

PHOTOVOLTAIC SYSTEM - CORDEVALLE GOLF COURSE

1005 HIGHLAND AVENUE, SAN MARTIN, CA 95046

Vicinity Map:



INSTALLATION AREA (TYP.)



Contact Info:

GENERAL CONTRACTOR:
SOLAR TECHNOLOGIES
23 LAS COLINAS LN., SUITE NO. 106
SAN JOSE, CA 95119

PREPARER:
SEAN KENNY
COMMERCIAL PROJECT MANAGER
23 LAS COLINAS LN., SUITE NO. 106
SAN JOSE, CA 95119
(831) 200-8763

ELECTRICAL ENGINEER:
NATRON RESOURCES INC.
1480 MORAGA ROAD, SUITE C #229
MORAGA, CA 94556

OWNER:
CORDEVALLE GOLF COURSE
1005 HIGHLAND AVENUE
SAN MARTIN, CA 95046

CODE REFERENCES:

- 2019 CALIFORNIA ELECTRICAL CODE (CEC).
- 2019 CALIFORNIA FIRE CODE (CFC).
- 2019 CALIFORNIA BUILDING CODE (CBC).
- 2019 CALIFORNIA GREEN BUILDING CODE (GBC).

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SCOPE OF WORK:

THIS IS A COMMERCIAL SOLAR ROOFTOP AND CANOPY SYSTEM. ALL ELECTRICITY GENERATED IS FOR CONSUMPTION ON SITE.

SYSTEM ELECTRICAL CONNECTION TO MAIN ELECTRICAL SERVICE IS AT 480Y/277V SWITCHGEAR.

PERMIT SHALL INCLUDE LABOR OF INSTALLING PANELS, RUNNING OF ELECTRICAL CONDUITS, INSTALLATION OF NEW ELECTRICAL EQUIPMENT AND ELECTRICAL CONNECTION TO EXISTING BUILDING SERVICE.

NO BATTERIES REQUIRED AS PART OF THIS PROJECT SCOPE.

System Specifications:

SYSTEM SIZE:	367.8 KWDC, 330 KWAC;
MODULES DETAILS:	(743) TRINA SOLAR TSM-495DEG18MC.20(II) (495 W)
INVERTER DETAILS:	(3) CHINT POWER CPS SCA50KTL-DO/US-480 [480V] (5) CHINT POWER CPS SCA36KTL-DO/US-480 [480V]
ARRAY SQUARE FOOTAGE	19,271.70
ARRAY WEIGHT (LBS)	49,335.20
CONSTRUCTION TYPE	COMMERCIAL
ASHRAE STATION	SALINAS MUNICIPAL AP
ASHRAE 2% HIGH DESIGN TEMP. DB	25
ASHRAE MIN MEAN EXTREME ANNUAL DB	-1

PROJECT TITLE:

CORDEVALLE GOLF COURSE
1005 HIGHLAND AVENUE,
SAN MARTIN, CA 95046
APN: 77920006

ENGINEER'S STAMP



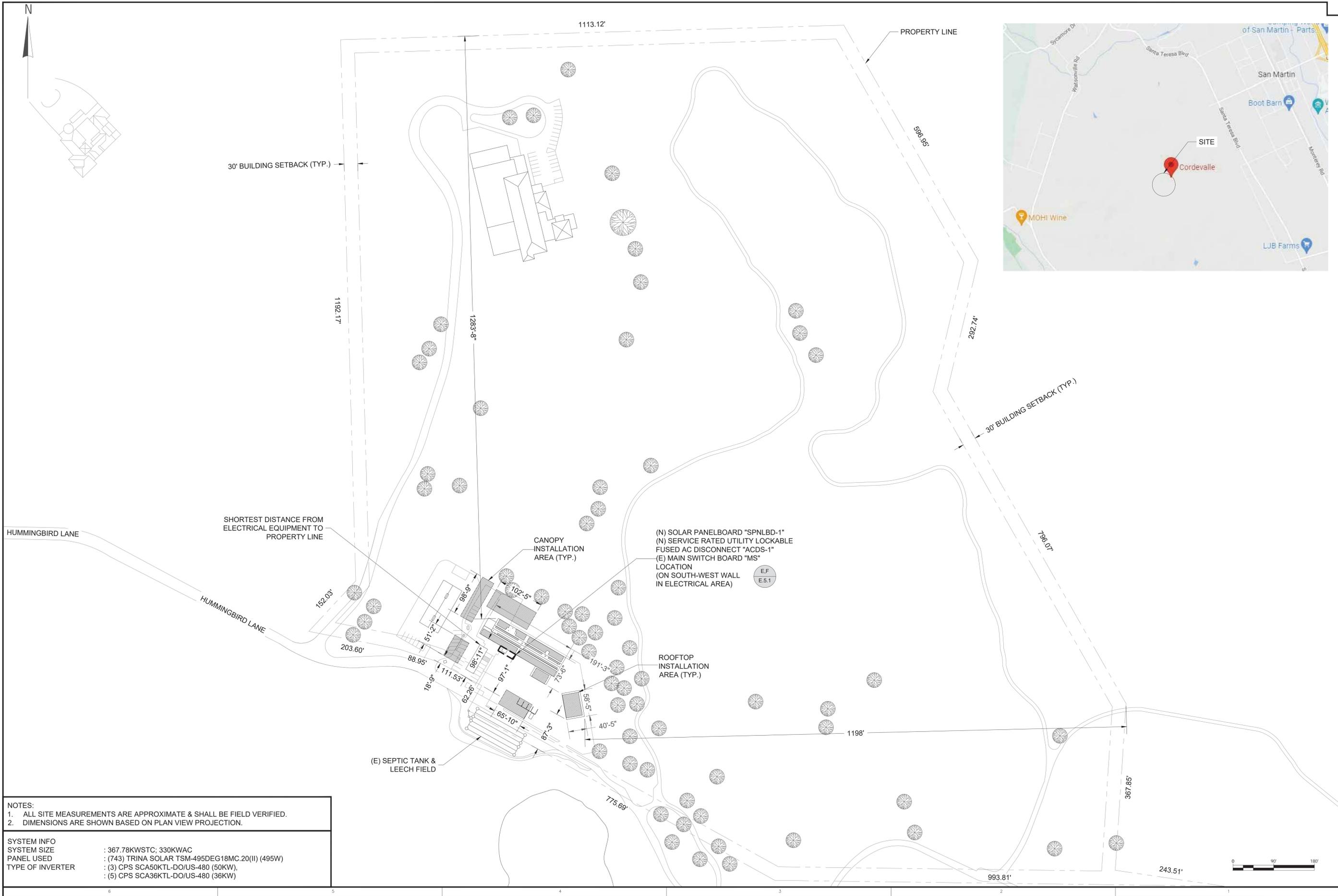
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APPROVED BY:	JHA

SCALE:
NTS

SHEET TITLE:
TITLE PAGE

SHEET #:
T



NOTES:
 1. ALL SITE MEASUREMENTS ARE APPROXIMATE & SHALL BE FIELD VERIFIED.
 2. DIMENSIONS ARE SHOWN BASED ON PLAN VIEW PROJECTION.

SYSTEM INFO
 SYSTEM SIZE : 367.78KWSTC; 330KWAC
 PANEL USED : (743) TRINA SOLAR TSM-495DEG18MC.20(II) (495W)
 TYPE OF INVERTER : (3) CPS SCA50KTL-DO/US-480 (50KW),
 : (5) CPS SCA36KTL-DO/US-480 (36KW)

PROJECT TITLE:
CORDEVALLE GOLF COURSE
 1005 HIGHLAND AVENUE,
 SAN MARTIN, CA 95046
 APN: 77920006

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 SAN JOSE, CA 95119
 JOB NUMBER: 11806

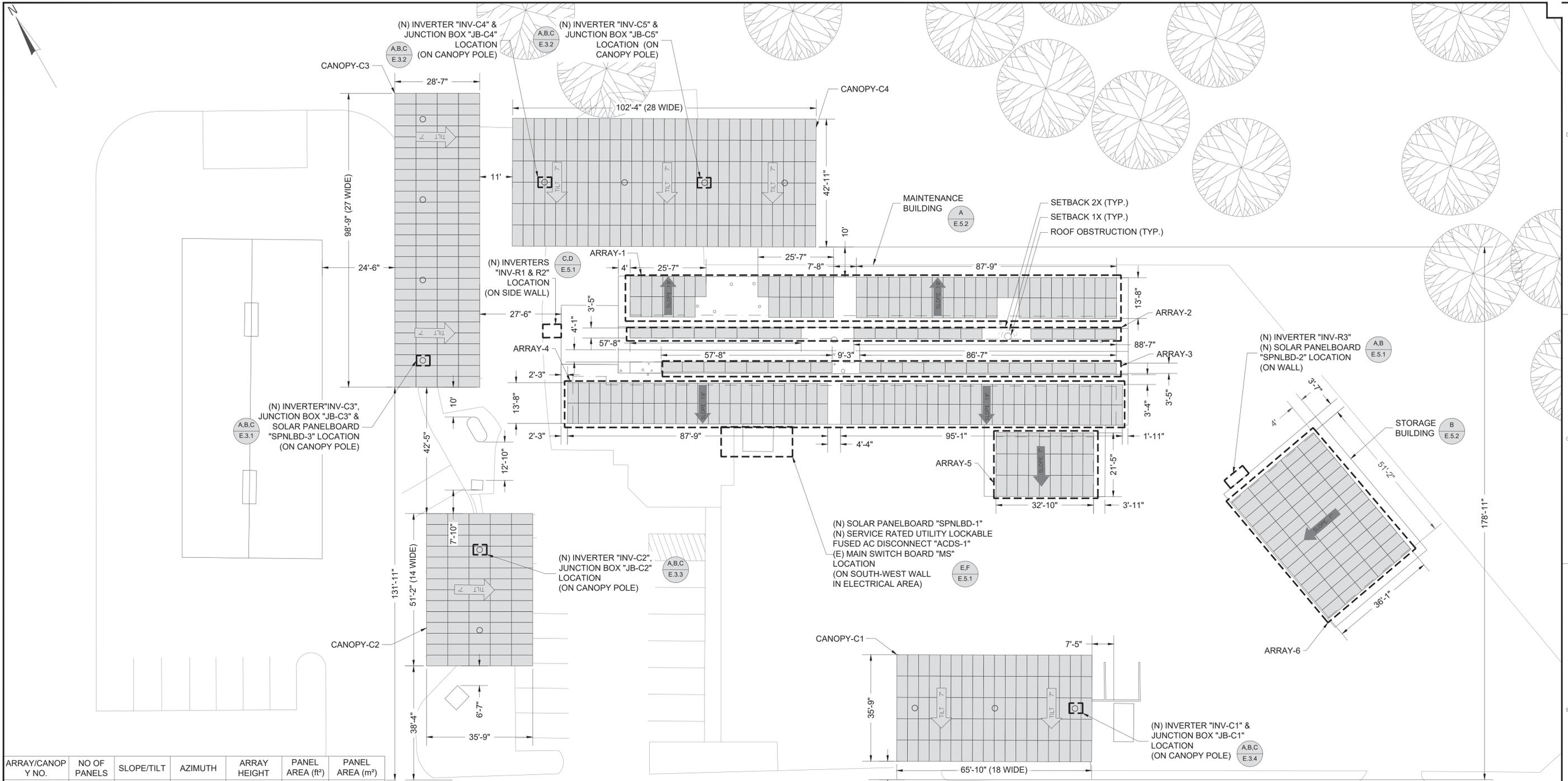
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SHEET TITLE:
SITE PLAN

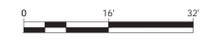
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 A.1.1



ARRAY/CANOPY NO.	NO OF PANELS	SLOPE/TILT	AZIMUTH	ARRAY HEIGHT	PANEL AREA (ft ²)	PANEL AREA (m ²)
1	72	19°	30°	18'-1"	1868	173
2	18	19°	30°	25'-5"	467	43
3	20	19°	210°	25'-5"	519	48
4	100	19°	210°	18'-1"	2594	240
5	27	7°	210°	12'	700	65
6	70	1°	260°	13'-8"	1816	168
C1	90	7°	210°	16'-4"	2335	216
C2	70	7°	120°	16'-4"	1816	168
C3	108	7°	120°	17'-3"	2802	259
C4	168	7°	210°	15'-6"	4358	403
TOTAL	743					

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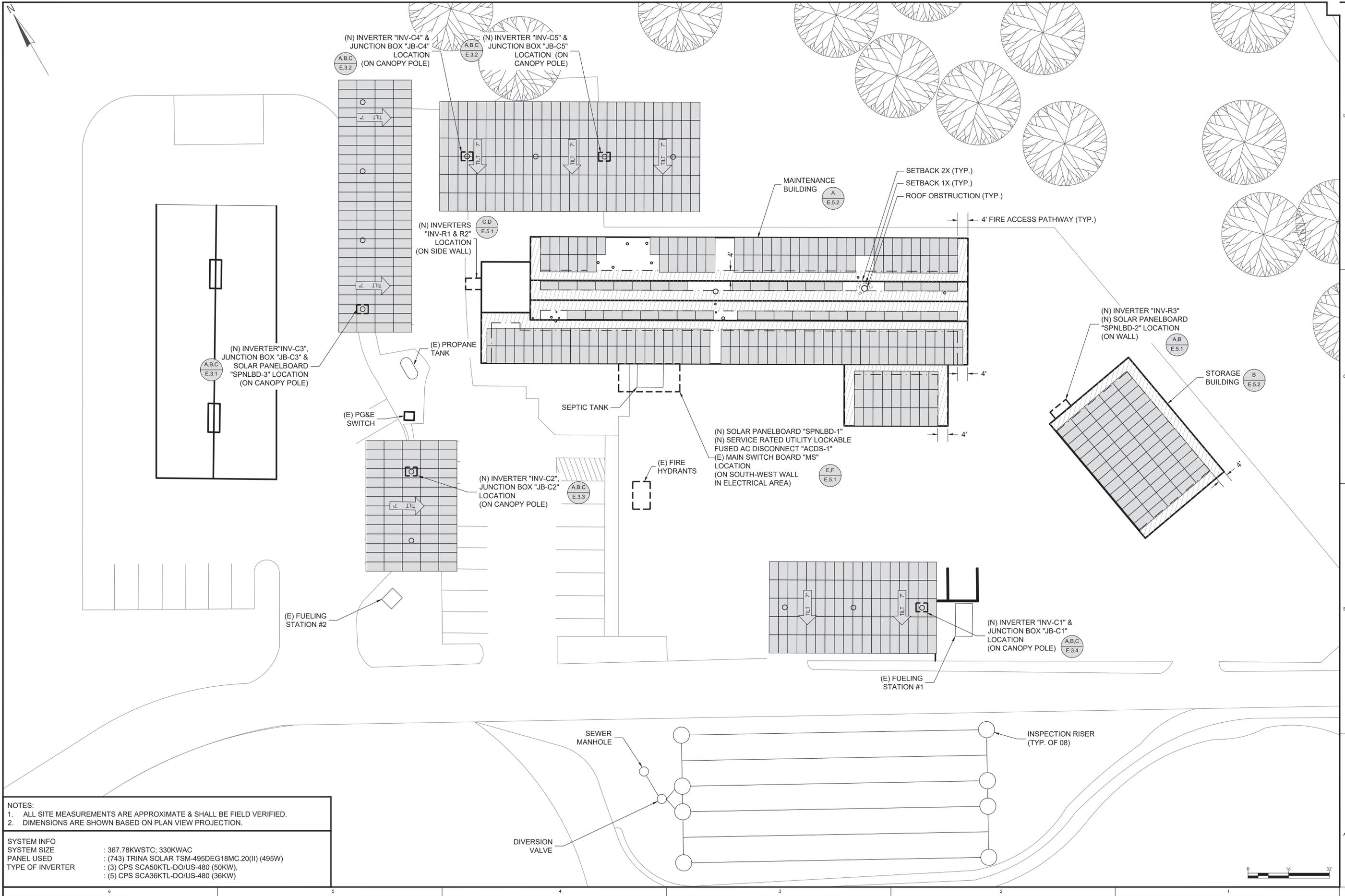
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SHEET TITLE:
ARRAY PLAN

SHEET #:
 A.2.1



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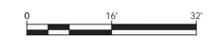
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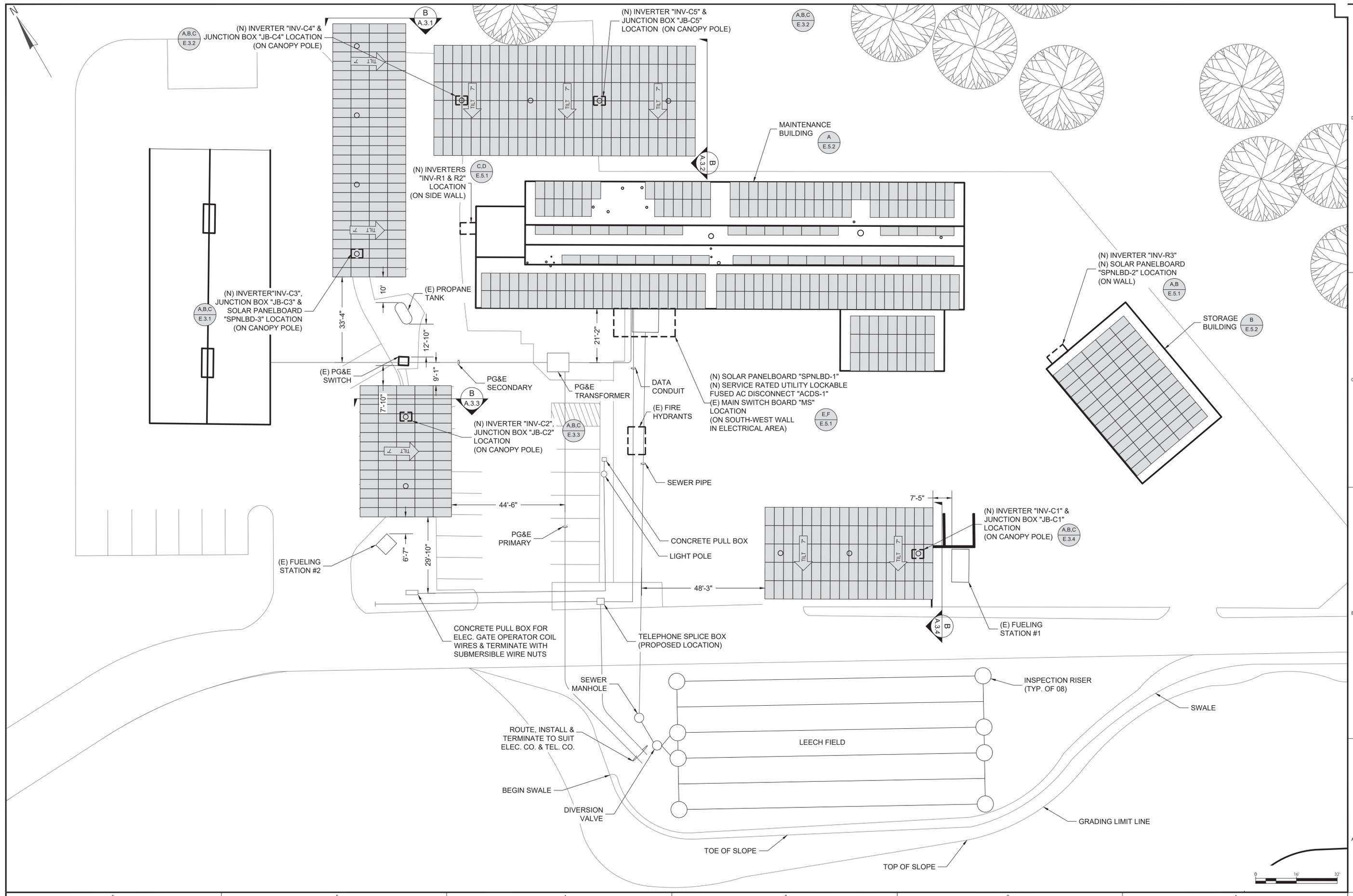
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FIRE ACCESS PLAN

