

CATALINA ISLAND CONSERVANCY SOLAR

DC SYSTEM CAPACITY = 167.2 kWp

GROUND MOUNTED

SOLAR PHOTOVOLTAIC SYSTEM

PROJECT SUMMARY

THE PROJECT CONSISTS OF THE INSTALLATION AND OPERATION OF A GRID-TIED SOLAR PHOTOVOLTAIC ARRAY SYSTEM. PV PANELS ARE INSTALLED ON GROUND MOUNTED, FENCED IN SOLAR SYSTEM AND THE INTERCONNECTION WILL BE WITH SOUTHERN CALIFORNIA EDISON AS A VIRTUAL NET ENERGY METERED SOLAR SYSTEM TO BENEFIT A COMBINATION OF METERS. THE ANTICIPATED PRODUCTION OF THE SOLAR SYSTEM WILL BE CONSUMED BY BUILDING LOADS.

THE SYSTEM WILL INCLUDE STRING INVERTERS. RAPID SHUTDOWN IS NOT REQUIRED FOR THE GROUND STRUCTURES.

THE PROPOSED ARRAYS WILL FOLLOW THE SLOPE:
AZIMUTH: +/- 180 DEG.
TILT: +/- 15 DEG.

COVERAGE AREA: 10,400 SQ.FT

DC SYSTEM SIZE: 304x 550 W = 167.2 kWp
AC SYSTEM SIZE: 2 x 62.5 kW = 125 kW
DC/AC RATIO: +/- 1.37
MAXIMUM AC POWER OUTPUT: 125 kW

SYSTEM DESCRIPTION*:

MODULE: (304) 550W ZNShine ZXM7-SHDB-144
INVERTER: (2x) 62.5 kW SMA CORE 1 INVERTERS
DC DISCONNECTS: TBD
AC DISCONNECTS: TBD
COMBINER BOXES: TBD
MONITORING: TBD

PV SYSTEM DISCONNECT
AC DISCONNECT: (1) 400 A 3PH, 240Y/120V

SYSTEM:

BUILDING CODE DATA

OCCUPANCY CLASSIFICATION: N/A
DESCRIPTION OF USE: GROUND MOUNTED SOLAR ARRAY
TYPE OF CONSTRUCTION: N/A
COVERED AREA: 27,000 sq.ft

CODE COMPLIANCE STATEMENT:

ALL ELECTRICAL WORK SHALL BE DESIGNED PER 2023 LOS ANGELES COUNTY ELECTRICAL CODE, 2022 CALIFORNIA ELECTRICAL CODE, AND 2020 NATIONAL ELECTRICAL CODE.

110.2 APPROVAL: ALL ELECTRICAL EQUIPMENT SHALL BE LABELED, LISTED, OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCREDITED BY THE UNITED STATES OCCUPATIONAL SAFETY HEALTH ADMINISTRATION.

PROJECT INFORMATION

OWNER: Catalina Island Conservancy
CONTACT: Reed Woodyard
708 Crescent Ave.
Avalon, CA 90704
PH: (360) 306-0472

SITE INFO:
4550 U Airport Road
Avalon, CA 90704
APN: 7480-041-042
Lat: 33.404 deg.
Long.: -118.414 deg.

LOT SIZE: 598.86 ACRES
ZONING: OS/C
LAND USE DESIGNATION: OPEN SPACE/CONSERVATION

SOLAR PROJECT TEAM

SOLAR CONTRACTOR AND DESIGNER

SATTTLER SOLAR INC.
4770 DEL MAR AVE.
SAN DIEGO, CA 92107
ENGINEERING MANAGER: ERIK SATTTLER
PH: (858) 327-0334
EMAIL: erik@satttlersolar.com



PROJECT MANAGER & CONSULTANT:
GSR ENERGY



PROJECT MANAGER: EMMA MALLONEE
PH: (831) 515-9181
EMAIL: emma@gsr-energy.com

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED IF NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES:

OSHA – STATE VERSION OF OSHA
ANSI/EIA-222- LIFE SAFETY CODE NFPA-101
CITY/COUNTY ORDINANCES (JURISDICTION)
2022 CALIFORNIA ELECTRIC CODE (CEC)
2022 CALIFORNIA BUILDING CODE (CBC)
2022 CALIFORNIA FIRE CODE (CFC)
2023 LOS ANGELES COUNTY ELECTRICAL CODE
2020 NATIONAL ELECTRICAL CODE

PLANS PREPARED WITH SUPPORT OF:

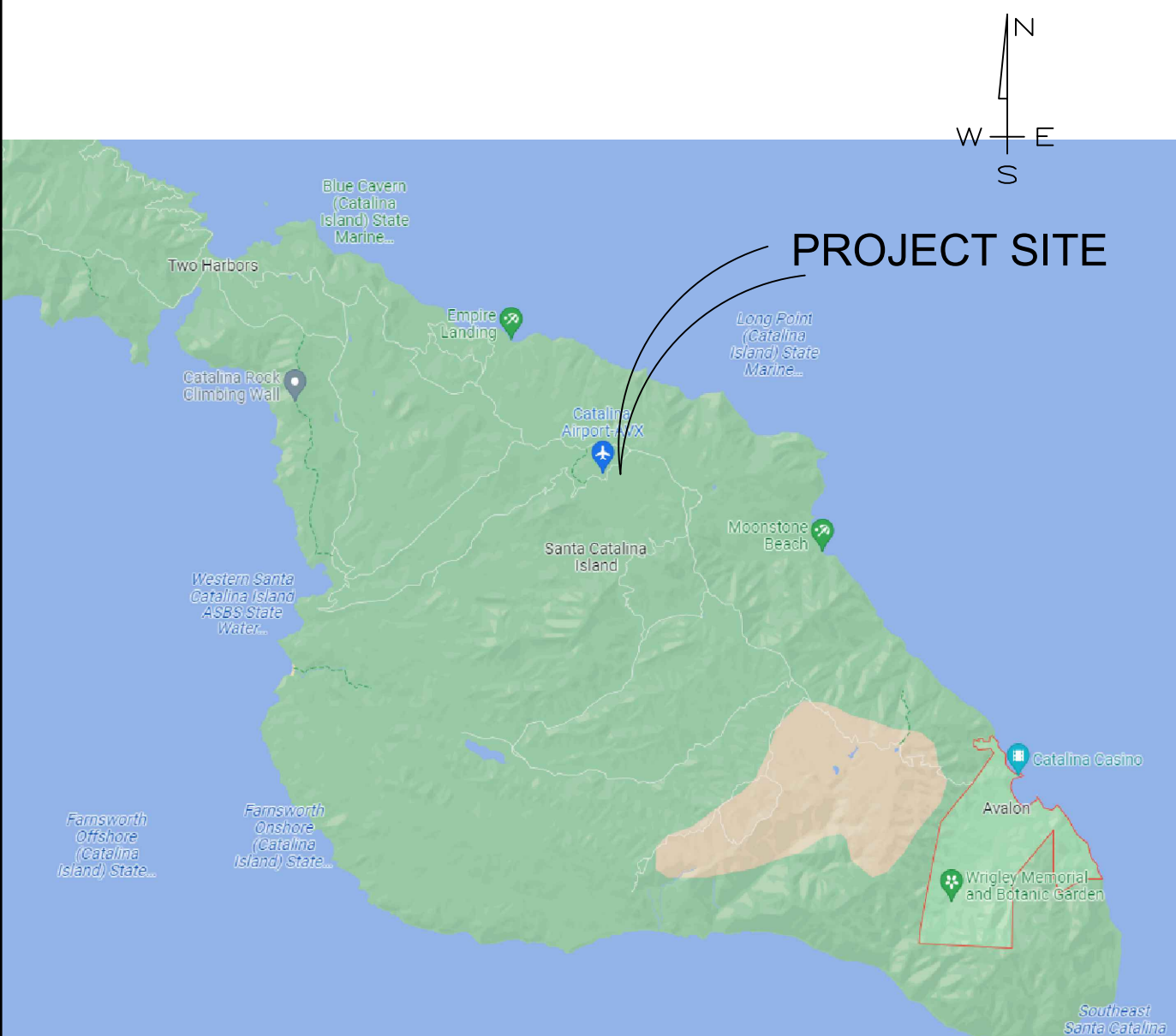


SATTTLER SOLAR INC. - 619.880.0445
www.satttlersolar.com

DISCLAIMER: THE PLANS WERE REVIEWED AND APPROVED BY THE INSTALLER PRIOR TO INSTALLATION. COMPLIANCE WITH ALL APPLICABLE ELECTRICAL, FIRE AND BUILDING CODES IS THE RESPONSIBILITY OF THE INSTALLER.

BY USING THESE PLANS FOR THE INSTALLATION OF THE PV SYSTEM DESCRIBED HEREIN, THE INSTALLER AGREES TO HAVE REVIEWED THE PLANS AND ENSURED THAT ALL APPLICABLE ELECTRICAL, BUILDING AND FIRE CODES ARE FOLLOWED AND THE INSTALLER ACCEPTS RESPONSIBILITY.

VICINITY MAP



Lat.: 33.404 deg.
Long.: -118.414 deg.

UNDERGROUND FACILITIES



Know what's below.
Call before you dig.

COLOR CODE

WHITE - PROPOSED EXCAVATION
PINK - TEMP SURVEY MARKINGS
RED - ELECTRIC
YELLOW - GAS-OIL-STEAM
ORANGE - COMMUNICATION CATV
BLUE - WATER
PURPLE - RECLAIMED WATER
GREEN - SEWER

EXISTING UNDERGROUND FACILITIES ARE SHOWN ON THESE PLANS FROM RECORD INFORMATION AND ARE FOR INFORMATION ONLY. OTHER UNDERGROUND FACILITIES NOT SHOWN ON THE PLANS MAY EXIST. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY A ONE-CALL SERVICE CENTER, TOLL FREE AT 811, NO LESS THAN TWO DAYS PRIOR TO ANY EXCAVATION.

SHEET INDEX

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PV-0.0	TITLE PAGE / PROJECT DESCRIPTION
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PV-1.2	PV LAYOUT
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PV-1.4	STRUCTURAL ANCHOR LAYOUT
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PV-5.0	PLAQUES/SIGNAGE
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S-200	Foundation Detail
S-300	Structural Purlins
S-400	Structural Connections Overview
S-500	Foundation Post & Bracing Overview
SSC-1.0	Solar Structural Calculations
SFL-1.0	Solar Foundation load test

PROJECT HOST:



CATALINA ISLAND CONSERVANCY

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LIC # 1017484

ERIK SATTTLER, SATTTLER SOLAR INC. LIC. # 1017484 (C-10)

PERMITTING AND SOLAR CONSULTANT:



CATALINA ISLAND CONSERVANCY
125 kW (AC)
SOLAR PV
4550 U AIRPORT ROAD
AVALON, CA 90704

Revision	Date
90% CONSTRUCTION DOCUMENTS	10/23/2023
PLAN CHECK #4	1/30/2024
BIOLOGIST REPORT REVISION	3/15/2024
SCE REQUESTED REVISIONS	7/08/2024
FENCE ALIGNMENT REVISED	7/25/2024
MAX. SPAN BETW. POSTS UPDATE	11/21/2024

Date	07/25/2024
Job No.	1511
Drawn By	LS
Checked By	ES
Scale	

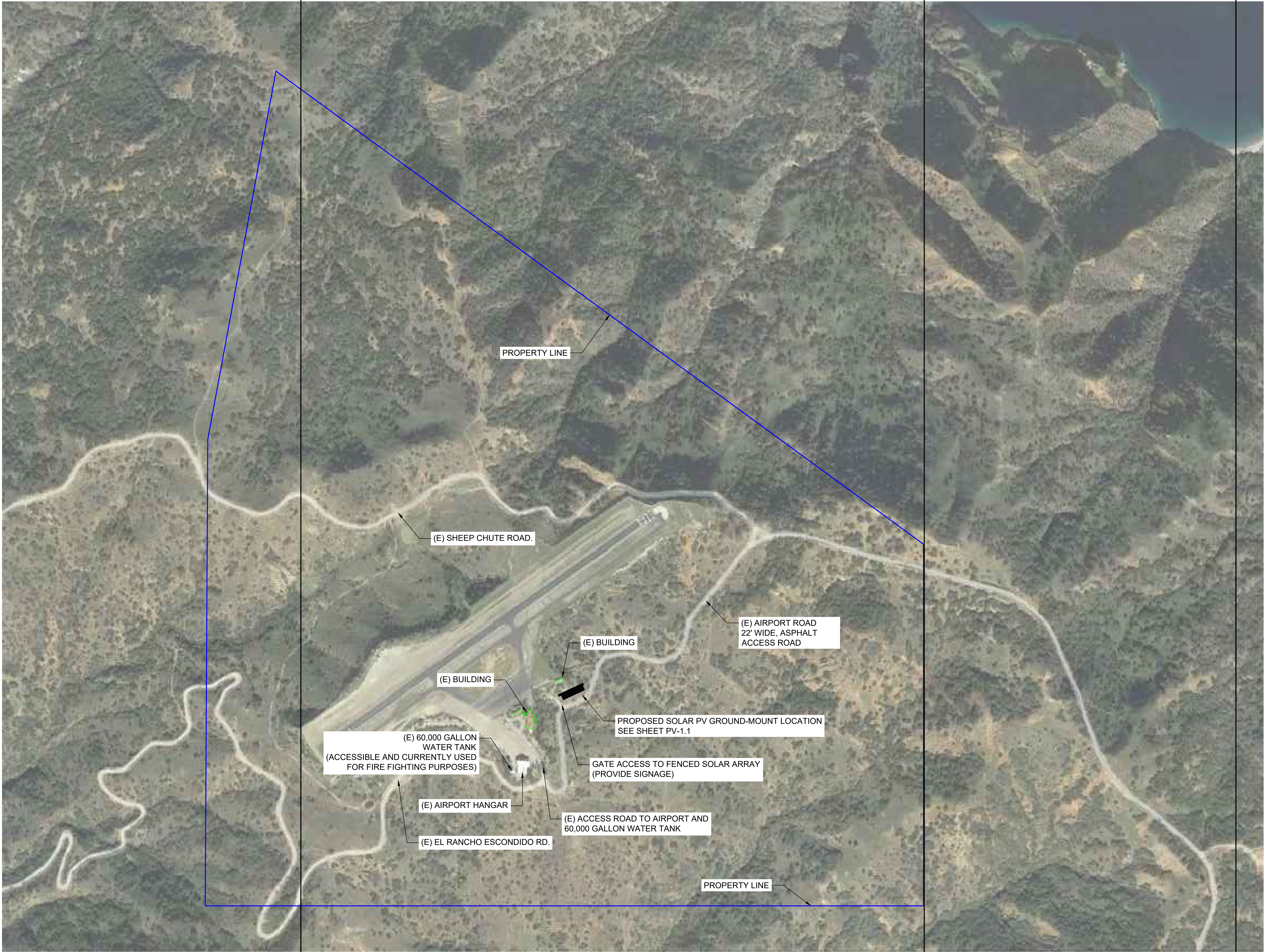
CONSTRUCTION DOCUMENTS

Drawing Title

SOLAR INSTALLATION
TITLE SHEET

Drawing No.

PV-0.0



PROPERTY AND SITE LOCATION MAP
NTS

PROJECT HOST:



**CATALINA
ISLAND
CONSERVANCY**

708 Crescent Ave.
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LIC # 1017454

Erk Sattler
ERIK SATTLER, SATTLER SOLAR INC. LIC. # 1017454 (C10)

PERMITTING AND SOLAR
CONSULTANT:



**CATALINA ISLAND
CONSERVANCY
125 kW (AC)
SOLAR PV**
4550 U AIRPORT ROAD
AVALON, CA 90704

Revision Date

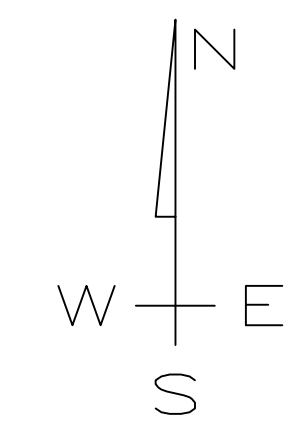
80% CONSTRUCTION DOCUMENTS	10/23/2023
PLAN CHECK #4	1/30/2024
BIOLOGIST REPORT REVISION	3/15/2024
SCE REQUESTED REVISIONS	7/08/2024

Date	07/08/2024
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Scale	

**CONSTRUCTION
DOCUMENTS**

Drawing Title
**SOLAR INSTALLATION
PROPERTY MAP**

Drawing No.
PV-1.0



PROJECT HOST:


 **Catalina Island
Conservancy**

**CATALINA
ISLAND
CONSERVANCY**

**708 Crescent Ave.
Avalon, CA 90704**

ERIK SATTTLER, SATTTLER SOLAR INC. LIC. # 1017484 (C10)

PERMITTING AND SOLAR
CONSULTANT:



**GSR
ENERGY**

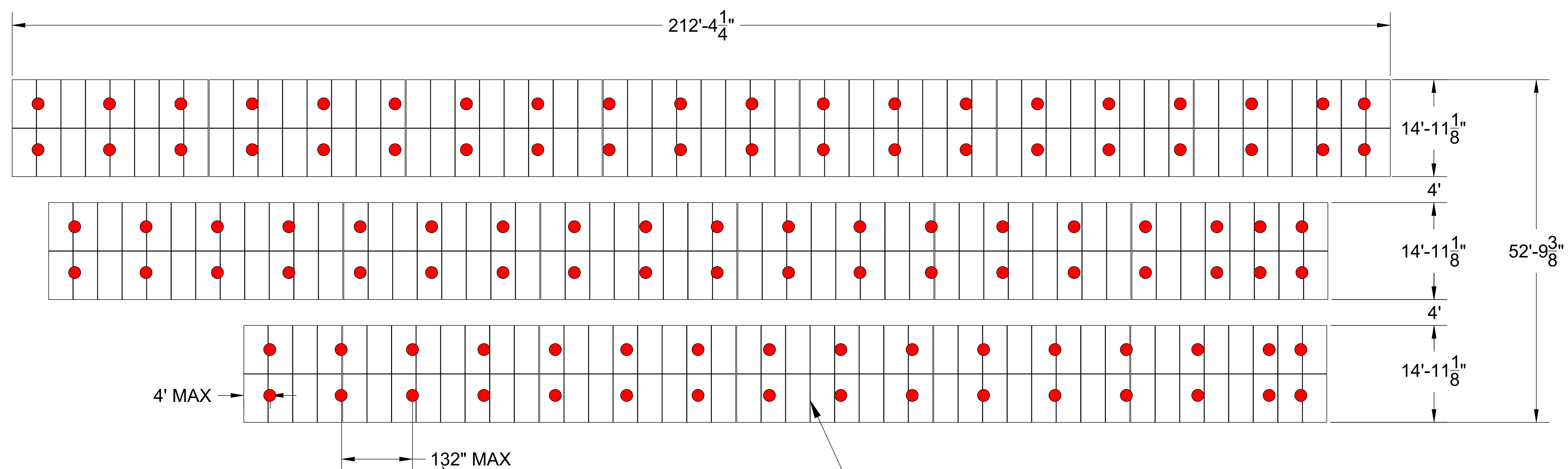
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**CATALINA ISLAND
CONSERVANCY
125 kW (AC)
SOLAR PV**
4550 U AIRPORT ROAD
AVALON, CA 90704

CONSTRUCTION
DOCUMENTS

Drawing No.

PV-1.3

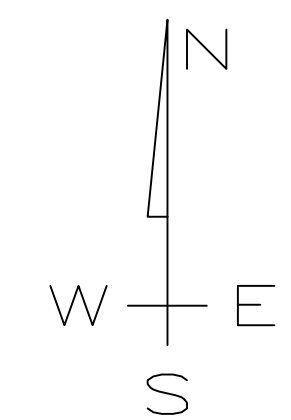


SEE STRUCTURAL SHEET S200 FOR ANCHOR DETAILS

SEE SHEET S100 FOR MAXIMUM SPANS AND S300 TO S500 FOR STRUCTURAL CONNECTION DETAILS

PLEASE NOTE THAT THE ACTUAL LOCATION OF THE GROUND
SCREW ANCHORS MAY SHIFT IN THE FIELD TO ACCOMMODATE
TERRAIN. MAXIMUM SPANS MAY NEVER BE EXCEEDED UNLESS
APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF
RECORD.

ANCHOR LOCATION PLAN
1"=8'



PROJECT HOST:



**CATALINA
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Lic # 1017484

 DATED: 01/30/24
 RIK SATTLER, SATTLER SOLAR INC. LIC. # 1017484 (C10)

PERMITTING AND SOLAR
CONSULTANT:

**CATALINA ISLAND
CONSERVANCY
125 kW (AC)
SOLAR PV
4550 U AIRPORT ROAD
AVALON, CA 90704**

Revision	Date
60% CONSTRUCTION DOCUMENTS PLAN CHECK #4	10/23/2023
BIOLOGIST REPORT REVISION	1/30/2024
SCE REQUESTED REVISIONS	3/15/2024
FENCE ALIGNMENT REVISED	7/08/2024
MAX. SPAN BETW. POSTS UPDATE	7/25/2024
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CONSTRUCTION DOCUMENTS

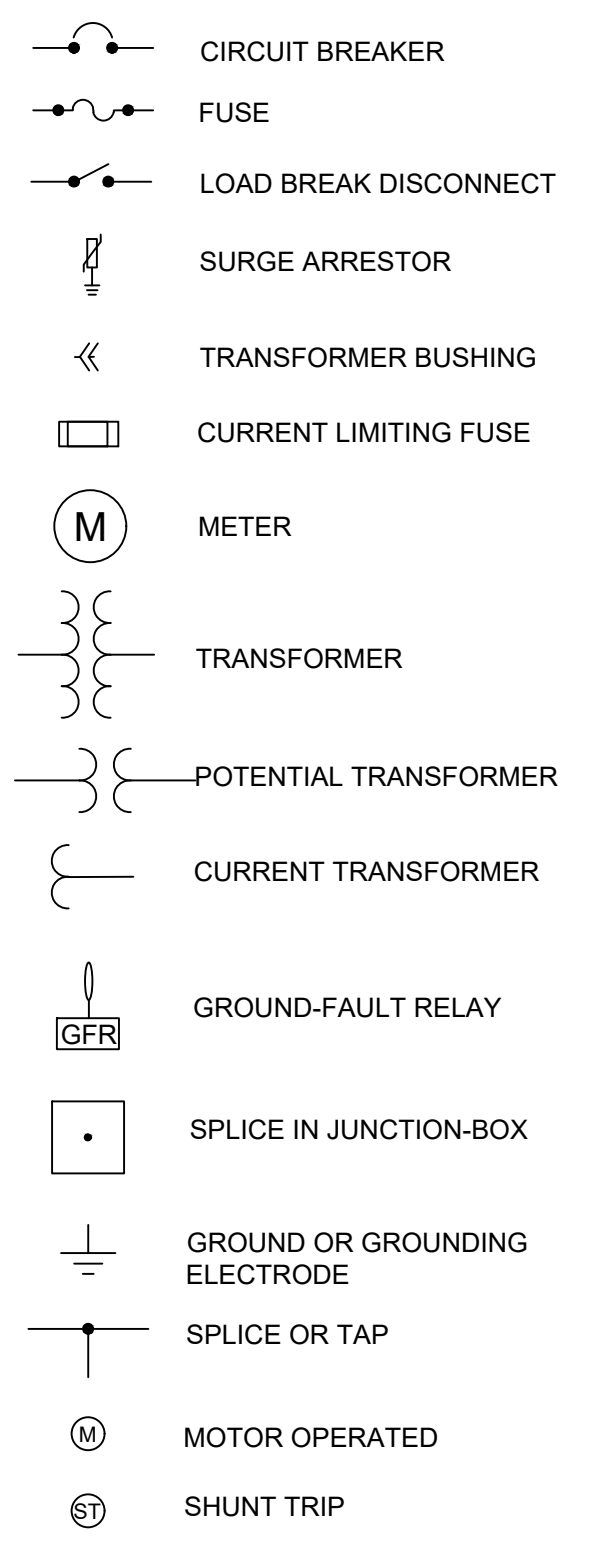
Drawing Title

FOOTING MAP

Drawing No.

