECTORS SHALL BE UNDER THE SUPERVISION OF A REGISTERED CIVIL OR STRUCTURAL ENGINEER.
2. THE QUALIFICATIONS OF ALL SPECIAL INSPECTORS SHALL BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.
3. THE MINIMUM QUALIFICATIONS FOR THE SPECIAL INSPECTORS ARE AS FOLLOWS:

- CONCRETE INSPECTION - I.C.C. CERTIFICATION IN REINFORCED CONCRETE OR E.I.T. CERTIFICATION.
- STRUCTURAL WELDING INSPECTION
- VISUAL TESTING - I.C.C. CERTIFICATION IN STRUCTURAL STEEL AND WELDING OR A.W.S. CERTIFIED WELD INSPECTOR (C.W.I.).
- NON-DESTRUCTIVE TESTING - A.W.S. C.W.I.

- HIGH STRENGTH BOLTING INSPECTION - I.C.C. CERTIFICATION IN STRUCTURAL STEEL AND WELDING.
- SPECIAL CASES - EXPERIENCE ACCEPTABLE TO THE STRUCTURAL ENGINEER OF RECORD.

4. DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR:

- THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK REQUIRING SPECIAL INSPECTION FOR CONFORMANCE WITH THE APPROVED DESIGN DRAWINGS AND SPECIFICATIONS.
- THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO BE KEPT AT THE SITE FOR USE BY THE BUILDING OFFICIAL, THE CONTRACTOR, THE STRUCTURAL ENGINEER OF RECORD, AND THE ARCHITECT OF RECORD. IF SPECIAL INSPECTION IS PROVIDED BY ANYONE OTHER THAN THE STRUCTURAL ENGINEER OF RECORD, INSPECTION REPORTS SHALL BE SUBMITTED TO THE OFFICE OF THE STRUCTURAL ENGINEER ON A WEEKLY BASIS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN IF UNCORRECTED, TO THE DESIGN AUTHORITY AND THE BUILDING OFFICIAL.
- UPON COMPLETION OF THE ASSIGNED WORK, THE SPECIAL INSPECTOR SHALL COMPLETE AND SIGN A FINAL REPORT CERTIFYING THAT TO THE BEST OF HIS KNOWLEDGE, THE WORK IS IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.

5. DUTIES AND RESPONSIBILITIES OF THE CONTRACTOR:

- NOTIFY THE RESPONSIBLE INSPECTOR THAT WORK IS READY FOR INSPECTION AT LEAST ONE WORKING DAY (24 HOURS MINIMUM) BEFORE SUCH INSPECTION IS REQUIRED.
- ALL WORK REQUIRING SPECIAL STRUCTURAL INSPECTION SHALL REMAIN ACCESSIBLE AND EXPOSED UNTIL IT IS OBSERVED BY THE SPECIAL STRUCTURAL INSPECTOR.

6. SPECIAL INSPECTION

- INSPECTION OF FABRICATORS
- INSPECTION OF CONCRETE CONSTRUCTION
- INSPECTION OF STRUCTURAL STEEL
- INSPECTION OF SOILS

SEE TABLES ON GSN FOR ADDITIONAL INFORMATION.

1705.6 SPECIAL INSPECTION OF SOILS

SPECIAL INSPECTION FOR EXISTING SITE SOIL CONDITIONS, FILL PLACEMENT AND LOAD-BEARING REQUIREMENTS SHALL BE AS REQUIRED BY TABLE 1705.6.

TABLE 1705.6: REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	—	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	—	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	—	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	—
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	—	X

2018 1705.3 SPECIAL INSPECTION OF CONCRETE CONSTRUCTION

SPECIAL INSPECTION AND VERIFICATIONS FOR CONCRETE CONSTRUCTION SHALL BE AS REQUIRED BY TABLE 1705.3.

EXCEPTIONS: SPECIAL INSPECTIONS SHALL NOT BE REQUIRED FOR:
1. ISOLATED SPREAD CONCRETE FOOTINGS OF BUILDING THREE STORIES OR LESS ABOVE GRADE PLANE THAT ARE FULLY SUPPORTED ON EARTH OR ROCK.
2. CONTINUOUS CONCRETE FOOTINGS SUPPORTING WALLS OF BUILDINGS THREE STORIES OR LESS ABOVE GRADE PLANE THAT ARE FULLY SUPPORTED ON EARTH OR ROCK WHERE:
3. THE FOOTINGS SUPPORT WALLS OF LIGHT-FRAME CONSTRUCTION;
4. THE STRUCTURAL DESIGN OF THE FOOTING IS BASED ON A SPECIFIED COMPRESSIVE STRENGTH, f'c, NO GREATER THAN 2,500 PSI REGARDLESS OF THE COMPRESSIVE STRENGTH SPECIFIED.
5. CONCRETE SLABS ON GRADE. STEEL REINFORCING STILL REQUIRES SPECIAL INSPECTION.