SHEET #:
 A.2.2





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UNDERGROUND LOCATE PLAN

SHEET #:
 A.2.3





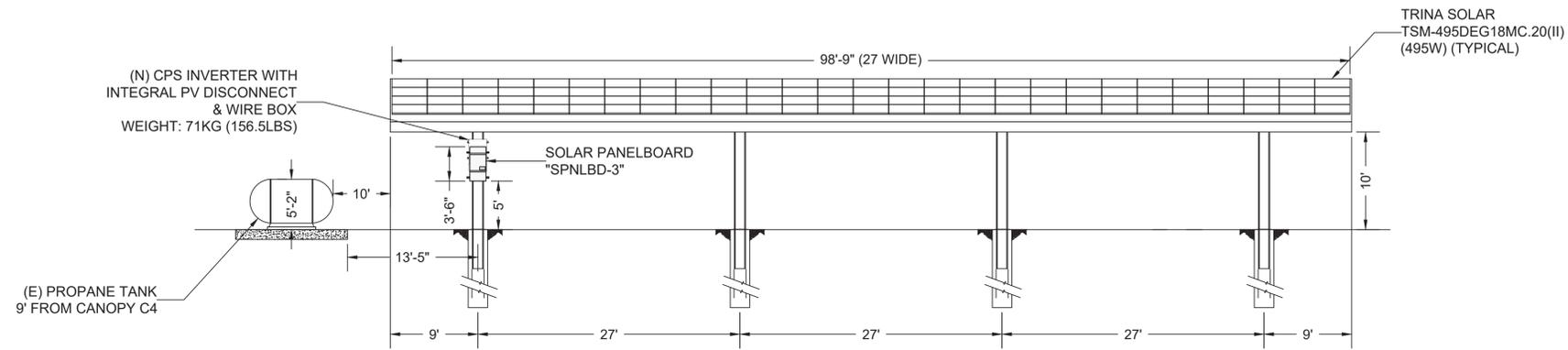
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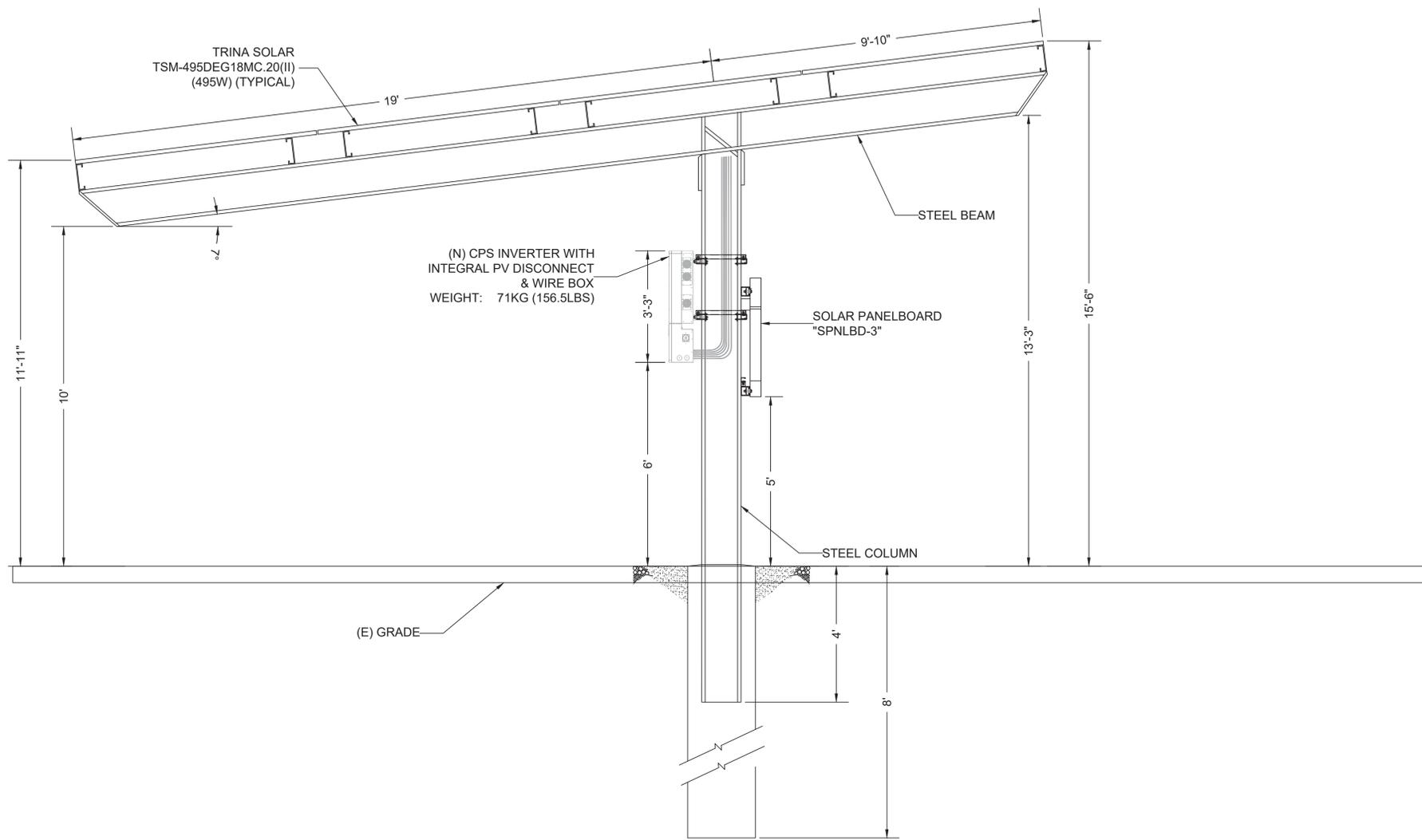
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CANOPY C3
ELEVATIONS

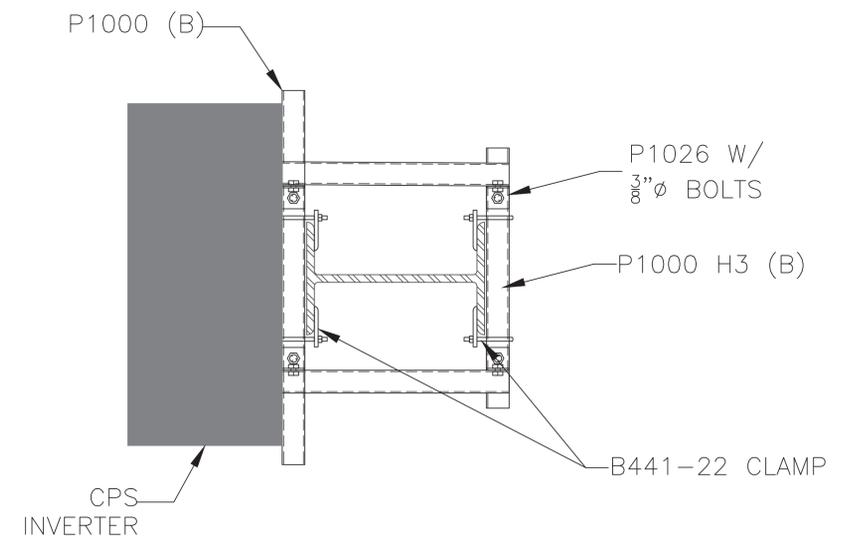
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A.3.1



A CANOPY C3 FRONT ELEVATION
SCALE: 1"=8'-0"



B CANOPY C3 SIDE ELEVATION
SCALE: 1"=2'-0"

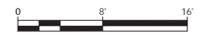
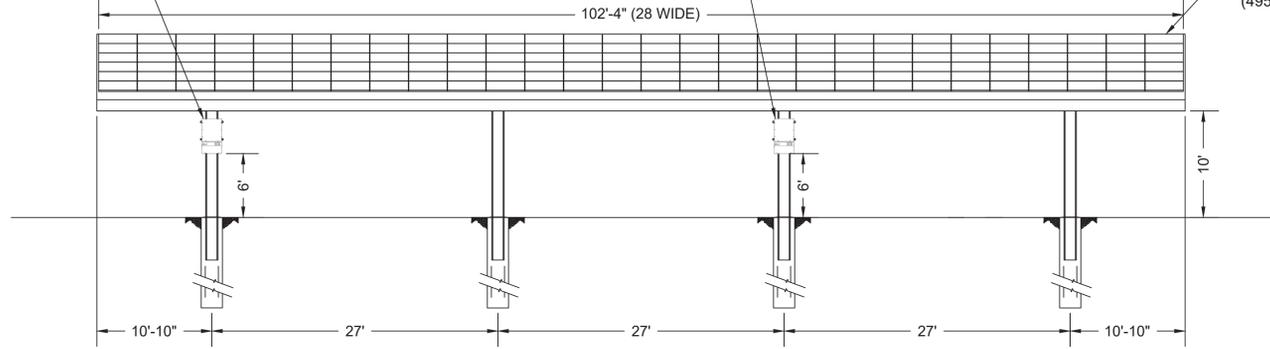


C PLAN VIEW OF INVERTER RACK
SCALE: NTS

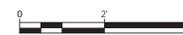
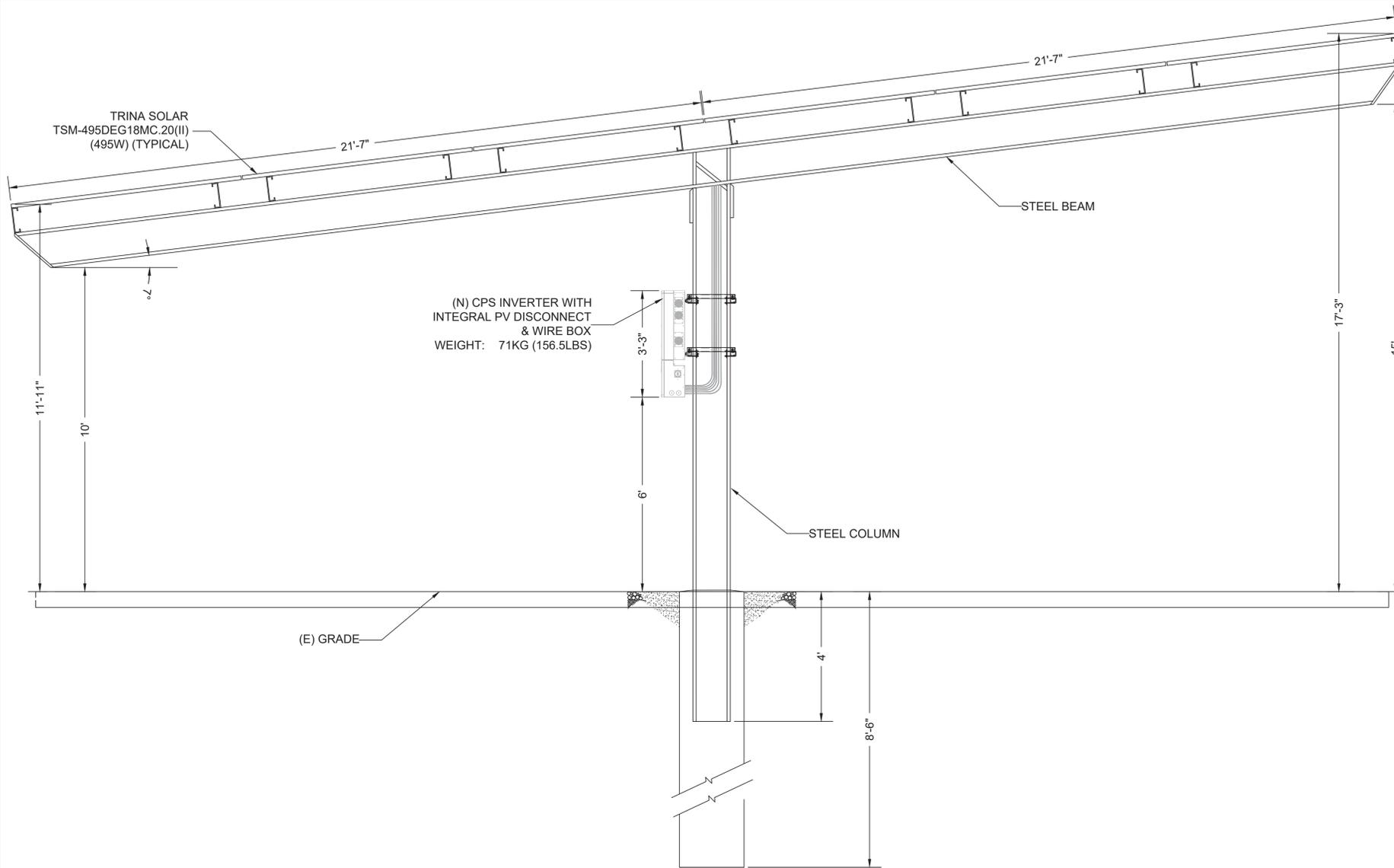
(N) CPS INVERTER WITH INTEGRAL PV DISCONNECT & WIRE BOX
WEIGHT: 71KG (156.5LBS)

(N) CPS INVERTER WITH INTEGRAL PV DISCONNECT & WIRE BOX
WEIGHT: 71KG (156.5LBS)

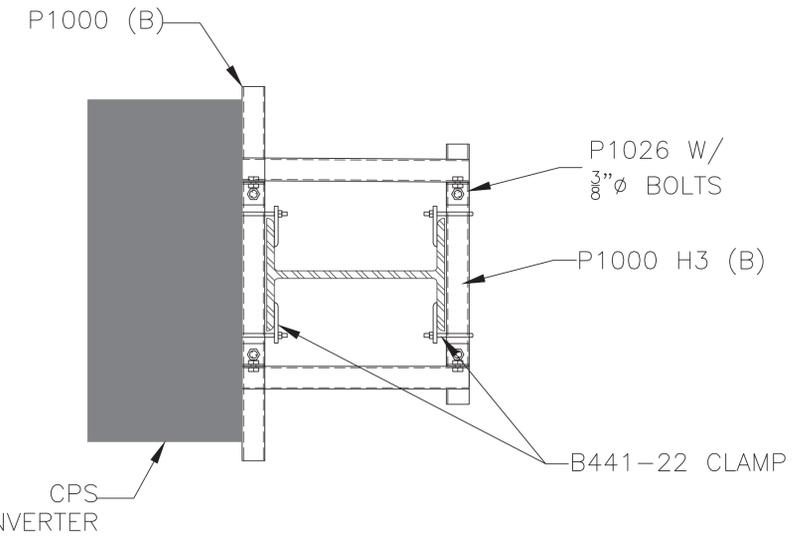
TRINA SOLAR
TSM-495DEG18MC.20(II)
(495W) (TYPICAL)



A CANOPY C4 FRONT ELEVATION
SCALE: 1"=8'-0"



B CANOPY C4 SIDE ELEVATION
SCALE: 1"=2'-0"



C PLAN VIEW OF INVERTER RACK
SCALE: NTS

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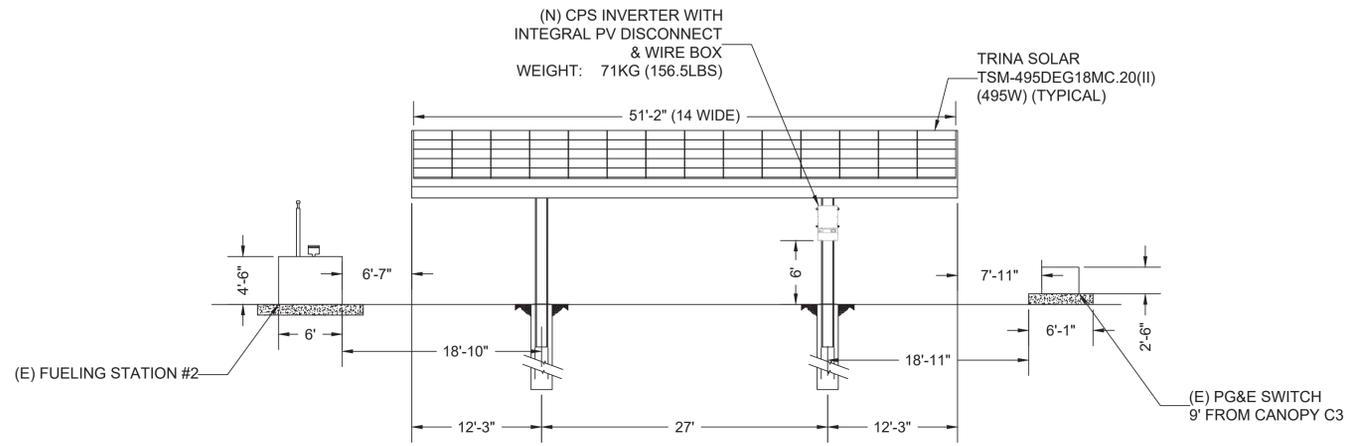
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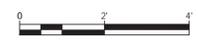
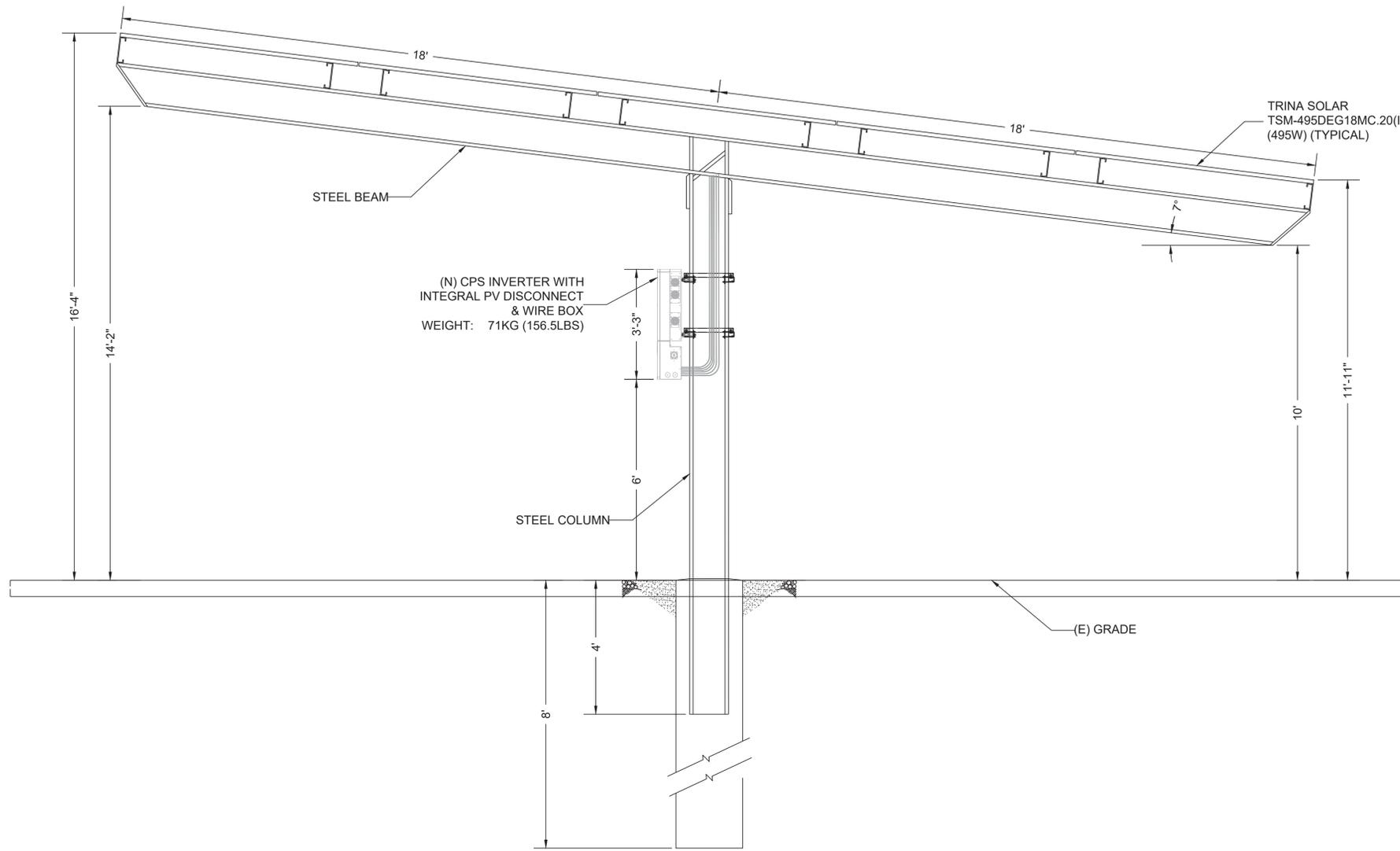
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C4
ELEVATIONS

SHEET #:
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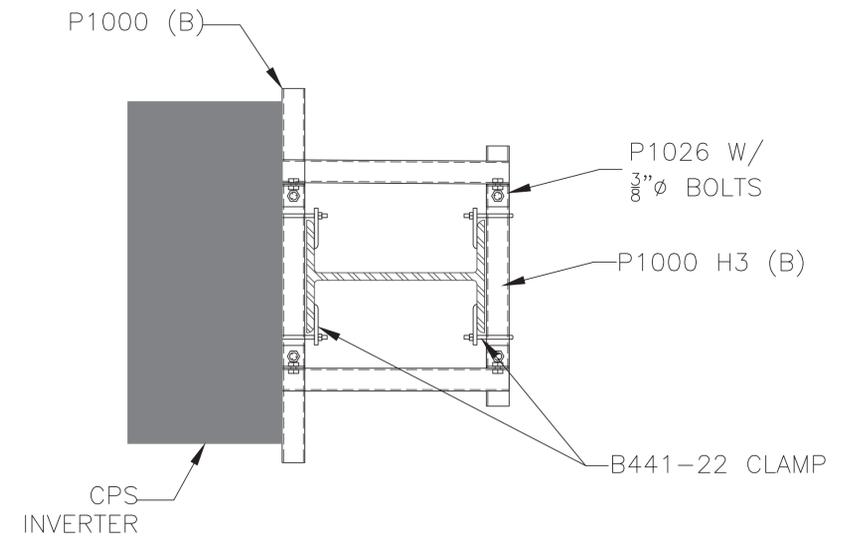




A CANOPY C2 FRONT ELEVATION
SCALE: 1"=8'-0"



B CANOPY C2 SIDE ELEVATION
SCALE: 1"=2'-0"