PV-1.4

LEGEND



AC WIRE SCHEDULE			
TAG	DESCRIPTION	CONDUIT	% FILL
J	(3) #3 CU THWN2, #8 CU THWN2 EGC	1-1/4" EMT	23.00%
L	(3) #10 CU THWN2, #6 CU THWN2 NEUTRAL, #4 CU THWN2 EGC (Neutral is Optional)	(1) 2.5" PVC	32%

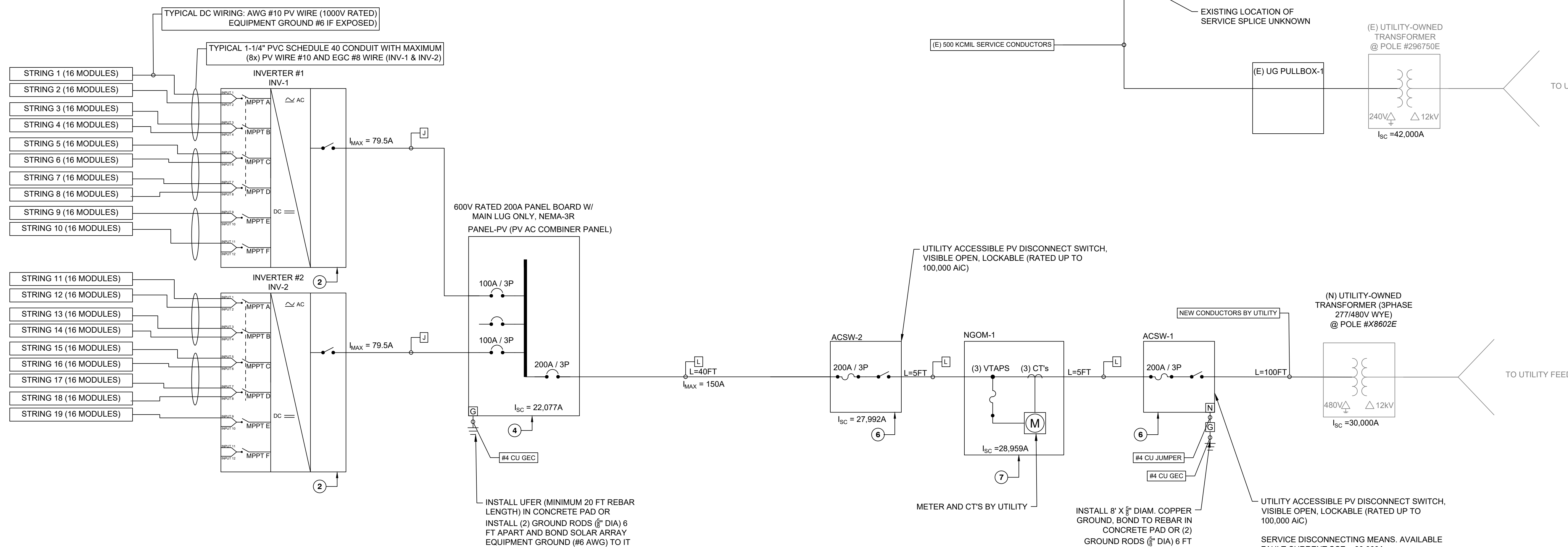
WIRE AND CONDUIT NOTES:
 1. ALL PVC CONDUIT TO BE OF SCHEDULE 40
 2. ALL AC WIRING SHALL BE COPPER THWN2 (rated for 600V)
 3. ALL DC WIRING SHALL BE COPPER PV WIRE (rated for 1000V)

ELECTRICAL EQUIPMENT SCHEDULE		
REF#	QTY.	DESCRIPTION
①	304	ZNShine ZXM7-SHDB144 550W
②	2	SMA SUNNY TRIPOWER CORE1 62-US-41
④	1	PV PANELBOARD 200A, 480V, 3φ, 4W, NEMA 3R; 25 KAIC
⑥	2	FUSIBLE UTILITY AC DISCONNECT SWITCH; 200A RATED WITH 200A FUSES, 277/280V, 3φ, 4W, NEMA 3R; 200KAIC; VISIBLE OPEN, LOCKABLE, SERVICE ENTRANCE RATED
⑦	1	UTILITY NGOM METER PER SCE REQUIREMENTS; 200A, 277/480V, 3φ, 4W, NEMA 3R
⑨	1	UNDERGROUND PULLBOX
⑩	1	FUSIBLE AC DISCONNECT SWITCH; 200A RATED WITH 200A FUSES, 277/480V, 3φ, 4W, NEMA 3R; VISIBLE OPEN, LOCKABLE

PROJECT DETAILS	
SYSTEM SIZE DC:	167.2 KW
SYSTEM SIZE AC:	125 kW
SYSTEM SIZE AC-CEC RATING:	
DC/AC RATIO:	1.3380
MODULE MODEL:	ZNShine ZXM7-SHDB144 550W
MODULE RATING:	550 W
TOTAL MODULE QTY:	304
INVERTER MODEL:	(2X) SMA TRIPOWER CORE 1 62-US
INVERTER QTY:	2
INVERTER RATING:	125 kW (COMBINED)

SHEET NOTES	
1	INSTALLATION SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE NEC REGARDING VOLTAGE CLASS.
2	RAPID SHUTDOWN IS NOT REQUIRED FOR THIS GROUND MOUNTED INSTALLATION
3	UTILITY AC DISCONNECT SWITCH SHALL MEET ALL REQUIREMENTS OF UTILITY NET ENERGY METERING INTERCONNECTION HANDBOOK. THE DISCONNECT SHALL BE A MANUAL, VISIBLY OPEN AND LOCKABLE OPEN.
4	ALL EXISTING AND NEW AC ELECTRICAL EQUIPMENT INCLUDING INVERTERS, BREAKERS, PANELBOARDS AND SPLICE TERMINALS SHALL BE VERIFIED TO HAVE AND PROCURED WITH 75C RATED TERMINALS.
5	ALL WALL MOUNTED PANELBOARDS, DISCONNECTS AND METER BASES SHALL BE ATTACHED PER MANUFACTURER'S INSTRUCTIONS.

CONDUCTOR & CONDUIT NOTES	
1	WHERE EQUIPMENT GROUNDING CONDUCTORS ARE EXPOSED TO PHYSICAL DAMAGE, ON THE OUTSIDE OF THE ARRAY AND NOT CONTINUOUSLY SECURED TO PV MODULE RACKING, THEY SHALL BE #6 AWG MIN.
2	ALL CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE NOTED. CONDUCTORS LARGER THAN #6 WILL TYPICALLY BE NOTED AS ALUMINUM.
3	ALL AC WIRE RATED 600V OR LESS SHALL BE THWN-2, XHHW, (OAE)
4	ALL DC CONDUCTORS SHALL BE PVWIRE AND RATED FOR THE VOLTAGE.
5	ABOVE GRADE CONDUITS SHALL BE EMT.
6	ABOVE GRADE CONDUITS SUBJECT TO PHYSICAL DAMAGE SHALL BE RMC OR PROTECTED BY A RMC SLEEVE.
7	UNDERGROUND CONDUITS SHALL BE SCHEDULE 40 PVC.
8	UNDERGROUND ELBOWS AND STUB-UPS SHALL BE SCHEDULE 80 PVC.
9	UNGROUND ELBOWS FOR RUNS >250' SHALL BE RIGID METAL (RMC OR IMC).
10	PV WIRE SOURCE CIRCUITS BEHIND MODULES AND UNDER ARRAY SHALL BE BUNDLED AND SECURED TO RACKING.
11	PVWIRE SOURCE CIRCUITS OUTSIDE THE ARRAY FOOTPRINT SHALL BE RUN IN EMT.



GROUNDING NOTES

EQUIPMENT GROUND:
 IN ADDITION TO THE EQUIPMENT GROUNDING CONDUCTORS RUN WITH THE PV SYSTEM CONDUCTORS, A GROUNDING CONDUCTOR SHALL BE PROVIDED FROM THE PV ARRAY TO A GROUNDING ELECTRODE SYSTEM ESTABLISHED AT THAT GROUND MOUNT.
 PROVIDE #6 GEC TO 2 GROUND RODS, MIN 6 FT APART LOCATED AT THE ARRAY STRUCTURE.
 SEE SHEET PV-3.1 for GROUNDING AND BONDING DETAILS.

PLEASE NOTE THAT THIS IS AN UNGROUNDED SOLAR INVERTER SYSTEM. THIS MEANS NEITHER THE POSITIVE NOR THE NEGATIVE PV WIRE WILL NEED TO BE GROUNDED. AN EQUIPMENT GROUND IS REQUIRED HOWEVER. ALL EXPOSED EGC CONDUCTORS SHALL BE #6 COPPER WIRE. WHEN PROTECTED IN CONDUIT, #8 EGC IS ACCEPTABLE.

EACH MODULE SHALL BE GROUNDED USING THE SUPPLIED CONNECTION POINT IDENTIFIED ON THE MODULE AND THE MANUFACTURER'S INSTRUCTIONS. OTHER NRTL APPROVED METHODS MAY BE USED AS AN ALTERNATIVE.

CLIMATE	
INSTALLATION TYPE	Ground Mount
ASHRAE STATION	AVAILON/ CATALINA
DISTANCE TO ASHRAE STATION	0.6 MILES
DESIGN DB MEAN - MINIMUM	2.2 deg. C
MINIMUM CELL TEMP.	2.2 deg. C
VOLTAGE DESIGN	
MODULE TYPE:	ZNShine ZXM7-SHDB144 550W
Voc @ STC:	50.2 Voc
TEMP. COEFFICIENT:	-0.29%/deg. C
MAX DESIGN VOLTAGE (MODULE):	53.52 Voc
MAX DESIGN VOLTAGE (STRING):	856.3 Voc 16 MOD. PER STRINGS
INVERTER/OPTIMIZER:	SMA Sunny Tripower Core1 62-US-41
MAX. DC INPUT VOLTAGE:	1000 VDC
INVERTER MAX. V COMPATIBLE	OK

CEC-AC CALCULATIONS	
INVERTER:	SMA Sunny Tripower CORE1 62-US-41
CEC EFFICIENCY OF INVERTER:	98%
MODULE MODEL:	ZNShine ZXM7-SHDB144 550W
MODULE PTC RATING:	515.6 W (PTC)
NO. OF MODULES:	304
CEC-AC = INVERTER EFFICIENCY x PTC x # PANELS	
CEC-AC:	153.6 kW CEC-AC
kWp (STC):	167.2 kWp

SYSTEM CHARACTERISTICS

(PER NEC 690.53)	
1. OPERATING CURRENT (Imp)	13.13 A
2. OPERATING VOLTAGE (Vmpp)	670.4 Vdc
3. MAXIMUM SYSTEM VOLTAGE (Voc)	856.3 Vdc
4. SHORT CIRCUIT CURRENT (Isc)	13.89 A
(Data Sheet Isc x 1.25)	

1	# OF STRINGS	19
2	# OF MODULES PER STRING	(19x) 16
3	MODULE MANUFACTURER AND MODEL	ZNShine ZXM7-SHDB144 550W
4	INVERTER MANUFACTURER AND MODEL	(2x) SMA Sunny Tripower CORE1 62-US-41
5	SERVICE BUS AMPERE RATING	200 A
6	MAIN BREAKER AMPERE RATING	200 A
7	PV BACK-FED AMPERE RATING	200A*

* MAX CONTINUOUS OUTPUT CURRENT PER DATA SHEET x 1.25

13.2 Greater than 10000 A—Multi-Family Residential (Three or More Grouped Meters), Commercial, and Industrial

Table 1-5: Short-Circuit Current			
Phase	Serving Voltage (V)	Service Entrance Ampacities (A)	Utilities Contribution to Fault Current will Not Exceed (A)
Single	120/240	600 or less	42000
Three	120/208 or 240	800 or less	42000
Three	480	1200 or less	30000

MAXIMUM NUMBER OF #10 PV-WIRE SOURCE CIRCUIT CONDUCTORS PER CONDUIT FOR EMT OR PVC40 WITH #10 THWN 2		
# OF CONDUCTORS	CONDUIT SIZE	FILL %
24	2"	39.5
14	1-1/2"	38.4
10	1-1/4"	37.7
4	1"	27.6
2	3/4"	24.3

IF #6 AWG OR LARGER EGC IS USED IN AREAS WHERE EXPOSED TO PHYSICAL DAMAGE AND IS THEN RUN IN CONDUIT WITH SOURCE CIRCUIT CONDUCTORS THE TABLE ABOVE IS NOT APPLICABLE AND CONTRACTOR SHALL RECALCULATE CONDUIT FILL AND SIZE.

CALCULATION: $50.2 \text{ Voc} (@25 \text{ deg. C}) \times (1 + (-0.0029 \times 2 \text{ deg.} - 25 \text{ deg.})) = 53.52 \text{ Voc(Max)}$

PROJECT HOST:



CATALINA ISLAND CONSERVANCY

708 Crescent Ave.
Avalon, CA 90704

EPC SATTLER SOLAR AND ELECTRICAL CONTRACTORS

4770 Del Mar Ave. San Diego, CA
TEL: +1 619 880 5445 www.sattlersolar.com
LIC # 1017458

ERIK SATTLER, SATTLER SOLAR INC. LIC. # 1017458 (C-10)

PERMITTING AND SOLAR CONSULTANT:



CATALINA ISLAND CONSERVANCY 125 kW (AC) SOLAR PV

4550 U AIRPORT ROAD
AVALON, CA 90704

Revision

Revision	Date
90% CONSTRUCTION DOCUMENTS	10/23/2023
PLAN CHECK #4	1/30/2024
BIOLOGIST REPORT REVISION	3/15/2024
SCE REQUESTED REVISIONS	7/08/2024

Date	07/08/2024
Job No.	1511
Drawn By	LS
Checked By	ES
Scale	

CONSTRUCTION DOCUMENTS

Drawing Title

SOLAR INSTALLATION
SINGLE LINE DIAGRAM

Drawing No.

PV-2.0



Note: This table was developed from Table 300.5 of the Code where information for other Wiring Methods defining the above can be found. Revised for the 2008 Code, 300.5 If the Code now contains definitive language neglecting the inclusion of the above, it is to be understood as such. All conductors installed in these raceways must be approved for use in raceways as listed in 310.8(K) of the Code.

1. Cover is defined as the shortest distance in inches measured between a point on the top surface of any direct-buried cable, conduit, cable, or other raceway and the top surface of finished grade, concrete, or similar cover.
2. The term "approved for use in raceways" shall only apply to those raceways that are listed in 310.8(K) of the Code.
3. Lesser depths shall be permitted where cables and conductors rise for terminations or splices where access is otherwise required.

Where one of the wiring methods listed in Columns 1-3 is used for the circuit types in Columns 4, 5, the shallowest depth of burial shall be permitted.

Where solid rock prevents compliance with the cover depths specified in this table, the wiring shall be installed in metal raceways, minimum 1/2 inch thick, for direct burial. The raceways shall be covered by a minimum of 2 inches of concrete extending down to rock.

NOTES:
FOR GROUND MOUNT STRUCTURE AND FOUNDATION DETAILS SEE STRUCTURAL SHEETS

[Ben Pedersen <ben.pedersen@state.nm.gov>](#); [Alynn Sanson <alynn.sanson@state.nm.gov>](#); [Rob Lashley <rob.lashley@state.nm.gov>](#); [Emma McElroy <emma@energy.com>](#); [Erik Satter <erik@satterenergy.com>](#)
Subject: [External] Questions related to Catalina Array Solar VHEM project NRT-216258-1 Airport Rd, Catalina

Hello SCE team,

I am following up on our meeting on 8/19/2023. I wanted to provide an update and also pose some questions.

- In terms of update, the teams are finally making solid progress with the AHJ stakeholders. We have resubmitted plans to the County with responses to their comments to the best of our knowledge, but need some insight to the questions below. The project must adhere to a schedule to get the permit no later than May or we will have to relocate (which would be bad from a time and cost perspective). We are aiming for construction in September 2024.
- In terms of our questions, Erik Satter, from the design/construction firm for this project, has some questions that we have been advised (by SCE Engineering) that would be best answered by SCE's Planning. I do not know the best person to ask with SCE. They have linked to the participants in the 8/19/23 meeting.

At issue here is the county plan checker has requested some specific information regarding the interconnection of a 160 VDC ground mounted solar system on Catalina Island, and we need SCE's assistance to prepare the right response. We are having some challenges here, as the interconnection service is not fully considered a "NEW" Service".

The specific questions are:

- What is the maximum utility full current at the NGOM (Net Generation Output Meter)? We have referred to SCE's Handbook for 240V three phase services (see below excerpt) but the plan checker needs confirmation from SCE that these values apply. If they are different we need to update the SLD to show this correctly. Please note that we are not connecting as is the site is so within the properties and/or just instead ahead of the gear inside a full box per the

10.2 Derate from 1000VA to 400VA Family Residential (Three or More Occupant Members).
 Commercial and Industrial

Phase	Rating Voltage (V)	Service Entrance Amperage (A)	Minimum Conductor Size Circuit with Not Exceed (A)
3-Phase	240	600	1000
3-Phase	240	600	1000
3-Phase	480	1200	1000

attached SCE Figure 1 drawing sketch (attached file NRT-216258 Supplemental Report -Revision 1)01.pdf).

- The location where the bonding jumper between the SCE and Neutral wire takes place is not clear to us. Our experience in SGOSE territory requires that the AC disconnected after the highlight (in yellow below) would be the location where the bonding jumper is installed. The plan checker is suggesting it should happen in the first AC disconnected before the meter but is requesting clarification from SCE if we can have your assistance on this that would be great as well.

Figure 1: Project NRT-216258 Method of Service One-Line Diagram

We really appreciate your assistance with this as it is one of the essence.

Thanks,
 Mark Thobe

Error!
 Filename
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 specified.
 Mark Thobe
 813201-104-0028

[Erik Satter <erik@satter.com>](#); [Ben Pedersen <ben.pedersen@state.nm.gov>](#); [Alynn Sanson <alynn.sanson@state.nm.gov>](#); [Rob Lashley <rob.lashley@state.nm.gov>](#); [Emma McElroy <emma@energy.com>](#); [Erik Satter <erik@satterenergy.com>](#)
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At issue here is the county plan checker has requested some specific information regarding the interconnection of a 160 VDC ground mounted solar system on Catalina Island, and we need SCE's assistance to prepare the right response. We are having some challenges here, as the interconnection service is not fully considered a "NEW" Service".

The specific questions are:

- What is the maximum utility full current at the NGOM (Net Generation Output Meter)? We have referred to SCE's Handbook for 240V three phase services (see below excerpt) but the plan checker needs confirmation from SCE that these values apply. If they are different we need to update the SLD to show this correctly. Please note that we are not connecting as is the site is so within the properties and/or just instead ahead of the gear inside a full box per the

10.2 Derate from 1000VA to 400VA Family Residential (Three or More Occupant Members).
 Commercial and Industrial

Phase	Rating Voltage (V)	Service Entrance Amperage (A)	Minimum Conductor Size Circuit with Not Exceed (A)
3-Phase	240	600	1000
3-Phase	240	600	1000
3-Phase	480	1200	1000

attached SCE Figure 1 drawing sketch (attached file NRT-216258 Supplemental Report -Revision 1)01.pdf).

- The location where the bonding jumper between the SCE and Neutral wire takes place is not clear to us. Our experience in SGOSE territory requires that the AC disconnected after the highlight (in yellow below) would be the location where the bonding jumper is installed. The plan checker is suggesting it should happen in the first AC disconnected before the meter but is requesting clarification from SCE if we can have your assistance on this that would be great as well.

Figure 1: Project NRT-216258 Method of Service One-Line Diagram

We really appreciate your assistance with this as it is one of the essence.

Thanks,
 Mark Thobe

Error!
 Filename
 not
 specified.
 Mark Thobe
 813201-104-0028

[Erik Satter <erik@satter.com>](#); [Ben Pedersen <ben.pedersen@state.nm.gov>](#); [Alynn Sanson <alynn.sanson@state.nm.gov>](#); [Rob Lashley <rob.lashley@state.nm.gov>](#); [Emma McElroy <emma@energy.com>](#); [Erik Satter <erik@satterenergy.com>](#)
Subject: [External] Questions related to Catalina Array Solar VHEM project NRT-216258-1 Airport Rd, Catalina

Hello SCE team,

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PERMITTING AND SOLAR
CONSULTANT:



**GSR
ENERGY**

[HTTPS://WWW.GSR-ENERGY.COM](https://www.gsr-energy.com)

**CATALINA ISLAND
CONSERVANCY
125 kW (AC)
SOLAR PV
1 AIRPORT RD.
AVALON, CA 90704**

[illegible]

UTILITY CONTRIBUTING SHORT CIRCUIT CURRENT LETTER

CERTIFICATE OF COMPLIANCE

Certificate Number E361443
Report Reference E361443-2023-03-23
Date 2023-March-28

Issued to: AP ALTERNATIVES LLC
20345 County Rd X
Ridgeville Corners OH, 43355 US

**This is to certify that
representative samples of**

MOUNTING SYSTEMS, MOUNTING DEVICES,
CLAMPING DEVICES AND GROUND LUGS FOR USE
WITH PHOTOVOLTAIC MODULES AND PANELS
See Addendum Page for Product Designation(s).

Have been evaluated by UL in accordance with the
Standard(s) indicated on this Certificate.

Standard(s) for Safety:

UL 2703, Standard for Safety for Mounting Systems, Mounting Devices,
Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate
Photovoltaic Modules and Panels

Additional Information:

See the UL Online Certifications Directory at
<https://lq.ulprospector.com> for additional information

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Robert Jennings, Director
Robert.Jennings@ul.com
Director, Jennings Center, VP Regulatory Services

UL LLC

All information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please
contact a local UL Customer Service Representative at ULCustomerService@ul.com

CERTIFICATE OF COMPLIANCE

Certificate Number	E361443
Report Reference	E361443-2023-03-23
Date	2023-March-28

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

USR Component - Rack Mounting System for use with Photovoltaic Modules, Models Titan Mono, Titan Duo.

Signature
Detlev Jönsson, Owner
UL LLC

Any information and documents involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact your local Customer Service Representative at UL-USA@ul.com

UL2703 CERTIFICATE
NTS

**CONSTRUCTION
DOCUMENTS**

Drawing Title

**SOLAR INSTALLATION
DETAILS**

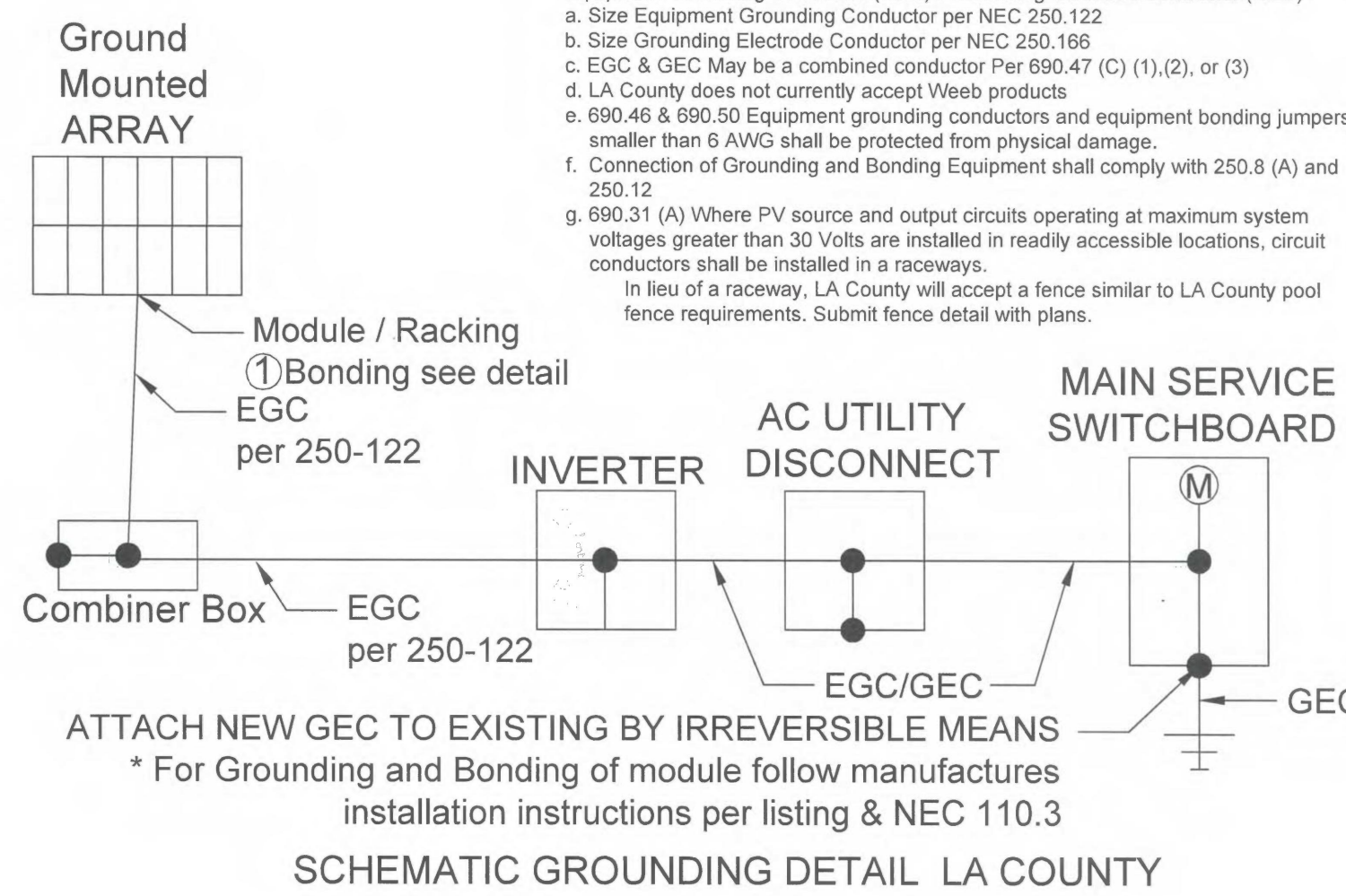
Drawing No.

PV-3.1

Photovoltaic Ground Mount

GROUNDING NOTES:

Equipment Grounding Conductor (EGC) / Grounding Electrode Conductor (GEC)
a. Size Equipment Grounding Conductor per NEC 250.122
b. Size Grounding Electrode Conductor per NEC 250.166
c. EGC & GEC may be a combined conductor per 690.47 (C) (1), (2), or (3)
d. LA County does not currently accept Weeb products
e. 690.46 & 690.50 Equipment grounding conductors and equipment bonding jumpers smaller than 6 AWG shall be protected from physical damage
f. Connection of Grounding and Bonding Equipment shall comply with 250.8 (A) and 250.12
g. 690.31 (A) Where PV source and output circuits operating at maximum system voltages greater than 30 Volts are installed in readily accessible locations, circuit conductors shall be installed in a raceway.
In lieu of a raceway, LA County will accept a fence similar to LA County pool fence requirements. Submit fence detail with plans.



