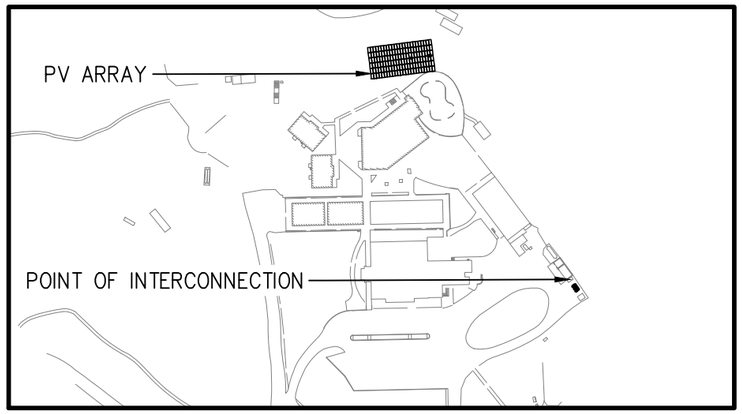
WALDEN WEST PHOTOVOLTAIC ARRAY
15555 SANBORN RD, SARATOGA, CA 95070

1 - VICINITY MAP

SCALE: NTS

N



2 - SITE PLAN

SCALE: NTS

N

APPLICABLE CODES

PART 1 2022 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE, TITLE 24 C.C.R.
PART 2 2022 CALIFORNIA BUILDING CODE, TITLE 24 C.C.R.
(2021 INTERNATIONAL BUILDING CODE OF THE INTERNATIONAL CODE COUNCIL WITH CALIFORNIA AMENDMENTS)
PART 3 2022 CALIFORNIA ELECTRICAL CODE, TITLE 24 C.C.R.
(2020 NATIONAL ELECTRICAL CODE OF THE NATIONAL FIRE PROTECTION ASSOCIATION, NFPA)
PART 4 2022 CALIFORNIA MECHANICAL CODE, TITLE 24 C.C.R.
(2021 UNIFORM MECHANICAL CODE OF THE INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS, IAPMO)
PART 5 2022 CALIFORNIA PLUMBING CODE, TITLE 24, C.C.R.
(2021 UNIFORM PLUMBING CODE OF THE INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS, IAPMO)
PART 6 2022 CALIFORNIA ENERGY CODE, TITLE 24 C.C.R.
PART 7 currently vacant
PART 8 2022 CALIFORNIA HISTORICAL BUILDING CODE, TITLE 24 C.C.R.
PART 9 2022 CALIFORNIA FIRE CODE, TITLE 24 C.C.R.
(2021 INTERNATIONAL FIRE CODE OF THE INTERNATIONAL CODE COUNCIL)
PART 10 2022 CALIFORNIA EXISTING BUILDING CODE, TITLE 24, C.C.R.
(2021 INTERNATIONAL EXISTING BUILDING CODE OF THE INTERNATIONAL CODE COUNCIL, WITH AMENDMENTS)
PART 11 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN CODE), TITLE 24 C.C.R.
PART 12 2022 CALIFORNIA REFERENCED STANDARDS CODE, TITLE 24 C.C.R.

SCOPE OF WORK

INSTALLATION OF (1) PHOTOVOLTAIC SUPPORT STRUCTURE.

ENGINEERS OF RECORD

BLYMYER ENGINEERS – JOON CHOI – CA LICENSE No. E24039

KEY PROJECT CONTACT INFORMATION

BLYMYER ENGINEERS – STANISLAV GORBIS, DIRECTOR – (510) 521-3773
ENGIE SERVICES U.S. – AMANDA GYOKERY, PROJECT ENGINEER – (858) 997-8498
ENGIE SERVICES U.S. – KURT BESKE, PROJECT MANAGER – (415) 905-0577

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Santa Clara County Office of Education
SANTA CLARA COUNTY OFFICE OF EDUCATION

PROJECT LOCATION
WALDEN WEST
15555 SANBORN RD
SARATOGA, CA 95070

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CONSULTANT
BLYMYER ENGINEERS
1101 MARINA VILLAGE PKWY, SUITE 100
ALAMEDA, CA 94501

ENGINEERING APPROVAL
REGISTERED PROFESSIONAL ENGINEER – JOON SUK CHOI – E 24039 – EXP 06/30/25 – ELECTRICAL – STATE OF CALIFORNIA