C PLAN VIEW OF INVERTER RACK
SCALE: NTS

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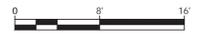
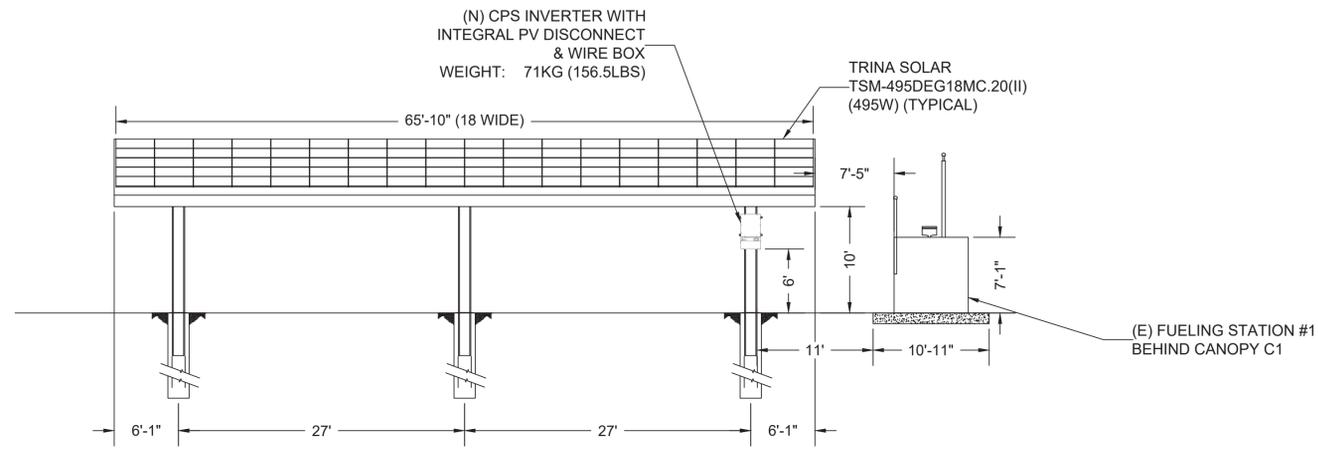
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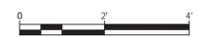
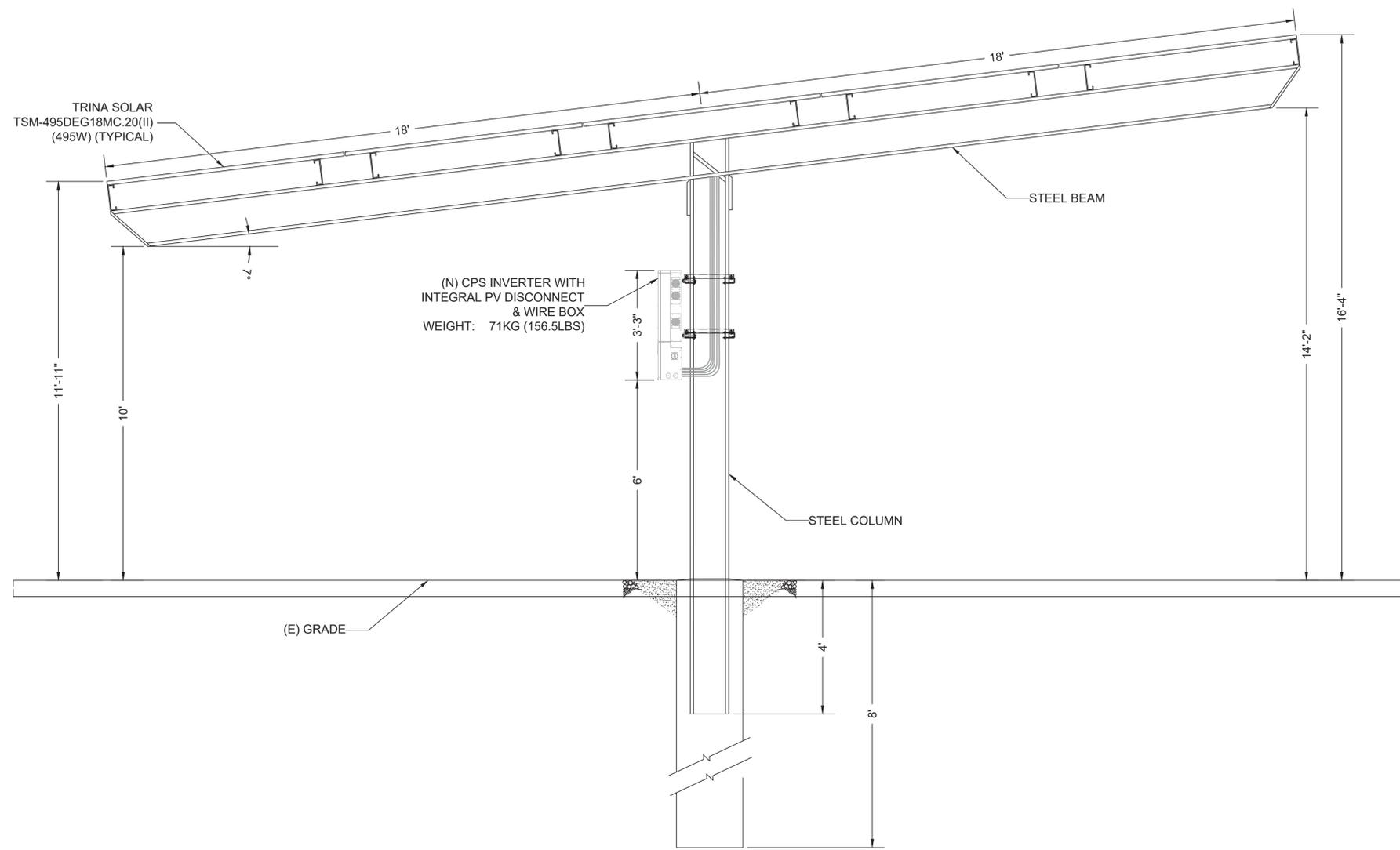
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ELEVATIONS

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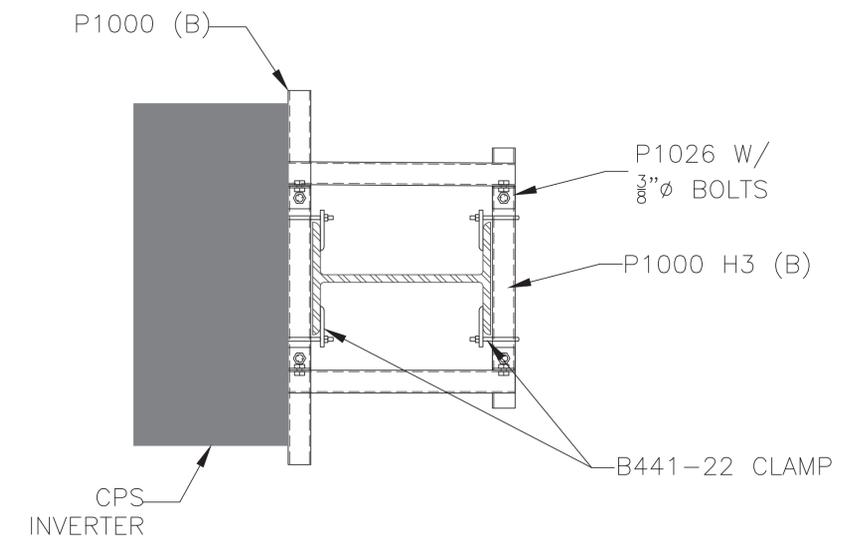
A CANOPY C1 FRONT ELEVATION
SCALE: 1"=8'-0"



B CANOPY C1 SIDE ELEVATION
SCALE: 1"=2'-0"



C PLAN VIEW OF INVERTER RACK
SCALE: NTS



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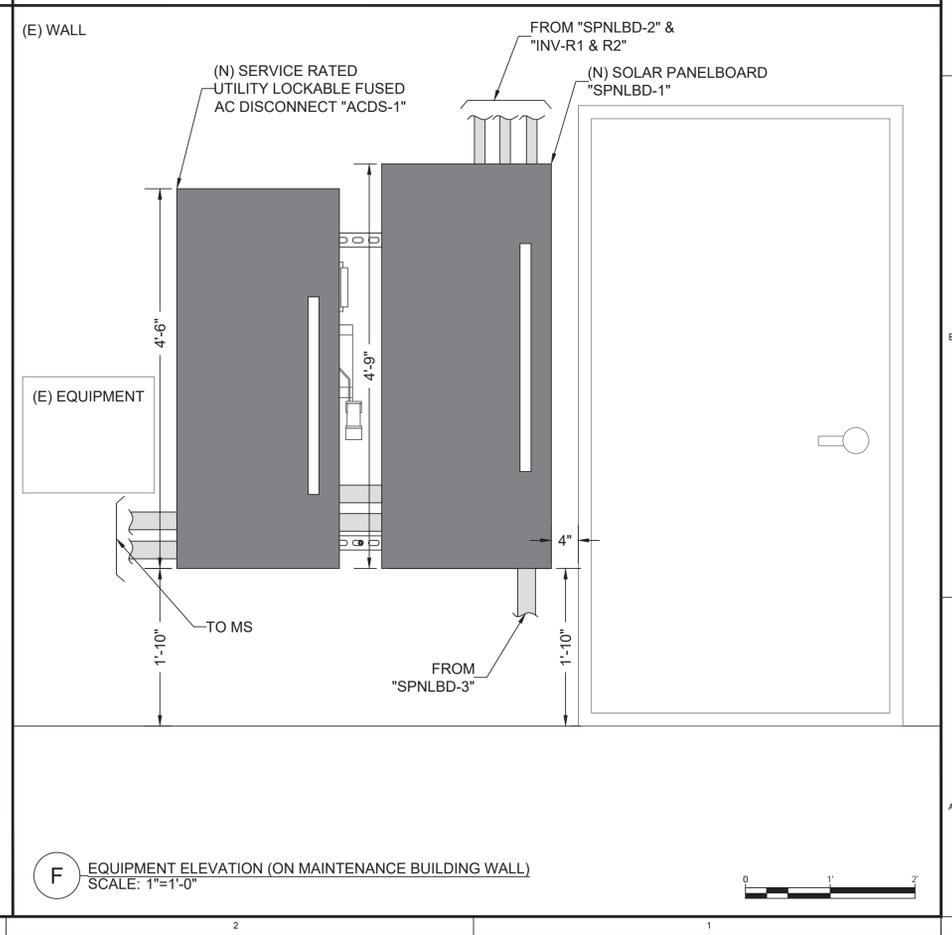
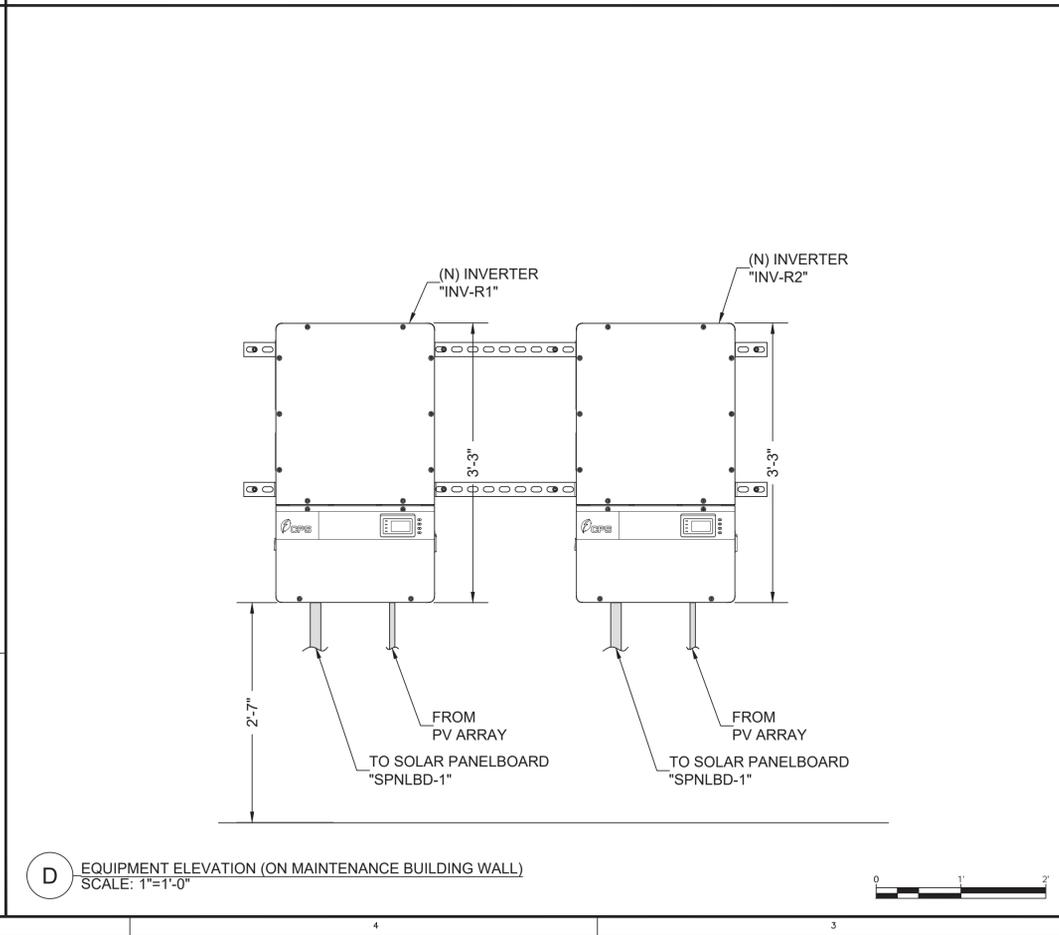
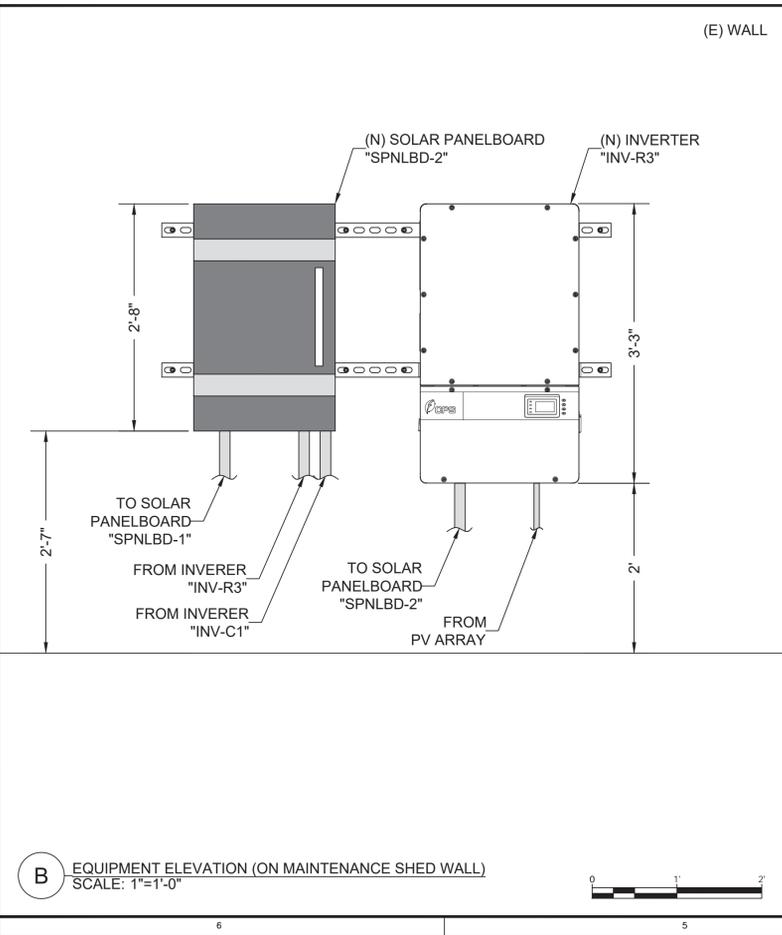
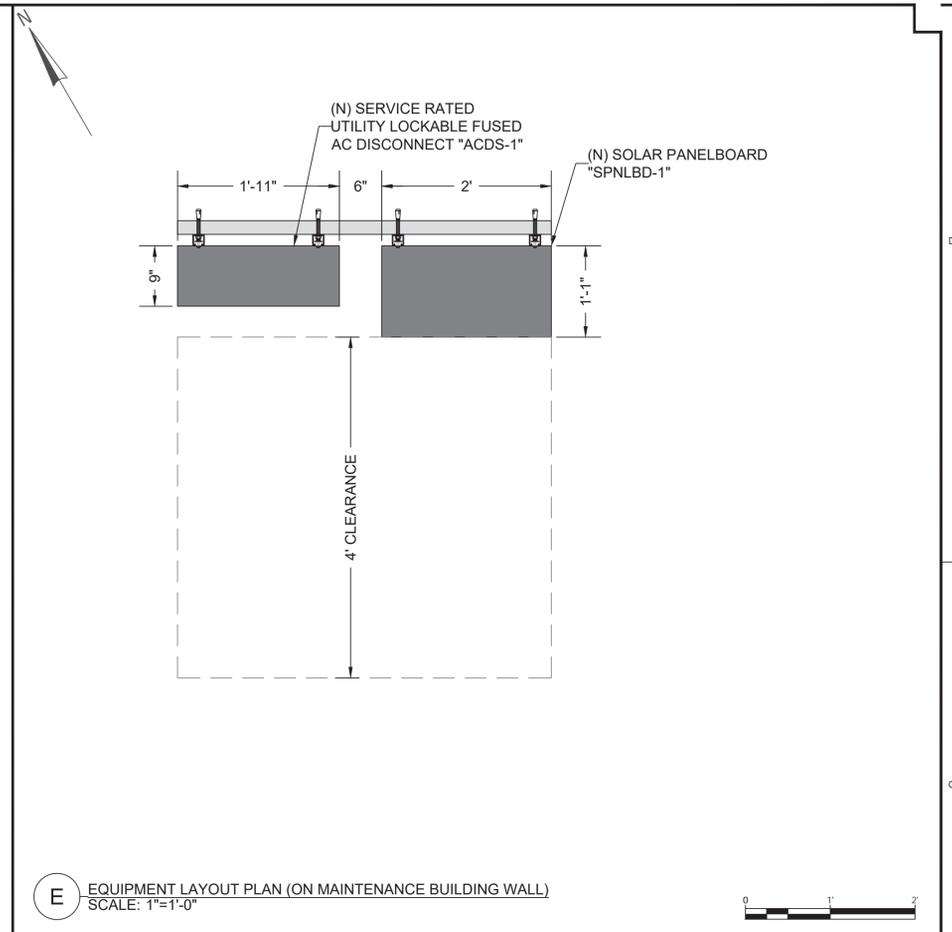
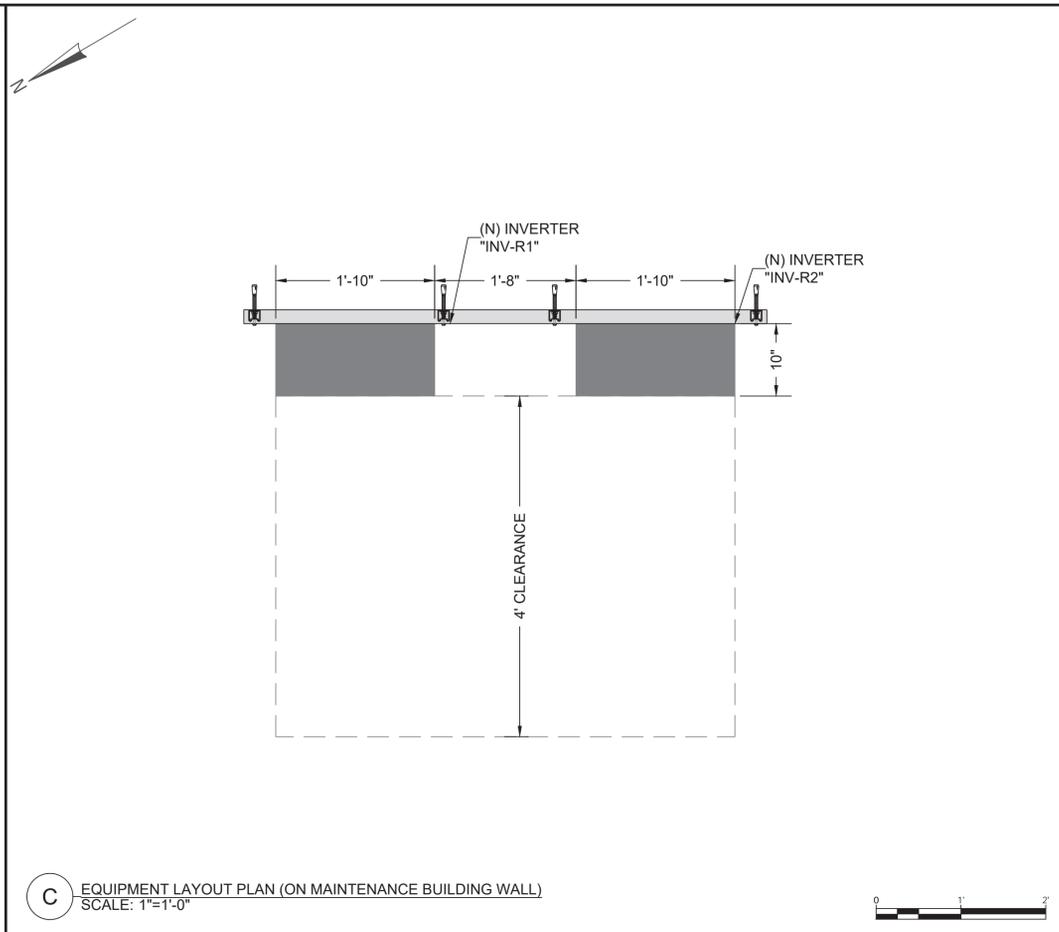
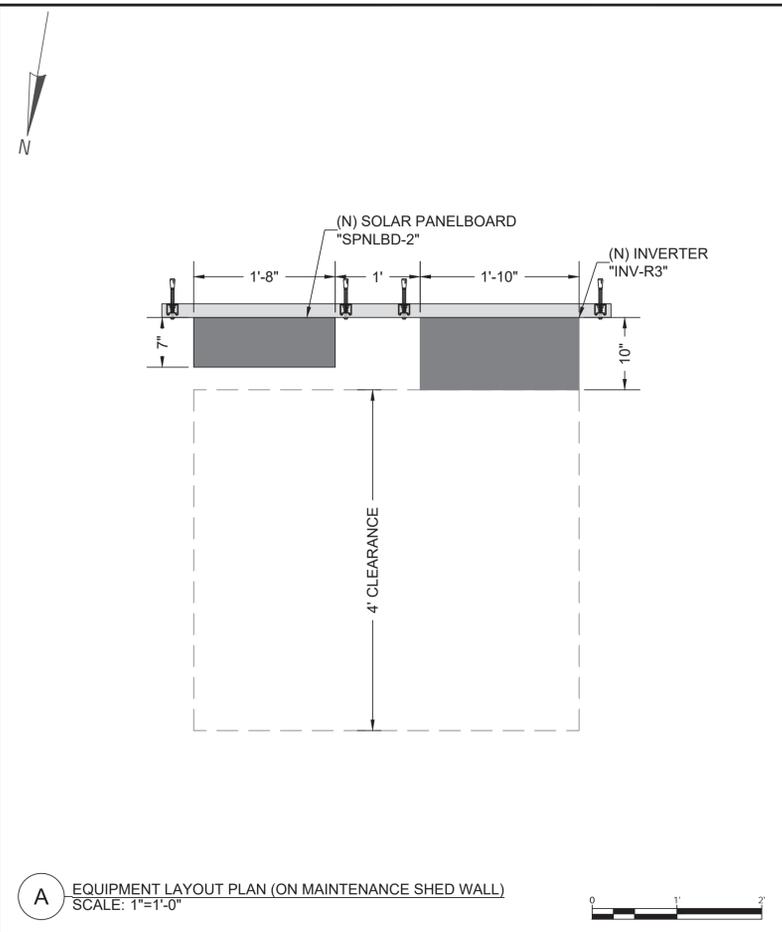
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SHEET TITLE:
CANOPY C1 ELEVATIONS