Photovoltaic under panel
Bonding 4 Modules
Exhibit A

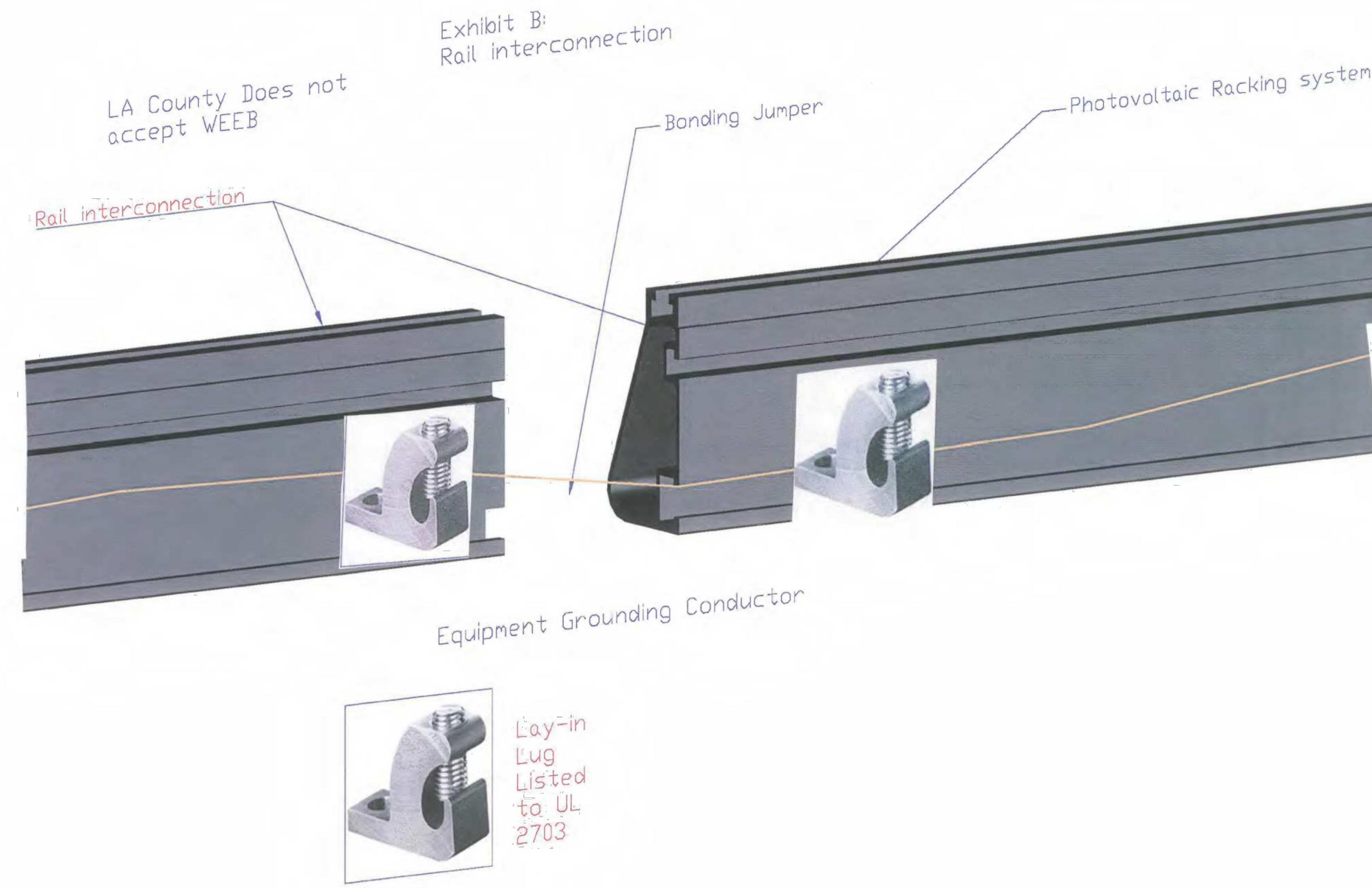
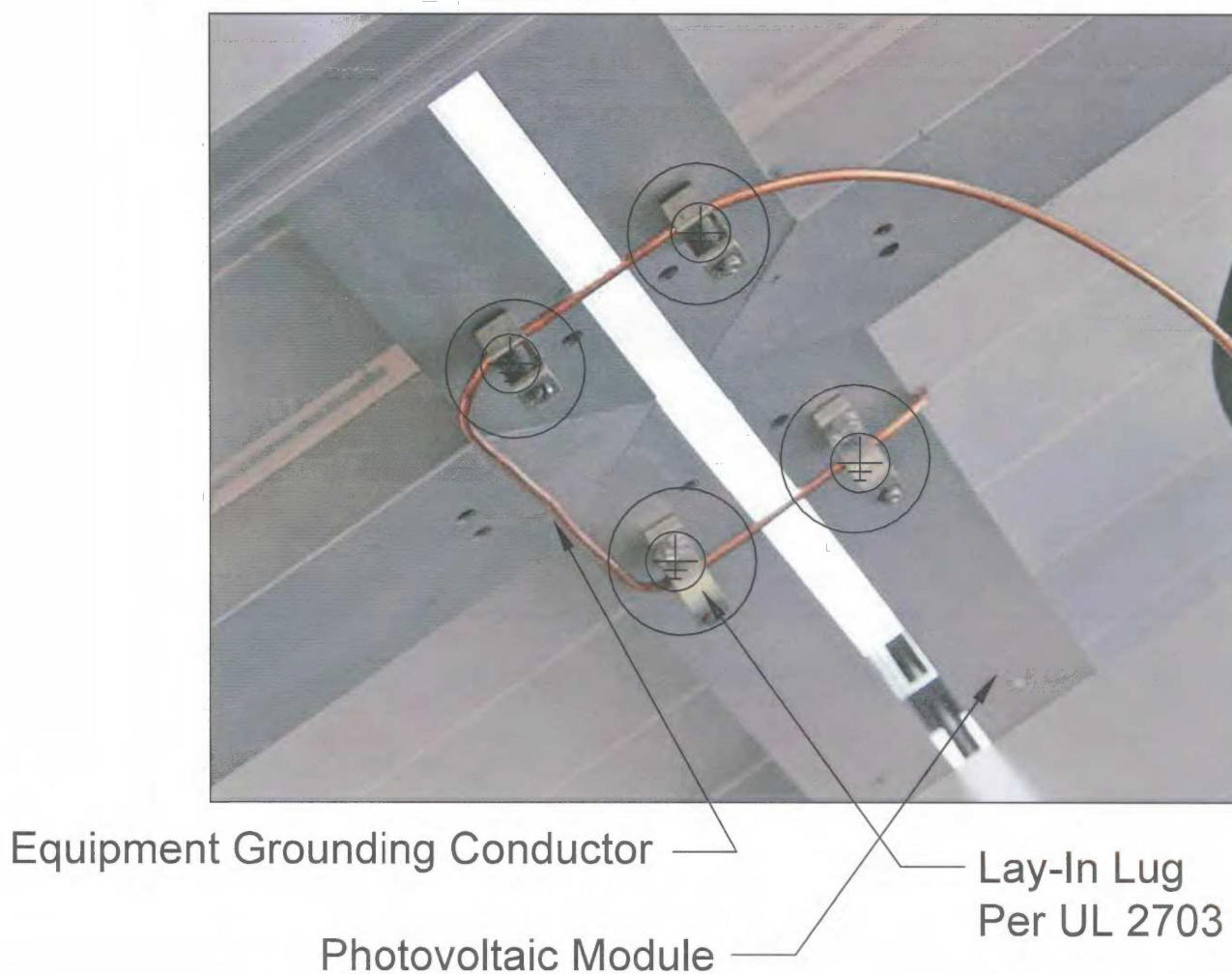
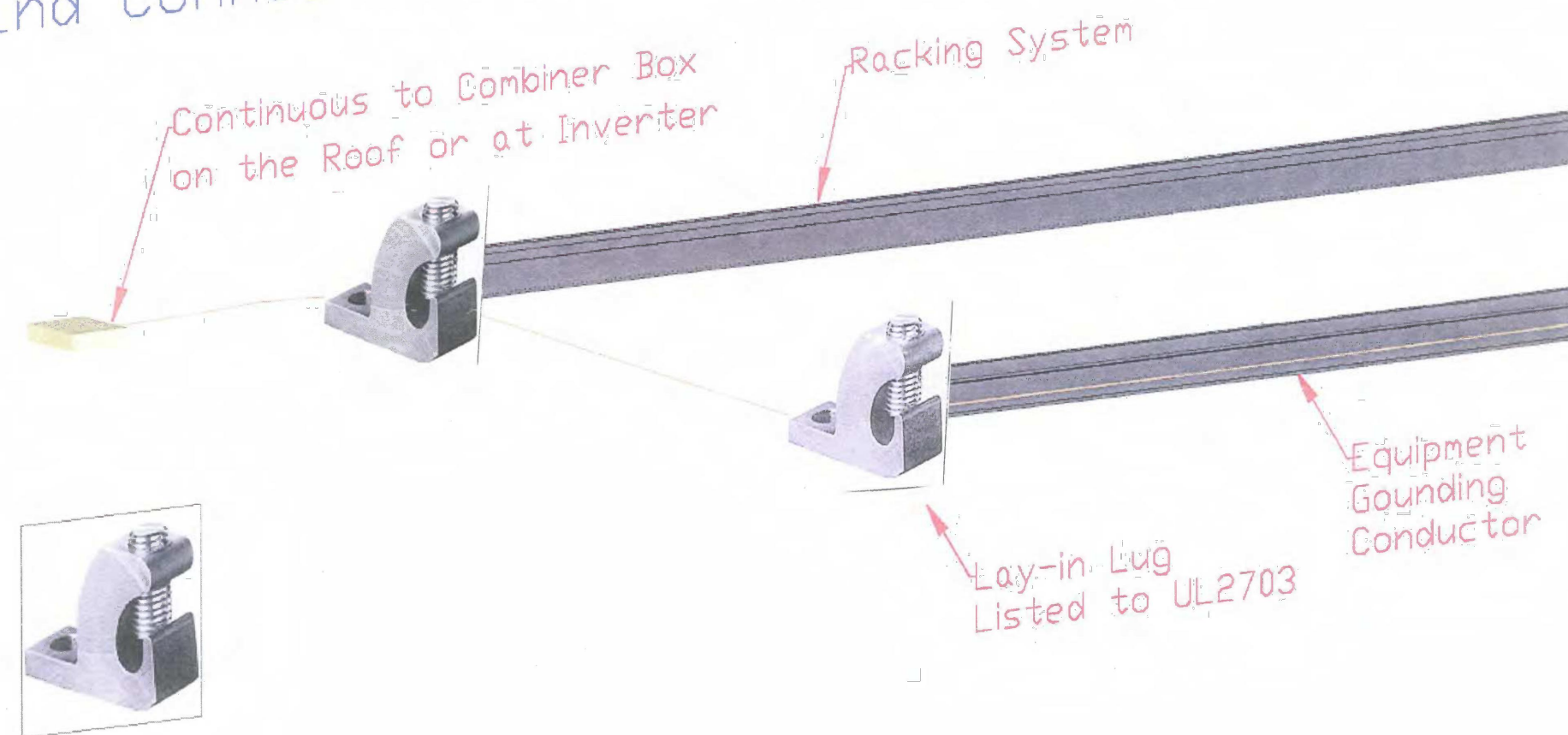
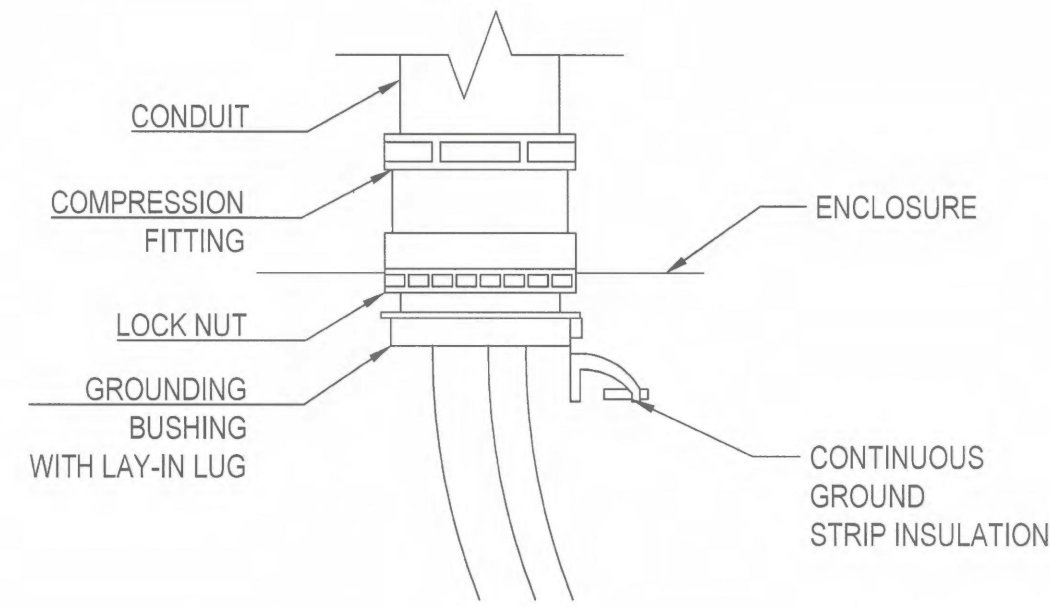
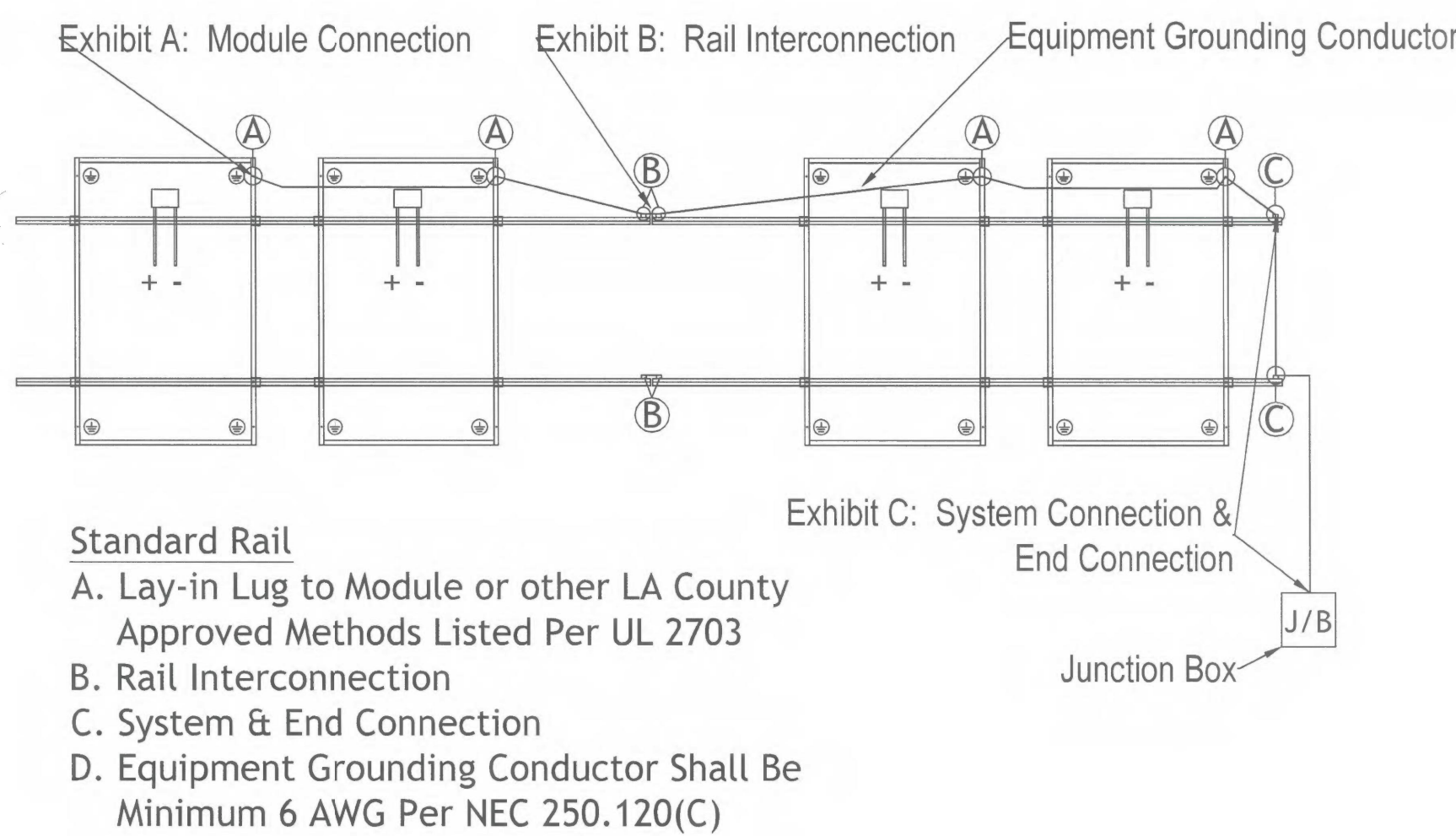


Exhibit C: System Connection (Rack to Rack) &
End Connection (Combiner Box / Junction Box)




① Photovoltaic Array





CONDUIT GROUNDING DETAIL

CIRCUITS MORE THAN 250V TO GROUND MUST HAVE GROUNDING BUSHING PER NEC 250.97



Dual Rated Lay-In Ground Lug





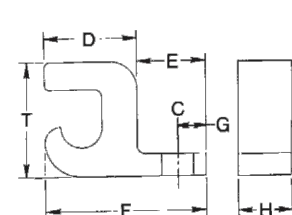
TYPE GBL

Features

- Manufactured from high strength 6061-T6 aluminum alloy
- Electro-plate plated
- Lay-in feature

Benefits

- Suitable for use with copper or aluminum conductors
- Provides low contact resistance
- Provides ease of installation



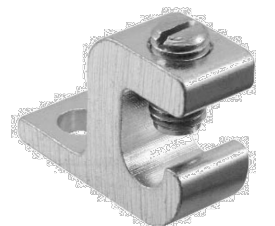


Fig. 1

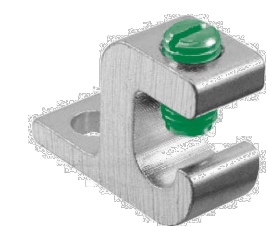


Fig. 2




Fig. 3

Catalog Number	Figure Number	Ground Wire Range	Bolt Size	Dimensions							Max Size
C	D	E	F	G	H	T					
* GBL-4	1	4-14	1/8	7/32	5/8	31/64	1-3/32	13/64	25/64	51/64	Slot
* GBL-4SS	2	4-14	1/8	7/32	5/8	31/64	1-3/32	13/64	25/64	51/64	Slot
GBL-10	2	10-14	1/4	9/32	51/64	27/32	1-5/8	71/8	5/8	1-5/32	Slot
GBL-250	3	250kcmil-6	1/4	9/32	31/64	1	2-31/64	25/64	7/8	1-23/32	7/32

All wire sizes, unless noted otherwise, are American Wire Gauge (AWG)

UL File #25440

* UL 467 and UL 486A/B Listed

* UL 467 Listed

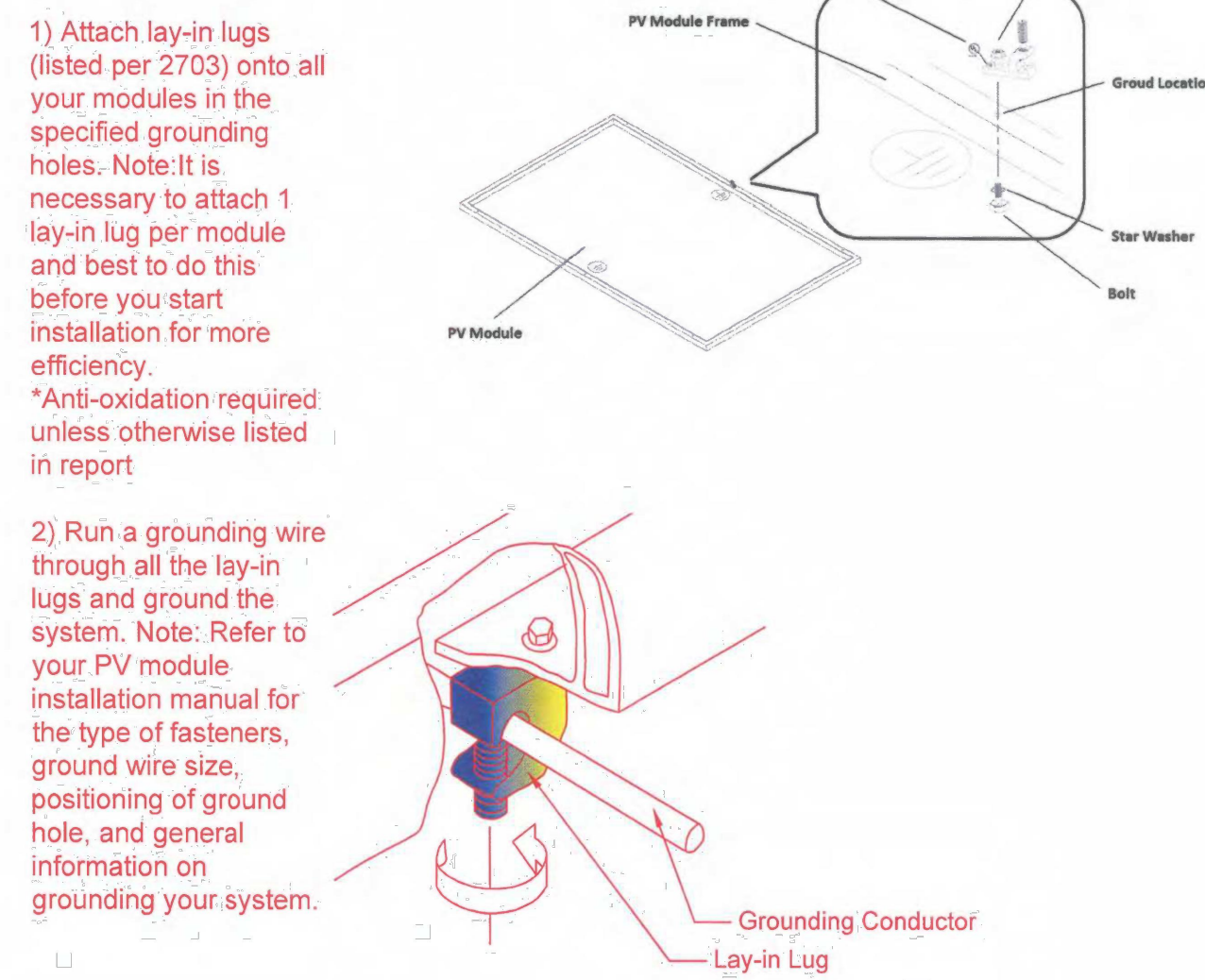
* IEC 455 is UL 27703 Listed UL E264040 Vol. 2

* Supplied with stainless steel hardware. Meets ASTM B111-03 and is resistant to outdoor salt spray

DE OX® oxide inhibitor is recommended for all aluminum terminations

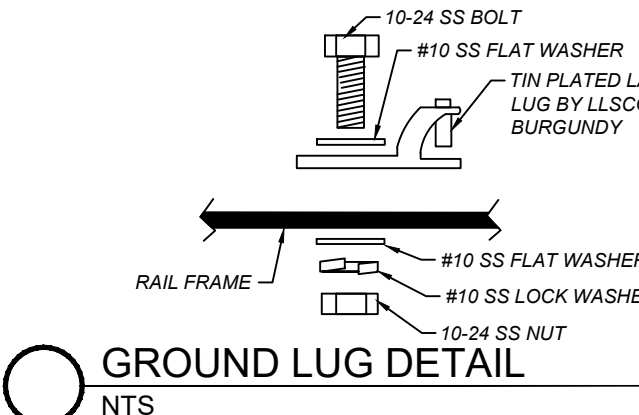
Optional NM-Series mounting hardware kit available, consult IEC20

All wire sizes, unless noted otherwise, are American Wire Gauge (AWG) (UL File E24400)
* UL 467 and UL 486A/B Listed
* UL 467 Listed
* GBL-4SS is UL 2703 Listed (UL E36420 Vol. 2)
* Supplied with stainless steel hardware. Meets ASTM B117-09 and is resistant to outdoor salt spray
DE-OX® oxide inhibitor is recommended for all aluminum terminations
Optional NH Series mounting hardware kits available, consult ILSCO



1) Attach lay-in lugs (listed per 2703) onto all your modules in the specified grounding holes. Note: It is necessary to attach 1 lay-in lug per module and best to do this before you start installation for more efficiency.
*Anti-oxidation required unless otherwise listed in report

2) Run a grounding wire through all the lay-in lugs and ground the system. Note: Refer to your PV module installation manual for the type of fasteners, ground wire size, positioning of ground hole, and general information on grounding your system.



GROUNDING NOTE:
EACH MODULE SHALL BE GROUNDED USING THE SUPPLIED CONNECTION POINT IDENTIFIED ON THE MODULE AND THE MANUFACTURER'S INSTRUCTIONS.

GROUNDING NOTES

EQUIPMENT GROUND:
IN ADDITION TO THE EQUIPMENT GROUNDING CONDUCTORS RUN WITH THE PV SYSTEM CONDUCTORS, A GROUNDING CONDUCTOR SHALL BE PROVIDED FROM THE PV ARRAY TO A GROUNDING ELECTRODE SYSTEM ESTABLISHED AT THAT GROUND MOUNT.
PROVIDE #6 GEC TO 2 GROUND RODS, MIN 6 FT APART LOCATED AT THE ARRAY STRUCTURE.