AGENCY APPROVAL

ISSUE

MARK	DATE	DESCRIPTION
–	02/15/24	30%
–	04/19/24	90%
–	05/17/24	100%
–	05/23/24	REVISED 100%

DESIGNER PROJECT NO.:	223091
DRAWN BY:	JC
CHECKED BY:	JC
SCALE:	NTS

KEY PLAN

SHEET TITLE
COVER SHEET

SHEET NUMBER
CS-1.0

BLYMYER ENGINEERS DRAWING LIST

SHEET NUMBER	SHEET TITLE
CS–1.0	COVER SHEET
CS–1.1	SHEET LIST
G–100	GENERAL SITE PLAN
E–1.0	ELECTRICAL GENERAL NOTES
E–1.1	ELECTRICAL GENERAL NOTES
E–1.2	ELECTRICAL GENERAL NOTES
E–1.3	ELECTRICAL GENERAL NOTES
E–2.0	SINGLE LINE DIAGRAM
E–2.1	SINGLE LINE DIAGRAM
E–2.2	SINGLE LINE DIAGRAM
E–2.3	THREE LINE DIAGRAM
E–2.4	THREE LINE DIAGRAM
E–2.5	THREE LINE DIAGRAM
E–2.6	THREE LINE DIAGRAM
E–3.0	ELECTRICAL SITE PLAN
E–3.1	ENLARGED POI PLAN
E–7.0	ELECTRICAL DETAILS
E–7.1	ELECTRICAL DETAILS
E–7.2	ELECTRICAL DETAILS
E–9.0	WARNING LABELS
E–9.1	WARNING LABELS
E–9.2	WARNING LABELS
E–10.0	EQUIPMENT SPECIFICATIONS
E–10.1	EQUIPMENT SPECIFICATIONS
E–10.2	EQUIPMENT SPECIFICATIONS

MBL DRAWING LIST (BY OTHERS)

SHEET NUMBER	SHEET TITLE
S0.1	PV CANOPY NOTES AND SPECS
S1.0	PV CANOPY LAYOUT PLAN
S2.0	PV CANOPY FOUNDATION PLAN
S3.0	PV CANOPY ELEVATION AND LAYOUT
S4.0	PV CANOPY CONNECTION DETAILS
S4.1	PV CANOPY PART DETAILS
S5.0	BEACON INSTALL GUIDE

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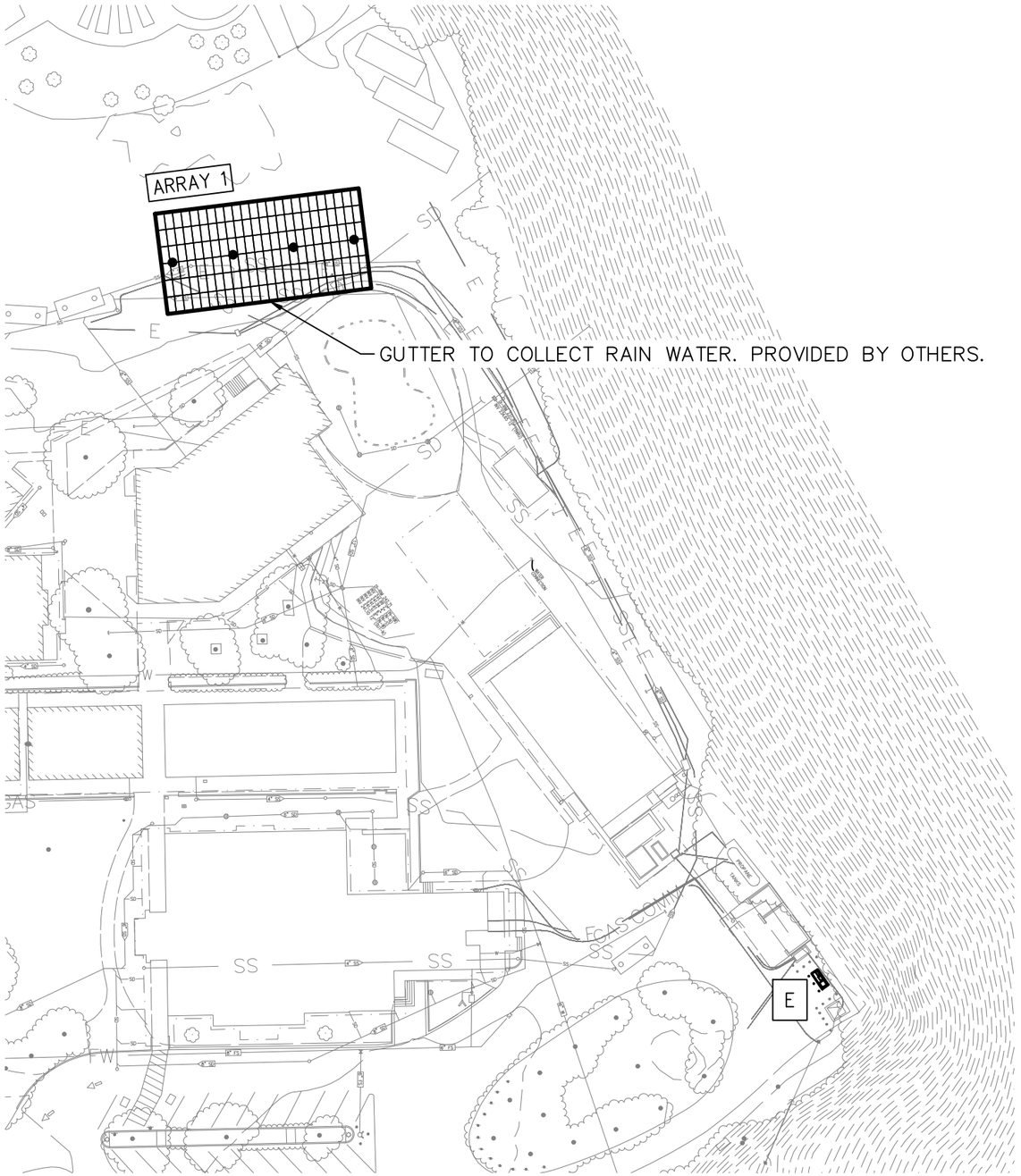