TABLE 1705.3: REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE STANDARD	IBC/CBC REFERENCE
1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT.	—	X	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. REINFORCING BAR WELDING. a. VERIFY WELDABILITY OF REINFORCING BARS. b. INSPECT SINGLE PASS FILLET WELDS, MAXIMUM 5/16". c. INSPECT ALL OTHER WELDS.	— — X	— X X	AWS D1.4 ACI 318: 26.6.4	—
5. VERIFYING USE OF REQUIRED DESIGN MIX.	—	X	ACI 318: Ch 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	—	ACI 318: 26.5	1908.6, 1908.7, 1908.8
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	—	X	ACI 318: 26.5.3-26.5.5	1908.9
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	—	X	ACI 318:26.11.2 (b)	—

Sheet List	
Sheet Number	Sheet Name
S0.1	GENERAL STRUCTURAL NOTES
S2.3	3 PANEL STRUCTURE PLANS
S2.4	3 PANEL STRUCTURE PLANS
S2.5	5 PANEL STRUCTURE PLANS
S4.1	SOLAR CANOPY DETAILS

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No.	Description	Date

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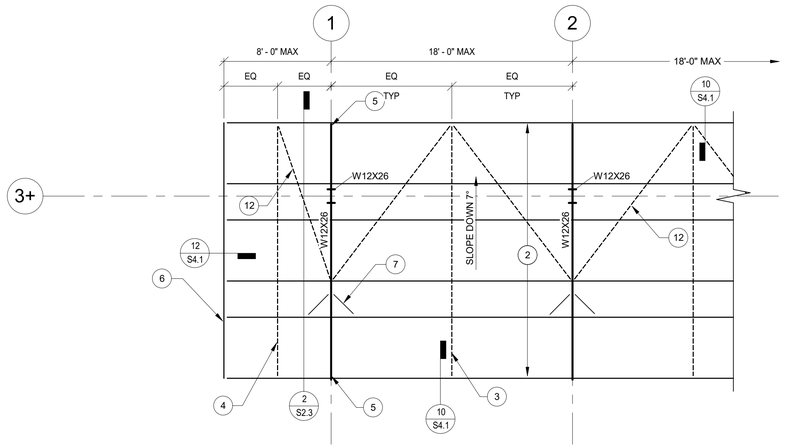
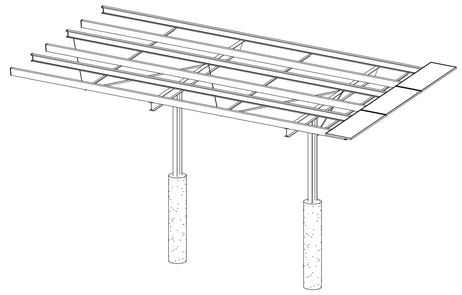
SHEET NAME
GENERAL STRUCTURAL NOTES

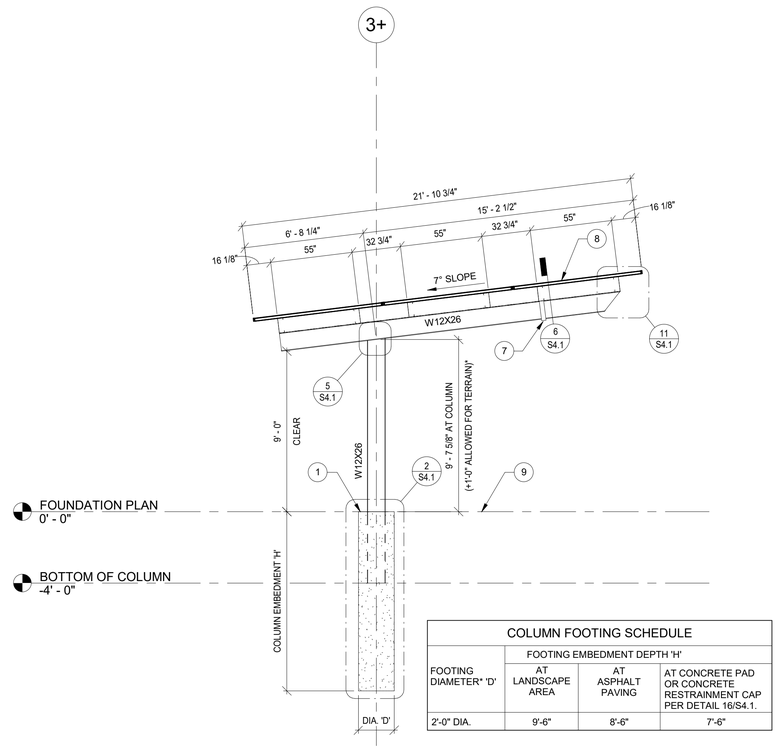
S0.1



1 3 PANEL - 7 DEG. + FRAMING PLAN
3/16" = 1'-0"



3 3 PANEL + 7 DEG
NO SCALE



COLUMN FOOTING SCHEDULE			
FOOTING DIAMETER* 'D'	FOOTING EMBEDMENT DEPTH 'H'		
	AT LANDSCAPE AREA	AT ASPHALT PAVING	AT CONCRETE PAD OR CONCRETE RESTRAINMENT CAP PER DETAIL 16/S4.1.
2'-0" DIA.	9'-6"	8'-6"	7'-6"

2 3 PANEL 7 DEG+ SECTION
1/4" = 1'-0"

SHEET NOTES

a. FOR STRUCTURE LOCATIONS REFERENCE PROJECT SITE PLAN. COLUMN SPACING AND LOCATIONS SHALL BE COORDINATED WITH PROJECT ARCHITECT OR PROFESSIONAL RESPONSIBLE FOR SITE PLAN.
b. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. DIMENSIONS, ELEVATIONS WHERE SHOWN ARE TO BE USED AS AN AID AND SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR PRIOR TO CONSTRUCTION.
c. FOR ADDITIONAL INFORMATION, REFERENCE GENERAL STRUCTURAL NOTES.