PLEASE NOTE THAT THIS IS AN UNGROUNDED SOLAR INVERTER SYSTEM. THIS MEANS NEITHER THE POSITIVE NOR THE NEGATIVE PV WIRE WILL NEED TO BE GROUNDED. AN EQUIPMENT GROUND IS REQUIRED HOWEVER. ALL EXPOSED EGC CONDUCTORS SHALL BE #6 COPPER WIRE. WHEN PROTECTED IN CONDUIT, #8 EGC IS ACCEPTABLE.

EACH MODULE SHALL BE GROUNDED USING THE SUPPLIED CONNECTION POINT IDENTIFIED ON THE MODULE AND THE MANUFACTURER'S INSTRUCTIONS. OTHER NRTL APPROVED METHODS MAY BE USED AS AN ALTERNATIVE.

ARRAY BONDING DETAILS
NTS

GROUNDING AND BONDING REQUIREMENTS
NTS

PROJECT HOST:



CATALINA ISLAND CONSERVANCY

708 Crescent Ave.
Avalon, CA 90704

EPC SATTTLER SOLAR AND ELECTRICAL CONTRACTORS

4770 Del Mar Ave. San Diego, CA
TEL: +1 619 680 5445 www.sattler.com
LIC # 1017454

ERIK SATTTLER, SATTTLER SOLAR INC. LIC. # 1017454 (C-10)

PERMITTING AND SOLAR CONSULTANT:



CATALINA ISLAND CONSERVANCY
125 kW (AC)
SOLAR PV
1 AIRPORT RD.
AVALON, CA 90704

Revision Date

90% CONSTRUCTION DOCUMENTS	10/23/2023
PLAN CHECK #4	1/30/2024
BIOLOGIST REPORT REVISION	3/15/2024

Date	01/02/2023
Job No.	1511
Drawn By	LS
Checked By	ES
Scale	

CONSTRUCTION DOCUMENTS

Drawing Title
SOLAR INSTALLATION DETAILS

Drawing No.

PV-3.2

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 installations
 - Six MPPT trackers for flexible stringing and maximum power production
 - OptiMax™ Global Peak shade tolerant MPPT tracking
- Enhanced safety, reliability**
- Integrated SunSpec PIC signal for modularized rapid shutdown compliance to 2017 NEC
 - Navigation DC-APC on-fault protection certified to new Standard UL 1699B
- Smart monitoring, control, service**
- Advanced smart inverter grid support capabilities
 - Increased ROI with SMA enexOS 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 expanding legacy solar projects. New with expanded features and new power classes, the CORE1 is the most versatile, cost-effective commercial solution available. From distribution to construction to operation, the Sunny Tripower CORE1 enables logistical, material, labor and service cost reductions. Integrated SunSpec PIC for rapid shutdown and enhanced DC-APC are fault protection ensure compliance to the latest safety codes and standards. With Sunny Tripower CORE1 and SMA's enexOS 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	1000 V	1000 V
Rated MPPT voltage range	330 V...800 V	500 V...800 V	550 V...800 V
MPPT operating voltage range	150 V...1000 V	150 V...1000 V	150 V...1000 V
Minimum DC voltage / start voltage	150 V / 188 V	150 V / 188 V	150 V / 188 V
MPPT trackers / strings per MPPT input	6 / 2	6 / 2	6 / 2
Maximum operating input current / per MPPT tracker	130 A / 20 A	130 A / 20 A	130 A / 20 A
Maximum short circuit current per MPPT / per string input	30 A / 30 A	30 A / 30 A	30 A / 30 A
Output (AC)			
AC nominal power	33300 W	50000 W	62500 W
Maximum apparent power	33300 VA	50000 VA	62500 VA
Output phases / line connections	3 / 3 (3P/3E)	3 / 3 (3P/3E)	3 / 3 (3P/3E)
Nominal AC voltage	480 V / 277 V WYE	480 V / 277 V WYE	480 V / 277 V WYE
AC voltage range	244 V...305 V	244 V...305 V	244 V...305 V
Maximum output current	40 A	64 A	79.5 A
Rated grid frequency	60 Hz	60 Hz	60 Hz
Grid frequency / range	50 Hz, 60 Hz / 0 Hz...+6 Hz	50 Hz, 60 Hz / 0 Hz...+6 Hz	50 Hz, 60 Hz / 0 Hz...+6 Hz
Power factor of rated power / adjustable displacement	1 / 0.0 leading...0.0 lagging	1 / 0.0 leading...0.0 lagging	1 / 0.0 leading...0.0 lagging
Harmonics THD	<3%	<3%	<3%
Efficiency			
CEC efficiency (preliminary)	97.5%	98%	98%
Protection and safety features			
Load rated DC disconnect	•	•	•
Load rated AC disconnect	•	•	•
Ground fault monitoring: Res / Differential current	•	•	•
DC-APC on-fault protection	•	•	•
SunSpec PIC signal for rapid shutdown	•	•	•
DC reverse polarity protection	•	•	•
AC short circuit protection	•	•	•
DC surge protection: Type 2 / Type 1+2	•	•	•
AC surge protection: Type 2 / Type 1+2	•	•	•
Protection class / overvoltage category (in per UL 84C)	1 / IV	1 / IV	1 / 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)	621 mm / 733 mm / 569 mm (24.4 in x 28.8 in x 22.4 in)	621 mm / 733 mm / 569 mm (24.4 in x 28.8 in x 22.4 in)
Device weight	84 kg (185 lb)	84 kg (185 lb)	84 kg (185 lb)
Operating temperature range	-25 °C...+60 °C (-13 °F...+140 °F)	-25 °C...+60 °C (-13 °F...+140 °F)	-25 °C...+60 °C (-13 °F...+140 °F)
Storage temperature range	-40 °C...+70 °C (-40 °F...+158 °F)	-40 °C...+70 °C (-40 °F...+158 °F)	-40 °C...+70 °C (-40 °F...+158 °F)
Audible noise emissions (at power @ 1m and 25 °C)	65 dB(A)	65 dB(A)	65 dB(A)
Internal consumption at night	5 W	5 W	5 W
Topology	Transformerless	Transformerless	Transformerless
Cooling Concept	OptiCool (forced convection, variable speed fans)	OptiCool (forced convection, variable speed fans)	OptiCool (forced convection, variable speed fans)
Enclosure protection rating	Type 4X, 3X (in per UL 50E)	Type 4X, 3X (in per UL 50E)	Type 4X, 3X (in per UL 50E)
Maximum permissible relative humidity (non-condensing)	100%	100%	100%
Additional information			
Mounting	Free-standing with included mounting feet	Free-standing with included mounting feet	Free-standing with included mounting feet
DC connection	Amphenol UTPI PV connectors	Amphenol UTPI PV connectors	Amphenol UTPI PV connectors
AC connection	Screw terminals: 4 AWG to 4/0 AWG CU/AL	Screw terminals: 4 AWG to 4/0 AWG CU/AL	Screw terminals: 4 AWG to 4/0 AWG CU/AL
LED indicators (Status / Fault / Communication)	•	•	•
Network interfaces (Ethernet / WLAN / RS485)	•	•	•
Data protocols: SMA Modbus / SunSpec Modbus / Waicomnet	•	•	•
Multi-function relay	•	•	•
Outflow Global Peak (shade tolerant MPPT tracking)	•	•	•
Integrated Part Control / Q on Demand 2.0 / 7	•	•	•
CE-Grid compatible / SMA Fuel-Save Controller compatible	•	•	•
SMA Smart Connected (operative monitoring and service support)	•	•	•
Certifications (pending as of June 2023)			
Certifications and approvals	UL 1741, UL 1699B, UL 1998, IEEE 1547, CAN/CSA C22.2 No. 62109	UL 1741, UL 1699B, UL 1998, IEEE 1547, CAN/CSA C22.2 No. 62109	UL 1741, UL 1699B, UL 1998, IEEE 1547, CAN/CSA C22.2 No. 62109
CEC compliance	CEC Rule 10 Class A	CEC Rule 10 Class A	CEC Rule 10 Class A
Grid interconnection standards	UL 1741 SA - CA Rule 21, IEEE C92.4, IEEE C92.5, IEEE C92.6, IEEE C92.7, IEEE C92.8, IEEE C92.9, IEEE C92.10, IEEE C92.11, IEEE C92.12, IEEE C92.13, IEEE C92.14, IEEE C92.15, IEEE C92.16, IEEE C92.17, IEEE C92.18, IEEE C92.19, IEEE C92.20, IEEE C92.21, IEEE C92.22, IEEE C92.23, IEEE C92.24, IEEE C92.25, IEEE C92.26, IEEE C92.27, IEEE C92.28, IEEE C92.29, IEEE C92.30, IEEE C92.31, IEEE C92.32, IEEE C92.33, IEEE C92.34, IEEE C92.35, IEEE C92.36, IEEE C92.37, IEEE C92.38, IEEE C92.39, IEEE C92.40, IEEE C92.41, IEEE C92.42, IEEE C92.43, IEEE C92.44, IEEE C92.45, IEEE C92.46, IEEE C92.47, IEEE C92.48, IEEE C92.49, IEEE C92.50, IEEE C92.51, IEEE C92.52, IEEE C92.53, IEEE C92.54, IEEE C92.55, IEEE C92.56, IEEE C92.57, IEEE C92.58, IEEE C92.59, IEEE C92.60, IEEE C92.61, IEEE C92.62, IEEE C92.63, IEEE C92.64, IEEE C92.65, IEEE C92.66, IEEE C92.67, IEEE C92.68, IEEE C92.69, IEEE C92.70, IEEE C92.71, IEEE C92.72, IEEE C92.73, IEEE C92.74, IEEE C92.75, IEEE C92.76, 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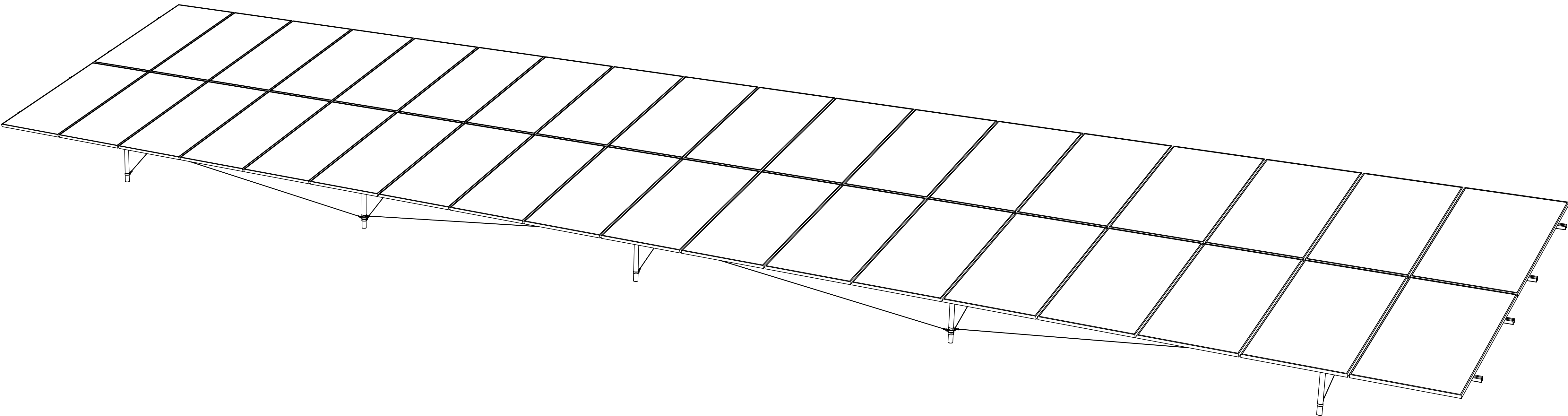


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SHEET INDEX

STRUCTURAL		
S.000	E	STRUCTURAL COVER
S.100	B	RACKING OVERVIEW
S.101	A	RACKING OVERVIEW ON SLOPE
S.300	A	STRUCTURAL PURLINS
S.400	B	CONNECTIONS OVERVIEW
S.500	A	FOUNDATION POST & BRACING OVERVIEW

GOVERNING STRUCTURAL CODE/S

2021 INTERNATIONAL BUILDING CODE
2022 CALIFORNIA BUILDING CODE

PACKAGE COVERAGE – LOADING AND SETUP RANGES & CONSTANTS

TILT ANGLES: 15°
MAX GROUND SNOW LOAD (PSF): 0
MAX WIND LOADS (MPH): 101
WIND EXPOSURE CATEGORY: C
MAX SEISMIC Ss: 3.730 g
MAX SEISMIC S1: 1.390 g

PV MODULE: CANADIAN SOLAR/CS6W-XXX-MB/AG
OR SIMILAR

MAX. PANEL WIDTH: 44.65"
MAX. PANEL LENGTH: 89.21"
MAX. PANEL HEIGHT: 2.00"
MAX. PANEL WEIGHT: 71.00 LBS

RISK CATEGORY: I
MAX FRONT LIP CLEARANCE: 42"

*PER USGS MIN/MAX DESIGN VALUES FOR REGIONS, VALUES BASED
ON MAX VALUES IN UNITED STATES. SEISMIC DOES NOT LIMIT DESIGN.

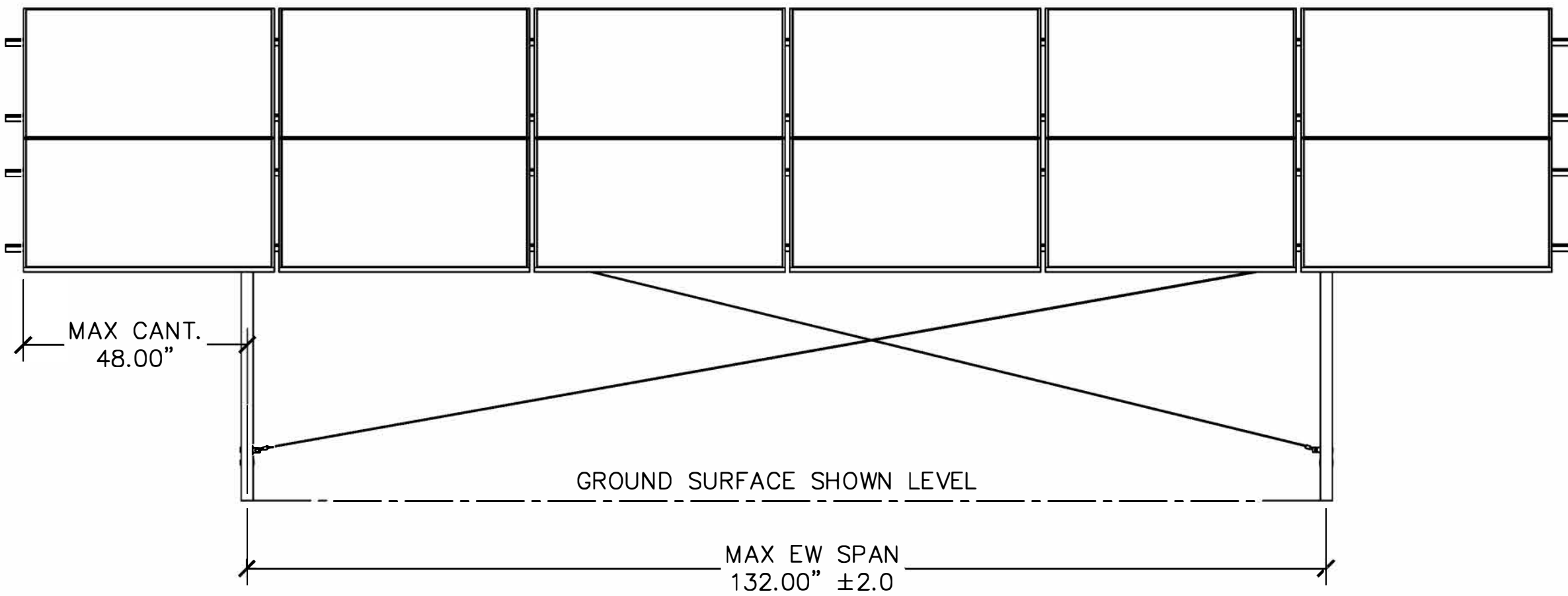
REFERENCES:

–Albus, 2024a, Supplemental Geotechnical
Recommendation, Foundation Plan, Proposed Solar
Panel Array Development, 1 Airport Road, Avalon,
California, prepared by Albus and Associates,
dated October 21, 2024, JN: 3155.01

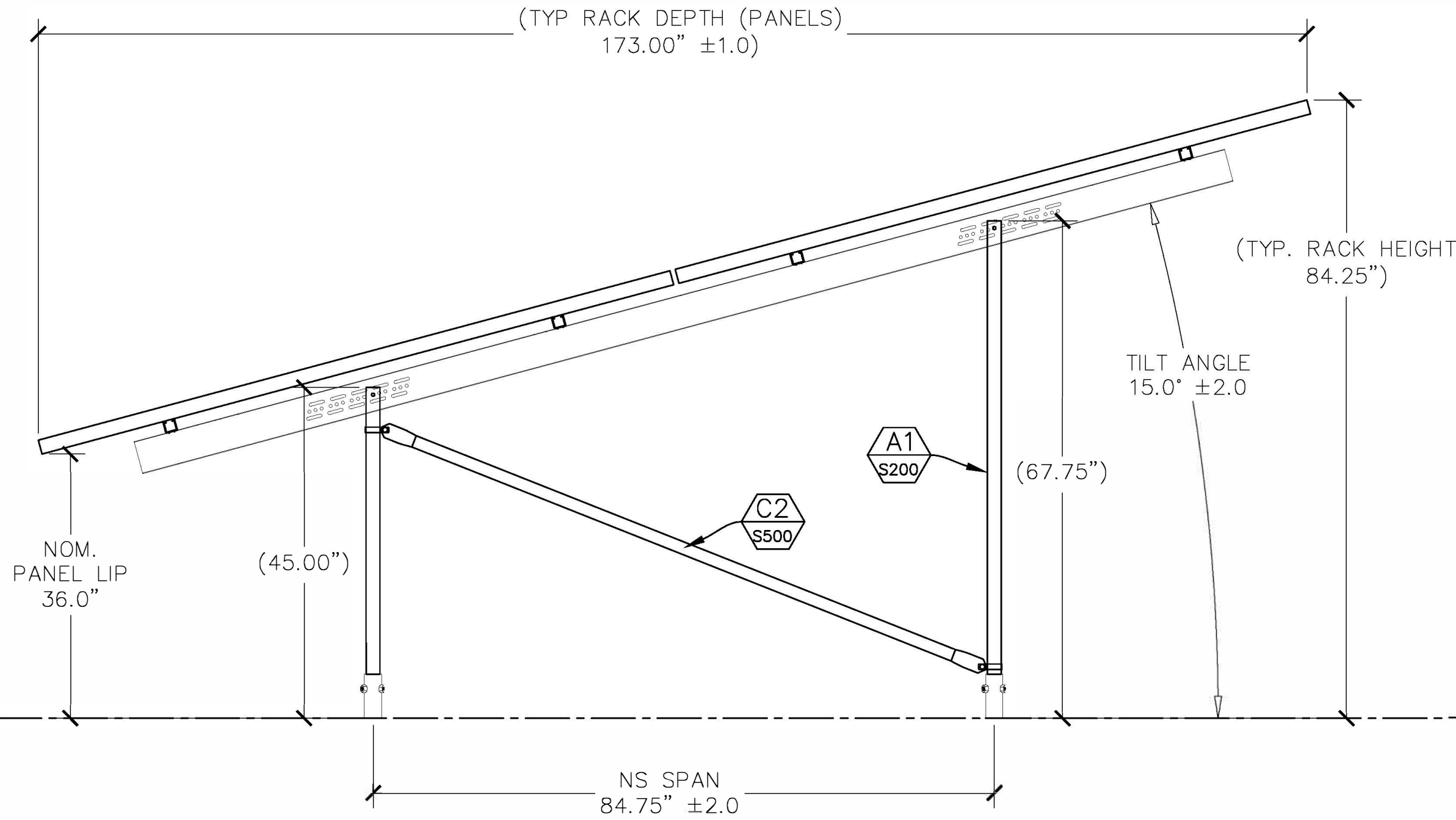
–Albus, 2024b, Geotechnical Review of the
Structural/Foundation Plan, Proposed Solar Panel
Array Development, 1 Airport Road, Avalon,
California, prepared by Albus and Associates,
dated October 8, 2024, JN 3155.01

–Albus, 2023, Geotechnical Design Report,
Proposed Solar Panel Array Development, 1 Airport
Road, Avalon, California, prepared by Albus and
Associates, dated May 30, 2023, JN 3155.00

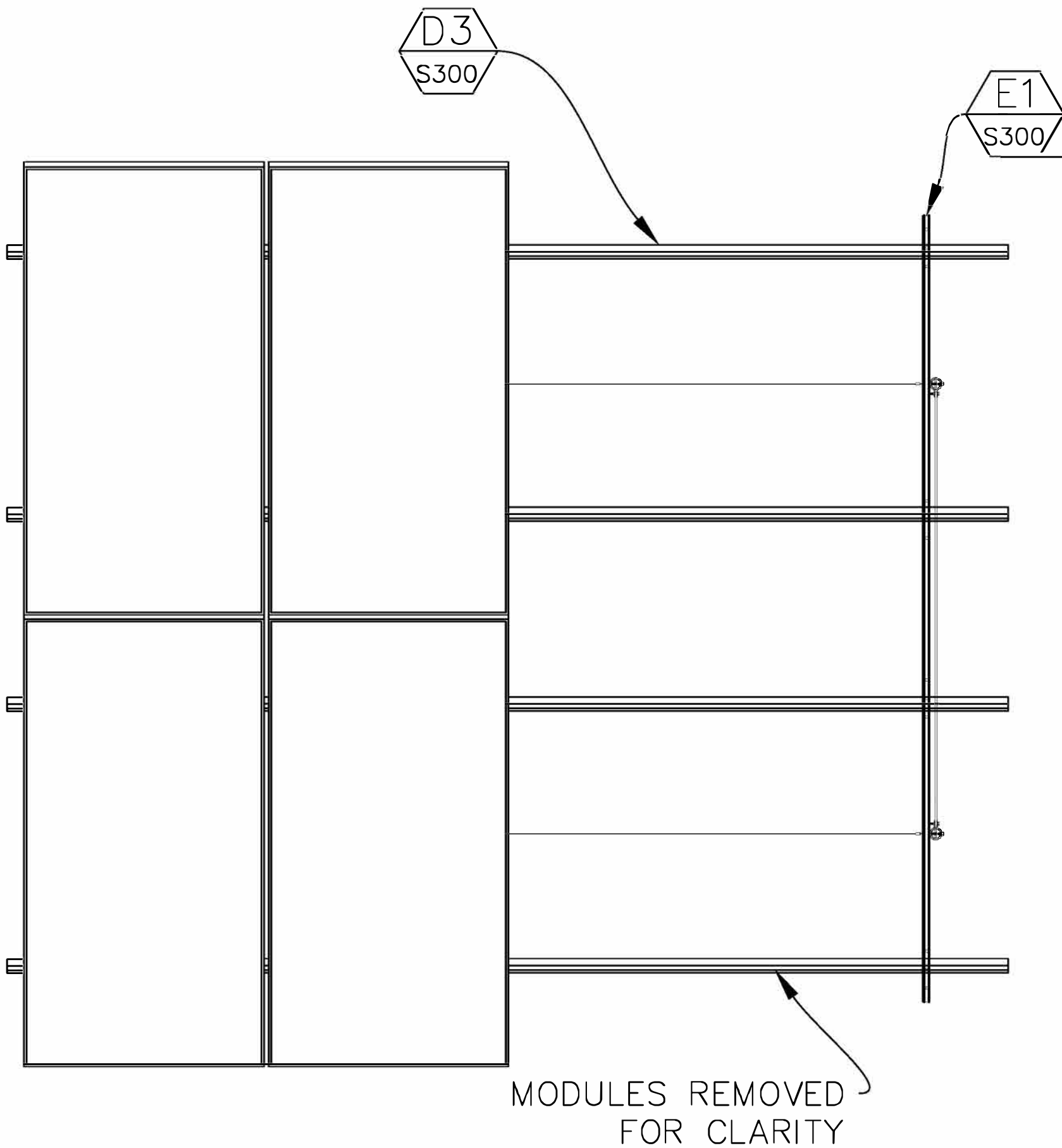
*IMAGE REFERENCE ONLY.SHOWS STRUCTURAL MAXIMUMS. NOT INDICATIVE OF REQUIRED QUANTITIES.PLEASE REFER TO SITE SPECIFIC BUILD PLANS FOR SITE SPECIFIC REQUIRED SPANS/QUANTITIES.