1 GENERAL SITE PLAN

SCALE: 1" = 60'-0"

0 15' 30' 60' 120'

1" = 60'-0"

N

SYSTEM SUMMARY

PROJECT LOCATION	15555 SANBORN RD, SARATOGA, CA 95070
MIN DESIGN TEMPERATURE	-2.2°C
MAX 2% DESIGN TEMPERATURE	32.4°C
PV MODULE	JA SOLAR JAM72D30-540/MB
PV MODULE WATTAGE @ STC	540
PV MODULE COUNT	144
DC SYSTEM SIZE	77.76 KW DC
AC SYSTEM SIZE	61 KW / 61 KVA
INVERTER TYPE & COUNT	(1) CPS SCA25KTL-DO/US-480
INVERTER TYPE & COUNT	(1) CPS SCA36KTL-DO/US-480

LEGEND

E EXISTING ELECTRICAL INTERCONNECTION POINT

PROJECT PARAMETERS

ARRAY	PANELS	POWER (kW)
1	144	77.76

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KEY PLAN

SHEET TITLE

GENERAL SITE PLAN

SHEET NUMBER

G-100

GENERAL NOTES

1. AT ALL TIMES THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITION OF JOB SITE, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY AND FOR ALL NECESSARY INDEPENDENT ENGINEERING REVIEWS OF THESE CONDITIONS. THE ENGINEERS JOB SITE REVIEW IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTORS SAFETY MEASURES.
2. THE CONTRACTOR SHALL MAKE AN EXAMINATION OF THE SITE AND COMPARE THE SITE WITH THE DRAWINGS AND SPECIFICATIONS AND SATISFY HIMSELF AS TO CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED. THE CONTRACTOR SHALL ASCERTAIN AND CHECK THE LOCATIONS OF ANY EXISTING STRUCTURES OR EQUIPMENT WHICH MAY AFFECT WORK THAT HAS TO BE PERFORMED, NO ALLOWANCE SHALL SUBSEQUENTLY BE MADE IN CONTRACTOR'S BEHALF FOR ANY EXPENSE TO WHICH THE CONTRACTOR MAY BE PUT DUE TO FAILURE OR NEGLECT BY CONTRACTOR TO MAKE SUCH EXAMINATION.
3. ALL WORK SHALL BE COORDINATED WITH THE OWNER TO MAINTAIN CONTINUITY OF SERVICE AND MAXIMUM UTILIZATION OF THE OWNERS FACILITY.
4. THE CURRENT ISSUE OF ALL NFPA, IBC, IFC, ANSI, OSHA, ASTM, NEMA, AND OTHER NATIONALLY PUBLISHED CODES OR STANDARDS SHALL APPLY TO THIS WORK UNLESS LOCAL JURISDICTION SUPERSEDES. THE MOST STRINGENT CODES SHALL APPLY.
5. NOTHING IN THE DRAWINGS OR SPECIFICATIONS IS INTENDED TO ALLOW A VIOLATION OF ELECTRICAL WORKING SPACE AROUND ELECTRICAL EQUIPMENT REQUIREMENT. ANY DEVIATION FROM THIS REQUIREMENT SHALL BE APPROVED IN WRITING, BY THE ENGINEER. THE CONTRACTOR SHALL RELOCATE ANY EQUIPMENT IN VIOLATION OF THE ELECTRICAL CODE AT HIS OWN COST.
6. PROVIDE PHENOLIC NAMEPLATE WITH WHITE LETTERING ON BLACK BACKGROUND FOR EACH ELECTRICAL EQUIPMENT. PROVIDE PERMANENT MEANS OF ATTACHMENT THAT WILL NOT VIOLATE NEMA RATING OR EQUIPMENT WARRANTY.
7. REFER TO THE DRAWINGS FOR LOCATIONS AND SPACE REQUIREMENTS OF ELECTRICAL EQUIPMENT. COORDINATE THE INSTALLATION OF ELECTRICAL EQUIPMENT WITH OTHER TRADES.
8. POWER FEEDERS MAY NOT BE SHOWN ON THE DRAWINGS. REFER TO THE SINGLE LINE DIAGRAM FOR FEEDER INFORMATION.
9. CONTRACTOR SHALL SECURE AND PAY FOR ELECTRICAL TRADE SPECIFIC CONSTRUCTION PERMITS, LICENSES, GOVERNMENTAL AND INSPECTION FEES NECESSARY FOR THE EXECUTION OF THE WORK, UNLESS OTHERWISE DIRECTED.
10. ELECTRICAL CONTRACTOR SHALL PROVIDE COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE WITH ESTABLISHED TECHNIQUES AND ACCEPTED PRACTICES AND ALL LOCAL, STATE, AND NATIONAL CODES HAVING JURISDICTION.
11. ELECTRICAL REQUIREMENTS SUCH AS CONDUIT ROUTING AND LOCATIONS OF ELECTRICAL DEVICES (RECEPTACLES, SWITCHES, FLOOR OUTLETS, CONDUIT STUBS, ETC.) SHOWN ON THESE PLANS ARE DIAGRAMMATIC AND SUBJECT TO VERIFICATION BY ELECTRICAL CONTRACTOR FOR THE INTERFACING OF THE ELECTRICAL WORK WITH THE INSTALLATION. CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS TO CLEAR THE OTHER FACILITIES EXCEPT AS SHOWN DIMENSIONED ON THE ARCHITECTURAL DRAWINGS OR AS APPROVED BY THE ARCHITECT.
12. ELECTRICAL EQUIPMENT SHOWN OR SPECIFIED FOR THIS PROJECT HAS BEEN GENERALLY SELECTED BASED ON DIMENSIONS TO FIT THE SPACE. THE CONTRACTOR SHALL VERIFY EQUIPMENT DIMENSIONS AND/OR ANY INTERFERENCES PRIOR TO ORDERING THE EQUIPMENT.
13. MANUFACTURER'S RECOMMENDATIONS FOR CONDUCTOR SIZING, CIRCUIT BREAKER OR FUSE RATING OF ELECTRICALLY OPERATED EQUIPMENT MAY DIFFER FROM THOSE INDICATED ON DRAWINGS. CONTRACTOR SHALL CONFIRM RATINGS PRIOR TO ORDERING EQUIPMENT.