PV PANEL INFORMATION

A. CONTRACTOR TO VERIFY PANEL INFORMATION PRIOR TO FABRICATION AND ERECTION.
B. THE PANEL INFORMATION BELOW AND IN THE PLANS WAS PROVIDED BY THE OWNER DURING THE DESIGN PHASE AND PRIOR TO THE START OF CONSTRUCTION. ALL PANEL INFORMATION INDICATED IN THESE DRAWINGS IS FOR REFERENCE ONLY AND SHALL BE VERIFIED WITH THE OWNER, THE ELECTRICAL DRAWINGS AND THE GENERAL CONTRACTOR PRIOR TO FABRICATION AND PRIOR TO CONSTRUCTION.
C. THE OWNER IS TO PROVIDE A PANEL CAPABLE OF SUPPORTING IN MANOR IN WHICH IS INTENDED BY THESE DRAWINGS (I.E. SUPPORTED BY SHORT END, DUAL SUPPORTS, ETC). SUBMIT PANEL SPEC SHEETS FOR REVIEW PRIOR TO PURCHASING ANY PANELS.
D. THE PANEL MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE PANELS INCLUDING ALL IT'S COMPONENTS. PHOTOVOLTAIC PANELS AND IT'S COMPONENTS SHALL BE DESIGNED TO SUPPORT PANEL WEIGHT PLUS SNOW, WIND, OR SEISMIC LOADING, WHICHEVER COMBINATION PRODUCES THE MOST SEVERE CONDITION IN ACCORDANCE WITH THE BUILDING CODE

PANEL MODEL	LENGTH	WIDTH
Q.PEAK DUO XL-G10.d 475-495	87.24"	41.14"

KEYNOTES

1 DRILLED CONCRETE POLE FOOTING. FOR DIAMETER AND EMBEDMENT OF FOOTING SEE FOUNDATION PLAN AND SECTION ON THIS SHEET. SEE DETAIL 2/S4.1 FOR REINFORCING AND STEEL COLUMN ANCHORAGE.
2 C9"x3"x14 GAUGE COLD FORMED STEEL PURLINS, TYPICAL. COORDINATE EXACT LOCATION WITH SOLAR PANEL MANUFACTURER SPECIFICATIONS. SEE DETAIL 9/S4.1 FOR MORE INFORMATION ON SECTION.
3 SAG ROD AS SHOWN ON PLANS, (1) MINIMUM AT SPANS LESS THAN 18'-0" AND (2) MINIMUM AT SPANS LESS THAN 27'-0". REFERENCE DETAIL 10/S4.1.
4 (1) SAG ROD REQUIRED BETWEEN SUPPORT AND CANTILEVER END AS SHOWN. REFERENCE DETAIL 10/S4.1. SAG ROD NOT REQUIRED WHERE CANTILEVER IS LESS THAN 5'-0".
5 DO NOT SPLICE PURLINS AT SUPPORT AT CANTILEVER ENDS.
6 16 GAUGE END CAP WITH 2" LEGS EACH END OF STRUCTURE.
7 BEAM FLANGE BRACES AS SHOWN ON PLANS. REFERENCE DETAIL 6/S4.1 FOR MORE INFORMATION.
8 PV MODULE BY OTHERS. ATTACH PER DETAILS.
9 FINISHED GRADE. FINISHED GRADE IS DEFINED AS THE LOWEST ADJACENT FINISHED GRADE WITHIN 5 FEET OF THE STRUCTURAL COLUMN.
12 DIAGONAL SAG ROD BRACING AS SHOWN. ATTACH PER DETAILS 13/S4.1 AND 14/S4.1.

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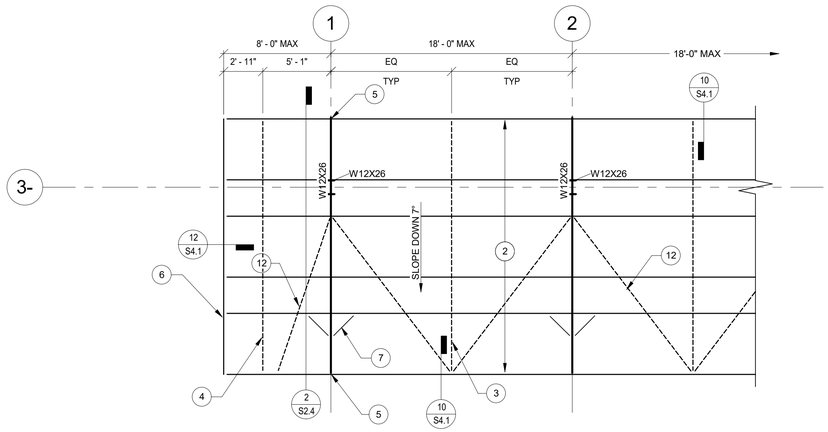
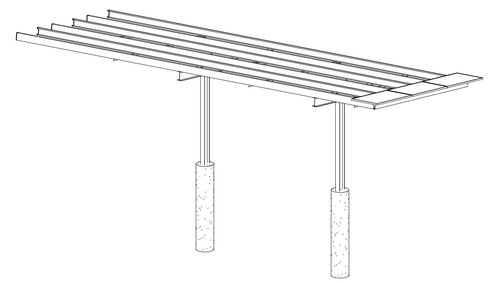
SHEET NAME
3 PANEL STRUCTURE PLANS