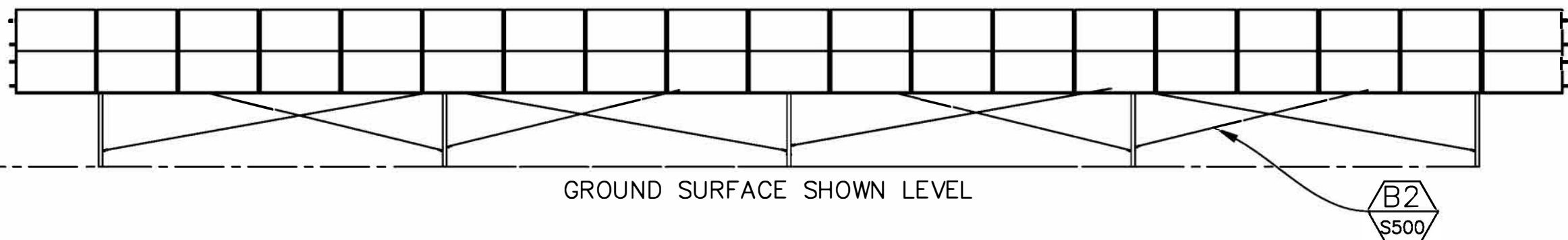
C1 SINGLE CENTER RACK: ELEVATION VIEW



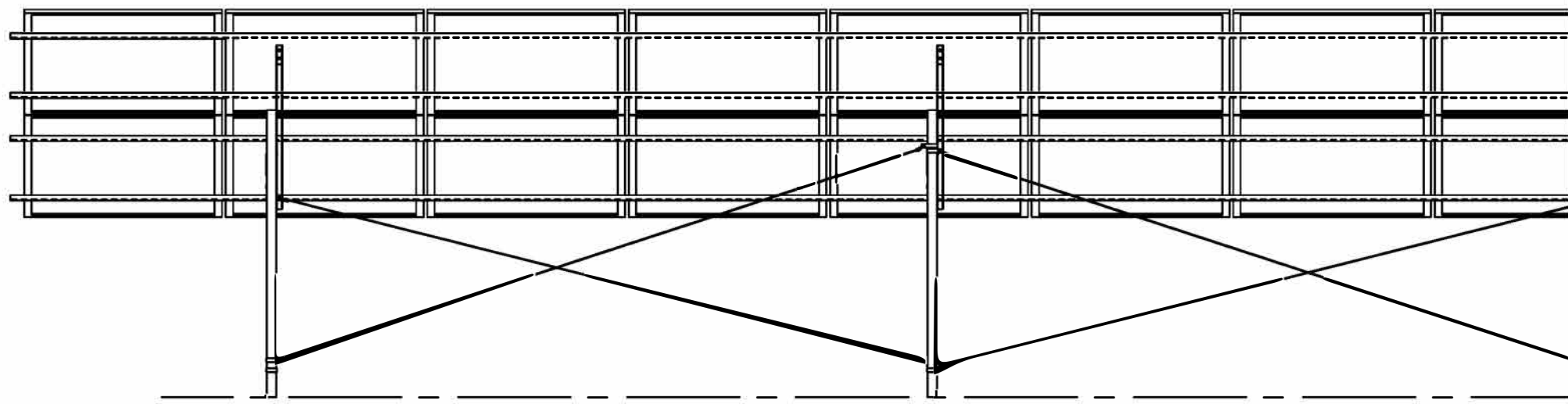
C3 SINGLE CENTER RACK: PROFILE VIEW



A1 SINGLE CENTER RACK: PLAN VIEW



B3 MULTIPLE SECTIONS OF RACKING: SOUTH ELEVATION VIEW



A3 MULTIPLE SECTIONS OF RACKING: NORTH ELEVATION VIEW

- NOTES:
1. STANDARD FRONT LIP HEIGHT AND TILT ANGLES MEASURED FROM LEVEL GROUND
 2. FOUNDATION TESTING, WHERE REQUIRED, SHALL BE DONE ACCORDING TO THE "QUICK TEST METHOD" PER ASTM D1143 & D3689.
 3. PRINT DIMENSIONS: DIMENSIONS SHOWN REFLECT POST HEIGHTS ON LEVEL GROUND. ON UNEVEN TERRAIN, REAR POST HEIGHT WILL BE DICTATED BY FRONT LIP HEIGHT, PANEL TILT, AND NORTH/SOUTH ANCHOR SPACING.
 4. ADDITIONAL TOLERANCES: POST PLUMBNESS SHOULD BE WITHIN $\pm 2"$
 5. SPECIAL INSPECTIONS (WHERE REQUIRED):

SPECIAL INSPECTIONS ARE NOT REQUIRED BY AP ALTERNATIVES OR THE STRUCTURAL ENGINEER OF RECORD. THE JDI GROUP, WHERE REQUIRED BY OWNER, CUSTOMER, AND/OR AUTHORITY HAVING JURISDICTION, MINIMUM INSPECTION SHALL FOLLOW IBC OR LOCAL AHJ SPECIAL INSPECTIONS GUIDELINES.

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Fax: 561.959.5344

PROFESSIONAL SEAL/STAMP

REGISTERED PROFESSIONAL ENGINEER
TIMOTHY JOHN WOLINE
C 63356
Exp. 09-30-2026
Timothy J. Woline
CIVIL
STATE OF CALIFORNIA

11/14/24
SITE NAME: STRUCTURAL PRINT PACKAGE
SITE STREET ADDRESS: 4550 U AIRPORT RD
SITE CITY, STATE, ZIP: AVALON, CA 90704

SHEET REVISIONS		DATE
REV.	DESCRIPTION	
A	INITIAL RELEASE	12/8/2023
B	REVISION CHANGE-LATERAL LOAD	11/5/2024

APPROVED

DRAWN	REVIEWED	APPROVED	SIZE
JK	TM	JDI	D
SHEET NAME			
RACKING OVERVIEW			
PROJECT NUMBER			
220367			
DRAWING NUMBER		REV.	
S.100		B	

1. FOUNDATION TESTING, WHERE REQUIRED, SHALL BE DONE ACCORDING TO THE "QUICK TEST METHOD" PER ASTM D1143 & D3689.
2. PRINT DIMENSIONS: REAR POST HEIGHT WILL BE DICTATED BY FRONT LIP HEIGHT, PANEL TILT, AND NORTH/SOUTH ANCHOR SPACING.
3. ADDITIONAL TOLERANCES: POST PLUMBNESS SHOULD BE WITHIN $\pm 2^{\circ}$
4. SPECIAL INSPECTIONS (WHERE REQUIRED):

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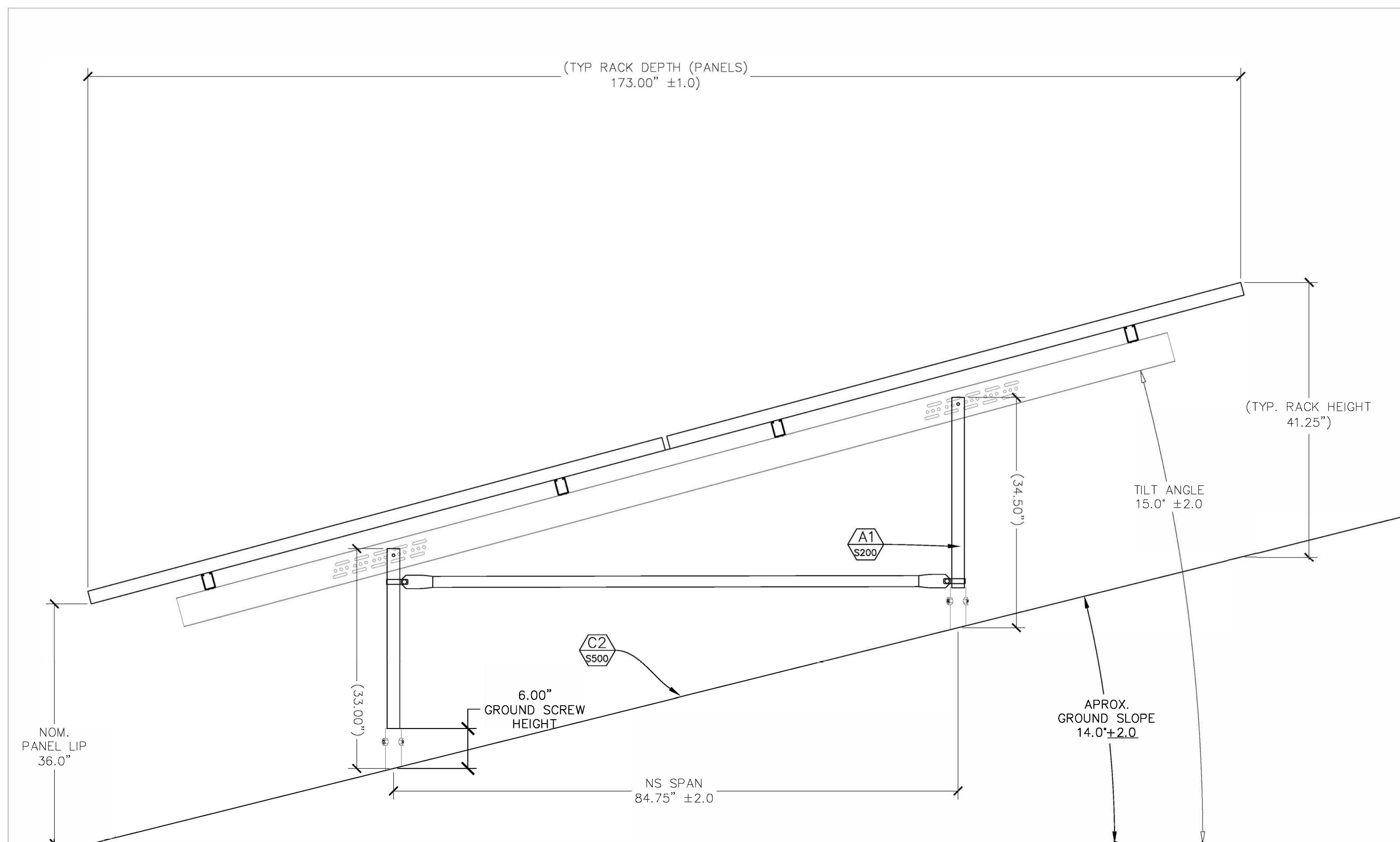
2/29/23

STRUCTURAL PRINT PACKAGE
SITE STREET ADDRESS:
1 AIRPORT RD

SHEET REVISIONS		
REV.	DESCRIPTION	DATE
A	INITIAL RELEASE	12/15/2023

APPROVED

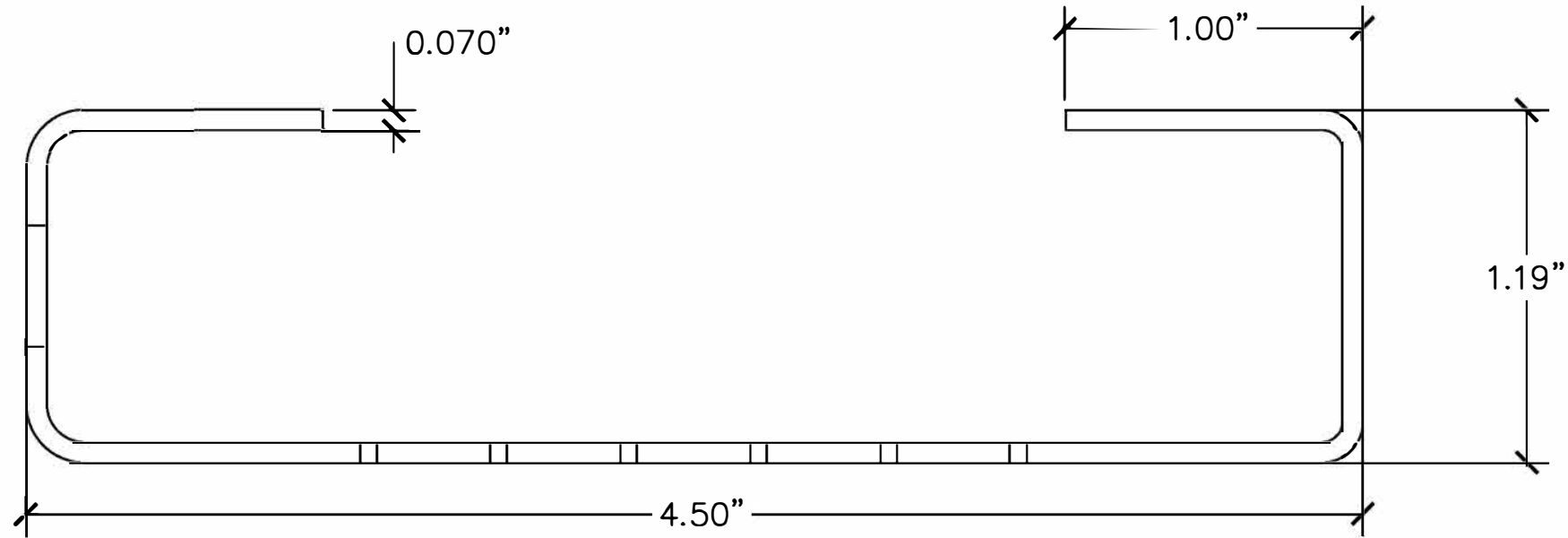
DRAWN	REVIEWED	APPROVED	SIZE
JK	TM	JDI	D
SHEET NAME			
TRACKING OVERVIEW ON SLOPE			
PROJECT NUMBER			
220367			
DRAWING NUMBER			REV.
S.101			A



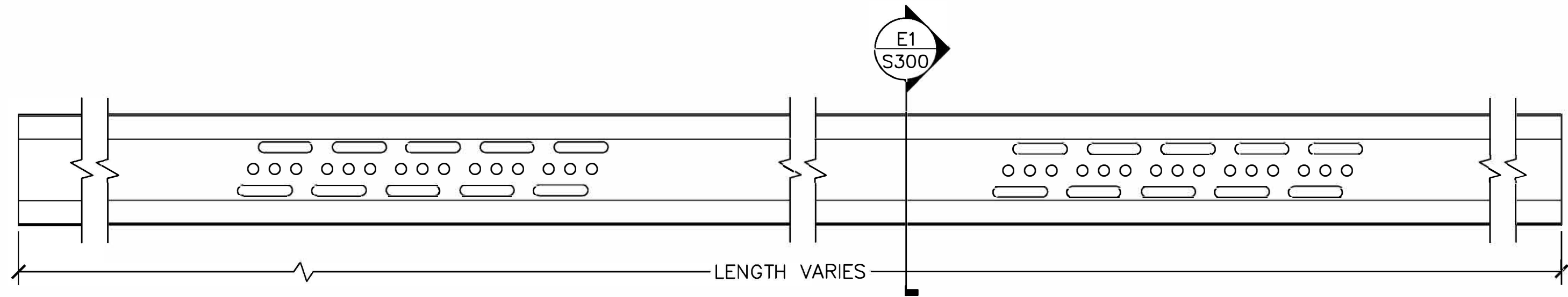
A1	SINGLE CENTER RACK: PROFILE VIEW WITH SLOPED GROUND
----	---

DRAWN	REVIEWED	APPROVED	SIZE
JK	TM	JDI	D
SHEET NAME			
FOUNDATIONS			
PROJECT NUMBER			
220367			
DRAWING NUMBER			REV.
S.200			A

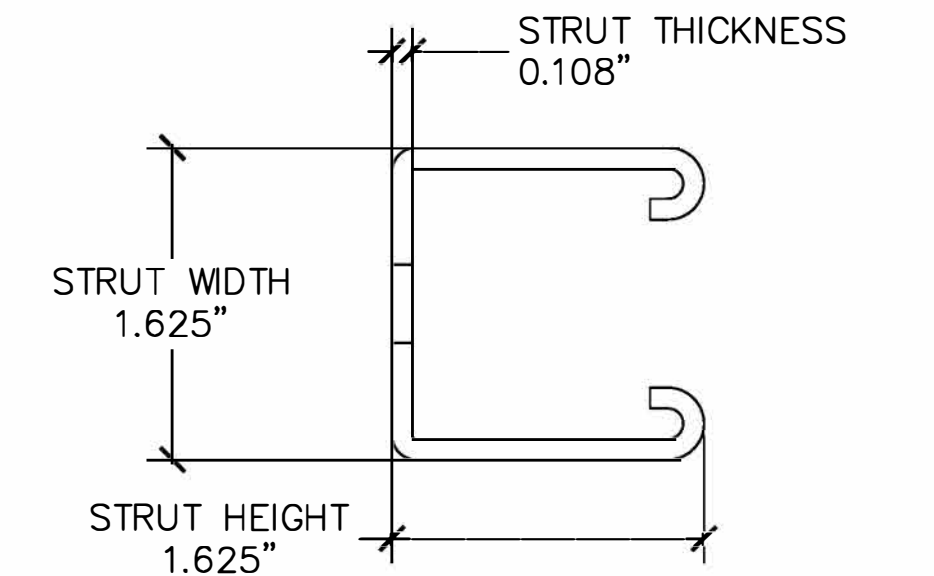
SCALE IS REDUCED WHEN SHEET SIZE IS 11" x 17"