14. CONTRACTOR SHALL REVIEW THE MECHANICAL AND PLUMBING DRAWINGS IF APPLICABLE, AND CONNECT ELECTRICALLY OPERATED EQUIPMENT UNLESS OTHERWISE NOTED. COORDINATE THE LOCATION AND ELECTRICAL CONNECTION REQUIREMENTS PRIOR TO ORDERING OF ELECTRICAL AND MECHANICAL EQUIPMENT.
15. CONTRACTOR SHALL REVIEW THE SECTIONS OF EACH DIVISION OF THE SPECIFICATION (WHERE APPROPRIATE) AND PROVIDE CONNECTIONS TO ELECTRICALLY OPERATED EQUIPMENT AS MAY BE SPECIFIED THEREIN.
16. ALL CONDUIT ONLY (CO) NOTED SHALL HAVE PULL ROPES OR WIRES INSTALLED, TENSILE STRENGTH MINIMUM OF 200 FT/LBS.
17. COORDINATE ALL UG PULLBOX LOCATIONS WITH THE CIVIL AND LANDSCAPE PLANS. REPORT AND RESOLVE ANY DISCREPANCIES PRIOR TO START OF WORK.
18. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITER'S LABORATORIES OR OTHER APPROVED NRTL, AND SHALL BEAR THEIR LABEL. ALL CONTROL PANELS SHALL BE SO LISTED AS AN ASSEMBLY.
19. ELECTRICAL EQUIPMENT AND FEEDERS SHALL BE SUPPORTED AND/OR ANCHORED IN ACCORDANCE WITH CBC SEISMIC REQUIREMENTS. DO NOT SUPPORT CONDUITS FROM MECHANICAL DUCTS, PLUMBING, PIPING, OR EQUIPMENT OF ANY KIND.
20. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, FEES AND EQUIPMENT SPECIFIED. INDICATED OR IMPLIED IN THESE DOCUMENTS TO ACCOMPLISH THE CONSTRUCTION IN A PROFESSIONAL, WORKMANLIKE MANNER. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION TASKS INDICATED AND LOCAL CODES AND/OR ORDINANCES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE GENERAL CONTRACTOR AND/OR OWNER FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK AT ISSUE.
21. THE CONTRACTOR SHALL CONSULT THE MECHANICAL, STRUCTURAL, AND OTHER DRAWINGS AND DOCUMENTATION RELATED TO THE PROJECT FOR ADDITIONAL WORK TO BE PROVIDED.
22. THE OWNER RETAINS FIRST SALVAGE RIGHTS TO ALL EXISTING EQUIPMENT REMOVED UNDER THIS CONTRACT. THE ELECTRICAL CONTRACTOR SHALL CONSULT WITH THE OWNER FOR DISPOSITION OF THE EXISTING EQUIPMENT TO BE REMOVED.
23. ANY WORK INSTALLED INCORRECTLY, OR BEFORE APPROVAL HAS BEEN OFFICIALLY GRANTED FOR THOSE ITEMS AT ISSUE, SHALL BE CORRECTED BY THE ELECTRICAL CONTRACTOR AT NO CHARGE TO OWNER/ARCHITECT/CLIENT.
24. ALL MATERIALS AND EQUIPMENT FURNISHED BY THE CONTRACTOR SHALL BE NEW AND COMPLETELY SERVICEABLE UNLESS OTHERWISE SPECIFIED.
25. CONTRACTOR SHALL COORDINATE ROUGH-IN AND FINAL CONNECTION REQUIREMENTS WITH THE OWNER, EQUIPMENT SUPPLIERS, GENERAL CONTRACTOR AND OTHER BUILDING TRADES BEFORE PROCEEDING WITH ANY FURTHER RELATED WORK. INSTALLATIONS SHALL BE IN FULL ACCORDANCE WITH EQUIPMENT MANUFACTURER'S RECOMMENDATIONS AND REQUIRED CODES. CONFLICTS AND INTERFERENCES SHALL BE RESOLVED IMMEDIATELY, BEFORE ANY INSTALLATION BEGINS.
26. FINAL ACCEPTANCE OF WORK IN PLACE SHALL BE SUBJECT TO APPROVAL BY OWNER'S REPRESENTATIVE AND ARCHITECT/ENGINEER. INSTALLATION APPROVAL SHALL BE BASED ON APPROVED SUBMITTALS, SHOP DRAWINGS AND LOCAL INSPECTION.
27. CONTRACTOR SHALL SUBMIT "FOR RECORD" MARKUP DRAWINGS WITHIN TWO (2) WEEKS AFTER DATE OF NOTIFICATION OF FINAL APPROVAL OF WORK-IN-PLACE. CONTRACTOR'S FINAL INVOICE WILL NOT BE PAID WITHOUT COMPLETE DOCUMENTATION.
28. CONTRACTOR SHALL WARRANT ALL WORKS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE OF WORK-IN-PLACE. CONTRACTOR SHALL REPAIR OR REPLACE ANY DEFECTIVE WORK INCLUDING MATERIALS AND EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER WITHIN WARRANTY PERIOD.
29. THE CONTRACTOR SHALL PROVIDE ALL FUSES AND OVERLOAD HEATER ELEMENTS REQUIRED FOR THIS CONTRACT INSTALLATION INCLUDING ANY FUSES BLOWN DURING INITIAL TESTING.
30. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO ALL WALLS, FLOORS AND PAVING. IF DAMAGE OCCURS DURING CONSTRUCTION, ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER TO PATCH, PAINT AND REPAIR TO MATCH EXISTING CONDITIONS.
31. CONDUIT AND WIRE SCHEDULE FOR NEW EQUIPMENT ARE GENERALLY INDICATIVE. CONTRACTOR SHALL REFER TO MANUFACTURER AND SUPPLIER OF EQUIPMENT FOR DETAILED WIRING DIAGRAM AND VERIFY THE EXACT ROUTING AND CONDUCTOR SIZE.
32. THE CONTRACTOR SHALL REFER TO MANUFACTURER AND SUPPLIER OF ELECTRICAL CONTROL EQUIPMENT FOR EXACT WIRING INTERCONNECTION.
33. ALL CONDUCTORS SHALL BE ALUMINUM OR COPPER STRANDED, AND HAVE INSULATION TEMPERATURE RATING NOT LESS THAN 90°C, UNLESS OTHERWISE NOTED.