SHEET #:
A.3.4



PROJECT TITLE:
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**EQUIPMENT
LAYOUT
PLAN**

SHEET #:
E.5.1

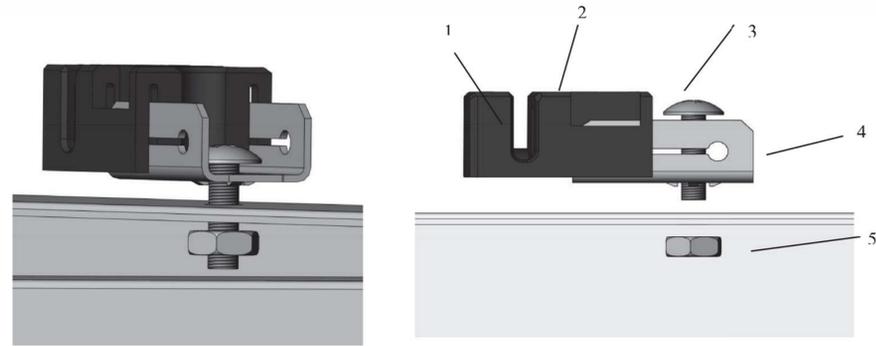
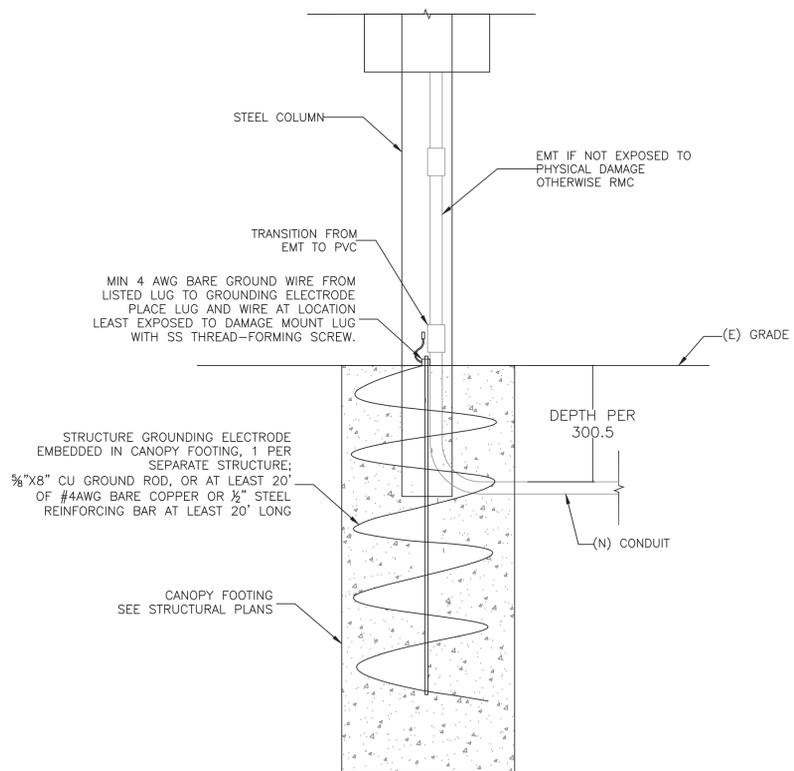


Figure 5. Tyco grounding bolt # 1954381-2
(Not applicable for TRINAMOUNT module series)

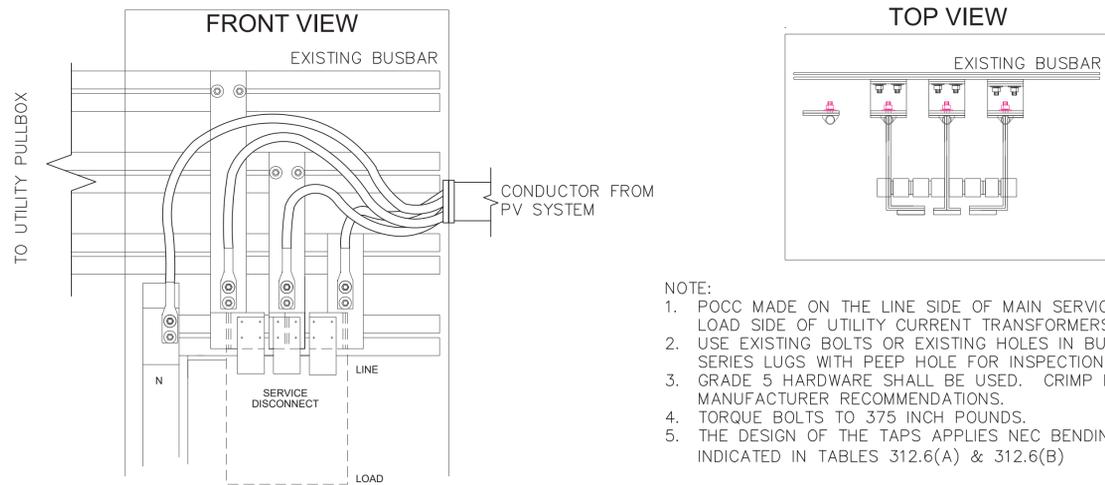
- 1) Wire slot (available for 0.006 to 0.025in² cable)
- 2) Slider
- 3) Bolt
- 4) Base
- 5) Nut

- Tyco grounding hardware comes in a package that includes the grounding bolt, mounting and grounding hex nut.
- Electrical contact is made by penetrating the anodized coating of the aluminum frame, and tightening the mounting hex nut (come with the star washer) to the proper torque of 251bf.in.
- Grounding wire size (6 to 12 AWG solid bare copper) should be selected and installed underneath the wire binding bolt.
- The wire binding bolt should be tightened to the proper torque of 451bf.in.
- The Tyco grounding bolt is only listed for use with 6 to 12 AWG bare solid copper wire.

A MODULE GROUNDING DETAIL
SCALE: NTS

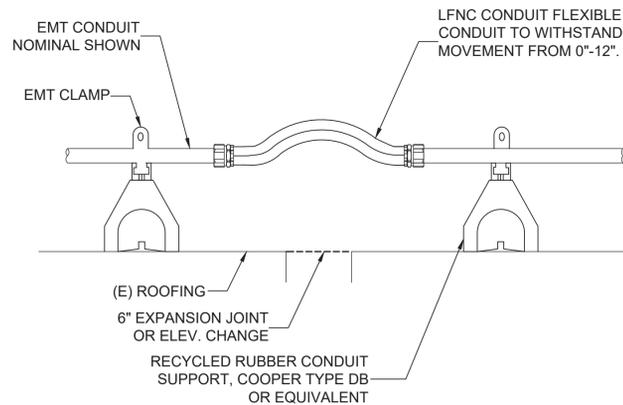


B CANOPY GROUNDING AND CONDUIT TRANSITION DETAIL
SCALE: NTS



- NOTE:**
1. POCC MADE ON THE LINE SIDE OF MAIN SERVICE DISCONNECT AND LOAD SIDE OF UTILITY CURRENT TRANSFORMERS.
 2. USE EXISTING BOLTS OR EXISTING HOLES IN BUS BAR. USE NSI GL SERIES LUGS WITH PEEP HOLE FOR INSPECTION OR EQUIVALENT. GRADE 5 HARDWARE SHALL BE USED. CRIMP LUG BARRELS PER MANUFACTURER RECOMMENDATIONS.
 3. TORQUE BOLTS TO 375 INCH POUNDS.
 4. THE DESIGN OF THE TAPS APPLIES NEC BENDING SPACES AS INDICATED IN TABLES 312.6(A) & 312.6(B)

C POCC DETAIL
SCALE: NTS



D CONDUIT DETAIL AT EXPANSION JOINT
SCALE: NTS

CORDEVILLE GOLF COURSE SOLAR TECHNOLOGIES	
Available Fault Current Calculation	
Utility Fault Current	65,000 amperes
$I = kVA \times 1000 = \text{trans. FLA}$	trans. FLA = 480
$E \times 1.732$	
$I_{sc} = \frac{\text{trans. FLA} \times 100 \times PF}{\text{transformer Z}}$	PF = 0.8
I_{sc} = amperes short-circuit current RMS symmetrical.	I_{sc} = 0 amperes
Point to Point Method	
Length (distance) (feet)	L = 0
(ASC)	$I_{sc} = 65,000$
f^* factor = $\frac{1.732 \times L \times I}{N \times C \times E \times L \times N}$	$f^* = 0.000$
Phase conductor constant	C = 28,770 Phase Conductor 1000 kcmil
Neutral conductor constant	C = 0.900 Neutral Conductor 350 kcmil
Multiplier	M = 1
$M = \frac{1}{1 + f}$	M = 1.000
Line to Line	M = 1.000
Line to Neutral	M = 1.000
$I_{sc} \times M$ = fault current at terminals of main disconnect L-L =	65,000 amperes
$I_{sc} \times M$ = fault current at terminals of main disconnect L-N =	65,000 amperes
Calculation does not include motor contribution	
Branch Circuit Fault from "MS to "SPNLBD-1"	
Three Phase Feeder	Length (distance) L = 20
(ASC)	$I_{sc} = 65,000$ Phase 65,000 Neutral
f^* factor = $\frac{1.732 \times L \times I}{N \times C \times E \times L \times N}$	$f^* = 0.142$
Phase conductor constant	C = 16,483 Phase Conductor 250 kcmil
Neutral conductor constant	C = 0.142 Neutral Conductor 250 kcmil
Multiplier	M = 1
$M = \frac{1}{1 + f}$	M = 0.875
Line to Line	M = 0.802
Line to Neutral	M = 0.802
$I_{sc} \times M$ = fault current at terminal of the panel L-L =	56,903 amperes
$I_{sc} \times M$ = fault current at terminal of the panel L-N =	52,143 amperes
Calculation does not include motor contribution	
Branch Circuit Fault from "SPNLBD-1" to "SPNLBD-3"	
Three Phase Branch	Length (distance) L = 200
(ASC)	$I_{sc} = 56,903$ Phase 52,143 Neutral
f^* factor = $\frac{1.732 \times L \times I}{N \times C \times E \times L \times N}$	$f^* = 5.631$
Phase conductor constant	C = 7,293 Phase Conductor 1
Neutral conductor constant	C = 5.631 Neutral Conductor AWG
Multiplier	M = 1
$M = \frac{1}{1 + f}$	M = 0.151
Line to Line	M = 0.053
Line to Neutral	M = 0.053
$I_{sc} \times M$ = fault current at terminal of the panel L-L =	8,582 amperes
$I_{sc} \times M$ = fault current at terminal of the panel L-N =	2,762 amperes
Calculation does not include motor contribution	

E FAULT CURRENT CALCULATION-1
SCALE: NTS

CORDEVILLE GOLF COURSE SOLAR TECHNOLOGIES	
Available Fault Current Calculation	
Utility Fault Current	65,000 amperes
$I = kVA \times 1000 = \text{trans. FLA}$	trans. FLA = 480
$E \times 1.732$	
$I_{sc} = \frac{\text{trans. FLA} \times 100 \times PF}{\text{transformer Z}}$	PF = 0.8
I_{sc} = amperes short-circuit current RMS symmetrical.	I_{sc} = 0 amperes
Point to Point Method	
Length (distance) (feet)	L = 0
(ASC)	$I_{sc} = 65,000$
f^* factor = $\frac{1.732 \times L \times I}{N \times C \times E \times L \times N}$	$f^* = 0.000$
Phase conductor constant	C = 28,770 Phase Conductor 1000 kcmil
Neutral conductor constant	C = 0.900 Neutral Conductor 350 kcmil
Multiplier	M = 1
$M = \frac{1}{1 + f}$	M = 1.000
Line to Line	M = 1.000
Line to Neutral	M = 1.000
$I_{sc} \times M$ = fault current at terminals of main disconnect L-L =	65,000 amperes
$I_{sc} \times M$ = fault current at terminals of main disconnect L-N =	65,000 amperes
Calculation does not include motor contribution	
Branch Circuit Fault from "MS to "SPNLBD-1"	
Three Phase Feeder	Length (distance) L = 20
(ASC)	$I_{sc} = 65,000$ Phase 65,000 Neutral
f^* factor = $\frac{1.732 \times L \times I}{N \times C \times E \times L \times N}$	$f^* = 0.142$
Phase conductor constant	C = 16,483 Phase Conductor 250 kcmil
Neutral conductor constant	C = 0.142 Neutral Conductor 250 kcmil
Multiplier	M = 1
$M = \frac{1}{1 + f}$	M = 0.875
Line to Line	M = 0.802
Line to Neutral	M = 0.802
$I_{sc} \times M$ = fault current at terminal of the panel L-L =	56,903 amperes
$I_{sc} \times M$ = fault current at terminal of the panel L-N =	52,143 amperes
Calculation does not include motor contribution	
Branch Circuit Fault from "SPNLBD-1" to "SPNLBD-3"	
Three Phase Branch	Length (distance) L = 180
(ASC)	$I_{sc} = 56,903$ Phase 52,143 Neutral
f^* factor = $\frac{1.732 \times L \times I}{N \times C \times E \times L \times N}$	$f^* = 5.058$
Phase conductor constant	C = 7,293 Phase Conductor 1
Neutral conductor constant	C = 5.058 Neutral Conductor AWG
Multiplier	M = 1
$M = \frac{1}{1 + f}$	M = 0.165
Line to Line	M = 0.050
Line to Neutral	M = 0.050
$I_{sc} \times M$ = fault current at terminal of the panel L-L =	9,378 amperes
$I_{sc} \times M$ = fault current at terminal of the panel L-N =	3,050 amperes
Calculation does not include motor contribution	

F FAULT CURRENT CALCULATION-2
SCALE: NTS

PROJECT TITLE:
CORDEVILLE GOLF COURSE
1005 HIGHLAND AVENUE,
SAN MARTIN, CA 95046
APN: 77920006

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NOT FOR
CONSTRUCTION

SOLAR TECHNOLOGIES
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23 LAS COLINAS LN., SUITE NO. 108
SAN JOSE, CA 95119
JOB NUMBER: 11866

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1	29-JUL-22	FOR SUBMITTAL		
2	13-SEP-22	UPDATED CLIENT COMMENTS		

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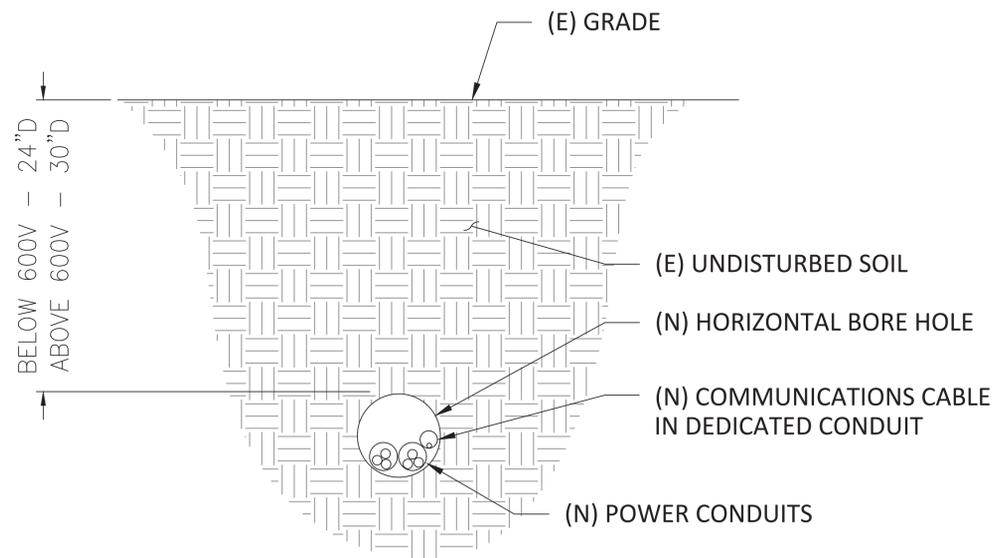
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SHEET TITLE:
ELECTRICAL
DETAILS-1

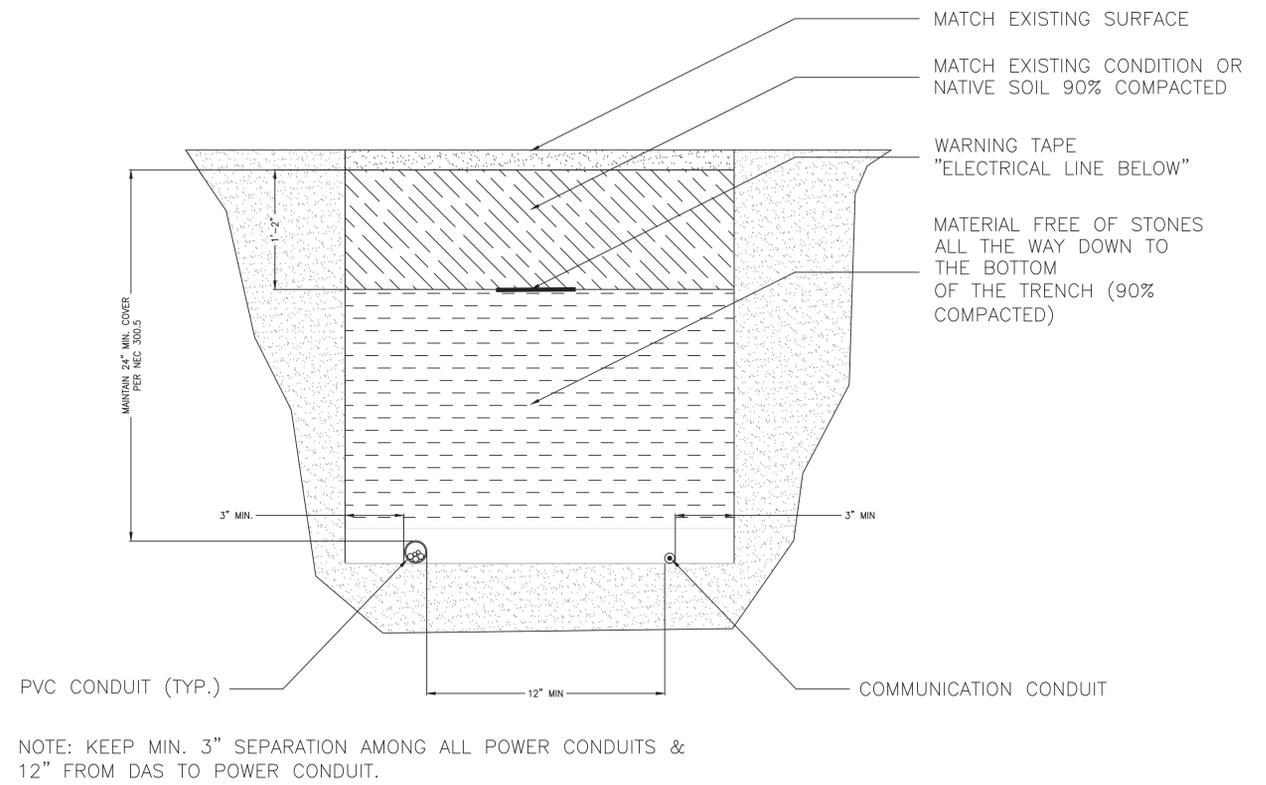
SHEET #:
E.6.1

HORIZONTAL BORING NOTES:

1. SLURRY BACKFILL ALL THE BORE PITS AND POTHOLES UNDER PAVEMENT AND SIDEWALKS.
2. CONDUIT SHALL BE HDPE.
3. A SINGLE BORE CASING SHALL NOT HAVE MORE THAN 2 POWER CONDUITS.



A TYPICAL BORE DETAIL
SCALE: NTS



NOTE: KEEP MIN. 3" SEPARATION AMONG ALL POWER CONDUITS & 12" FROM DAS TO POWER CONDUIT.

B TYPICAL TRENCH DETAIL
SCALE: NTS

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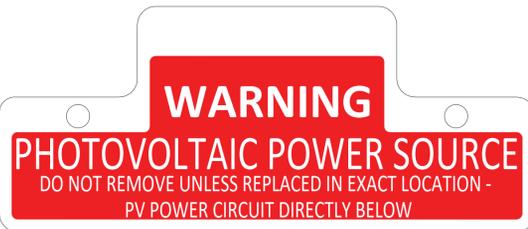
SHEET TITLE:
ELECTRICAL
DETAILS-2

SHEET #:
E.6.2

1 EMT / CONDUIT RACEWAYS, JUNCTION BOXES
*(REFLECTIVE MATERIAL REQUIRED)

WARNING: PHOTOVOLTAIC POWER SOURCE

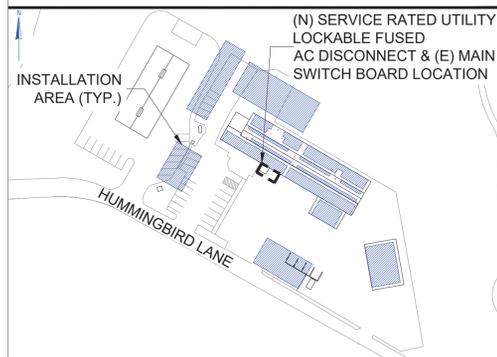
PER NEC 690.31(G)(3) & (4)



PER NEC 690.31(G)(1) - WHERE CIRCUITS ARE EMBEDDED IN BUILT-UP, LAMINATE, OR MEMBRANE ROOFING MATERIALS IN ROOF AREAS NOT COVERED BY PV MODULES AND ASSOCIATED EQUIPMENT.