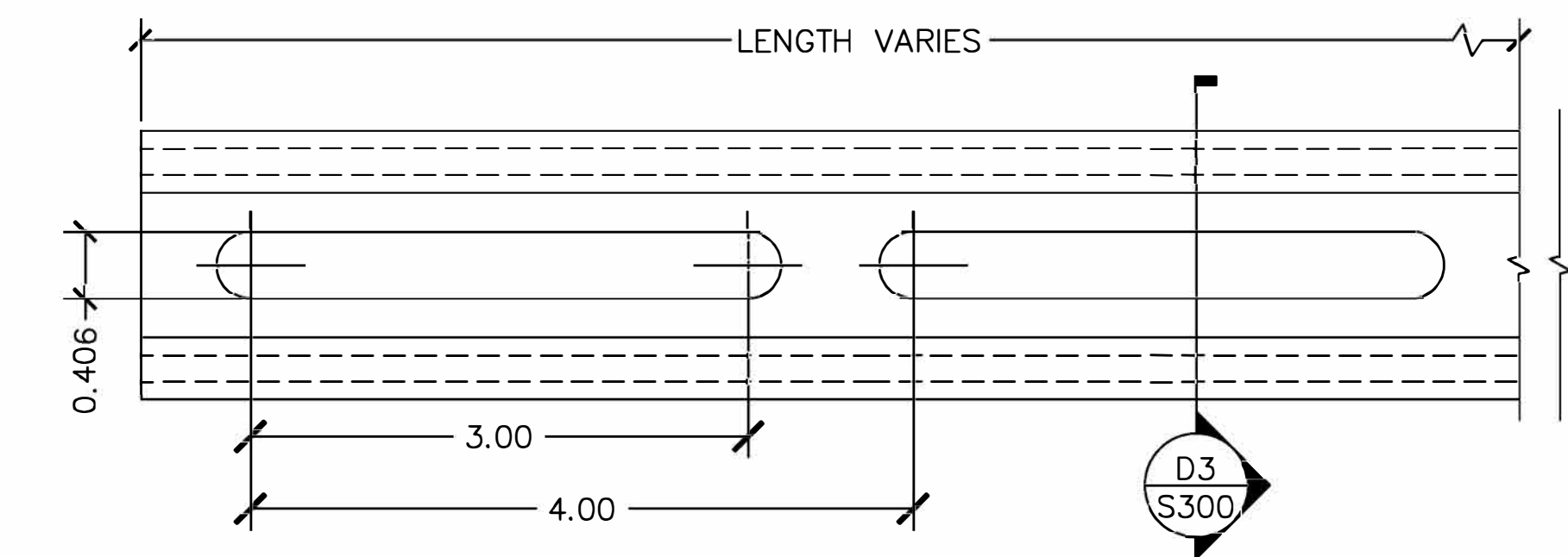
E1 PART: NS (VERTICAL) CEE PURLIN



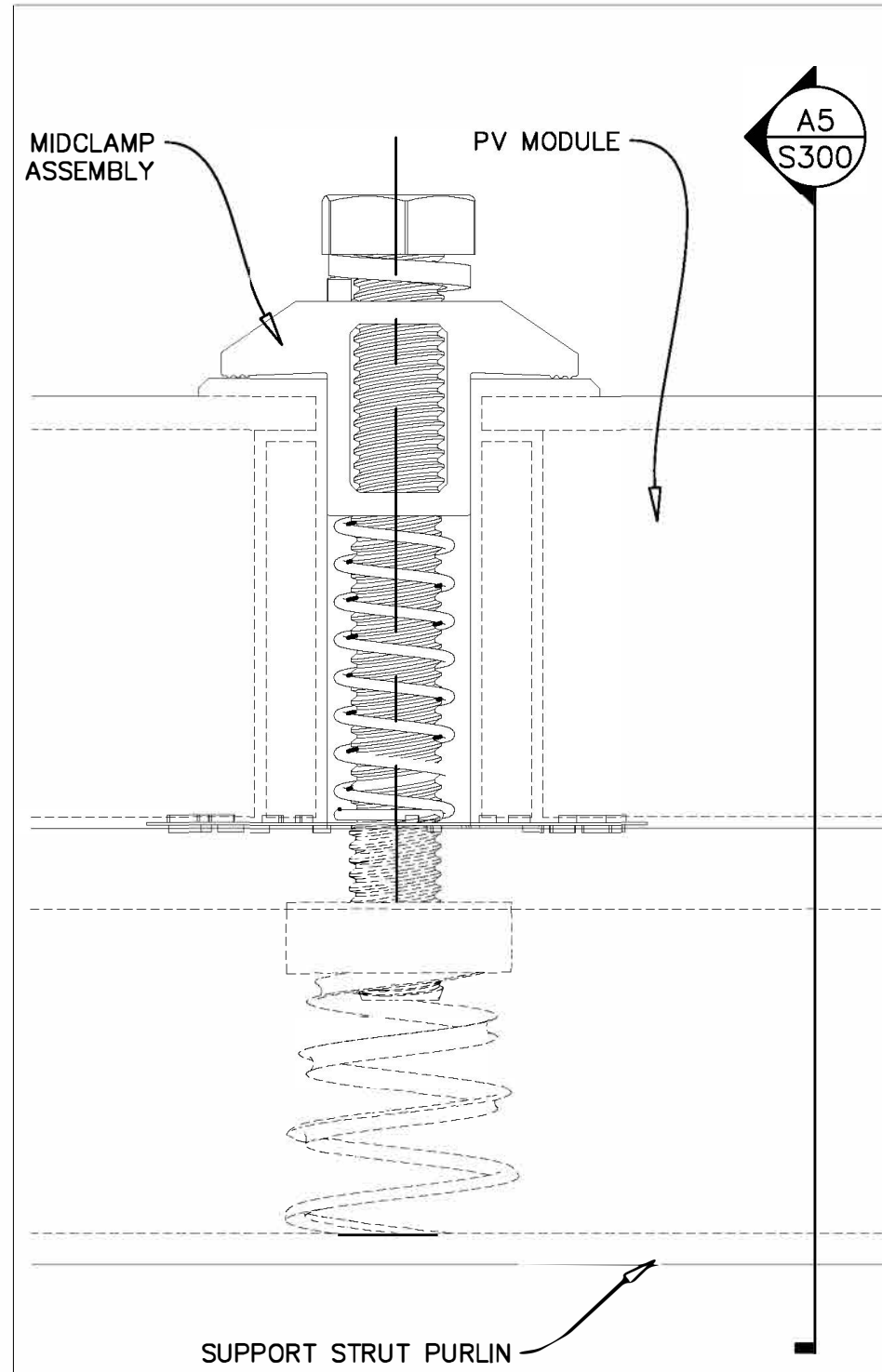
E3 VIEW: NS CEE PURLINS



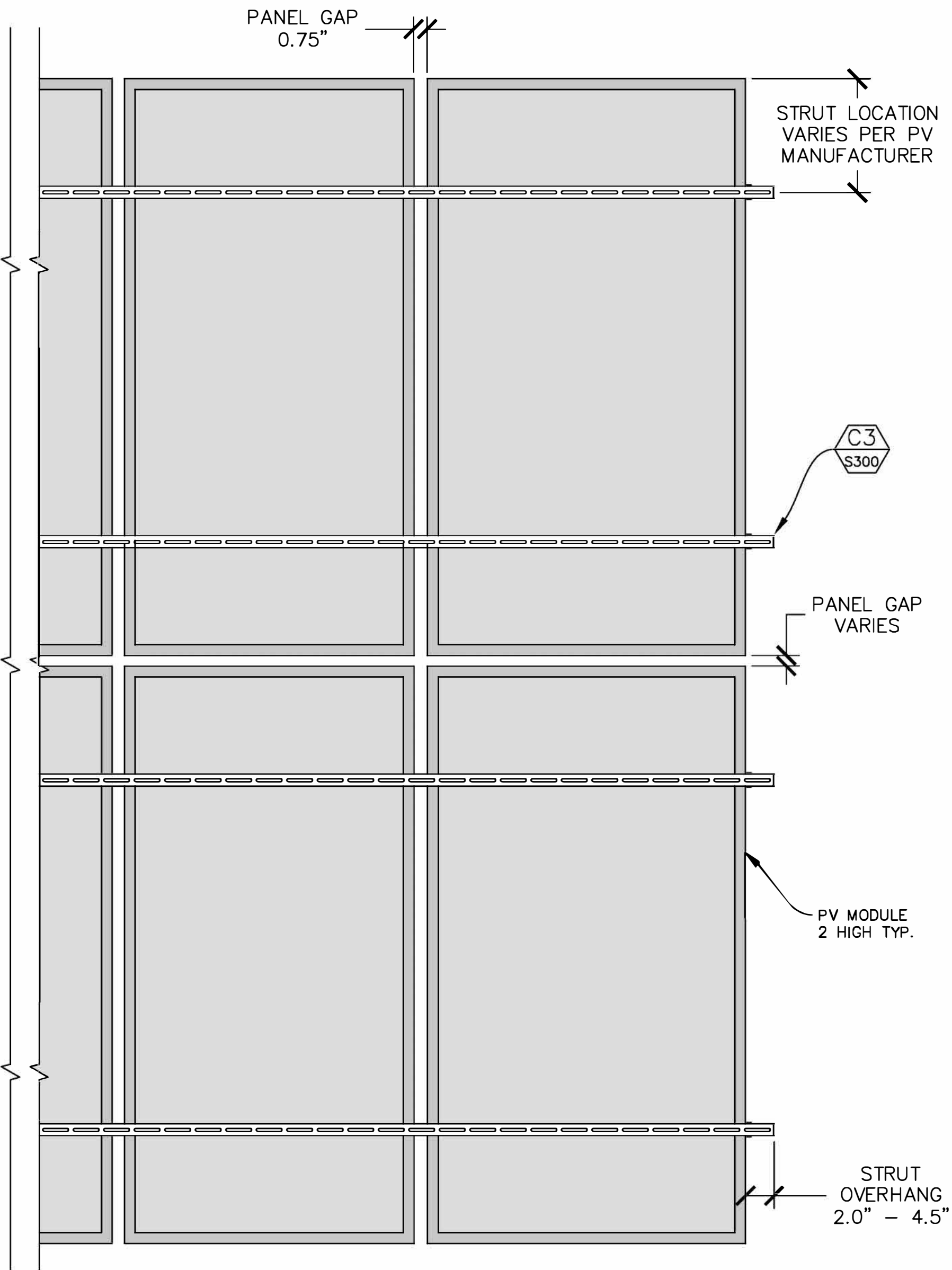
EQ. 12 GA.
D3 SECTION: EW STRUT



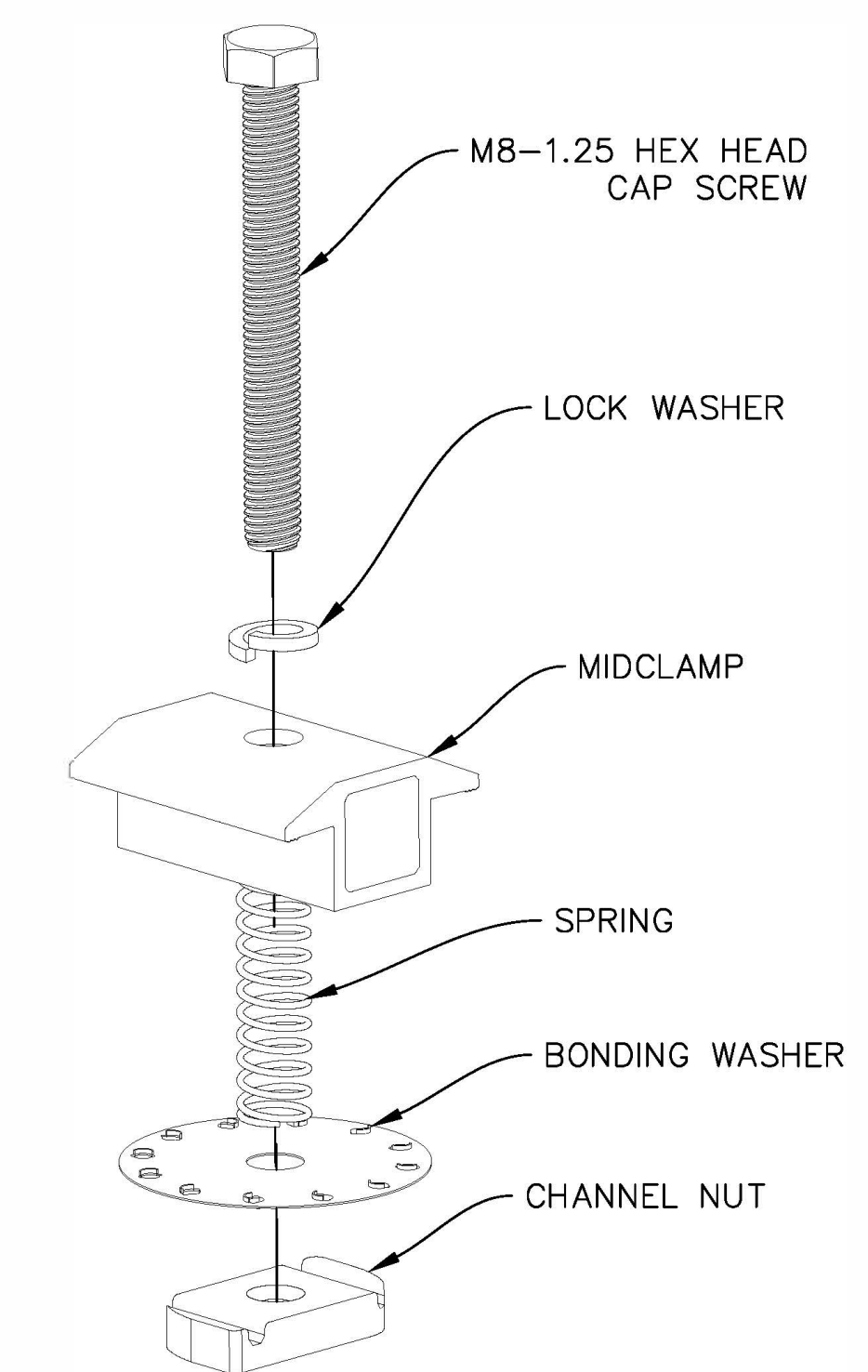
C3 PART: STRUT CHANNEL WITH LONG SLOTS



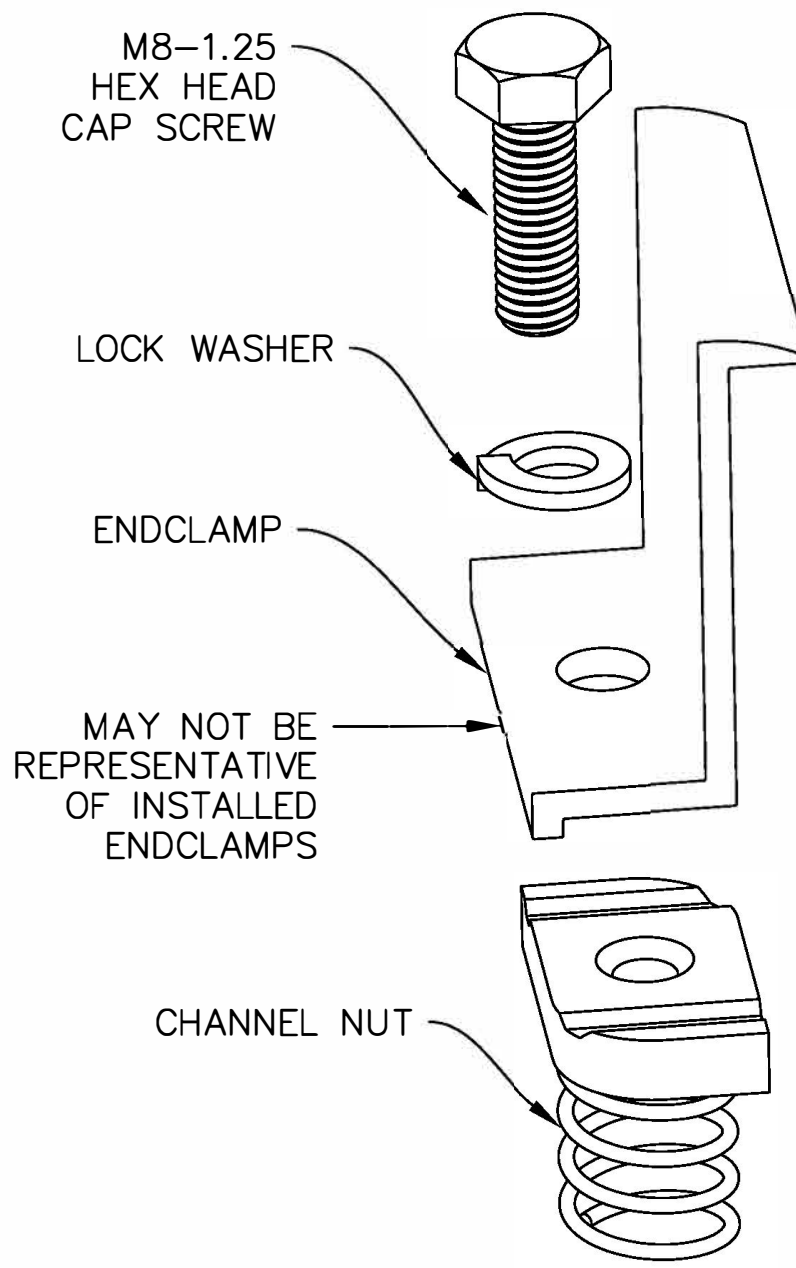
C5 CONNECTION: PV-TO-STRUT



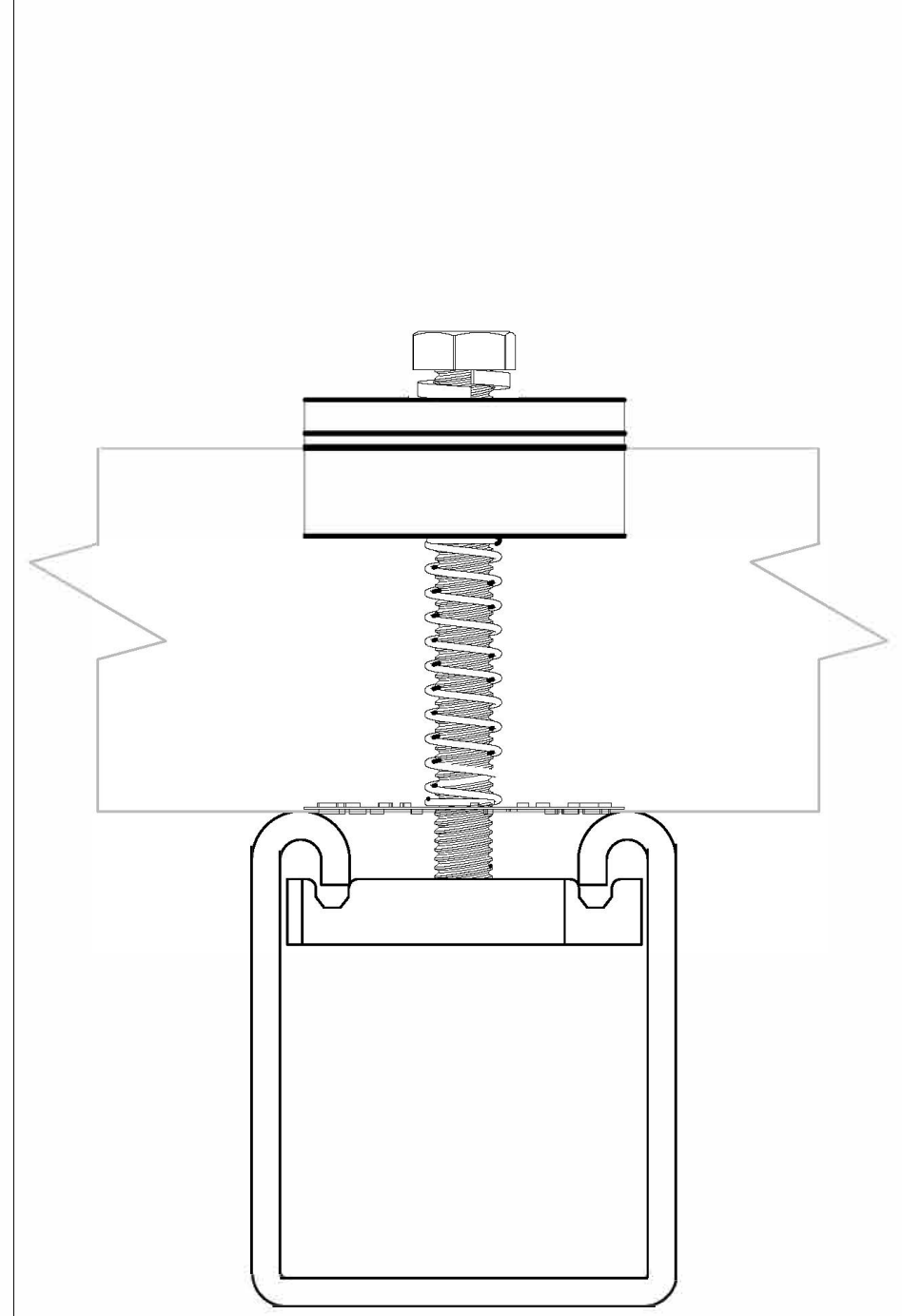
A1 ASSEMBLY: PANELS TO EW STRUTS - BOTTOM VIEW



A3 CONNECTION: MIDCLAMP



A4 CONNECTION: ENDCLAMP



A5 CONNECTION: PV-TO-STRUT

NOTES

1. STRUT PURLIN MATERIAL AND FINISH ARE MANUFACTURED TO SPECIFICATIONS THAT EXCEED OUR STANDARD PRODUCT WARRANTY.
2. STRUT PURLIN GALVANIZED TO CONFORM TO A MINIMUM THICKNESS DESIGNATION EQUAL TO G90 OR INLINE GALVANIZED TO COMPARABLE THICKNESS AS PER ASTM A1057.
3. ALL PURLINS MANUFACTURED USING ASTM A1011/A1011M STRUCTURAL STEEL.
4. MINIMUM STEEL Fy YIELD STRENGTH OF STRUT PURLINS TO BE 50 KSI.
5. MINIMUM STEEL Fy YIELD STRENGTH OF CEE CHANNEL TO BE 60 KSI.
6. SLOT DIMENSIONS FOR REFERENCE ONLY. ALTERNATE HOLE PATTERNS MAY BE SUBSTITUTED.
7. LENGTH OF PURLINS VARIES BY PROJECT AND LOCATION WITHIN ARRAY.
8. PANEL DIMENSIONS VARY. REFER TO MANUFACTURER'S SPEC SHEET.
9. STRUT PLACEMENT IN RELATIONSHIP TO PANEL DICTATED BY MANUFACTURER, SEE MANUFACTURER'S INSTALL MANUAL.
10. CLAMP PLACEMENT DETERMINED BY STRUT PLACEMENT.
11. ENDCLAMPS MUST BE INSTALLED AT BOTH ENDS OF THE ROW, AT THE EAST AND WEST END (TYP.) OF EACH STRUT.
12. STAINLESS STEEL HARDWARE)

NOMINAL TORQUE VALUE
M8-1.25: 15.6 FT-LBS

MIN/MAX TORQUE VALUES
M8-1.25: 14.0 - 32 FT-LBS

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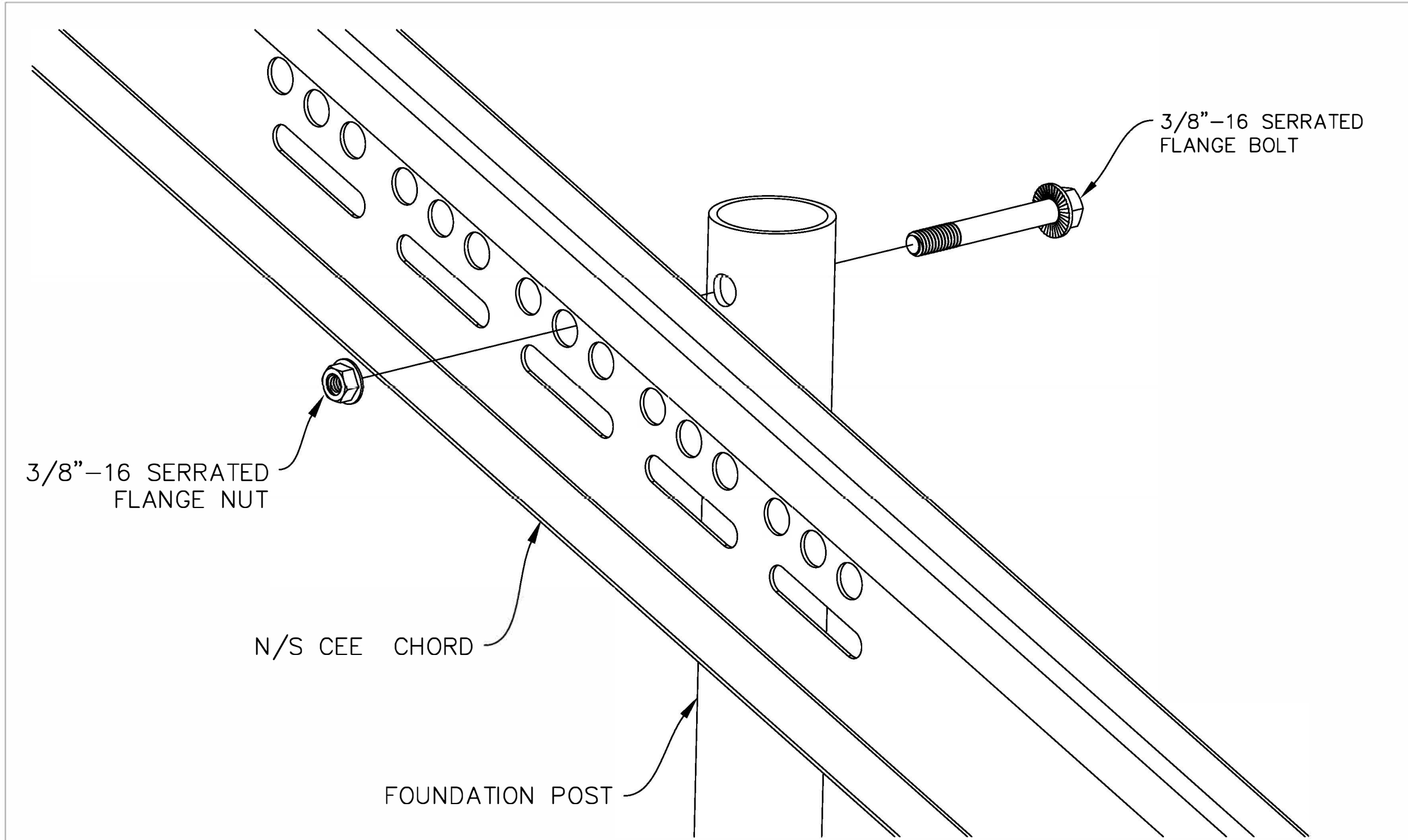
REGISTERED PROFESSIONAL ENGINEER
TIMOTHY JOHN WOLFE
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Exp. 09-30-2026
Timothy J. Wolfe
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STATE OF CALIFORNIA

11/14/24
SITE NAME: STRUCTURAL PRINT PACKAGE
SITE STREET ADDRESS: 4550 U AIRPORT RD
SITE CITY, STATE, ZIP: AVALON, CA 90704

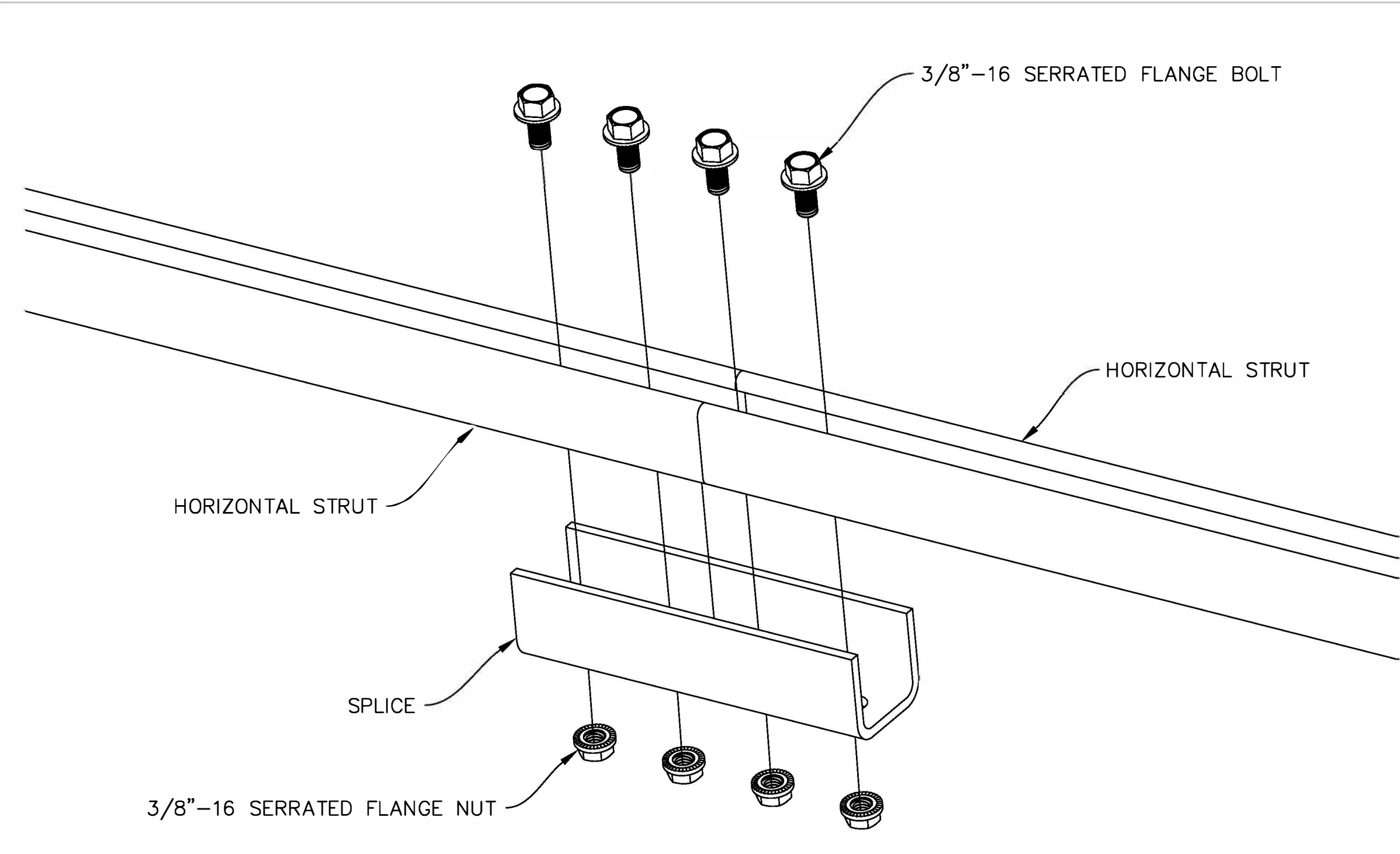
SHEET REVISIONS
REV. DESCRIPTION DATE
A INITIAL RELEASE 12/8/2023

APPROVED

DRAWN: JK REVIEWED: TM APPROVED: JDI SIZE: D
SHEET NAME: STRUCTURAL PURLINS
PROJECT NUMBER: 220367
DRAWING NUMBER: S.300 REV: A