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KEY PLAN

SHEET TITLE

ELECTRICAL GENERAL NOTES

SHEET NUMBER

E-1.0

GENERAL NOTES (CONTINUED)

34. IDENTIFICATION OF GROUNDED CONDUCTORS SHALL BE IN ACCORDANCE WITH NEC 200.6. IDENTIFICATION OF EQUIPMENT GROUNDING CONDUCTORS SHALL BE IN ACCORDANCE WITH NEC 250.119. IDENTIFICATION OF UNGROUNDED CONDUCTORS SHALL BE IN ACCORDANCE WITH NEC 210.5(C) AND SHALL BE IDENTIFIED BY THE FOLLOWING COLORED INSULATION, MARKING TAPE, OR TAGGING AS FOLLOWS:

SYSTEM	480Y/277V	208Y/120V	120/240V 1-PHASE
PHASE A	BROWN	BLACK	BLACK (LINE 1)
PHASE B	ORANGE	RED	RED (LINE 2)
PHASE C	YELLOW	BLUE	
PV OUTPUT CIRCUIT	NEGATIVE GROUNDED SYSTEM		UNGROUNDED SYSTEM
POSITIVE (+)	RED		RED
NEGATIVE (-)	PER 200.6		BLACK
PV SOURCE CIRCUIT	NEGATIVE GROUNDED SYSTEM		UNGROUNDED SYSTEM
POSITIVE (+)	RED		RED
NEGATIVE (-)	PER 200.6		BLACK

35. USE WIRE IDENTIFICATION COLOR CODE PER SPECIFICATIONS BELOW.

COLOR	DESCRIPTION
LT. BLUE	INTRINSICALLY SAFE CIRCUITS
GREEN	EQUIPMENT GROUNDING CONDUCTOR
YELLOW	CONTROL CIRCUITS SUPPLIED FROM EXTERNAL POWER SOURCE, INTERLOCKS