2 BUILDING / STRUCTURE

CAUTION
POWER TO THIS SERVICE IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN



PER NEC 690.56(B) & 705.10

3 PHOTOVOLTAIC SYSTEM AC DISCONNECT

MAIN PHOTOVOLTAIC SYSTEM AC DISCONNECT

PER NEC 690.13(B)



PER NEC 690.13(B)

PHOTOVOLTAIC AC DISCONNECT
RATED AC OUTPUT CURRENT: 398 A
NOMINAL OPERATING AC VOLTAGE: 480V

PER NEC 690.54



PER NEC 705.12(B)(2)(3)(b)



PER NEC 705.12(B)(3)

SOLAR POWER SYSTEM EQUIPPED WITH RAPID SHUTDOWN

PER NEC 690.56(C)(3)

4 SOLAR PANELBOARD/SWITCHBOARD



PER NEC 705.12(B)(2)(3)(c)

DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL NO LOAD SHALL BE ADDED TO THIS PANEL

PER NEC 705.12(B)(2)(3)(c)

5 MAIN SERVICE DISCONNECT



PER NEC ARTICLE 110.16(A) AND NFPA 70E ARTICLE 130.5(C)(1),(2),(3)

LABELING REQUIREMENTS FOR ARTICLE 110.16, 690 & 705.12

NEC 110.21(B) Field-Applied Hazard Markings.

Where caution, warning, or danger signs or labels are required by this Code, the labels shall meet the following requirements:

- The marking shall warn of the hazards using effective words, colors, symbols, or any combination thereof. Informational Note: ANSI Z535.4-2011, Product Safety Signs and Labels, provides guidelines for suitable font sizes, words, colors, symbols, and location requirements for labels.
- The label shall be permanently affixed to the equipment or wiring method and shall not be handwritten. Exception to (2): Portions of labels or markings that are variable, or that could be subject to changes, shall be permitted to be handwritten and shall be legible.
- The label shall be of sufficient durability to withstand the environment involved. Informational Note: ANSI Z535.4-2011, Product Safety Signs and Labels, provides guidelines for the design and durability of safety signs and labels for application to electrical equipment.

NEC 110.16 Arc Flash:

(A) General -

Electrical equipment, such as switchboards, switchgear, panelboards, industrial control panels, meter socket enclosures, and motor control centers, that is in other than dwelling units, and is likely to require examination, adjustment, servicing, or maintenance while energized, shall be field or factory marked to warn qualified persons of potential electric arc flash hazards. The marking shall meet the requirements in 110.21(B) and shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

(B) Service Equipment

In other than dwelling units, in addition to the requirements in (A), a permanent label shall be field or factory applied to service equipment rated 1200 amps or more. The label shall meet the requirements of 110.21(B) and contain the following information.

- Nominal system voltage
- Available fault current at the service overcurrent protective devices.
- The clearing time of service overcurrent protective devices based on the available fault current at the service equipment.
- The date the label was applied.

Exception: Service equipment labeling shall not be required if an arc flash label is applied in accordance with acceptable industry practice.

NEC 690.13(B)

Each PV system disconnecting means shall plainly indicate whether in the open (off) or closed (on) position and be permanently marked "PV SYSTEM DISCONNECT" or equivalent. Additional markings shall be permitted based upon the specific system configuration. For PV system disconnecting means where the line and load terminals may be energized in the open position, the device shall be marked with the following words or equivalent.

NEC 690.31(G)(1)

Where circuits are embedded in build up, laminate or membrane roofing materials not covered by PV modules and associated equipment, the location of the circuits shall be clearly marked.

NEC 690.31(G)(3) & (4)

PV dc system circuit labels shall appear on every section of the wiring system that is separated by enclosures, walls, partitions, ceilings, or floors. Spacing between labels or markings, or between a label and a marking, shall not be more than 3 m (10 ft). Labels required in this section shall be suitable for the environment where they are installed.

NEC 690.53

A permanent label for the dc PV power source indicating items (1) through (3) shall be provided by the installer at dc PV system disconnecting means and at each dc equipment disconnecting means required by 690.15. Where a disconnecting means has more than one dc PV power source, the values in 690.53 (1) through (3) shall be specified for each source.

NEC 690.54

All interactive system(s) points of interconnection with other sources shall be marked as an accessible location at the disconnecting means as a power source and with the rated ac output current and the nominal operating ac voltage.

NEC 690.56(B)

Plaques or directories shall be installed in accordance with 705.10.

NEC 690.56(C)(1)(a)

For PV systems that shut down the array and conductors leaving the array shall be labeled accordingly.

NEC 690.56(C)(3)

A rapid shutdown switch shall have a label located on or no more than 1 meter (3 ft) from the switch that includes the following wording.

NEC 705.10

A permanent plaque or directory, denoting the location of all electric power source disconnecting means on or in the premises, shall be installed at each service equipment location and at the location(s) of the system disconnect(s) for all electric power production sources capable of being interconnected. Also see 690.4(d) One sign required for each PV system.

NEC 705.12(B)(2)(3)(b)

Where two sources, one a primary power source and the other another power source, are located at opposite ends of a busbar that contains loads, the sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent device protecting the busbar shall not exceed 120 percent of the ampacity of the busbar. A permanent warning label shall be applied to the distribution equipment adjacent to the back-fed breaker from the power source that displays the following or equivalent wording.

NEC 705.12(B)(2)(3)(c)

The sum of the ampere ratings of all overcurrent devices on panelboards, both load and supply devices, excluding the rating of the overcurrent device protecting the busbar, shall not exceed the ampacity of the busbar. The rating of the overcurrent device protecting the busbar shall not exceed the rating of the busbar. Permanent warning labels shall be applied to distribution equipment displaying the following or equivalent wording.

NEC 705.12(B)(3)

Equipment containing overcurrent devices in circuits supplying power to a busbar or conductor supplied from multiple sources shall be marked to indicate the presence of all sources. Circuits if backfed shall be suitable for such operations.

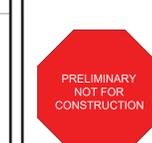
SIGNAGE NOTES:

- SIGNAGE SHALL BE WEATHER RESISTANT. UL 969 SHALL BE USED AS A STANDARD FOR WEATHER RATING.
- ALL SIGNAGE SHALL HAVE ALL CAPITAL LETTERS WITH MINIMUM 3/8" LETTER HEIGHT FOR HEADERS & 1/4" FOR REST OF THE TEXT. TEXT WITH RED BACKGROUND TO BE OF 3/8" HEIGHT DO NOT USE SCREWS FOR SIGNAGE ATTACHMENT. USE ONLY PERMANENT ADHESIVE.

PROJECT TITLE:

CORDEVALLE GOLF COURSE
1005 HIGHLAND AVENUE,
SAN MARTIN, CA 95046
APN: 77920006

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JOB NUMBER: 11806

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APPROVED BY:	JHA

SCALE:
NTS

SHEET TITLE:
LABELS & MARKINGS

SHEET #:
E.7.1

THE Vertex

BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

500W+
MAXIMUM POWER OUTPUT

21.0%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

Founded in 1997, Trina Solar is the world's leading total solution provider for solar energy. With local presence around the globe, Trina Solar is able to provide exceptional service to each customer in each market and deliver our innovative, reliable products with the backing of Trina's a strong, bankable brand. Trina Solar now distributes its PV products to over 120 countries all over the world. We are committed to building strategic, mutually beneficial collaborations with installers, developers, distributors, and other partners in driving smart energy together.

Comprehensive Products and System Certifications
IEC61215/IEC6170/IEC61701/IEC62716/UL1703 ISO 9001: Quality Management System ISO 14001: Environmental Management System ISO 14064: Greenhouse Gas Emissions Verification ISO 50001: Occupational Health and Safety Management System



TrinaSolar

PRODUCTS
TSM-DEGLBMC200H | POWER RANGE
475-505W

High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation; extended 30-year warranty
- Designed for compatibility with existing mainstream system components
- Higher return on investment

High power up to 505W

- Large area cells based on 210mm silicon wafers and 1/3-cut cell technology
- Up to 21.0% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection

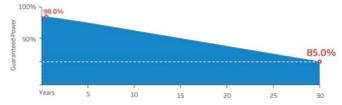
High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load
- Certificated to fire class A

High energy yield

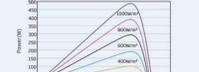
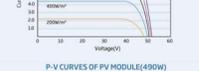
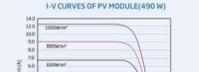
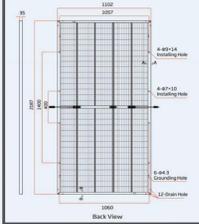
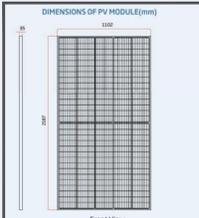
- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.35%) and operating temperature
- Up to 25% additional power gain from back side depending on albedo

Trina Solar's VERTEX Bifacial Dual Glass Performance Warranty



Vertex

BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE



Electrical Data (STC)	475	480	485	490	495	500	505
Peak Power Watts-P _{max} (W)*	475	480	485	490	495	500	505
Power Tolerance-P _{max} (W)	0~+5%						
Maximum Power Voltage-V _{mp} (V)	41.9	42.2	42.5	42.8	43.1	43.4	43.7
Maximum Power Current-I _{mp} (A)	11.34	11.38	11.42	11.45	11.49	11.53	11.56
Open Circuit Voltage-V _{oc} (V)	50.5	50.7	50.9	51.1	51.3	51.5	51.7
Short Circuit Current-I _{sc} (A)	11.93	11.97	12.01	12.05	12.09	12.13	12.17
Module Efficiency η _m (%)	19.7	19.9	20.1	20.3	20.5	20.7	21.0

Electrical Characteristics with different power bin (reference to 10% irradiance ratio)	508	514	519	524	530	535	540
Total Equivalent power-P _{max} (W)	508	514	519	524	530	535	540
Maximum Power Voltage-V _{mp} (V)	41.9	42.2	42.5	42.8	43.1	43.4	43.7
Maximum Power Current-I _{mp} (A)	12.13	12.18	12.22	12.24	12.29	12.34	12.37
Open Circuit Voltage-V _{oc} (V)	50.5	50.7	50.9	51.1	51.3	51.5	51.7
Short Circuit Current-I _{sc} (A)	12.77	12.81	12.85	12.89	12.94	12.98	13.02
Irradiance ratio (rear/front)	10%						

Electrical Data (NMOT)	360	363	367	371	374	378	382
Maximum Power-P _{max} (W)	360	363	367	371	374	378	382
Maximum Power Voltage-V _{mp} (V)	39.5	39.8	40.0	40.2	40.5	40.8	41.0
Maximum Power Current-I _{mp} (A)	9.09	9.13	9.18	9.21	9.25	9.28	9.33
Open Circuit Voltage-V _{oc} (V)	47.7	47.9	48.1	48.3	48.5	48.7	48.8
Short Circuit Current-I _{sc} (A)	9.61	9.64	9.67	9.70	9.73	9.77	9.80

Mechanical Data	Value
Solar Cells	Monocrystalline
No. of cells	150 (6R)
Module Dimensions	2107*1102*25 mm (86.10*43.39*1.38 inches)
Weight	30.1 kg (66.6 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)
Frame	35mmx1.38 inches Anodized Aluminum Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4-Driver (0.006 inches) ¹ , Puritan: 290/980 mm (11.02/31.02 inches) ² , Landscape: 2000*2000 mm(78.74/78.74 inches)
Connector	MC4 EVQ2 / T54 ³

Temperature Ratings	Value
NMOT (Maximum Module Operating Temperature)	41°C (105°F)
Operational Temperature	-40~+85°C
Temperature Coefficient of P _{max}	-0.35%/°C
Maximum System Voltage	1500V DC (IEC)
Temperature Coefficient of V _{oc}	-0.25%/°C
Maximum Series Fuse Rating	25A
Temperature Coefficient of I _{sc}	0.04%/°C

Warranty	Value
24h first year degradation	0.45%
12 year Product Workmanship Warranty	
30 year Power Warranty	
0.45% Annual Power Attenuation	

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.
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Version number: TSM_RK_020_A www.trinasolar.com

TrinaSolar

CPS

50/60kW, 1000Vdc String Inverters for North America

The 50 & 60kW (55 & 66kVA) medium power CPS three phase string inverters are designed for ground mount, large rooftop and carport applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 98.8% peak and 98.5% CEC, wide operating voltages, broad temperature ranges and a NEMA Type 4X enclosure enable this inverter platform to operate at high performance across many applications. The CPS 50/60kTL products ship with either the Standard wire-box or the Rapid Shutdown wire-box, each fully integrated and separable with touch safe fusing, monitoring, and AC and DC disconnect switches. The integrated PLC transmitter in the Rapid Shutdown wire-box enables PVRS certified module-level rapid shutdown when used with the Tigo TS4-F/TS4-A-F/TS4-A-2F products and APS RSD-S-PLC/RSD-D products. The CPS FlexOM Gateway enables monitoring, controls and remote product upgrades.

Key Features

- NEC 2017/2020 PVRS Certified Rapid Shutdown
- 55 & 66kVA rating allows max rated Active Power @+0.91PF
- Selectable Max AC Apparent Power of 50/55kVA and 60/66kVA
- NEC 2014/17 compliant & UL listed Arc-Fault circuit protection
- 15-90° Mounting orientation for low profile roof installs
- Optional FlexOM Gateway enables remote FW upgrades
- Integrated AC & DC disconnect switches
- 3 MPPT's with 5 inputs each for maximum flexibility
- NEMA Type 4X outdoor rated, tough tested enclosure
- UL1741 SA Certified to CA Rule 21, including SA8 through SA18
- Separable wire-box design for fast service
- Standard 10 year warranty with extensions to 20 years



CPS SCA50KTL-DO/US-480
CPS SCA60KTL-DO/US-480



50/60KTL Standard Wire-box



50/60KTL Rapid Shutdown Wire-box



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Chint Power Systems America
6800 Koll Center Parkway, Suite 233 Pleasanton, CA 94566
Tel: 925-504-7168 Mail: AmericaSales@chintpower.com Web: www.chintpower.com

CPS

Model Name	CPS SCA3KTL-DO/US-480
DC Input	
Max. PV Power	54kW (27kW per MPPT)
Max. DC Input Voltage	1000Vdc
Operating DC Input Voltage Range	240-950Vdc
Start-up DC Input Voltage / Power	320V / 80W
Number of MPP Trackers	2
MPPT Voltage Range	540-800Vdc
Max. PV Short-Circuit Current (I _{sc} x 1.25)	125A (82.5A per MPPT)
Number of DC Inputs	10 inputs, 5 per MPPT
DC Disconnection Type	Load rated DC switch
DC Surge Protection	Type II MOV, 2000V _c , 10kA I _{sm} (8/20μs)
AC Output	
Rated AC Output Power	36kW
Max. AC Apparent Power	36kVA
Rated Output Voltage	480Vac
Output Voltage Range ¹	422 - 528Vac
Grid Connection Type	3Φ / PE / N (Neutral optional)
Max. AC Output Current @480Vac	43.5A
Rated Output Frequency	60Hz
Output Frequency Range ²	57 - 63Hz
Power Factor	>0.99 (±0.8 adjustable)
Current THD @ Rated Load	<3%
Max. Fault Current Contribution (1 Cycle RMS)	73.2A
AC Disconnection Type	Load rated AC switch
AC Surge Protection	Type II MOV, 1500V _c , 10kA I _{sm} (8/20μs)
System and Performance	
Topology	Transformerless
Max. Efficiency	98.5%
CEC Efficiency	98.0%
Stand-by / Night Consumption	<1W
Environment	
Enclosure Protection Degree	NEMA Type 4X
Cooling Method	Variable speed cooling fans
Operating Temperature Range	-22°F to +140°F / -30°C to +80°C (derating from +113°F / +45°C)
Non-Operating Temperature Range ³	No low temp minimum to +158°F / +70°C maximum
Operating Humidity	0 to 100%
Operating Altitude	13,123.4ft / 4000m (derating from 6561.7ft / 2000m)
Audible Noise	<50dBA @ 1m and 25°C
Display and Communication	
User Interface and Display	LCD-LED
Inverter Monitoring	Modbus RS485
Site Level Monitoring	CPS Flex Gateway (1 per 32 inverters)
Modbus Data Mapping	CPS
Remote Diagnostics / FW Upgrade Functions	Standard / (with Flex Gateway)
Mechanical	
Dimensions (HxWxD)	Inverter: 26 x 23.6 x 9.1in. (660 x 600 x 230mm), Wire-box: 13.4 x 23.6 x 9.1in. (340 x 600 x 230mm)
Weight	Inverter: 121lbs/55kg, Wire-box: 24lbs/11kg
Mounting / Installation Angle ⁴	15 to 90 degrees from horizontal (vertical or angled)
AC Termination	Screw Clamp Terminal Block (Wire range: #14 - 10AWG CU/AL)
DC Termination	Screw Clamp Fuse Holder (Wire range: #14 - #6AWG CU)
Fused String Inputs (5 per MPPT) ⁵	15A fuses provided (Fuse values up to 30A acceptable) ⁶
Safety	
Certifications and Standards	UL1741SA-2016, UL1699B, CSA-C22.2 NO.107-1-01, IEEE1547-2014, FCC PART15
Selectable Grid Standard	IEEE 1547-2003, CA Rule 21, ISO-NE
Smart-Grid Features	Voltage-RideThru, Freq-RideThru, Soft-Start, Volt-Var, Freq-Watt, Volt-Watt
Warranty	
Standard	10 years
Extended Terms	15 and 20 years

1) The "Output Voltage Range" and "Output Frequency Range" may differ according to the specific grid standard.
2) See user manual for further requirements regarding non-operating conditions.
3) Shade Cover accessory required for installation angles of 75 degrees or less.
4) Fuse values above 20A have additional spacing requirements. See user manual for further details.

Industrial Solutions



Catalog No. TH3366R

Description: 600A 3P HD N3R 600V FUSIBLE

UPC No 783164009187

Home > Switches & Disconnects > Disconnect & Safety Switches > Safety Switches > Heavy Duty

Designed for commercial and industrial applications where safety, high performance and continuity of service are essential. Listed to UL standard 98 enclosed and dead front switches. Suitable for use as service equipment when installed in accordance with the National Electrical Code. Certified to CSA standard 22.2 no. 4-04 enclosed and dead front switches. Meets or exceeds NEMA ICS1 standard for enclosed switches, Type HD. Fusible and non-fusible switches available (consult BuyLog for interrupt ratings). Quick-make, quick-break mechanism. 60/75 C conductor rating. Full cover interlocks. TH3366R

Descriptors	Value
Category	Heavy Duty
GO Schedule	S1
Specifications	
Voltage	600 AC
Amperage	600 A
Poles	3
Wires	3
Fusing	Fusible
Enclosure	NEMA 3R (Outdoor)
Options	None
Wire Range (Cu/Al)	(2) 4-500
240 Vac, NEC Std, 3-φ	75.0 hp
240 Vac, Time Delay, 3-φ	200.0 hp
480 Vac, NEC Std, 3-φ	150.0 hp
480 Vac, Time Delay, 3-φ	400.0 hp
600 Vac, NEC Std, 3-φ	200.0 hp
600 Vac, Time Delay, 3-φ	500.0 hp
250 Vdc	50.0 hp
GSA Compliance	Yes
Classifications	
cUL Listed	Yes
UL Listed	Yes
Dimensions	
Height	53.5 in
Depth	8.5 in
Width	23.0 in
Weight	136.0 lb

by ABB

electrification.us.abb.com

Created on 03/23/2022

Tigo Flex MLPE



TS4-A-2F PV Module Advanced Add-On

The TS4-A-2F (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-2F 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