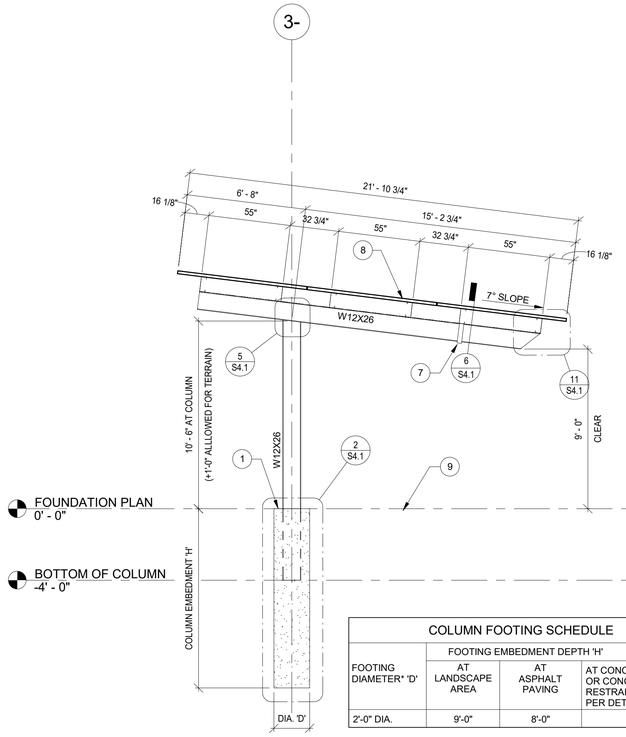
S2.3



1 3 PANEL - 7 DEG. - FRAMING PLAN
3/16" = 1'-0"



3 3 PANEL - 7 DEG
NO SCALE



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2 3 PANEL 7 DEG SECTION
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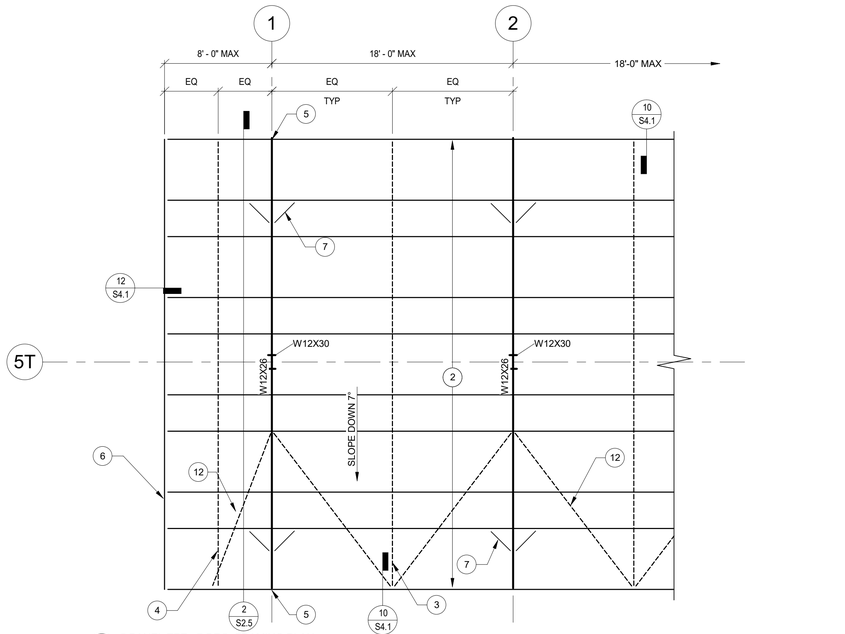
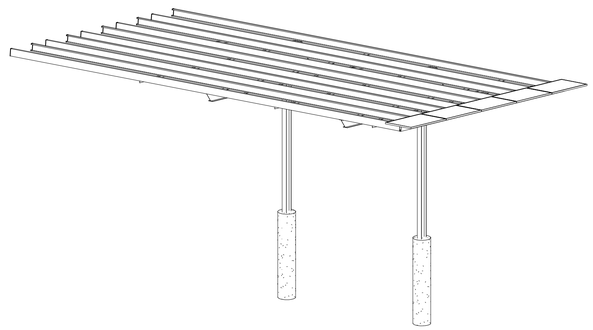
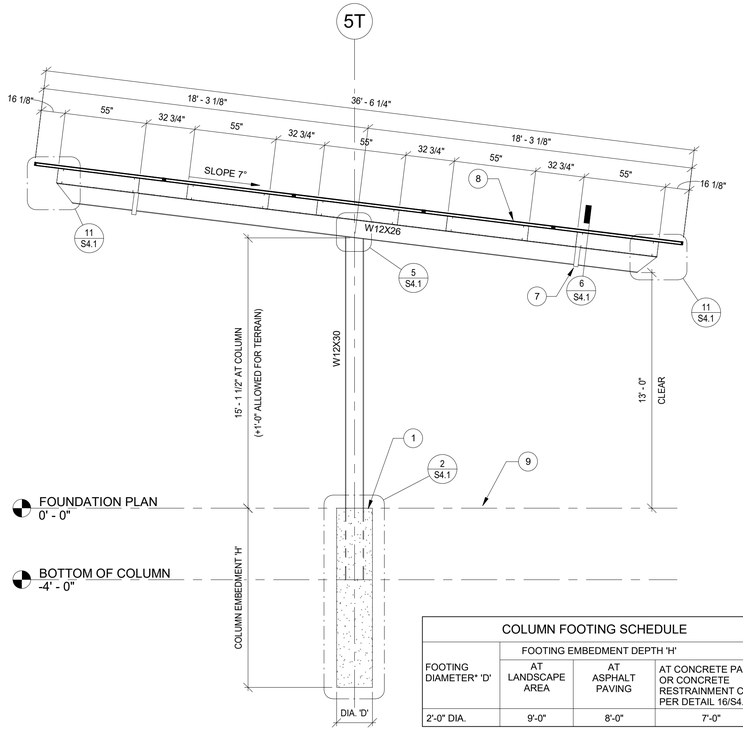
S2.4