36. MEDIUM VOLTAGE CABLE MARKINGS SHALL UTILIZE COLORED CONDUCTOR TAPE FOR ALL PHASES: YELLOW COLORED, SELF-ADHESIVE VINYL TAPE NOT LESS THAN 3 MILS THICK BY 1 INCH WIDE. 1 STRIPE FOR THE A PHASE CONDUCTOR, 2 STRIPES FOR THE B PHASE CONDUCTOR, 3 STRIPES FOR THE C PHASE CONDUCTOR. TAPE SHALL BE LOCATED AT ALL TERMINATIONS, SPLICES AND PULL BOXES.
37. THE ELECTRICAL ENGINEER OF RECORD SHALL PROVIDE REQUIRED SETTINGS FOR ALL ADJUSTABLE CIRCUIT BREAKERS AND RELAYS SPECIFIED IN THIS PROJECT. ARC FLASH LABELS SHALL ALSO BE PROVIDED FOR ALL NEW ELECTRICAL EQUIPMENT AS NEEDED. SETTINGS AND ARC FLASH LABELS ARE TYPICALLY SHOWN IN NEW ELECTRICAL SYSTEM STUDIES, BUT MAY INSTEAD BE PROVIDED IN THE PROJECT DRAWINGS OR VIA RFI. CONTRACTOR SHALL VERIFY ALL CIRCUIT BREAKER AND RELAY SETTINGS ARE PROVIDED AND HAVE BEEN APPLIED ONSITE. IF SETTINGS ARE NOT PROVIDED, CONTRACTOR SHALL REQUEST THEM FROM THE ENGINEER OF RECORD.
38. OUTDOOR SITE LIGHTING SHALL COMPLY WITH DARK SKY GUIDELINES.
39. TAMPER-RESISTANT RECEPTACLES SHALL BE INSTALLED IN ALL DWELLING UNITS AS REQUIRED IN NEC 406.12.

ABBREVIATIONS

A, AMPS	AMPERES
A/C	AIR CONDITIONER
AC	ALTERNATING CURRENT
AF	AMPERE FRAME
AIC	AMPERE INTERRUPTING CURRENT
AL	ALUMINUM
AT	AMPERES TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BC	BARE COPPER
BESS	BATTERY ENERGY STORAGE SYSTEM
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CB	CIRCUIT BREAKER
CC	CENTER TO CENTER
CKT	CIRCUIT
℄	CENTER LINE
CLG	CEILING
CLR	CLEAR
CO	CONDUIT ONLY WITH PULL ROPE
CONC	CONCRETE
CU	COPPER
DB	DIRECT BURIAL
DC	DIRECT CURRENT
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EPO	EMERGENCY POWER OFF
EQ	EQUAL
EQUIP	EQUIPMENT
(E)	EXISTING
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL

ABBREVIATIONS (CONTINUED)

FLA	FULL LOAD AMPERES
(F)	FUTURE
GND	GROUND
GALV	GALVANIZED
GRS	GALVANIZED RIGID STEEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HH	HANDHOLE
HP	HORSEPOWER
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HZ	HERTZ
IMC	INTERMEDIATE METAL CONDUIT
ISC	INTERRUPTING SHORT CIRCUIT
INST	INSTANTANEOUS
JB	JUNCTION BOX
KAIC	KILO AMPERES INTERRUPTION CAPACITY
KCMIL	KILO CIRCULAR MILS
KV	KILOVOLTS
KVA	KILOVOLT-AMPERES
KWH	KILO WATT-HOURS
LCP	LIGHTING CONTROL PANEL
LTG	LIGHTING
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCB	MAIN CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MSBD	MAIN SWITCHBOARD
MSGR	MAIN SWITCHGEAR
MV	MEDIUM VOLTAGE
MVA	MEGAVOLT-AMPERES
(N)	NEW
N	NEUTRAL
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OH	OVERHEAD
PH, ϕ	PHASE
PB	PUSHBUTTON
PDU	POWER DISTRIBUTION UNIT
PNL	PANEL
POCC	POINT OF COMMON CONNECTION
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
(R)	EXISTING TO BE REMOVED
(RE)	NEW LOCATION OF RELOCATED DEVICE
(RL)	EXISTING TO BE RELOCATED
SCA	SHORT CIRCUIT AVAILABLE
SEC	SECONDARY
SPECS	SPECIFICATIONS
STD	STANDARD
STP	SHIELDED TWISTED PAIR
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
TBD	TO BE DETERMINED
TD	TIME DELAY
TEL	TELEPHONE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UON	UNLESS OTHERWISE NOTED
UPB	UNDERGROUND PULLBOX
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
V	VOLTS
VA	VOLT-AMPERES
VFD	VARIABLE FREQUENCY DRIVE
VFI	VACUUM FUSED INTERRUPTER
VP	VAPORPROOF
W	WATTS, WIRE
WP	WEATHERPROOF
WT	WATERTIGHT
XFMR	TRANSFORMER
XLPE	CROSS-LINKED POLYETHYLENE
XP	EXPLOSION PROOF