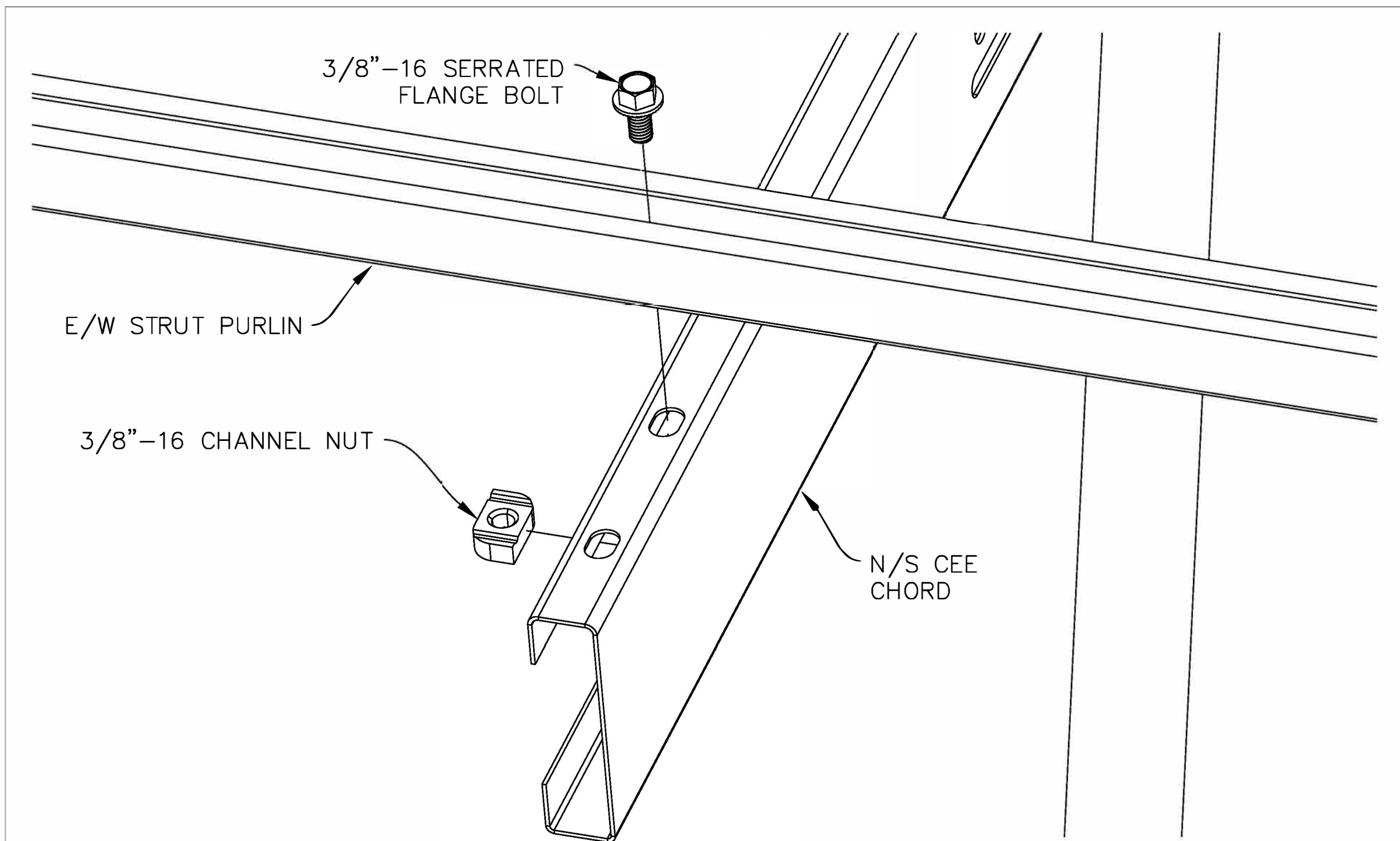
D1 CONNECTION: CEE-TO-POST



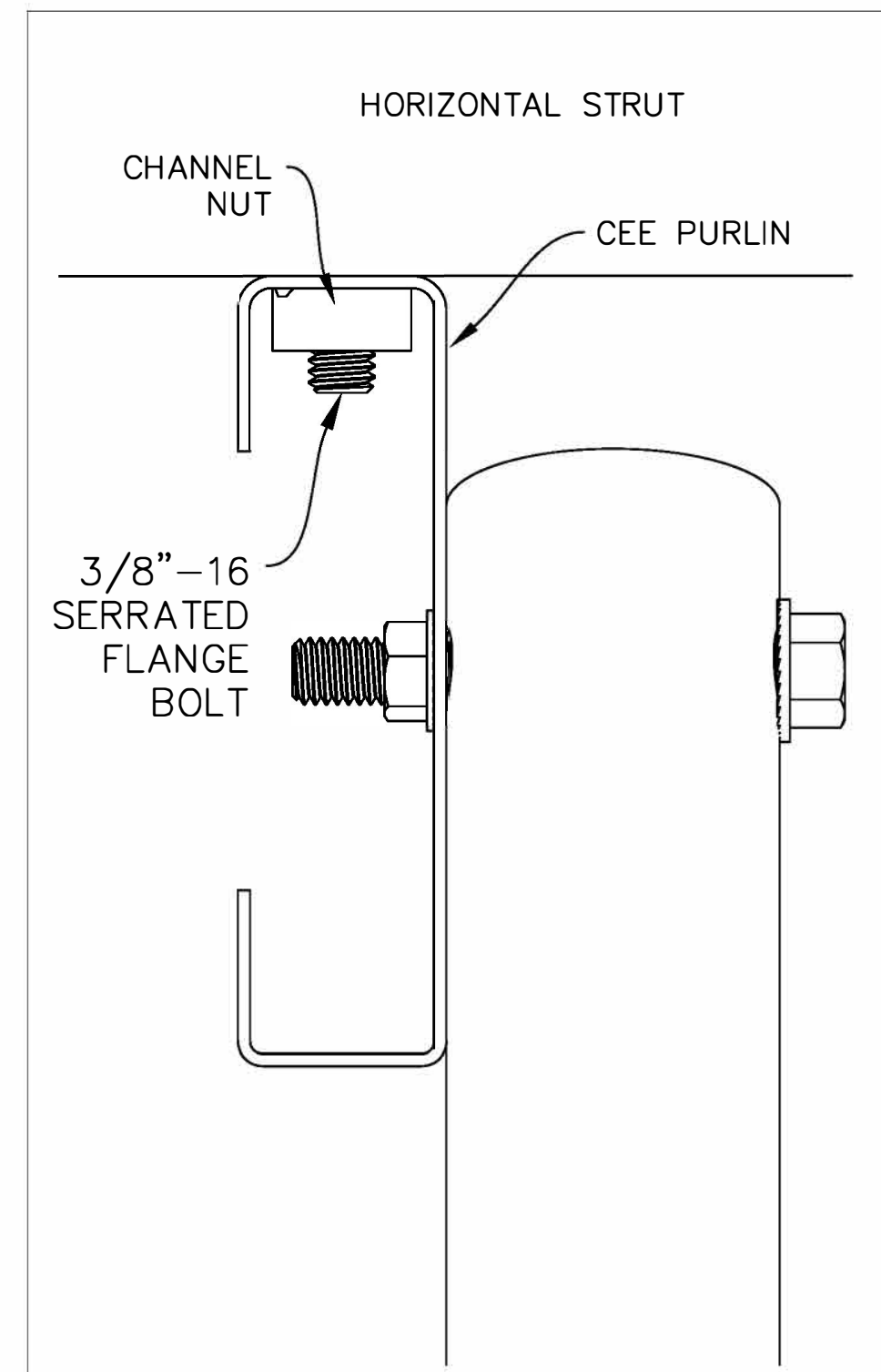
D3 CONNECTION: STRUT-TO-STRUT SPLICE

NOTES

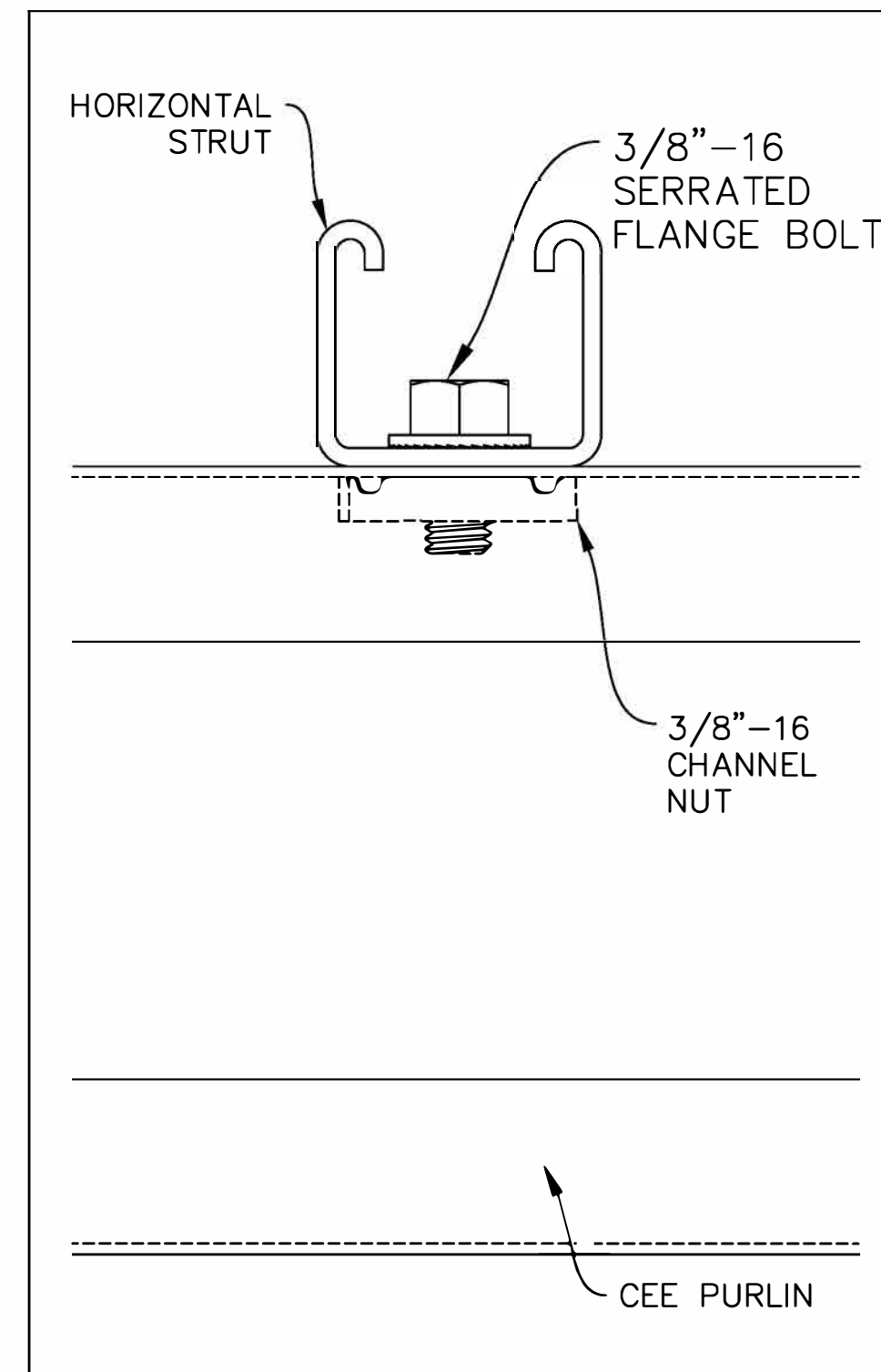
- RECOMMENDED TORQUE VALUES (FOR STAINLESS STEEL HARDWARE)
 - 3/8-16: 19.6 FT-LBS
- MIN/MAX TORQUE VALUES (FOR STAINLESS STEEL HARDWARE)
 - 3/8-16: 17.5 - 50.0 FT-LBS
- DEPICTED HARDWARE AND PART PLACEMENT NOT INDICATIVE OF PREFERRED OR REQUIRED POSITIONS.
- TILT ANGLE IS SETUP BY FOUNDATION POST HEIGHTS.
- CEE CHANNEL ALLOWS FOR HEIGHT ADJUSTMENT, FORWARD/REAR ADJUSTMENT, AND MULTIPLE TILT ANGLES.
- OTHER SPECIFIC CONNECTIONS ELSEWHERE IN PRINT SET.
- STRUT PURLINS MUST CONNECT TO THE CORRECT HOLES IN CEE CHANNEL, AS DEFINED IN CONSTRUCTION PRINTS (INNER, MIDDLE, OR OUTER TYPICALLY), AND AS DETERMINED BY PV MODULE MANUFACTURERS.
- USE CORRECT NOMINAL HOLES IN CEE TO CONNECT TO FOUNDATION POST, AS INDICATED IN CONSTRUCTION PRINTS. ADJACENT HOLES AND SLOTS ONLY FOR IN-FIELD ADJUSTMENTS.
- SERRATED HARDWARE MAY BE REPLACED WITH EQUIVALENT HARDWARE WITH WASHERS IF NECESSARY.



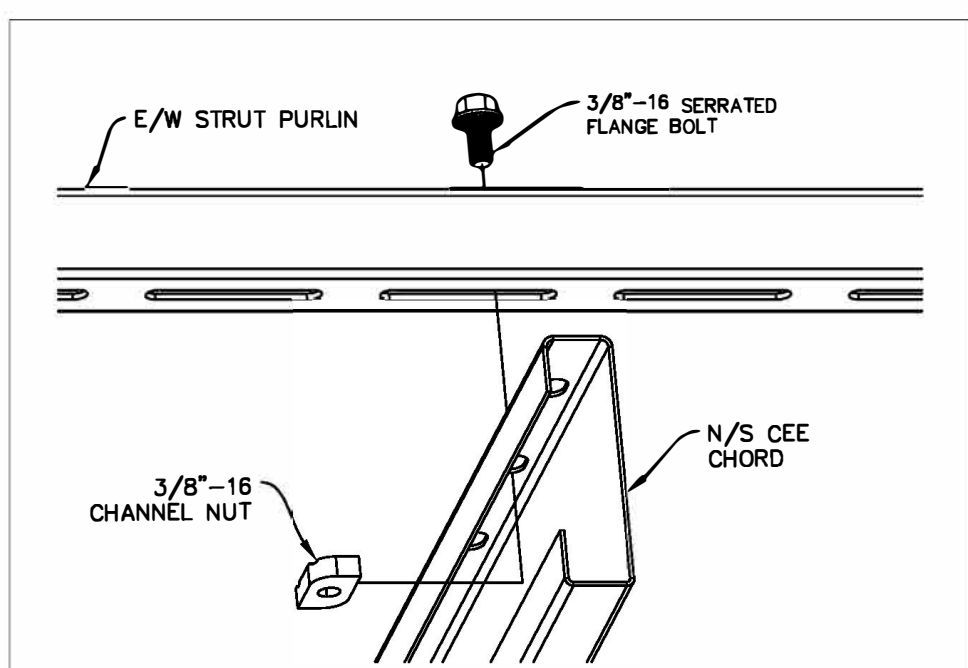
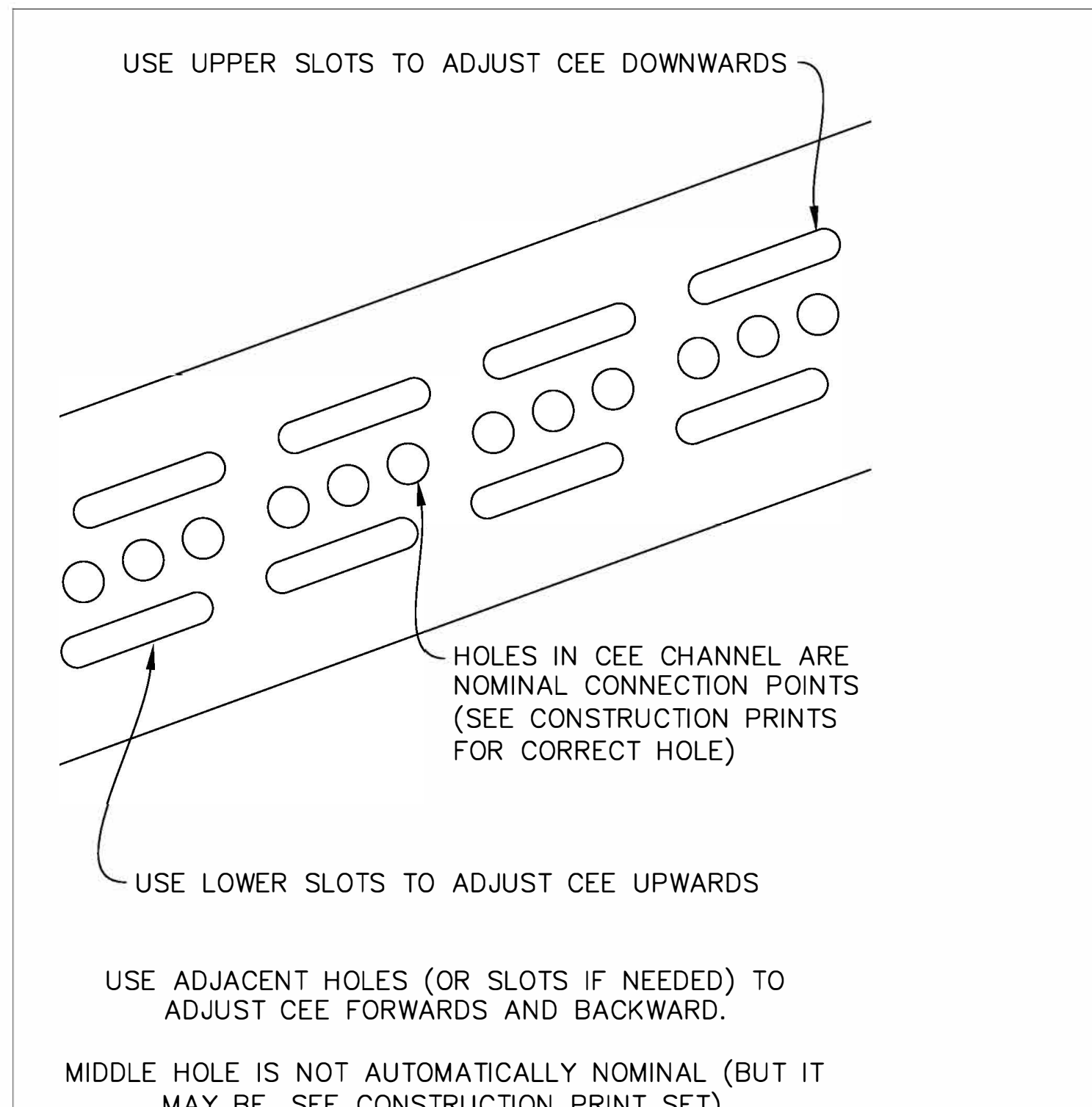
B1 CONNECTION: STRUT-TO-CEE



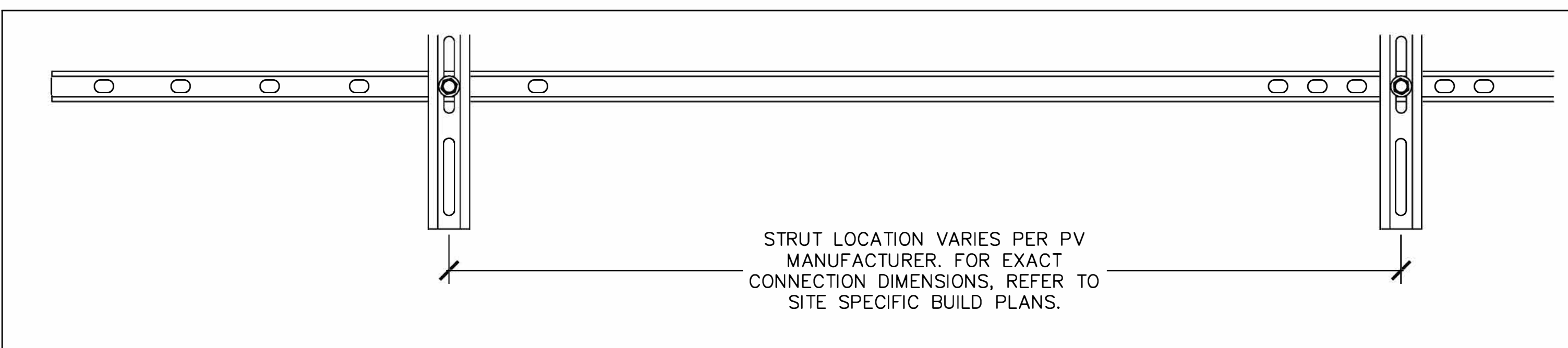
B3 DETAIL B1 FRONT VIEW



B4 DETAIL B1 SIDE VIEW



A1 DETAIL B1 UNDERSIDE



A2 DETAIL: STRUT-TO-CEE CONNECTION ZONES

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STATE OF CALIFORNIA

11/14/24

STRUCTURAL PRINT PACKAGE

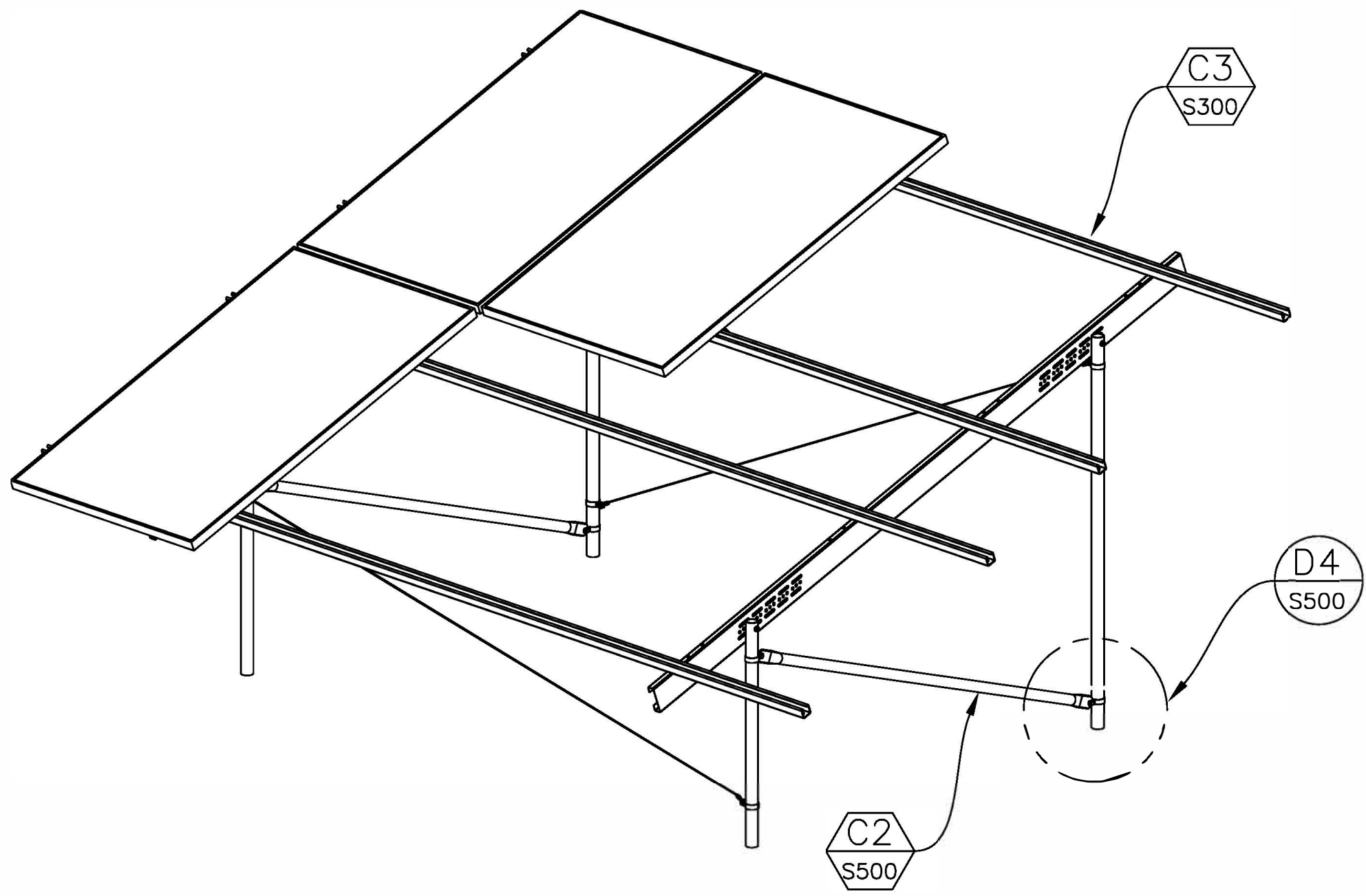
SITE NAME:
4550 U AIRPORT RD
SITE STREET ADDRESS:
SITE CITY, STATE, ZIP:
AVALON, CA 90704

REV.	DESCRIPTION	DATE
A	INITIAL RELEASE	12/8/2023
B	DESIGN CHANGE-LATERAL LOAD	11/5/2024

APPROVED

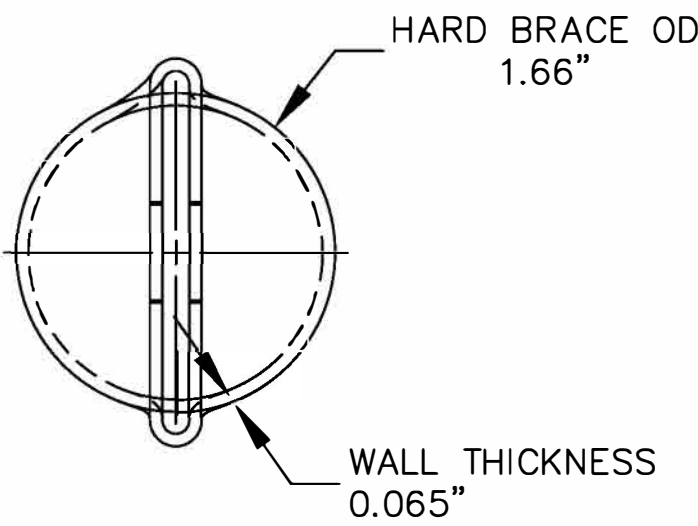
DRAWN	REVIEWED	APPROVED	SIZE
JK	TM	JDI	D
SHEET NAME CONNECTIONS OVERVIEW			
PROJECT NUMBER 220367			
DRAWING NUMBER S.400			REV. B

IMAGE FOR REFERENCE ONLY



D1 VIEW: TYPICAL END OF ROW BRACING

EQV. NPS 1-1/4 SCH 5S



C1 SEC.: HARD BRACE

0.50" TYP

Ø0.50"

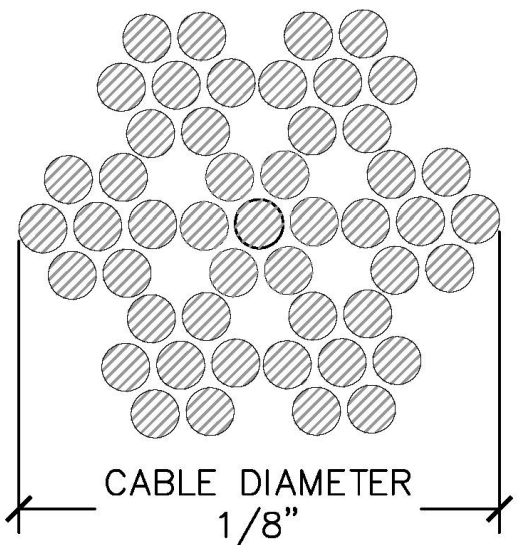
2 PLACES



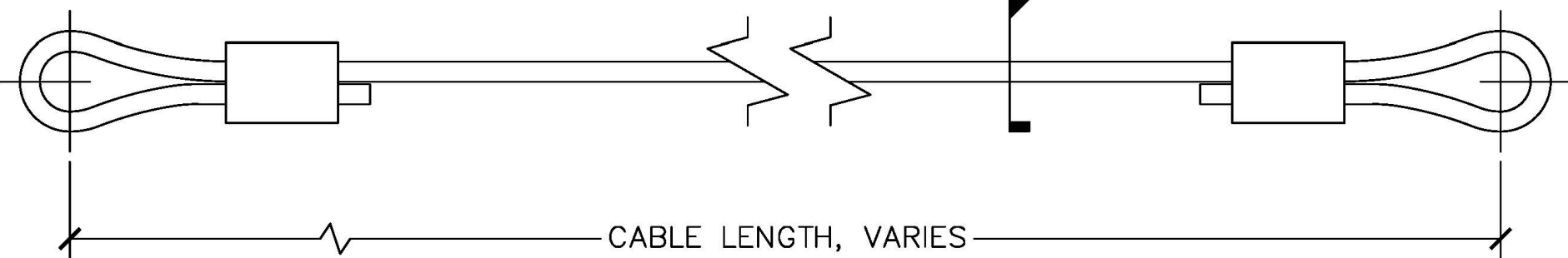
HARD BRACE LENGTH, VARIES

C2 PART: HARD BRACE

MIN. BREAKING STRENGTH: 1,700 LBS



B1 SEC.: CABLE BRACE



B2 PART: CABLE BRACE

HARD BRACE

CLAMP BOLT

CABLE BRACE

BRACE CLAMP
TYP 2 PER CABLE BRACE

BRACE CLAMP
TYP 2 PER HARD BRACE

FOUNDATION POST

D4 DETAIL: BRACING CONNECTIONS

MAX FRONT
OFFSET
10.0"

C4 HARD BRACE OFFSET

LEVEL GROUND

MAX. REAR
OFFSET
7.0"