1 5 PANEL TEE - 7 DEG. FRAMING PLAN
3/16" = 1'-0"



3 5 PANEL T - 7 DEG
NO SCALE



2 5 PANEL 7 DEG TEE SECTION
1/4" = 1'-0"

COLUMN FOOTING SCHEDULE			
FOOTING DIAMETER* 'D'	FOOTING EMBEDMENT DEPTH 'H'		
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PV PANEL INFORMATION

A. CONTRACTOR TO VERIFY PANEL INFORMATION PRIOR TO FABRICATION AND ERECTION.
B. THE PANEL INFORMATION BELOW AND IN THE PLANS WAS PROVIDED BY THE OWNER DURING THE DESIGN PHASE AND PRIOR TO THE START OF CONSTRUCTION. ALL PANEL INFORMATION INDICATED IN THESE DRAWINGS IS FOR REFERENCE ONLY AND SHALL BE VERIFIED WITH THE OWNER, THE ELECTRICAL DRAWINGS AND THE GENERAL CONTRACTOR PRIOR TO FABRICATION AND PRIOR TO CONSTRUCTION.
C. THE OWNER IS TO PROVIDE A PANEL CAPABLE OF SUPPORTING IN MANOR IN WHICH IS INTENDED BY THESE DRAWINGS (I.E. SUPPORTED BY SHORT END, DUAL SUPPORTS, ETC). SUBMIT PANEL SPEC SHEETS FOR REVIEW PRIOR TO PURCHASING ANY PANELS.
D. THE PANEL MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE PANELS INCLUDING ALL IT'S COMPONENTS. PHOTOVOLTAIC PANELS AND IT'S COMPONENTS SHALL BE DESIGNED TO SUPPORT PANEL WEIGHT PLUS SNOW, WIND, OR SEISMIC LOADING, WHICHEVER COMBINATION PRODUCES THE MOST SEVERE CONDITION IN ACCORDANCE WITH THE BUILDING CODE

PANEL MODEL	LENGTH	WIDTH
Q.PEAK DUO XL-G10.d 475-495	87.24"	41.14"

KEYNOTES

1 DRILLED CONCRETE POLE FOOTING. FOR DIAMETER AND EMBEDMENT OF FOOTING SEE FOUNDATION PLAN AND SECTION ON THIS SHEET. SEE DETAIL 2/S4.1 FOR REINFORCING AND STEEL COLUMN ANCHORAGE.
2 C9"x3"x14 GAUGE COLD FORMED STEEL PURLINS, TYPICAL. COORDINATE EXACT LOCATION WITH SOLAR PANEL MANUFACTURER SPECIFICATIONS. SEE DETAIL 9/S4.1 FOR MORE INFORMATION ON SECTION.
3 SAG ROD AS SHOWN ON PLANS, (1) MINIMUM AT SPANS LESS THAN 18'-0" AND (2) MINIMUM AT SPANS LESS THAN 27'-0". REFERENCE DETAIL 10/S4.1.
4 (1) SAG ROD REQUIRED BETWEEN SUPPORT AND CANTILEVER END AS SHOWN. REFERENCE DETAIL 10/S4.1. SAG ROD NOT REQUIRED WHERE CANTILEVER IS LESS THAN 5'-0".
5 DO NOT SPLICE PURLINS AT SUPPORT AT CANTILEVER ENDS.
6 16 GAUGE END CAP WITH 2" LEGS EACH END OF STRUCTURE.
7 BEAM FLANGE BRACES AS SHOWN ON PLANS. REFERENCE DETAIL 6/S4.1 FOR MORE INFORMATION.
8 PV MODULE BY OTHERS. ATTACH PER DETAILS.
9 FINISHED GRADE. FINISHED GRADE IS DEFINED AS THE LOWEST ADJACENT FINISHED GRADE WITHIN 5 FEET OF THE STRUCTURAL COLUMN.
12 DIAGONAL SAG ROD BRACING AS SHOWN. ATTACH PER DETAILS 13/S4.1 AND 14/S4.1.