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KEY PLAN

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SHEET NUMBER
E-1.1

ELECTRICAL SYMBOLS

POWER

- EXPOSED CONDUIT OR CABLE
- CONDUIT (UNDERGROUND OR CONCEALED IN FLOOR, WALL, OR CEILING)
- JUNCTION BOX WITH COVER
- 52 — CIRCUIT BREAKER, INSCRIBED NUMBER INDICATES IEEE DEVICE NUMBER
- LED FIXTURE
- POST TOP MOUNTED FIXTURE
- KEYED NOTE

SCHEMATIC

- NON–FUSIBLE LOAD INTERRUPTER SWITCH, AIR INSULATED
- FUSIBLE LOAD INTERRUPTER SWITCH, AIR INSULATED
- CIRCUIT BREAKER, MOLDED CASE
- MOTOR CIRCUIT PROTECTOR
- CIRCUIT BREAKER WITH CURRENT LIMITING FUSES – SIZE AS SHOWN
- CIRCUIT BREAKER, DRAW–OUT TYPE
- GFR 52 — MAIN CIRCUIT BREAKER W/ GFR
- MOTOR OVERLOAD RELAY
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- BUS DUCT (SINGLE LINE ONLY)
- TRANSFORMER
- ZIG ZAG TRANSFORMER
- GROUNDING ELECTRODE
- XXXXX — CIRCUIT CALLOUT
- 52 — ANSI/IEEE DEVICE NUMBER

QUALITY ASSURANCE NOTES

1. FOLLOW AND ADHERE TO ALL MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. ALL BACKFILL AND COMPACTION SHALL COMPLY WITH GEOTECH REPORT.
3. ALL ELECTRICAL TERMINATIONS SHALL BE TORQUED TO MANUFACTURERS' SPECIFICATIONS. WHERE THEY ARE NOT SPECIFIED, REFER TO UL STANDARDS 486A AND 486B. FINAL TORQUE TEST DOCUMENTATION SHALL BE PROVIDED TO OWNER OR HIS REPRESENTATIVE, WITH ONE OR THE OTHER IN WITNESS AT RANDOM TIMES.
4. LINE AND LOAD CONDUCTORS SHALL BE BRACED AND SUPPORTED (LASHED, HELD FIRMLY IN PLACE) IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S SPECIFICATIONS AND NECA/IBEW APPROVED INSTALLATION PRACTICES.
5. COMPRESSION CONNECTORS SHALL BE CRIMPED ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, USING MANUFACTURER–APPROVED TOOLS AND DIES. ALWAYS TUG–TEST ALL TERMINATIONS AFTER COMPLETION.
6. LISTED OXIDE INHIBITOR MUST BE APPLIED TO ALL ALUMINUM WIRE TERMINATIONS. LUGS USED WITH ALUMINUM WIRE MUST BE LISTED FOR USE WITH ALUMINUM, OR BE MARKED DUAL–RATED (AL9CU).
7. CORROSION POTENTIAL IN OUTDOOR ELECTRICAL CONNECTIONS SUCH AS GROUNDING AND BONDING CONNECTIONS SHOULD BE REDUCED BY MINIMIZING CONTACT BETWEEN DISSIMILAR METALS. WITHIN 1 MILE OF THE OCEAN, APPLICATION OF OUTDOOR ELECTRICAL JOINT COMPOUND BETWEEN DISSIMILAR METAL CONNECTIONS IS RECOMMENDED. ALL LUGS AND TERMINATION DEVICES USED OUTDOORS MUST BE LISTED FOR DIRECT BURIAL OR OUTDOOR USE.

MOUNTING HEIGHTS

MOUNTING HEIGHTS SHALL BE TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED.

RECEPTACLES	18"	VOLUME CONTROLS	MAX. 48" TO TOP
RECEPTACLE WIREWAYS	43"	THERMOSTATS	MAX. 48" TO TOP
SWITCHES	MAX. 48" TO TOP	TELE/COMMUNICATION OUTLET	15" MIN. TO BOTTOM
MOTOR STARTERS, TO TOP	72"	PANELBOARDS, TO TOP	72"
DISCONNECTS, TO TOP	72"	CABINETS, TO TOP	72"
JUNCTION BOXES	15" MIN.	FIRE ALARM PULL STATIONS	MAX 48" TO TOP

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REGISTERED PROFESSIONAL ENGINEER — JOON SUK CHOI — E 24039 — EXP. 06/30/25 — ELECTRICAL — STATE OF CALIFORNIA

AGENCY APPROVAL

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DESIGNER PROJECT NO.:	223091
DRAWN BY:	JC
CHECKED BY:	JC
SCALE:	NTS

KEY PLAN

SHEET TITLE

ELECTRICAL GENERAL NOTES

SHEET NUMBER

E-1.2

ACCEPTANCE TESTING

THE FOLLOWING TESTS SHALL BE PERFORMED PRIOR TO ENERGIZATION OF THE SYSTEM WHEN APPLICABLE:
TEST RESULTS SHALL BE MADE AVAILABLE TO THE ENGINEER OF RECORD OR BUILDING OFFICIAL UPON REQUEST.