- Enhanced safety for NEC 690.12 rapid shutdown compliance
- Free Safety

Easy Installation

Snap to standard module frame or remove brackets for rack mounting

PLC Signaling

Control rapid shutdown with the Tigo RSS Transmitter

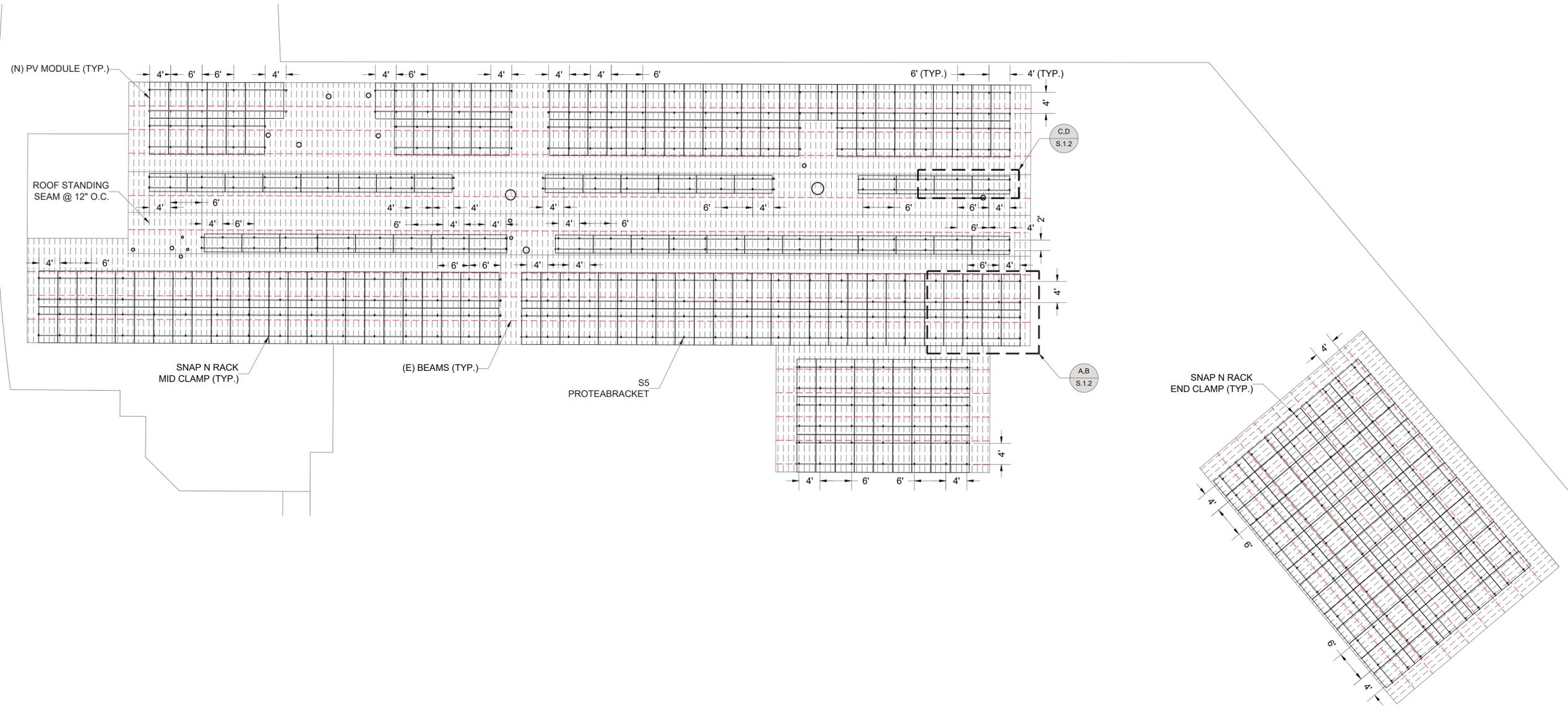
Automatic Shutdown

PV array enters rapid shutdown in event of AC grid loss



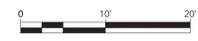
CPS

Model Name	CPS SCA50KTL-DO/US-480	CPS SCA60KTL-DO/US-480
DC Input		
Max. PV Power	54kW (27kW per MPPT)	60kW (30kW per MPPT)
Max. DC Input Voltage	1000Vdc	1000Vdc
Operating DC Input Voltage Range	240-950Vdc	240-950Vdc
Start-up DC Input Voltage / Power	320V / 80W	320V / 80W
Number of MPP Trackers	2	3
MPPT Voltage Range	540-800Vdc	540-850Vdc
Max. PV Short-Circuit Current (I _{sc} x 1.25)	125A (82.5A per MPPT)	204A (68A per MPPT)
Number of DC Inputs	10 inputs, 5 per MPPT	15 inputs, 5 per MPPT
DC Disconnection Type	Load-rated DC switch	Load-rated DC switch
DC Surge Protection	Type II MOV, 2800V _c , 20kA I _{sm} (8/20μs)	Type II MOV, 2800V _c , 20kA I _{sm} (8/20μs)
AC Output		
Rated AC Output Power @ PF=0.99 to ±0.91 ¹	50kW	60kW
Max. AC Apparent Power (Selectable)	50/55kVA	60/66kVA
Rated Output Voltage	480Vac	480Vac
Output Voltage Range ²	422 - 528Vac	422 - 528Vac
Grid Connection Type	3Φ / PE / N (Neutral optional)	3Φ / PE / N (Neutral optional)
Max. AC Output Current @480Vac	60.2/66.2A	72.2/79.4A
Rated Output Frequency	60Hz	60Hz
Output Frequency Range ³	57 - 63Hz	57 - 63Hz
Power Factor	>0.99 (±0.8 adjustable)	>0.99 (±0.8 adjustable)
Current THD @ Rated Load	<3%	<3%
Max. Fault Current Contribution (1 Cycle RMS)	73.2A	64.1A (1.060.88 PU)
AC Disconnection Type	Load-break rated AC switch	Load-break rated AC switch
AC Surge Protection	Type II MOV, 1200V _c , 15kA I _{sm} (8/20μs)	Type II MOV, 1200V _c , 15kA I _{sm} (8/20μs)
System and Performance		
Topology	Transformerless	Transformerless
Max. Efficiency	98.5%	98.5%
CEC Efficiency	98.0%	98.0%
Stand-by / Night Consumption	<1W	<1W
Environment		

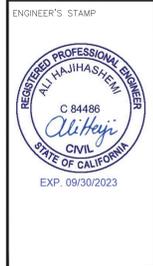


A FRAMING PLAN
SCALE: 1"=8'-0"

NOTES:
 1. SNAP N RACK MID CLAMP: 564
 2. SNAP N RACK END CLAMP: 96
 3. S5 PROTEABRACKET: 500



PROJECT TITLE:
CORDEVALLE GOLF COURSE
 1005 HIGHLAND AVENUE,
 SAN MARTIN, CA 95046
 APN: 77920006



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DRAWN BY:	HK
CHECKED BY:	VJ
APPROVED BY:	JHA

SCALE:
 VARIES

SHEET TITLE:
ROOF FRAMING PLAN

SHEET #:
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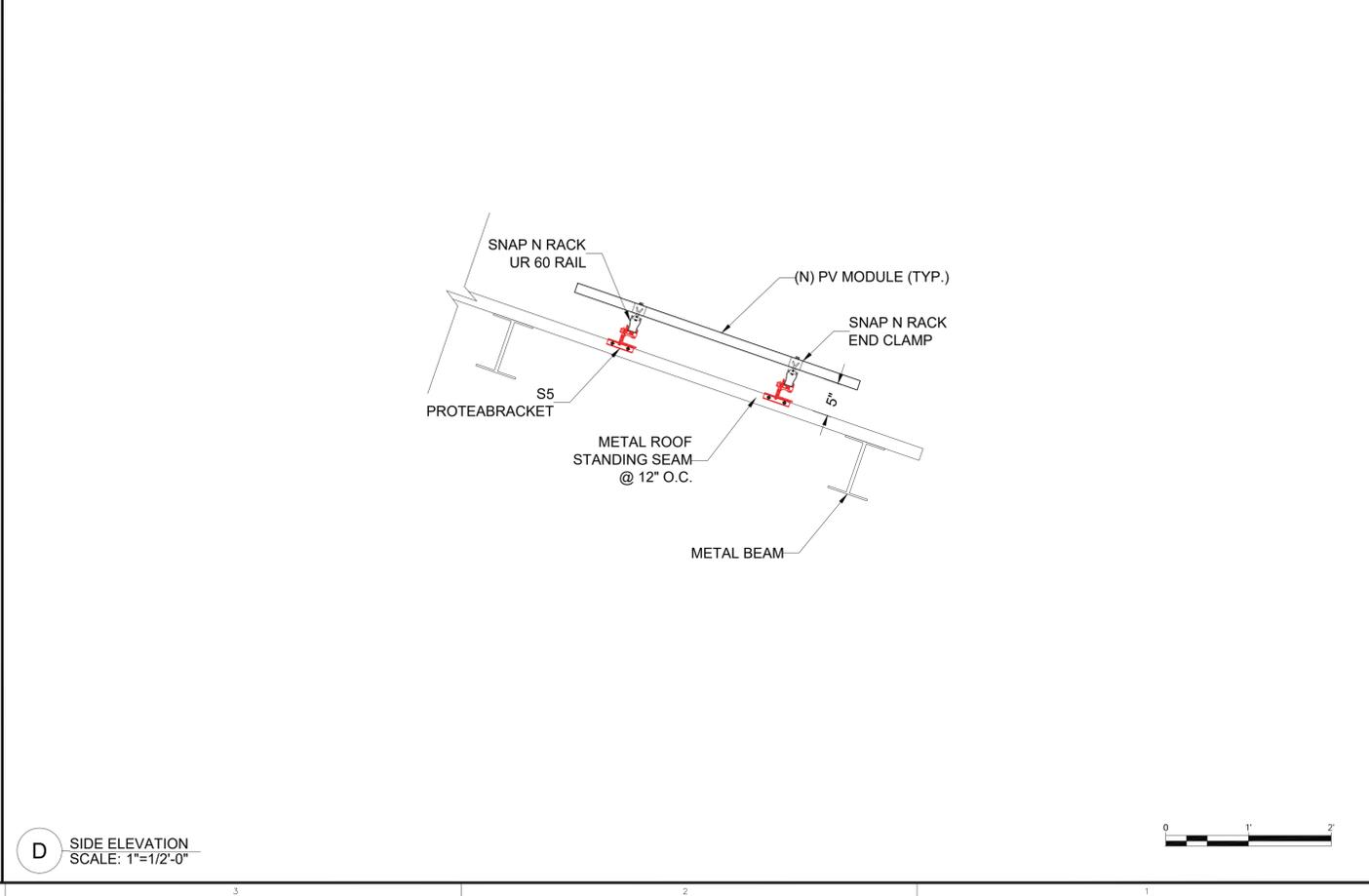
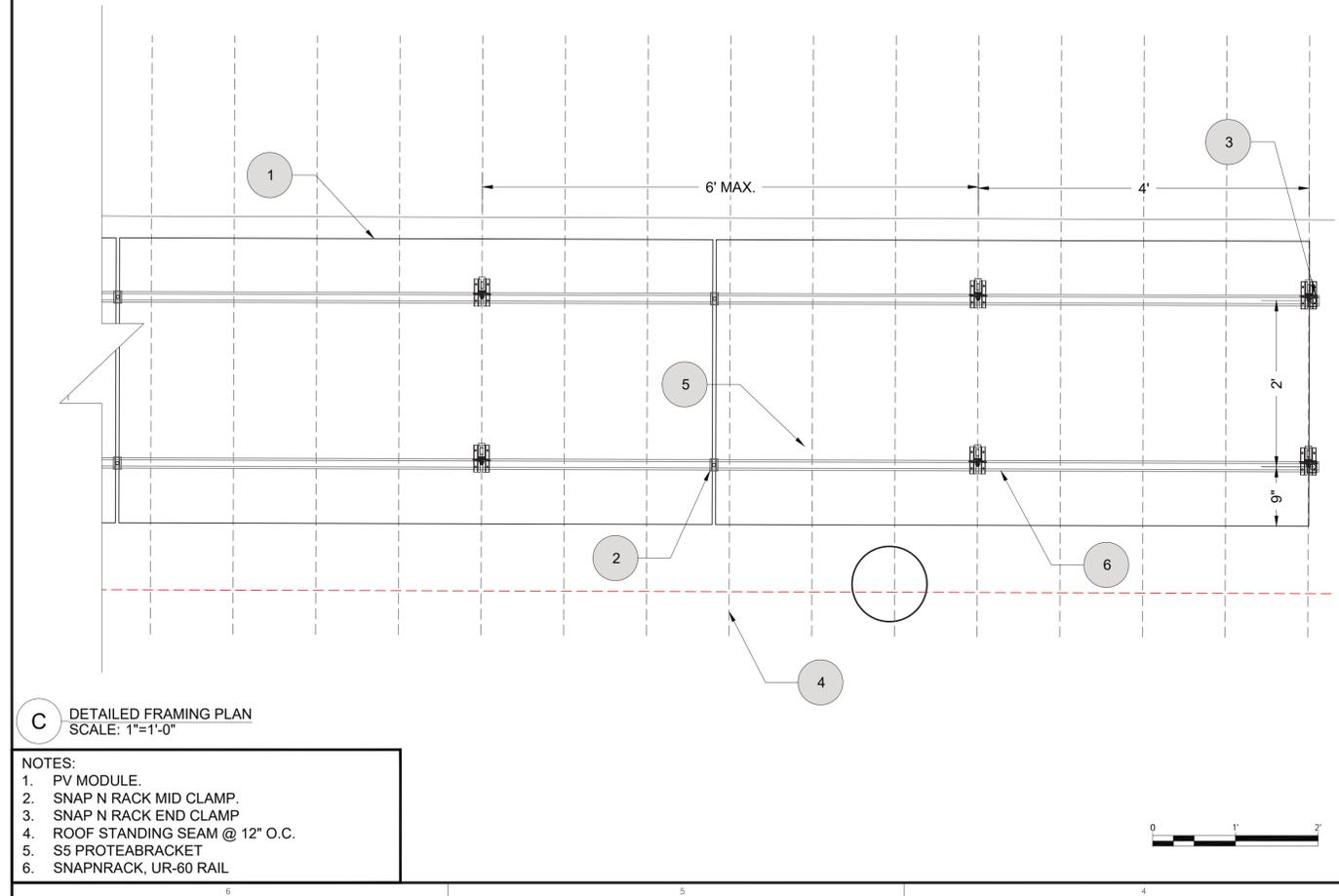
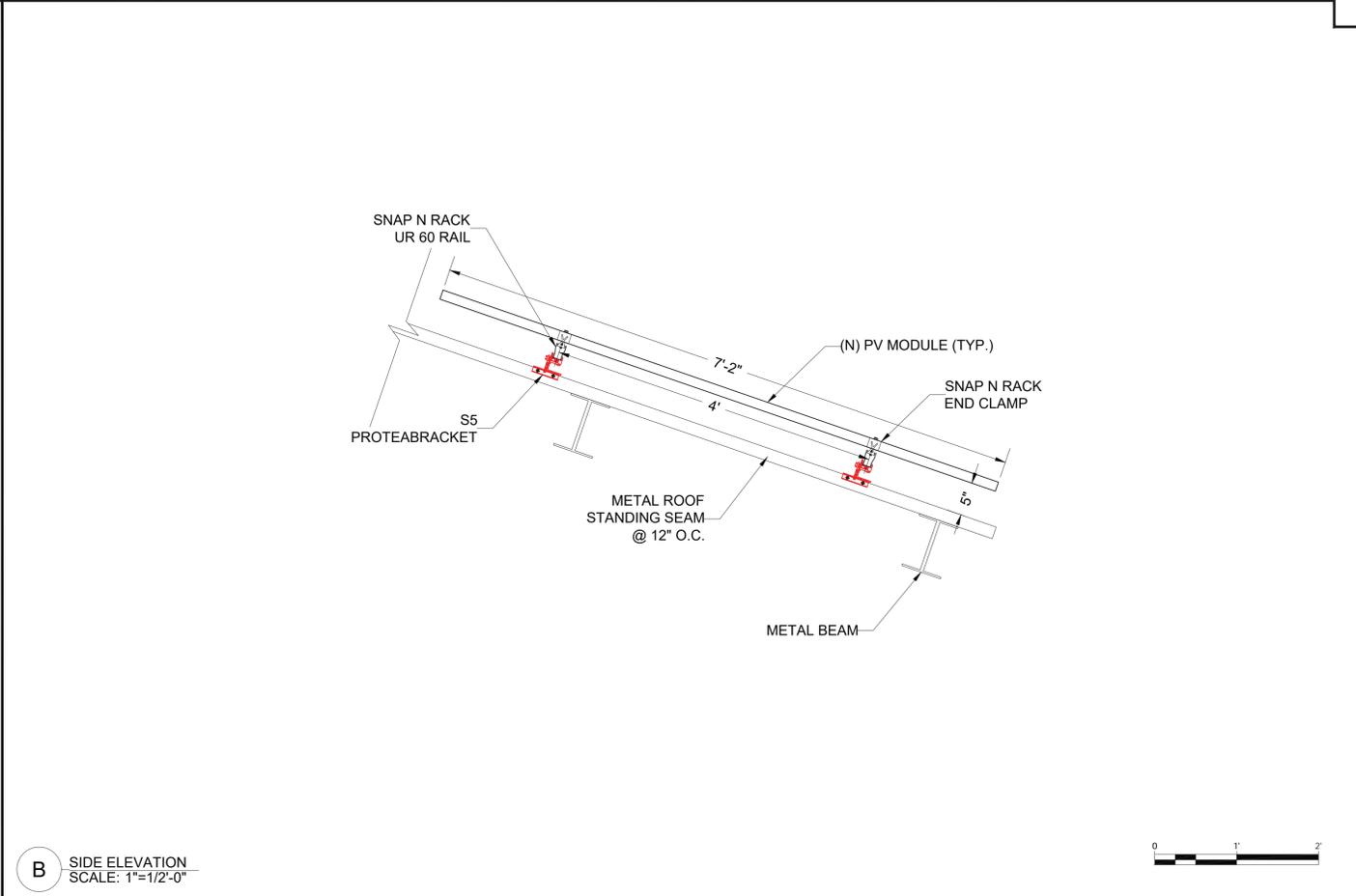
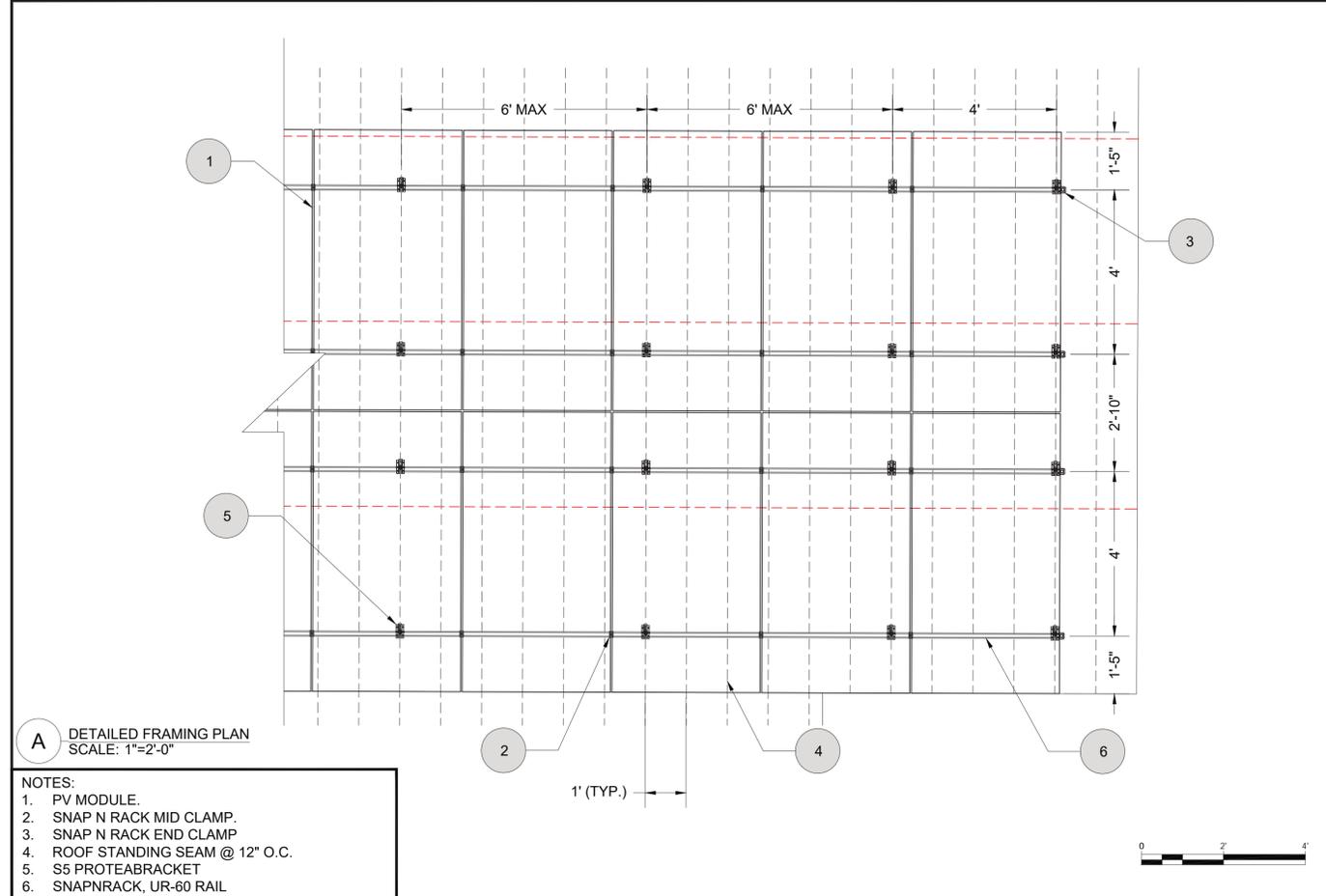
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 DETAILS

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S-5!® The Right Way!

The right way to attach almost anything to metal roofs!

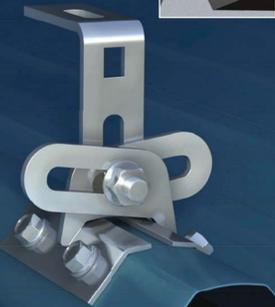
ProteaBracket™

ProteaBracket™ is the most versatile standing seam metal roof attachment solution on the market, fitting most trapezoidal sheet profiles with and without intermediate insulation. It features an adjustable attachment base and multiple solar module attachment options (illustrated on back) to accommodate varying widths and heights. There are no messy sealants to apply and no chance for leaks; the ProteaBracket comes with factory-applied, adhesive rubber sealant to ensure quick installation and a weather-proof fit.

Installation is simple! The ProteaBracket is mounted directly onto the crown of the panel, straddling the profile. No surface preparation is necessary; simply wipe away excess oil and debris, align, and apply. Secure ProteaBracket through its pre-punched holes, using the hardened drill point S-5!® screws.

ProteaBracket is the perfect match for our S-5-PV Kit and spares you the hassle of cold-bridging! For a solar attachment solution that is both economical and easy to use, choose ProteaBracket.*

S-5!® ProteaBracket™ is a versatile bracket that adjusts easily to most trapezoidal roof profiles.



ProteaBracket™

888-825-3432 | www.S-5.com

S-5!® The Right Way!

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal exposed-fastened metal roof profiles! No messy sealants to apply. The factory-applied adhesive rubber sealant weather-proofs and makes installation easy!

Each ProteaBracket™ comes with a factory-applied, adhesive rubber sealant on the base. A structural A2 stainless steel bimetal attachment bracket, ProteaBracket is compatible with most common metal roofing materials. All four pre-punched holes must be used to achieve tested strength. Mounting hardware is furnished with the ProteaBracket. 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 Rail Option



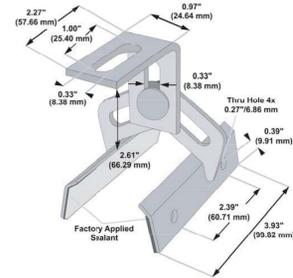
Top Rail Option



S-5-PV Kit Option



ProteaBracket™



Please note: All measurements are rounded to the second decimal place.

Example Applications



Example 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 torques, and trademarks, visit the S-5! website at www.S-5.com.
Copyright 2013, Metal Roof Innovations, Ltd. S-5! products are patent protected.
S-5! aggressively protects its patents, trademarks, and copyrights. Version 11/2013.