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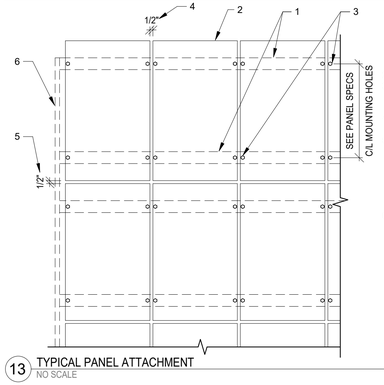
12765 MUELLER DR.
GROVELAND, CA

No.	Description	Date

PROJECT NUMBER: 22039
DRAWN BY: KS
CHECKED BY: JE
DATE: 02/01/2022

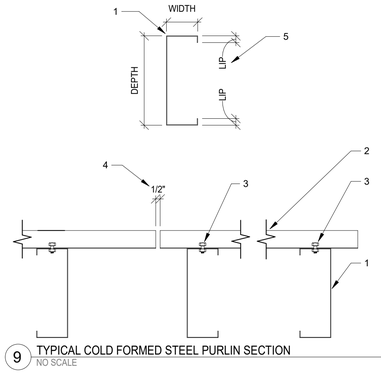
SHEET NAME
5 PANEL STRUCTURE PLANS

S2.5



1. STEEL PURLIN, SEE PLANS AND GSN FOR SIZE, GAUGE AND FINISH.
2. SOLAR PANELS BY OTHERS.
3. THRU BOLT BY PANEL MFR. (1/4" OR M6 DIAMETER MINIMUM).
4. SPACING BETWEEN LONG SIDE OF PANELS, TYPICAL.
5. SPACING BETWEEN SHORT SIDE OF PANELS, TYPICAL. CONTRACTOR TO VERIFY PURLIN SPACING WITH PANEL AND BRACKET SPECIFICATIONS PRIOR TO INSTALLATION.
6. END CAP.

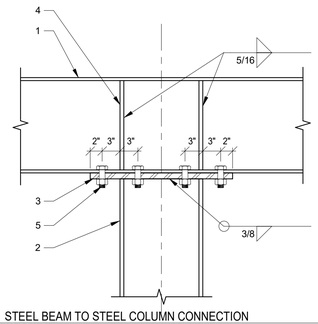
13 TYPICAL PANEL ATTACHMENT
NO SCALE



1. STEEL PURLIN, SEE PLANS AND GSN FOR SIZE, GAUGE AND FINISH.
2. SOLAR PANELS BY OTHERS.
3. THRU BOLT BY PANEL MFR (1/4" OR M6 DIAMETER MINIMUM).
4. SPACING BETWEEN PANELS, TYPICAL. CONTRACTOR TO VERIFY PURLIN SPACING WITH PANEL AND BRACKET SPECIFICATIONS PRIOR TO INSTALLATION.
5. MINIMUM LIP LENGTH SHALL MEET OR EXCEED THE FOLLOWING:

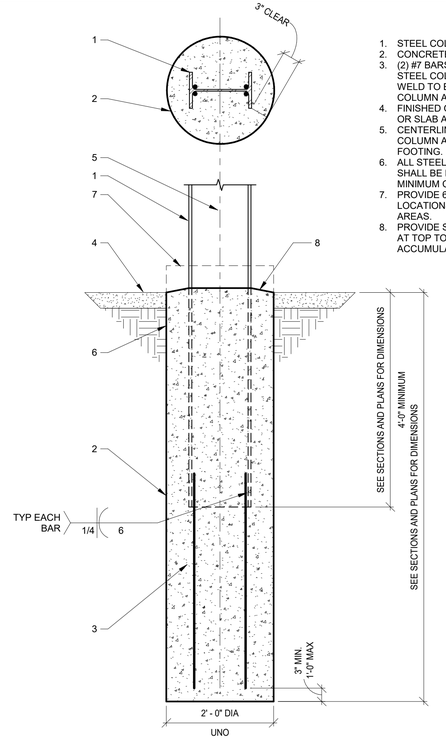
C-SHAPES
- 16 GAUGE - 0.773 INCHES
- 14 GAUGE - 0.800 INCHES
- 12 GAUGE - 0.885 INCHES

9 TYPICAL COLD FORMED STEEL PURLIN SECTION
NO SCALE



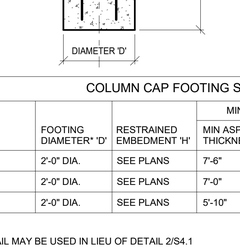
1. STEEL BEAM, FOR TILT DIRECTION SEE SECTIONS AND ELECTRICAL DRAWINGS.
2. STEEL COLUMN.
3. 3/4" x WIDTH COLUMN (OR BEAM, WHICH EVER IS GREATER), Fy = 50 KSI MINIMUM.
4. 1/2" FULL DEPTH WEB STIFFENERS EACH SIDE OF COLUMN, AS SHOWN TYP.
5. (4) 3/4" DIA. ASTM A325 BOLTS EACH SIDE OF BEAM, CENTERED ON BEAM GAUGE (8 TOTAL). TENSION BOLTS SNUG TIGHT.