C5 HARD BRACE OFFSET

MAX. OFFSET
REAR BOTTOM
10.0"

B4 REAR CABLE OFFSET

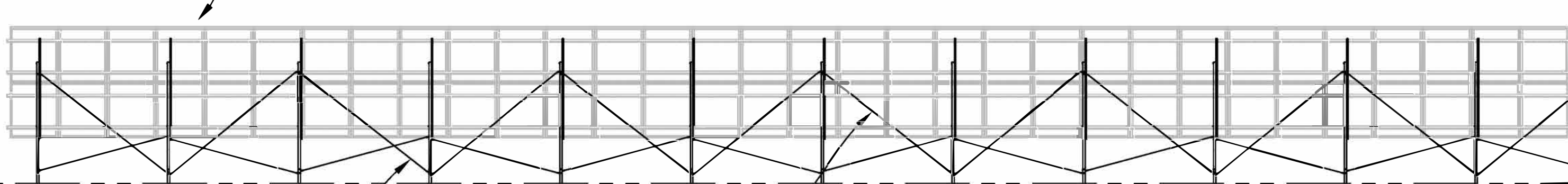
MAX. OFFSET
FRONT TOP
7.0"

MAX. OFFSET
FRONT BOTTOM
12.0"

B5 FRONT CABLE OFFSET

IMAGE FOR REFERENCE ONLY

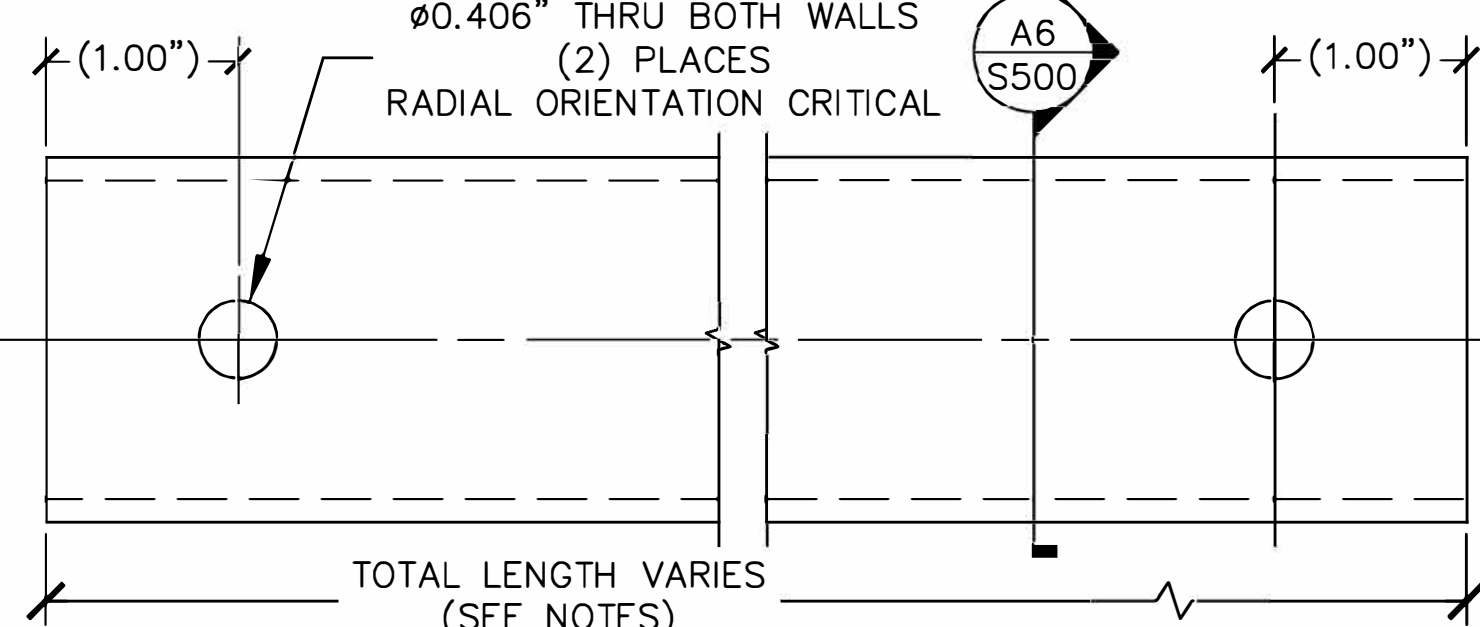
CABLE BRACING 100% (EVERY BAY)



A1 VIEW: TYPICAL END AND MID ROW CONDITIONS

NOTES:
1. LENGTHS VARY, SEE SHEET NOTES

A4 PART: FOUNDATION POST



NOTES:

- NORTH/SOUTH HARD BRACING TO BE INSTALLED BETWEEN EVERY NORTH AND SOUTH FOUNDATION POST. (100%)
- EAST/WEST CABLE BRACING (B1) TO BE INSTALLED IN THE SPACE BETWEEN FOUNDATION SETS (BAY).
- VEE CABLES TO BE INSTALLED ACCORDING TO CABLE SCHEDULE SHOWN IN A1.
- MINIMUM CABLE BREAKING STRENGTH DETERMINED BY PROJECT SPECIFIC STRUCTURAL CALCULATIONS.
- LENGTH OF BRACES WILL VARY DEPENDENT ON PROJECT SPECIFICS.
- CABLE TO BE STAINLESS STEEL AIRCRAFT CABLE.
- CABLE MAY BE OF ANY CONFIGURATION (IE. 7X7 OR 7X19) AS LONG AS IT MEETS THE REQUIREMENTS LISTED ON THIS SHEET.
- BRACE CLAMPS TO BE LOCATED FROM MIDPLANE OF CLAMP TO NOMINAL LEVEL GROUND AT HEIGHTS DESCRIBED BELOW:
 - HARD BRACE:
 - TOP: 10.0"
 - BOTTOM: 7.0"
 - FRONT CABLES:
 - TOP: 7.0"
 - BOTTOM: 12.0"
 - REAR CABLES:
 - TOP: 15.0"
 - BOTTOM: 10.0"

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REGISTERED PROFESSIONAL ENGINEER
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C 63356
Exp. 09-30-2026
Timothy J. Worline
CIVIL
STATE OF CALIFORNIA

11/14/24

STRUCTURAL PRINT PACKAGE
SITE NAME:
SITE STREET ADDRESS:
4550 U AIRPORT RD
SITE CITY, STATE, ZIP:
AVALON, CA 90704

SHEET REVISIONS
REV. DESCRIPTION DATE
A INITIAL RELEASE 12/8/2023

APPROVED

DRAWN: JK, REVIEWED: TM, APPROVED: JDI, SIZE: D
SHEET NAME:
FOUNDATION POST & BRACING OVERVIEW
PROJECT NUMBER:
220367
DRAWING NUMBER: S.500, REV: A

SOLAR PV GROUND MOUNT

STRUCTURAL CALCULATIONS

LOCATION

California

PRINT PACKAGE NUMBER:

220367

REVISION: E

ON:

11/5/2024

DESIGN CRITERIA:

TITAN

15° TILT

0 PSF SNOW

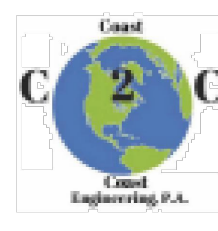
101 MPH WIND, RISK CAT I, EX. C.

ASCE7-16

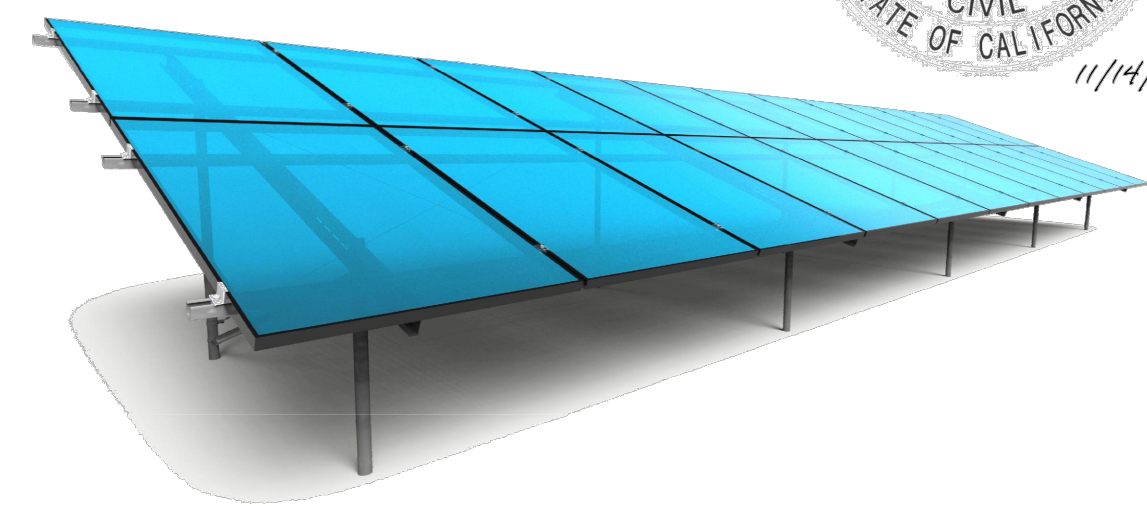
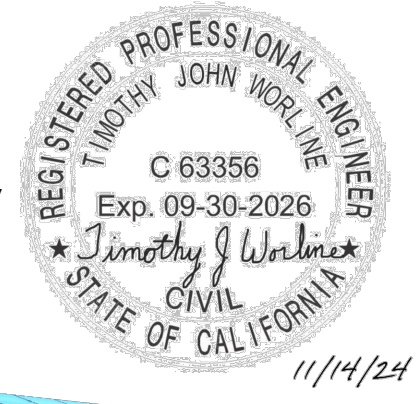
Allowable Stress Design (ASD)

Office: 419.267.5280
Fax: 419.267.5214

architects & engineers



Timothy J Worline

Digitally signed by Timothy J Worline
Date: 2024.11.14 15:21:49 -05'00'20-345 County Road X, PO Box 326
Ridgeville Corners, OH 43355
Office: 419.267.5280
Fax: 419.267.5214Minimum:
Eq 12.8-5
Calculated (Eq 12.8-3)
Seismic response coefficient $C_{s, min} = 0.0766$
 $C_{s, calc} = 1.3925$
 $C_s = 1.3925$

Seismic base shear (Sect 12.8.1)

Effective seismic weight of the structure

Seismic base shear (Eq 12.8-1)

 $W = 8.58192 \text{ kips}$
 $V = C_s \times W = 12.0 \text{ kips}$

Distributed Seismic Loading

Analyzed Rack Length

Analyzed Rack Weight

Analyzed Rack Anchor Qty

Load per node (top of post)

 $AR_L = 2208 \text{ in}$
 $AR_W = AR_L / (PV_{PV} \times 0.75) \times 2 \times DL_{L1} = 8581.92 \text{ lbs}$
 $AR_A = 34$
 $EL = V / AR_A = 351.49 \text{ lbs/post}$

*Seismic based on worst case for United States per USGS min/max per region chart.
Seismic does not limit design.

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General Calculations

General Dimensions		
Quantity of PV Modules, Vertically (Cartridge)	$PV_{V2} =$	1
PV Module Tilt	$PVT =$	15°
PV Module Length	$PVL =$	89.21 in
PV Module Width	$PVW =$	44.65 in
PV Module Area	$PVA = PVL \times PVW =$	27.66 ft ²
PV Module Weight	$PV_{W2} =$	71.00 lbs
Force Resisting Members Quantity	$M_0 =$	2
Vertical Section Flat Length (chord)	$PV_{FL} = PV_L \times PV_{V2} =$	7.43 ft
Vertical Section Profile Length (at tilt)	$PV_{PL} = PV_{FL} \times \cos(PVT) =$	7.18 ft
Horizontal Width (at tilt)	$PV_{WH} = PV_{FL} =$	3.72 ft
Profile Height (at tilt)	$PV_{PH} = PV_{FL} \times \sin(PVT) =$	1.92 ft
Area Projected Vertically	$PV_{AV} = PV_{PH} \times PV_{WH} =$	26.72 ft ²
Area Projected Horizontally	$PV_{AH} = PV_{PH} \times PV_{WH} =$	7.16 ft ²

Dead Loading

Force Resisting Member Weight	$M_{FR} =$	1.80 lbs/ft
Cartridge Weight per Member	$PV_{W2} = PV_{W2} / PV_{V2} / M_0 =$	35.5 lbs
Misc. Hardware Weight per Vertical Section	$W_{WH} =$	5.00 lbs
Dead Load per Vertical Section	$DL_{L1} = (PV_{W2} \times PV_{V2} + M_{FR} \times PV_{AH} + M_0 \times PV_{V2} \times W_{WH}) =$	89.40 lbs
TD: Distributed Dead Load on Member	$DL_{L2} = DL_{L1} / PV_{V2} / M_0 / PV_{WH} =$	12.01 lbs/ft/mem.

Live Roof Loading

Live Roof Pressure	$LLR_{R2} =$	5.00 lbs/ft
Live Roof Load per Vertical Section	$LLR_{L1} = (LLR_{R2} \times PV_{V2} \times PV_{V2} =$	138.31 lbs
RR: Distributed Live Roof Load on Member	$LLR_{L2} = LLR_{L1} / PV_{V2} / M_0 / PV_{WH} =$	18.59 lbs/ft/mem.

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SNOW

Tedd's calculation version 1.0.09

Snow loading (ASCE7-16)

Building details

Roof type	Monoslope
Width of roof	$W = 7.18 \text{ ft}$
Slope of roof 1	$\alpha = 15 \text{ deg}$
Ground snow load	
Density of snow	$P_g = 0 \text{ lb/ft}^2$
Terrain type	$Y = 14 \text{ lb/ft}^2$
Exposure condition (Table 7-2)	C (see Section 26.7)
Exposure factor (Table 7-2)	Fully Exposed
Thermal condition (Table 7-3)	Ce = 0.9
Thermal factor (Table 7-3)	Ct = 1.2
Risk category (Table 1-1)	I = 0.8
Risk factor (Table 7-4)	$I_s = 0.8$
Flat roof snow load (Sect 7.3)	$p_f = 0.7 \times C_e \times Ct \times I_s \times p_g \text{ lb/ft}^2$

Cold roof slope factor (Ct > 1.0)

Roof surface type	Slippery
Ventilation	Ventilated
Thermal resistance (R-value)	R = 30
Roof slope factor Fig 7-2c (dashed line)	$C_{sl} = 1.00$

Monoslope

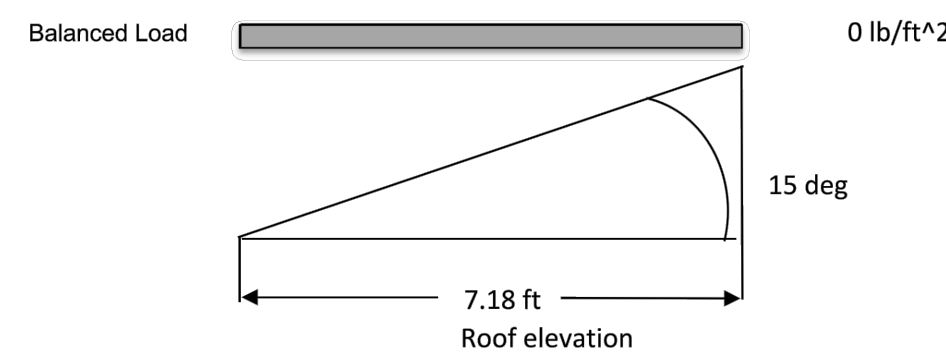
Sloped roof snow load (CL7.4)

 $ps = C_s \times p_f = 0 \text{ lb/ft}^2$

Distributed Snow Loading

Snow load per Vertical Section

TD: Distributed Snow Load on Member

 $SL_{L1} = (p_s \times PV_{V2}) = 0 \text{ lbs}$
 $SL_{L2} = SL_{L1} / PV_{V2} / M_0 / PV_{WH} = 0 \text{ lbs/ft/mem.}$ 20-345 County Road X, PO Box 326
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Load data - with ASD Combos (for reactions)

GLOSSARY

Load conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
LLR	Live Roof Load	No	EQ
SL	Snow Load	No	SNOW
WLH1	Wind Horizontal At	No	WIND
WLH2	Wind Horizontal Away	No	WIND
EL1	Seismic Left	No	EQ
EL2	Seismic Right	No	EQ
EL3	Seismic North	No	EQ
EL4	Seismic South	No	EQ
D1	DL	Yes	
D2	DL+LLR	Yes	
D3	DL+SL	Yes	
D4	DL+0.75SL	Yes	
D5	DL+0.75LLR	Yes	
D6	DL+0.6WLH1	Yes	
D7	DL+0.6WLH2	Yes	
D8	DL+0.7EL1	Yes	
D9	DL+0.7EL2	Yes	
D10	DL+0.7EL3	Yes	
D11	DL+0.7EL4	Yes	
D12	DL+0.75SL+0.45WLH1	Yes	
D13	DL+0.75SL+0.45WLH2	Yes	
D14	DL+0.75LLR+0.45WLH1	Yes	
D15	DL+0.75LLR+0.45WLH2	Yes	
D16	DL+0.75SL+0.52SEL1	Yes	
D17	DL+0.75SL+0.52SEL2	Yes	
D18	DL+0.75SL+0.52SEL3	Yes	
D19	DL+0.75SL+0.52SEL4	Yes	
D20	DL+0.75LLR+0.52SEL1	Yes	
D21	DL+0.75LLR+0.52SEL2	Yes	
D22	DL+0.75LLR+0.52SEL3	Yes	
D23	DL+0.75LLR+0.52SEL4	Yes	
D24	0.6DL+0.6WLH1	Yes	
D25	0.6DL+0.6WLH2	Yes	
D26	0.6DL+0.7EL1	Yes	
D27	0.6DL+0.7EL2	Yes	
D28	0.6DL+0.7EL3	Yes	
D29	0.6DL+0.7EL4	Yes	

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SEISMIC

Tedd's calculation version 3.1.01

Seismic loading (ASCE7-16)

Site parameters

Site class	D
Mapped acceleration parameters (Section 11.4.1)	
at short period	$S_{S1} = 3.73$
at 1 sec period	$S_{S1} = 1.39$
Site coefficientshort period (Table 11.4-1)	$F_a = 1$
at 1 sec period (Table 11.4-2)	$F_v = 1.7$

Spectral response acceleration parameters

at short period (Eq. 11.4-1)	$S_{S1} = 3.73$
at 1 sec period (Eq. 11.4-2)	$S_{S1} = 2.363$

Design spectral acceleration parameters (Sect 11.4.4)

at short period (Eq. 11.4-3)	$S_{D1} = 2.4866667$
at 1 sec period (Eq. 11.4-4)	$S_{D1} = 1.5753333$

Seismic design category

Risk category (Table 1.5-1)

Seismic design category

	I
	E

Approximate fundamental period

Height above base to highest level of building

$T_u =$	7.484384 ft.
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From Table 12.8-2:

Structure type	All other systems
Building period parameter C_t	$C_t = 0.02$
Building period parameter x	$x = 0.75$
Approximate fundamental period (Eq 12.8-7)	$T_u = 0.090 \text{ sec}$
Building fundamental period (Sect 12.8.2)	$T = 0.090$
Long-period transition period	$T_L = 8$

Seismic response coefficient

Seismic force-resisting system (Table 12.2-1)

G. CANTILEVERED COLUMN SYSTEMS DETAILED TO CONFORM TO THE REQUIRE

2. Steel ordinary cantilever column systems

Response modification factor (Table 12.2-1)

Seismic importance factor (Table 1.5-2)

Seismic response coefficient (Sect 12.8.1.1)

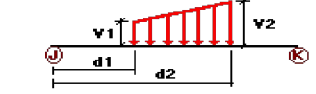
$C_{sm} =$	13.93
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Maximum ((Eq 12.8-3))

Load on nodes

Condition	Node	FX [Lb]	FY [Lb]	FZ [Lb]	MX [Lb*ft]	MY [Lb*ft]	MZ [Lb*ft]
EL1	153	455.00	0.00	0.00	0.00	0.00	0.00
EL2	153	-455.00	0.00	0.00	0.00	0.00	0.00
EL3	153	0.00	0.00	455.00	0.00	0.00	0.00
EL4	153	0.00	0.00	-455.00	0.00	0.00	0.00

Distributed Forces on Members



Condition	Member	Dir1 [Lb/ft]	Val1 [Lb/ft]	Val2 [Lb/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	57	Y	-12.01	-12.01	0.00	Yes	100.00	Yes
LLR	57	Y	-18.59	-18.59	0.00	Yes	100.00	Yes
SL	57	Y	0.00	0.00	0.00	Yes	100.00	Yes
WLH1	57	Z	26.88	26.88	0.00	Yes	100.00	Yes
WLH2	57	Z	-26.88	-26.88	0.00	Yes	100.00	Yes

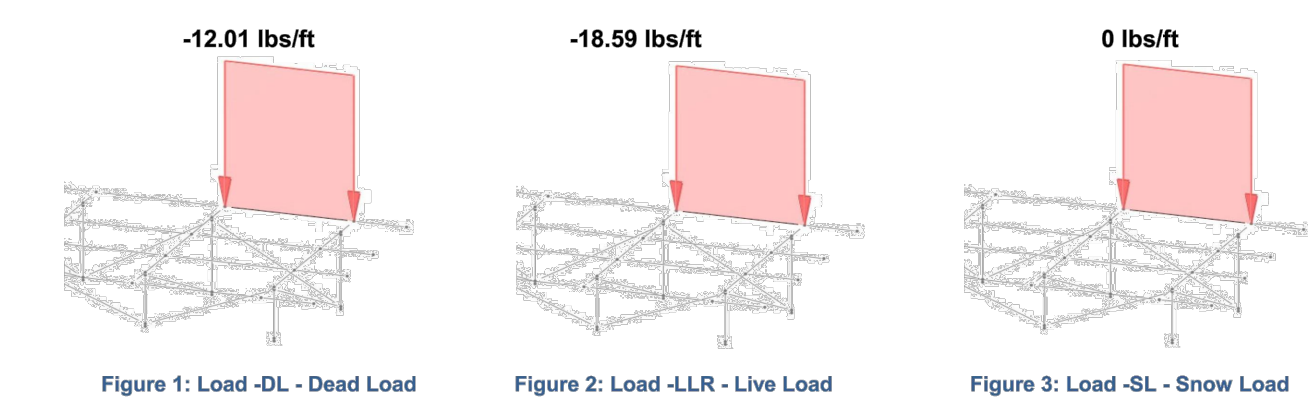


Figure 1: Load -DL - Dead Load

Figure 2: Load -LLR - Live Load

Figure 3: Load -SL - Snow Load

Figure 4: Load -WL0A - Wind 180° Load Case A

Figure 5: Load -WL0A - Wind 0° Load Case B

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455 lbs/post

-455 lbs/post

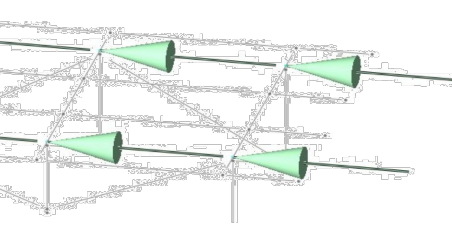


Figure 6: Load -EL1 - Seismic West

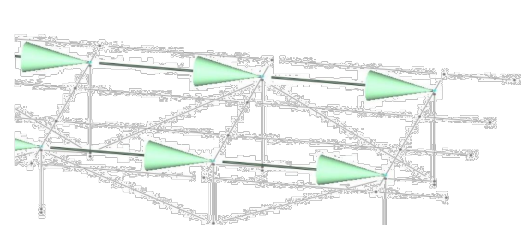


Figure 7: Load -EL2 - Seismic East

455 lbs/post

-455 lbs/post

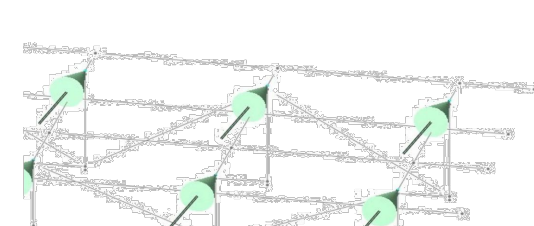


Figure 8: Load -EL3 - Seismic North

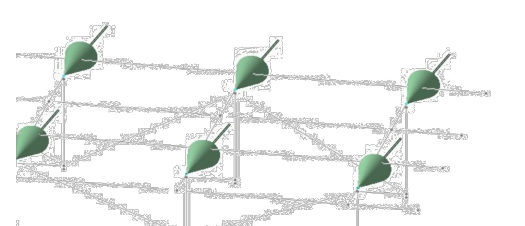


Figure 9: Load -EL4 - Seismic South

PROJECT HOST:



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TEL. +1 619 800 5445 www.sattlersolar.com
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ERIK SATTLER, SATTLER SOLAR INC. LIC. # 1071626 (C70)

PERMITTING AND SOLAR CONSULTANT:

CATALINA ISLAND CONSERVANCY
125 kW (AC) SOLAR PV
4550 U AIRPORT ROAD
AVALON, CA 90704

Revision

Date

80% CONSTRUCTION DOCUMENTS 10/23/2023

PLAN CHECK #4 1/30/2024

BIOLOGIST REPORT REVISION 3/15/2024

RCE REQUESTED REVISIONS 7/08/2024

FENCE ALIGNMENT REVISED 7/25/2024

MAX. SPAN BETW. POSTS UPDATE 11/21/2024

Date 07/31/2024

Job No. 1511

Drawn By LS

Checked By ES

Scale

CONSTRUCTION DOCUMENTS

Drawing Title

SOLAR STRUCTURAL CALCULATIONS

Drawing No.

SSC-1.0

SFL-1.0