Distributed by

DESCRIPTION: SNAPNRACK, BONDING ADJUSTABLE END CLAMP	DRAWN BY: M.Watkins	 SnapNrack Solar Mounting Solutions <small>888 MARKET STREET, 20TH FLOOR • SAN FRANCISCO, CA 94103 USA PHONE: (415) 580-8900 • FAX: (415) 580-8902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISSEMINATION, OR USE OF THIS DRAWING IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNKING SOLUTIONS, LLC.</small>
PART NUMBER(S): 242-02065, 242-02066, 242-02067, 242-02068	REVISION: A	

PARTS LIST	
ITEM	DESCRIPTION
1	5/16IN SS SPLIT LOCK WASHER
2	SNAPNRACK, BONDING ADJUSTABLE END CLAMP TOP, CLEAR / BLACK
3	5/16IN-18 SS HCS BOLT, LENGTH VARIES, CLEAR / BLACK
4	SNAPNRACK, BONDING ADJUSTABLE END CLAMP BASE, CLEAR / BLACK

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL	OPTIONS:	CLEAR / BLACK ANODIZED
DESIGN LOAD (LBS):	800		
ULTIMATE LOAD (LBS):	2400		
TORQUE SPECIFICATION:	10+ LB-FT		
CERTIFICATION:	UL 2703, FILE E359313		
WEIGHT (LBS):	0.17 - 0.19		

DESCRIPTION: SNAPNRACK, BONDING MID CLAMP	DRAWN BY: D.Ryan	 SnapNrack Solar Mounting Solutions <small>888 MARKET STREET, 20TH FLOOR • SAN FRANCISCO, CA 94103 USA PHONE: (415) 580-8900 • FAX: (415) 580-8902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISSEMINATION, OR USE OF THIS DRAWING IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNKING SOLUTIONS, LLC.</small>
PART NUMBER(S): 242-02050, 242-02051, 242-02052, 242-02053, 242-02054, 242-02055, 242-02056, 242-02057	REVISION: A	

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

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

DESCRIPTION: SNAPNRACK, UR-60 RAIL	DRAWN BY: m.watkins	 SnapNrack Solar Mounting Solutions <small>888 MARKET STREET, 20TH FLOOR • SAN FRANCISCO, CA 94103 USA PHONE: (415) 580-8900 • FAX: (415) 580-8902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISSEMINATION, OR USE OF THIS DRAWING IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNKING SOLUTIONS, LLC.</small>
PART NUMBER(S): 232-02481, 232-02482, 232-02483	REVISION: A	

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

SECTION PROPERTIES	
PROPERTY	VALUE
A	0.515 in ²
Ixx	0.327 in ⁴
Iyy	0.181 in ⁴
Sx (TOP)	0.270 in ³
Sx (BOT)	0.315 in ³
Sy (LEFT)	0.242 in ³
Sy (RIGHT)	0.242 in ³

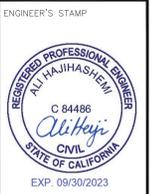
MATERIALS:	6000 SERIES ALUMINUM	OPTIONS:	CLEAR / BLACK ANODIZED
DESIGN LOAD (LBS):	N/A		
ULTIMATE LOAD (LBS):	N/A		
TORQUE SPECIFICATION:	N/A LB-FT		BUNDLES OF 120
CERTIFICATION:	UL 2703, FILE E359313		BOXES OF 8
WEIGHT (LBS):	8.46		

DESCRIPTION: SNAPNRACK, ULTRA RAIL MOUNTING HARDWARE	DRAWN BY: m.watkins	 SnapNrack Solar Mounting Solutions <small>888 MARKET STREET, 20TH FLOOR • SAN FRANCISCO, CA 94103 USA PHONE: (415) 580-8900 • FAX: (415) 580-8902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISSEMINATION, OR USE OF THIS DRAWING IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNKING SOLUTIONS, LLC.</small>
PART NUMBER(S): 242-01229	REVISION: A	

PARTS LIST	
ITEM	DESCRIPTION
1	SNAPNRACK, ULTRA RAIL MOUNT THRU PRC, SILVER
2	5/16IN-18 X 2-1/4IN SS HCS BOLT
3	SNAPNRACK, ULTRA RAIL MOUNT TAPPED PRC, SILVER
4	SNAPNRACK, ULTRA RAIL MOUNT SPRING, SS
5	SNAPNRACK, ULTRA RAIL MOUNT SPRING CAGE, 6061-T6 AL

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL	OPTIONS:	
DESIGN LOAD (LBS):	N/A		
ULTIMATE LOAD (LBS):	N/A		
TORQUE SPECIFICATION:	12 LB-FT		
CERTIFICATION:	UL 2703, FILE E359313		
WEIGHT (LBS):	0.19		

PROJECT TITLE:
CORDEVALLE GOLF COURSE
1005 HIGHLAND AVENUE,
SAN MARTIN, CA 95046
APN: 77920006



REV.	DATE	ISSUE
A	09-AUG-22	FOR SUBMITTAL

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DRAWN BY: HK
CHECKED BY: VJ
APPROVED BY: JHA

SCALE:
NTS

SHEET TITLE:
STRUCTURAL
SPEC
SHEETS

SHEET #:
S.2.1

TERMS AND ABBREVIATIONS

ABBRV	TERM
(#)	NUMERICAL QUANTITIES WHEN ENCLOSED IN PARENTHESES
AIE	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
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
D	DEPTH
DIA	DIAMETER
DM	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 MOMENT OF INERTIA
I	INTERNATIONAL BUILDING CODE
IBC	INSIDE DIAMETER
ID	INSIDE DIAMETER
KIP, K	ONE THOUSAND POUNDS
KLF	KIP PER LINEAR FOOT
L	LINEAR
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 _____ 86 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 - DEFAULT
Ss _____ 1.5
S1 _____ 0.6
SDS _____ 1.2
SD1 _____ 0.68
SDI _____ 1.25
SEISMIC DESIGN CATEGORY: _____ D
BASIC SEISMIC FORCE RESISTING SYSTEM:
STEEL ORDINARY CANTILEVER COLUMN SYSTEMS
R _____ 1.25
O _____ 1.25
Ct _____ 1.25
Cs _____ 0.800
BASE SHEAR, V _____ 0.800W

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 BUILT ITEMS. CONTRACTOR SHALL SUBMIT DESIGN BY OTHERS FOR REVIEW

FOUNDATIONS:

1. GEOTECHNICAL CONSULTANT: NINYO & MOORE GEOTECHNICAL & ENVIRONMENTAL SCIENCES CONSULTANTS
2. REPORT NUMBER: 404295001
3. REPORT DATE: JULY 7, 2022
4. SPREAD FOOTINGS SHALL BEAR ON COMPACTED FILL. FOR FILL REQUIREMENTS, SEE SOIL REPORT. DESIGN SOIL BEARING VALUE 1,500 PSF WAS ASSUMED IN ACCORDANCE WITH SOIL CLASS 5 AS DEFINED IN IBC/CBC TABLE 1806.2 "PRESUMPTIVE LOAD-BEARING VALUES". 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 400 PSF/FT WAS USED IN DESIGN FOR BEDROCK. ALL SOIL ABOVE BEDROCK HAS BEEN IGNORED FOR LATERAL SOIL RESISTANCE DESIGN PURPOSES. DRILLED PIERS SHOULD BE AT LEAST 18 INCHES IN DIAMETER AND SHOULD EXTEND AT LEAST 6 FEET INTO ROCK. 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. 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 ONE 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 CHANNIELED 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
STRENGTH _____ COMPRESSIVE
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 ANY 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. SPICES SHALL BE FULL PENETRATION WELDED AND TESTED PER THIS SECTION. INDICATE ALL SPICE 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 SPICES IN CONCRETE SHALL BE PER TYPICAL DETAIL UNLESS NOTED OTHERWISE. ALL SPICE 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-3064(P).
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 GAUGE STEEL FRAMING WORK.
6. ALL SCREWS REFERENCED IN THE DRAWINGS FOR LIGHT GAUGE CONNECTIONS SHALL BE DRILL-FLEX BY HILLTI 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 CBC SECTION 1704 AND 1705 SPECIAL INSPECTIONS ARE IN ADDITION TO THE REQUIRED INSPECTION CONDUCTED BY THE BUILDING JURISDICTION PER 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.
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. 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.
 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	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
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	AWS D1.4 ACI 318: 26.6.4
3. INSPECT USE OF REQUIRED DESIGN MIX.		---	X	ACI 318: Ch 19, 26.4.3, 26.4.4
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.		X	---	ACI 318: 26.5
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.		---	X	ACI 318: 26.5.3-26.5.5
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
S2.4	4 PANEL STRUCTURE PLANS
S2.5	5 PANEL STRUCTURE PLANS
S2.6	6 PANEL STRUCTURE PLANS
S4.1	SOLAR CANOPY DETAILS



SHEET NOTES

- FOR STRUCTURE LOCATIONS REFERENCE PROJECT SITE PLAN. COLUMN SPACING AND LOCATIONS SHALL BE COORDINATED WITH PROJECT ARCHITECT OR PROFESSIONAL RESPONSIBLE FOR SITE PLAN.
- 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.
- FOR ADDITIONAL INFORMATION, REFERENCE GENERAL STRUCTURAL NOTES.

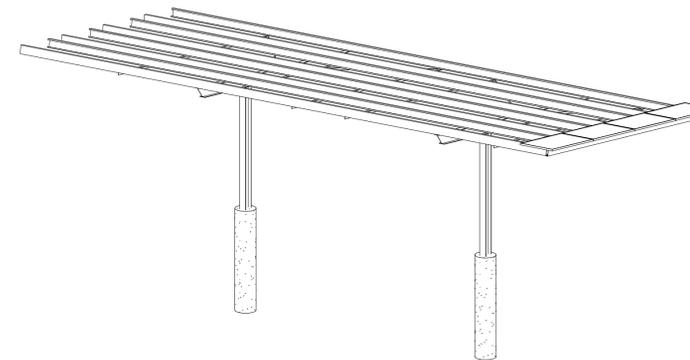
PV PANEL INFORMATION

- CONTRACTOR TO VERIFY PANEL INFORMATION PRIOR TO FABRICATION AND ERECTION.
- 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.
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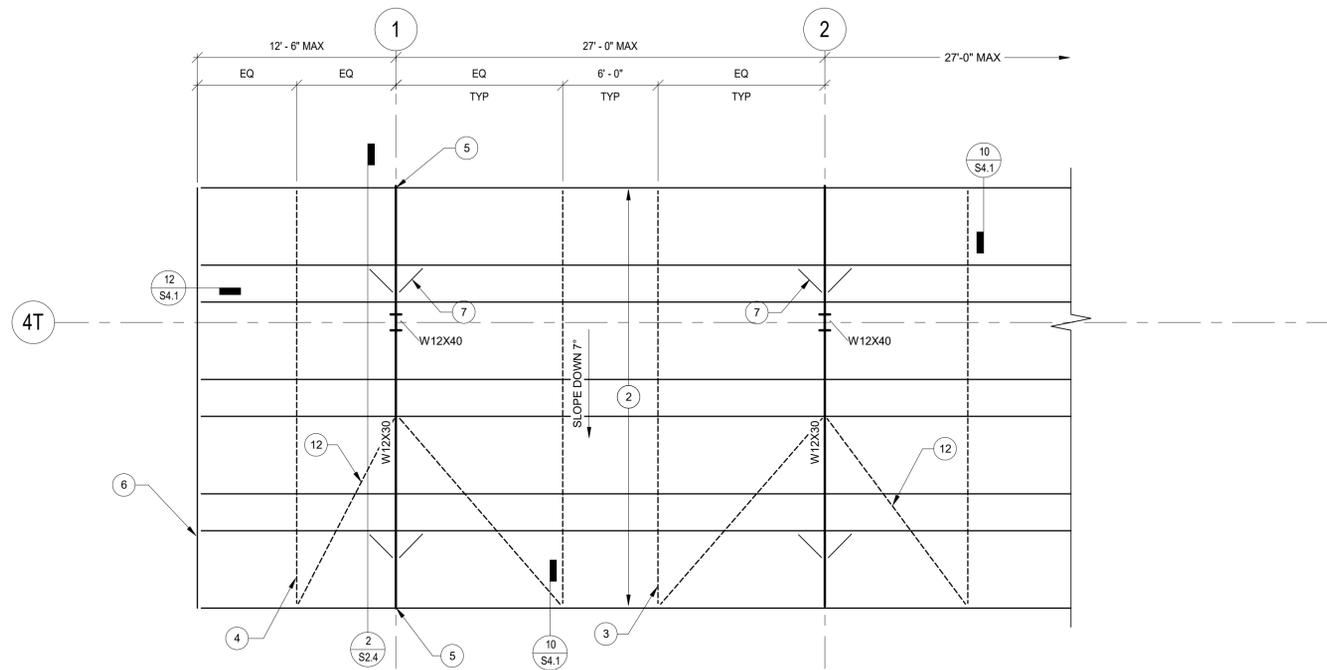
PANEL MODEL	LENGTH	WIDTH
VERTEX	86.1"	43.39"

KEYNOTES

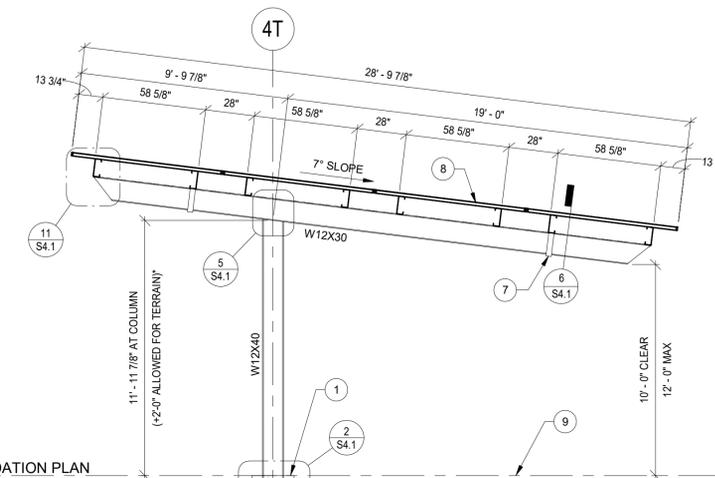
- DRILLED CONCRETE POLE FOOTING. FOR DIAMETER AND EMBEDMENT OF FOOTING SEE FOUNDATION PLAN AND SECTION ON THIS SHEET. SEE DETAIL 2/S4.1 FOR REINFORCING AND STEEL COLUMN ANCHORAGE.
- C9"x3"x14 GAUGE COLD FORMED STEEL PURLINS, TYPICAL. COORDINATE EXACT LOCATION WITH SOLAR PANEL MANUFACTURER SPECIFICATIONS.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



3 4 PANEL T - 7 DEG
NO SCALE



1 4 PANEL TEE - 7 DEG. FRAMING PLAN
3/16" = 1'-0"



FOUNDATION PLAN
0' - 0"

BOTTOM OF COLUMN
-4' - 0"

TOP OF BEDROCK
VARIES

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

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

SHEET NOTES

- FOR STRUCTURE LOCATIONS REFERENCE PROJECT SITE PLAN. COLUMN SPACING AND LOCATIONS SHALL BE COORDINATED WITH PROJECT ARCHITECT OR PROFESSIONAL RESPONSIBLE FOR SITE PLAN.
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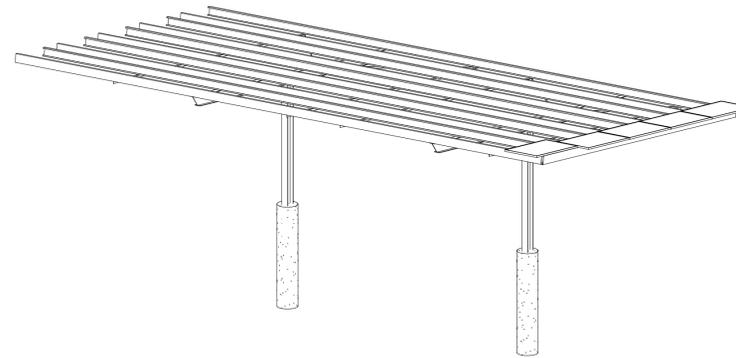
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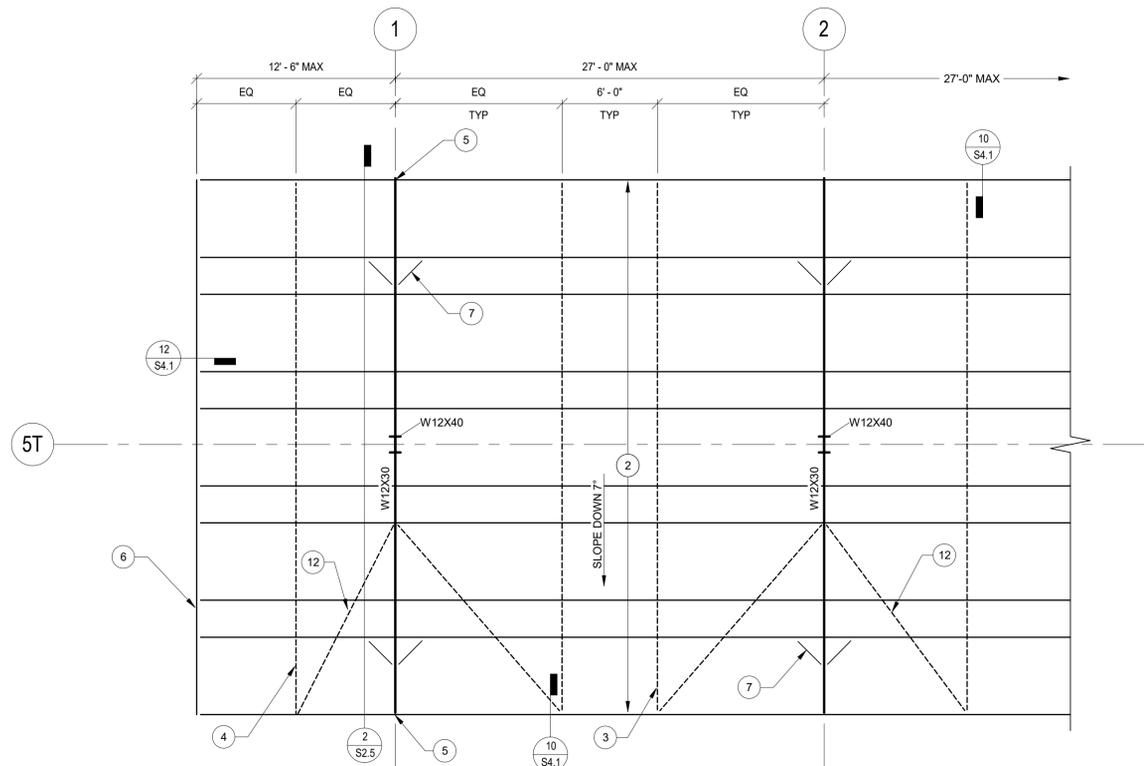
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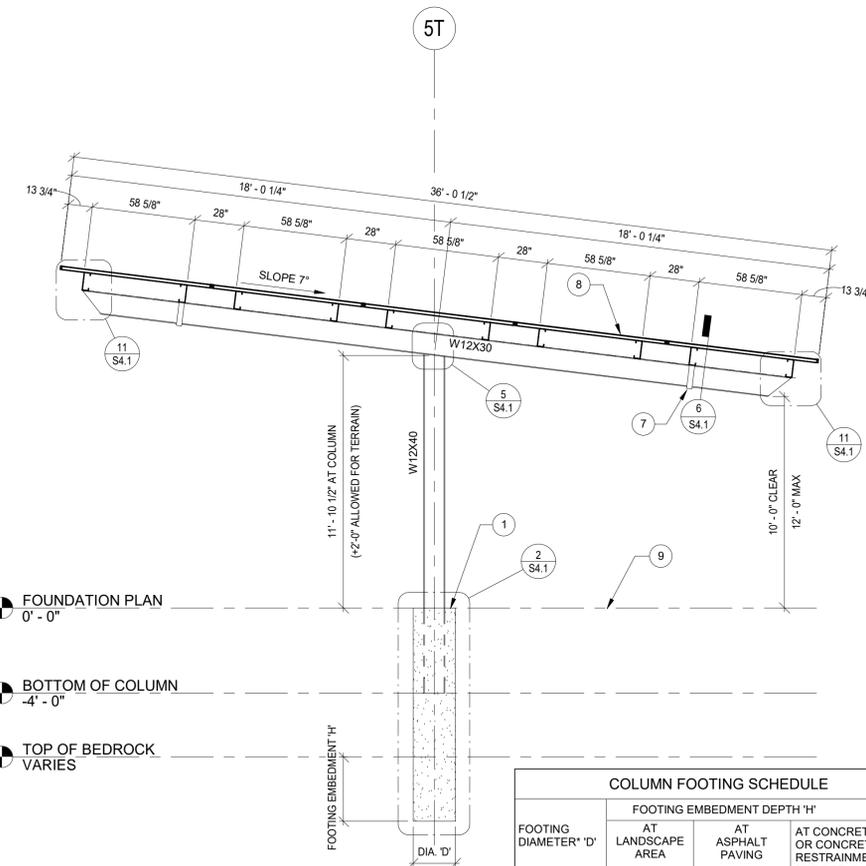
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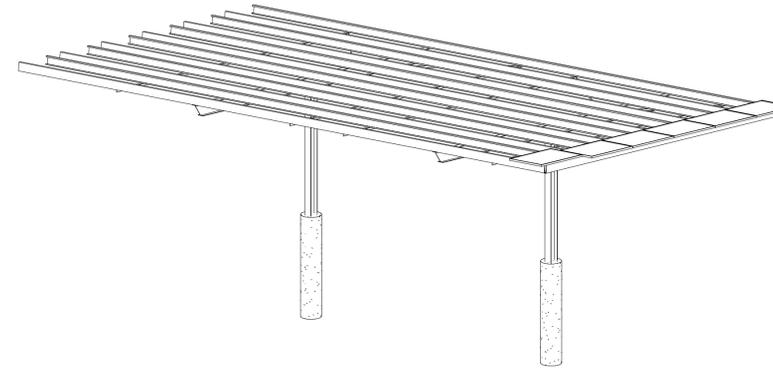
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- THE OWNER IS TO PROVIDE A PANEL CAPABLE OF SUPPORTING IN MANNER IN WHICH IS INTENDED BY THESE DRAWINGS (I.E. SUPPORTED BY SHORT END, DUAL SUPPORTS, ETC). SUBMIT PANEL SPEC SHEETS FOR REVIEW PRIOR TO PURCHASING ANY PANELS.
- THE PANEL MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE PANELS INCLUDING ALL ITS COMPONENTS, PHOTOVOLTAIC PANELS AND ITS 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.