5 STEEL BEAM TO STEEL COLUMN CONNECTION
NO SCALE



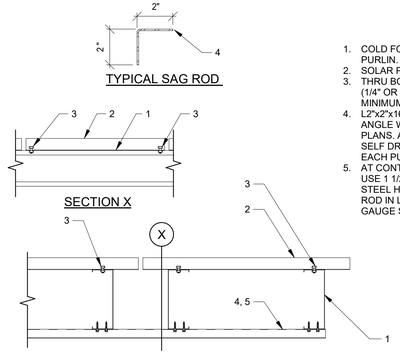
1. STEEL COLUMN PER PLAN.
2. CONCRETE POLE FOOTING
3. (2) #7 BARS EACH SIDE OF STEEL COLUMN (4 - TOTAL). WELD TO EACH SIDE OF COLUMN AS INDICATED.
4. FINISHED GRADE, ASPHALT OR SLAB AS OCCURS.
5. CENTERLINE OF STEEL COLUMN AND CONCRETE FOOTING.
6. ALL STEEL BELOW GRADE SHALL BE ENCASED IN 3" MINIMUM CONCRETE.
7. PROVIDE 6" EXPOSED PIER AT LOCATIONS OUTSIDE PAVED AREAS.
8. PROVIDE SLOPPED SURFACE AT TOP TO PREVENT ACCUMULATION OF WATER.

2 STEEL COLUMN AT POLE FOOTING CONNECTION
NO SCALE



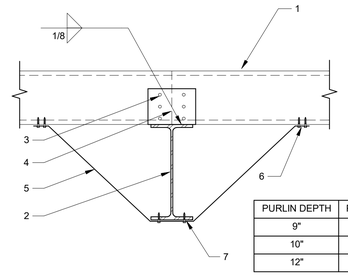
1. COLD FORMED STEEL PURLIN.
2. L2"x2"x16 GAUGE STEEL SAG ROD BRACE BOTTOM OF PURLINS. SEE PLANS FOR LOCATIONS. REFERENCE DETAIL 10/S4.1 FOR SECTION INFORMATION.
3. (2) #12 SELF DRILLING SCREWS AT EACH PURLIN. SCREWS SHALL BE LONG ENOUGH SO THAT AT LEAST 3 EXPOSED THREADS EXIST ON THE PROJECTED END.

14 STEEL SAG ROD AT BOTTOM FLANGE OF STEEL PURLINS
NO SCALE



1. COLD FORMED STEEL PURLIN.
2. SOLAR PANELS BY OTHERS.
3. THRU BOLT PER PANEL MFR. (1/4" OR M6 DIAMETER MINIMUM).
4. L2"x2"x16 GAUGE STEEL SAG ANGLE WHERE SHOWN ON PLANS. ATTACH WITH (2) #12 SELF DRILLING SCREWS AT EACH PURLIN.
5. AT CONTRACTORS OPTION, USE 1 1/2"x1 1/4"x18 GAUGE STEEL HAT CHANNEL SAG ROD IN LIEU OF L2"x2"x14 GAUGE STEEL SAG ROD.

10 SAG ROD AT STEEL PURLINS ATTACHMENT
NO SCALE

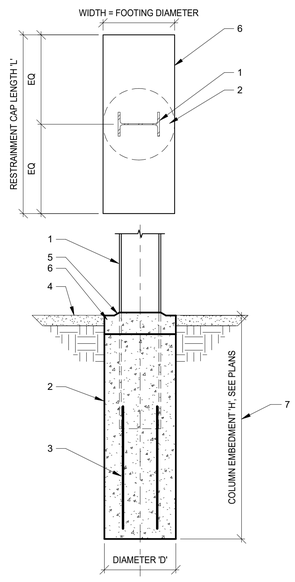


1. STEEL JOIST PURLIN PER PLANS.
2. STEEL BEAM.
3. STEEL PLATE AND SCREWS PER SCHEDULE THIS DETAIL.
4. PURLIN SPLICE AT INTERIOR BEAMS ONLY.
5. 2"x14 GAUGE FLANGE BRACE STRAP WHERE SHOWN ON PLANS.
6. AT CONTRACTORS OPTION, SCREW STRAP TO PURLIN WITH (2) #12 SELF TAPPING SCREWS ILO WELD.
7. PROVIDE (2) HILTI 0.157" DIA. XU POWDER ACTUATED FASTENERS ILO WELD.

PURLIN DEPTH	PLATE DIMENSIONS	NUMBER OF SCREWS
9"	3/16"x8"x6" (LSH)	(6) #12 SCREWS
10"	3/16"x8"x8"	(6) #12 SCREWS
12"	1/4"x8"x10" (LSV)	(8) #12 SCREWS

*LSH - LONG SIDE HORIZONTAL
*LSV - LONG SIDE VERTICAL

6 TYPICAL PURLIN TO STEEL BEAM CONNECTION
NO SCALE

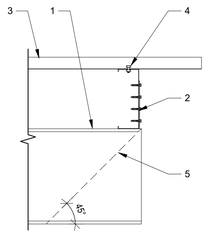


1. STEEL COLUMN. EMBED IN FOOTING PER OTHER DETAILS AND SECTION ON PLANS.
2. CONCRETE POLE FOOTING.
3. REINFORCING PER DETAIL 2/S4.1.
4. ASPHALT, FIELD VERIFY THICKNESS. WHERE CONCRETE SLAB IS PRESENT, RESTRAINMENT CAP NOT REQUIRED.
5. PROVIDE SLOPPED SURFACE AT TOP TO PREVENT ACCUMULATION OF WATER.
6. 4" THICK CONCRETE RESTRAINMENT CAP. RESTRAINMENT CAP NOT REQUIRED WHERE FOOTING IS RESTRAINED AT TOP BY A CONCRETE SLAB ON GRADE.
7. COLUMN EMBEDMENT 'H', REFERENCE SCHEDULE ON PLANS AND STRUCTURE SECTION.

COLUMN CAP FOOTING SCHEDULE					
			MINIMUM RESTRAINMENT CAP LENGTH 'L'		
	FOOTING DIAMETER* 'D'	RESTRAINED EMBEDMENT 'H'	MIN ASPHALT THICKNESS 2"	MIN ASPHALT THICKNESS 2 1/2"	MIN ASPHALT THICKNESS 3"
3 PANEL (+)	2'-0" DIA.	SEE PLANS	7'-6"	6'-0"	5'-0"
3 PANEL (-)	2'-0" DIA.	SEE PLANS	7'-0"	5'-8"	4'-8"
5 PANEL 'T'	2'-0" DIA.	SEE PLANS	5'-10"	4'-8"	3'-10"

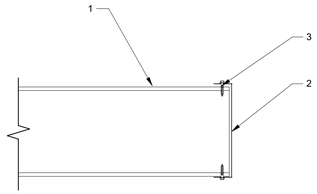
* THIS DETAIL MAY BE USED IN LIEU OF DETAIL 2/S4.1

16 STEEL COLUMN AT RESTRAINED POLE FOOTING CONNECTION
NO SCALE



1. STEEL BEAM PER PLAN.
2. STEEL PURLIN, ATTACH TO BEAM PER OTHER DETAILS.
3. SOLAR PANELS BY OTHERS.
4. THRU BOLT PER PANEL MFR.(1/4" OR M6 DIAMETER MINIMUM).
5. OPTIONAL MITERED END CUT.

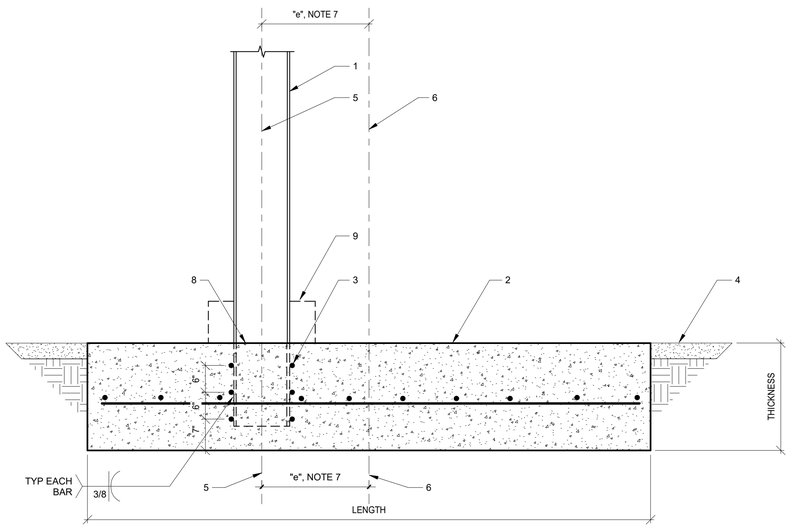
11 TYPICAL PURLIN TO STEEL BEAM CONNECTION
NO SCALE



1. COLD FORMED STEEL PURLIN.
2. END CAP PER PLANS.
3. (1) #12 SELF DRILLING SCREWS TOP AND BOTTOM AT EACH PURLIN (2 - TOTAL EACH PURLIN).

12 TYPICAL PURLIN END CAP DETAIL
NO SCALE

FOOTING SCHEDULE				
STRUCTURE	FOOTING SIZE (LENGTH x WIDTH x THICKNESS)	FOOTING ECCENTRICITY "e"	FOOTING REINFORCING	CONCRETE STRENGTH
3 PANEL (+)	10'-0"x5'-6"x2'-0"	1'-6"	#6 AT 10" O.C. EACH WAY TOP AND BOTTOM	3,000 PSI
3 PANEL (+)	10'-0"x5'-6"x2'-0"	1'-6"	#6 AT 10" O.C. EACH WAY TOP AND BOTTOM	3,000 PSI
5 PANEL	10'-0"x5'-6"x2'-0"	0'-0"	#6 AT 10" O.C. EACH WAY TOP AND BOTTOM	3,000 PSI



*THIS DETAIL MAY BE USED IN LIEU OF DETAIL 2/S4.1

8 STEEL COLUMN AT CONCRETE SPREAD FOOTING
NO SCALE

1. STEEL COLUMN PER PLAN.
2. CONCRETE SPREAD FOOTING, SEE SCHEDULE THIS DETAIL FOR SIZE AND REINFORCING.
3. (3) #9 x 5'-0" BARS AT 6" O.C. VERTICAL WELDED TO EACH SIDE OF COLUMN FLANGE (6 TOTAL PER COLUMN).
4. FINISHED GRADE OR SLAB AS OCCURS.
5. CENTERLINE OF STEEL COLUMN AND CONCRETE FOOTING WIDTH.
6. CENTERLINE OF FOOTING LENGTH.
7. OFFSET COLUMN PER FOOTING SCHEDULE. WHERE FOOTING ECCENTRICITY EXISTS, LONGER FOOTING TOE SHALL OCCUR ON THE SAME SIDE OF THE COLUMN.
8. PROVIDE SLOPPED SURFACE AT COLUMN TO PREVENT ACCUMULATION OF WATER AGAINST STEEL.
9. PROVIDE 6" EXPOSED PIER AT LOCATIONS OUTSIDE PAVED AREAS.

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No.	Description	Date

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SHEET NAME
SOLAR CANOPY DETAILS

S4.1