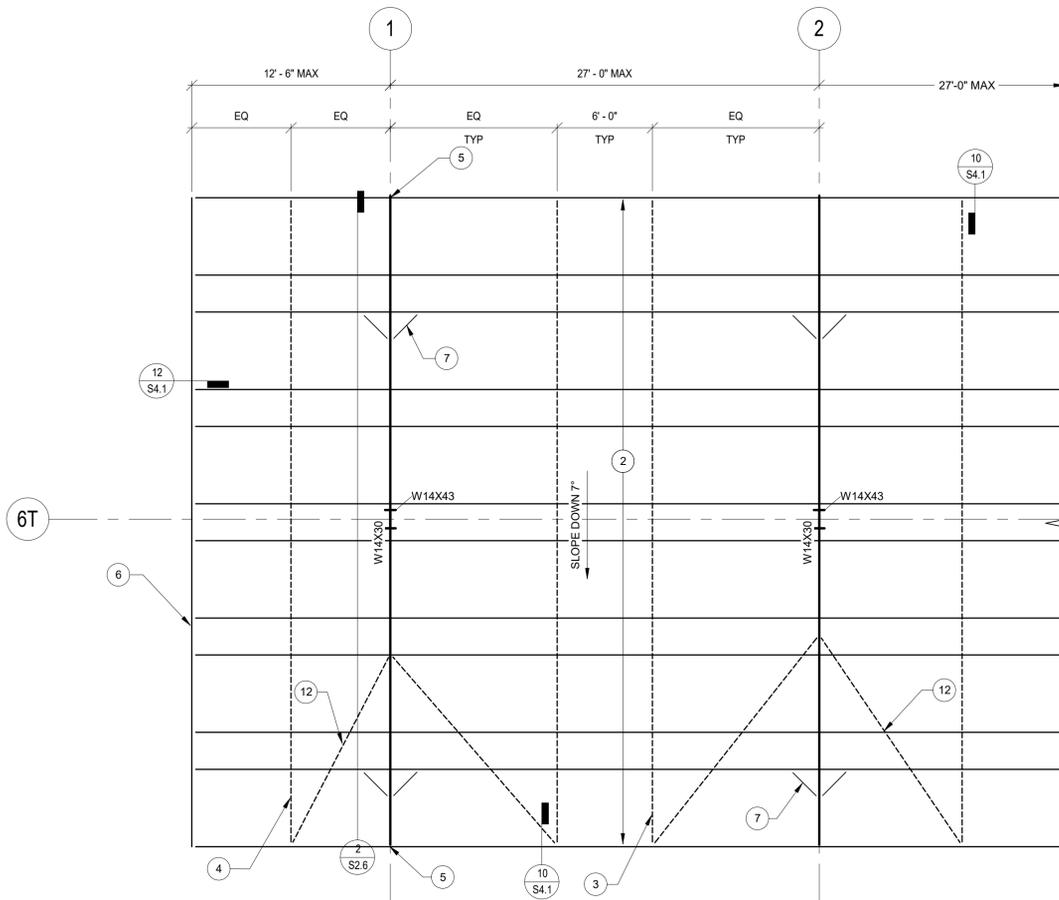
PANEL MODEL	LENGTH	WIDTH
VERTEX	86.1"	43.39"

KEYNOTES

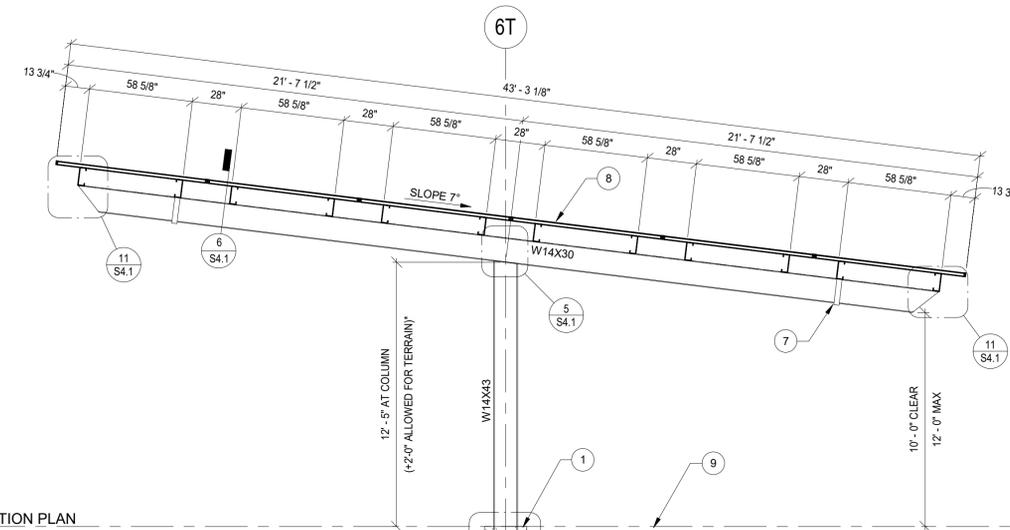
- DRILLED CONCRETE POLE FOOTING. FOR DIAMETER AND EMBEDMENT OF FOOTING SEE FOUNDATION PLAN AND SECTION ON THIS SHEET. SEE DETAIL 2/S4.1 FOR REINFORCING AND STEEL COLUMN ANCHORAGE.
- C9"x3"x14 GAUGE COLD FORMED STEEL PURLINS. TYPICAL. COORDINATE EXACT LOCATION WITH SOLAR PANEL MANUFACTURER SPECIFICATIONS.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



3 6 PANEL T - 7 DEG
NO SCALE



1 6 PANEL TEE - FRAMING PLAN
3/16" = 1'-0"



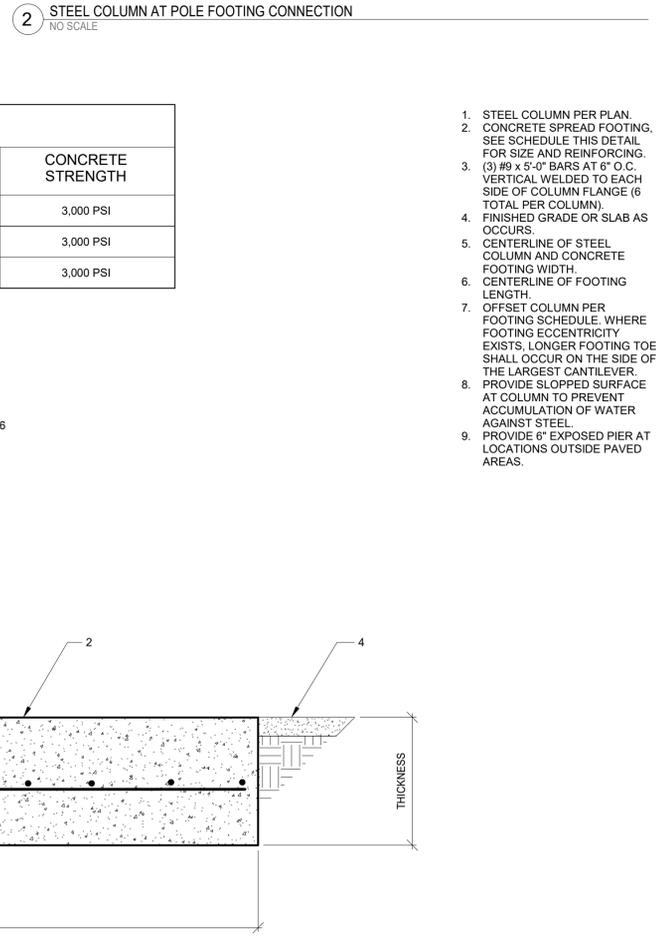
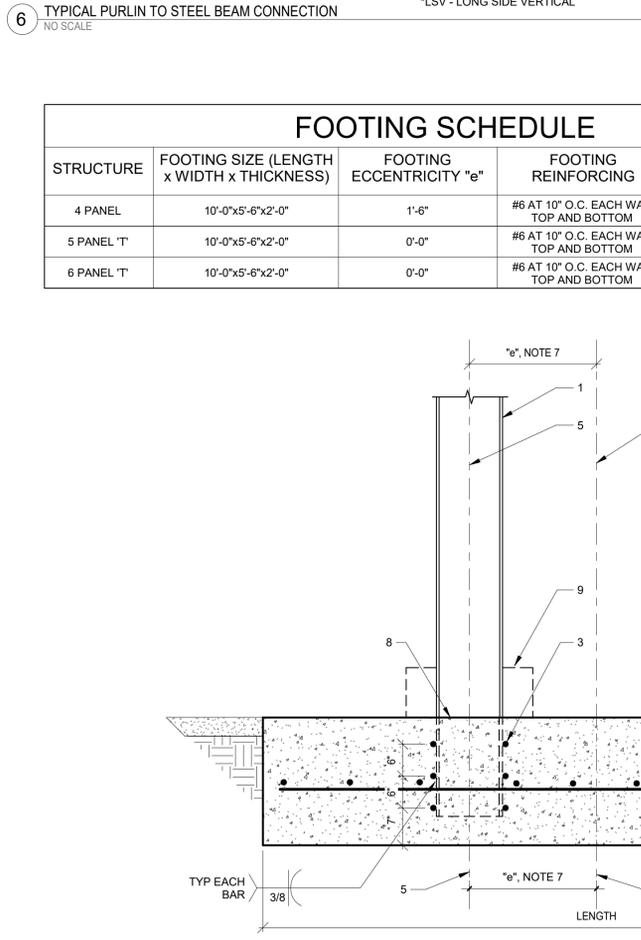
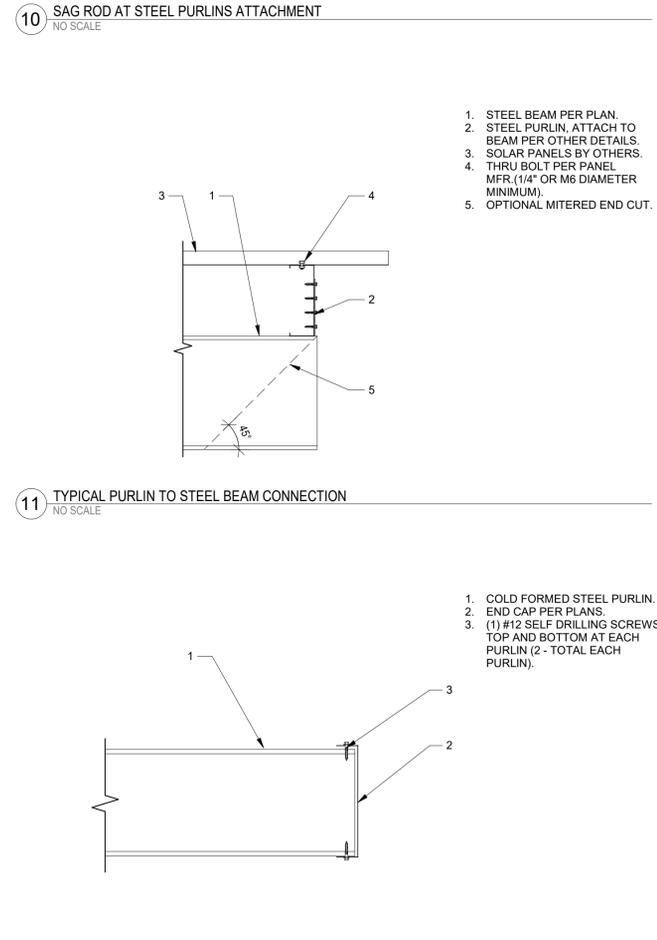
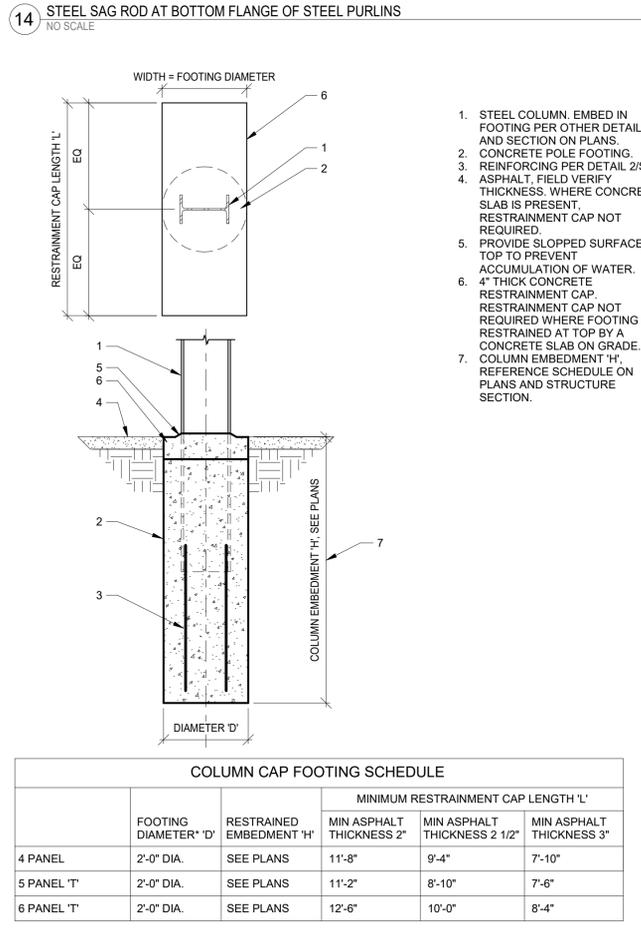
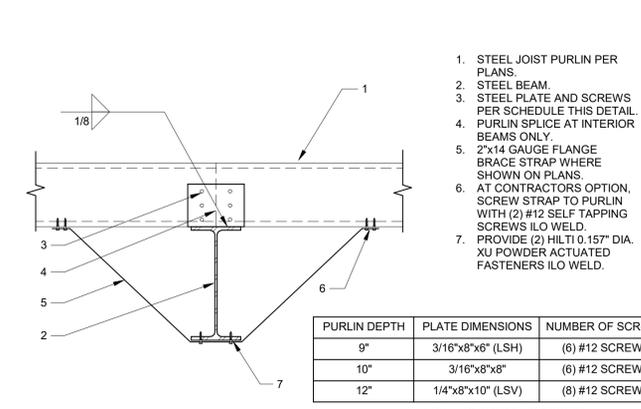
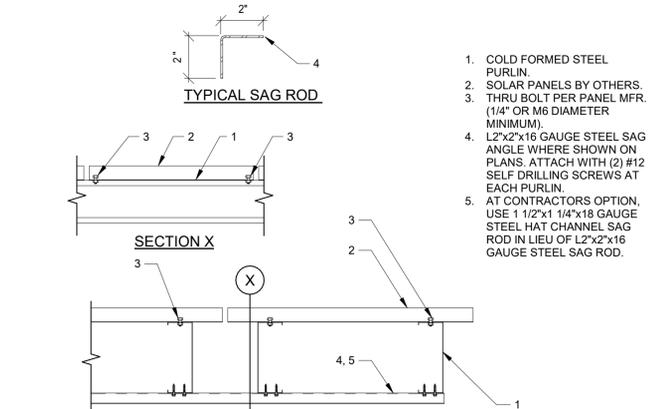
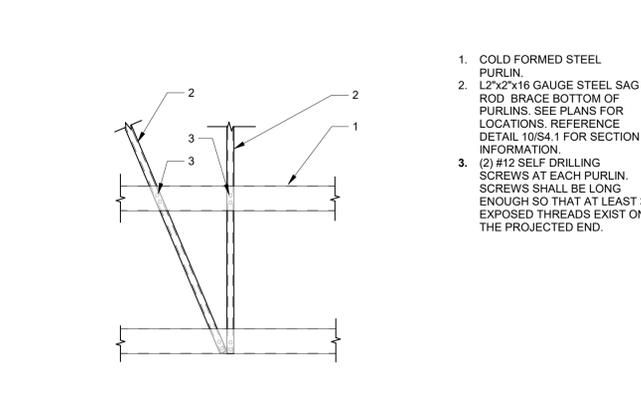
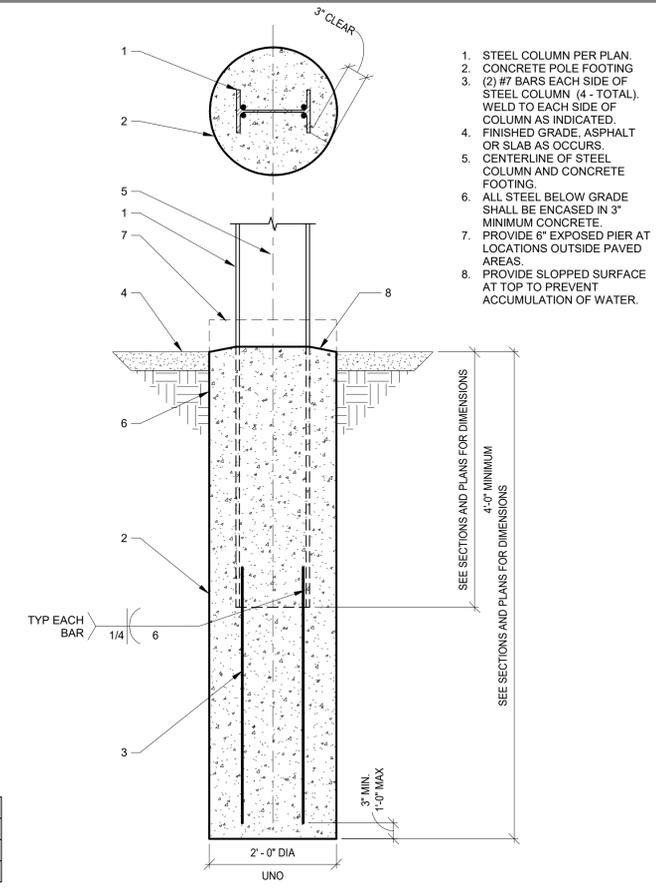
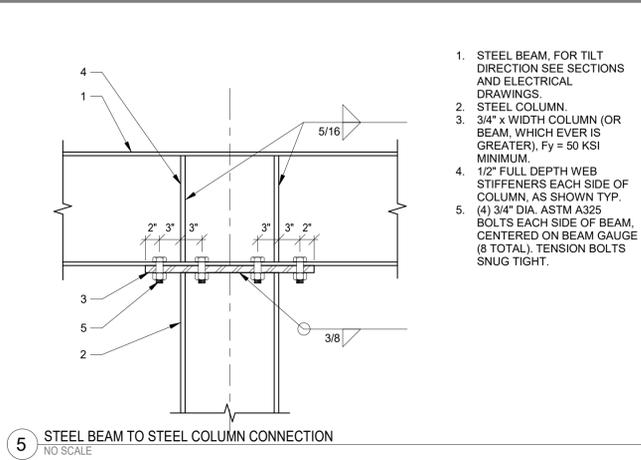
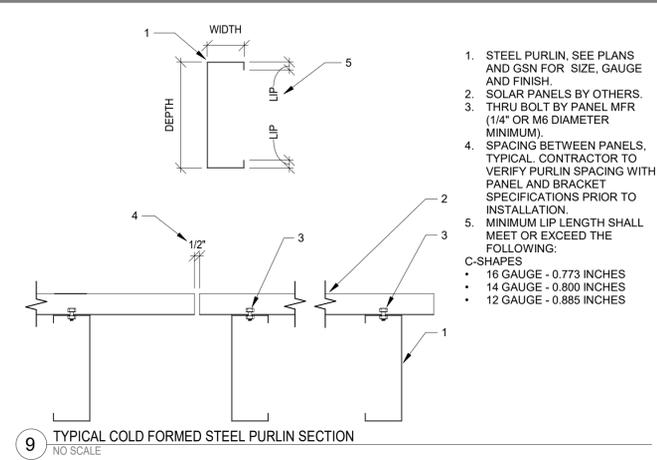
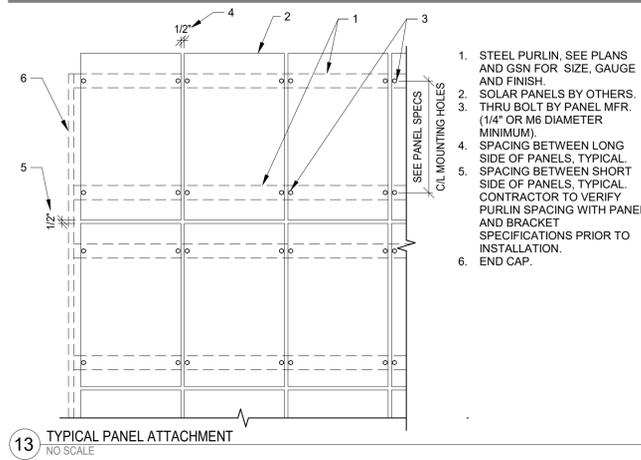
FOUNDATION PLAN
0' - 0"

BOTTOM OF COLUMN
-4' - 0"

TOP OF BEDROCK
VARIES

2 6 PANEL 7 DEG TEE SECTION
1/4" = 1'-0"

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



STRUCTURE	FOOTING SIZE (LENGTH x WIDTH x THICKNESS)	FOOTING ECCENTRICITY "e"	FOOTING REINFORCING	CONCRETE STRENGTH
4 PANEL	10'-0"x5'-6"x2'-0"	1'-6"	#6 AT 10" O.C. EACH WAY TOP AND BOTTOM	3,000 PSI
5 PANEL 'T'	10'-0"x5'-6"x2'-0"	0'-0"	#6 AT 10" O.C. EACH WAY TOP AND BOTTOM	3,000 PSI
6 PANEL 'T'	10'-0"x5'-6"x2'-0"	0'-0"	#6 AT 10" O.C. EACH WAY TOP AND BOTTOM	3,000 PSI

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



No.	Description	Date

PROJECT NUMBER: 22297
DRAWN BY: KS
CHECKED BY: JE
DATE: 06/29/2022