1. GROUND-FAULT PROTECTION EQUIPMENT
   - 1.1 VERIFY PICKUP AND TIME DELAY SETTINGS ARE IN ACCORDANCE WITH SETTINGS PROVIDED BY THE ENGINEER OR EQUIPMENT MANUFACTURER.
2. ELECTRICAL TESTS SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS AND OTHER EQUIPMENT RATED 1000 AMPERES OR MORE, OR OVER 1000 VOLTS.
   - 2.1. RELAY PICKUP CURRENT BY CURRENT INJECTION AT THE SENSOR AND OPERATION OF THE CIRCUIT INTERRUPTING DEVICE
   - 2.2. TEST RELAY TIMING.
   - 2.3. TEST PRIMARY CONTROL VOLTAGE AT NOT MORE THAN 57 PERCENT OF ITS RATED VOLTGROUNDED CONDUCTOR INSULATION RESISTANCE
   - 2.4. VERIFICATION OF CONTINUITY OF EQUIPMENT GROUNDING SYSTEM.
   - 2.5. INSULATION RESISTANCE TEST ON EACH BUS AND PROTECTIVE DEVICE, PHASE-TO-PHASE AND PHASE-TO-GROUND.
   - 2.6. DIELECTRIC VOLTAGE-WITHSTAND TEST ON EACH BUS AND PROTECTIVE DEVICE, PHASE-TO-PHASE AND PHASE-TO-GROUND.
   - 2.7. CONTROL POWER TRANSFORMER, CONTROL POWER CIRCUITS AND POTENTIAL CIRCUITS.
   - 2.8. CONTROL AND PROTECTIVE DEVICES FOR PROPER OPERATION.
3. ELECTRICAL TESTS ON TRANSFORMERS RATED 100 KVA OR MORE SINGLE PHASE AND 300 KVA OR MORE THREE PHASE.
   - 3.1. INSULATION RESISTANCE TEST ON EACH WINDING. TEST WINDING-TO-WINDING AND WINDINGS-TO-GROUND.
   - 3.2. TURNS-RATIO TEST FOR EACH WINDING AT ALL TAP SETTINGS.
   - 3.3. CONTROL POWER TRANSFORMER, CONTROL POWER CIRCUITS AND POTENTIAL CIRCUITS.
   - 3.4. CONTROL AND PROTECTIVE DEVICES FOR PROPER OPERATION.
4. INSULATION RESISTANCE TEST ON EACH CONDUCTOR, PHASE-TO-PHASE AND PHASE-TO-GROUND FOR ALL AC CONDUCTORS
   - 4.1. VLF TESTING FOR MEDIUM VOLTAGE CONDUCTORS
   - 4.2. MEGGER TESTING FOR LOW VOLTAGE CONDUCTORS
5. ELECTRICAL TESTS ON EMERGENCY AND STANDBY POWER SYSTEMS: SWITCHBOARDS, PANELBOARDS, DISTRIBUTION BOARDS, TRANSFER EQUIPMENT, POWER SOURCE, CONDUCTORS, FIRE PUMPS, EXHAUST AND VENTILATION FANS.
   - 5.1. CONTROL AND PROTECTIVE DEVICES FOR PROPER OPERATION.
   - 5.2. PHASE ROTATION TEST
   - 5.3. INSULATION RESISTANCE TEST ON FEEDER CONDUCTORS AND EQUIPMENT, PHASE-TO-PHASE AND PHASE-TO-GROUND
   - 5.4. AUTOMATIC LOAD TRANSFER TEST. TEST NORMAL AND EMERGENCY POWER, OR NORMAL AND STANDBY POWER, OR BOTH. SIMULATE LOSS OF EMERGENCY AND NORMAL POWER OR STANDBY AND POWER, OR BOTH. SIMULATE ALL FORMS OF SINGLEPHASE CONDITIONS.
   - 5.5. CONDUCT OPERATIONAL TEST ON SYSTEM UNDER LOAD CONDITIONS.
6. USING A PV MODULE TEST KIT (SEWARD OR EQUIVALENT EQUIPMENT), PERFORM VOC, ISC, AND INSULATION RESISTANCE TESTING ON ALL PV MODULE STRINGS.
7. INVERTER TESTING
   - 7.1. LINE TO LINE VOLTAGE
   - 7.2. LINE TO NEUTRAL VOLTAGE
   - 7.3. ALL COMMISSIONING STEPS LISTED IN INSTALLATION MANUAL PROVIDED BY MANUFACTURER

EQUIPMENT SPECIFICATIONS

THE FOLLOWING EQUIPMENT SPECIFICATION AND SUBMITTALS SHALL BE PROVIDED TO AND APPROVED BY THE ENGINEER OF RECORD PRIOR TO INSTALLATION:

- ELECTRICAL EQUIPMENT INCLUDING: SWITCHGEAR, PANELBOARDS, MOTOR CONTROL CENTERS, AND SAFETY SWITCHES.
- CONDUCTORS AND CABLES INCLUDING: MEDIUM VOLTAGE CABLES, LOW VOLTAGE CABLES, PV DC WIRING, AND CONTROL CABLES.
- COMMUNICATION CABLES SUCH AS RS-485/EIA-485 CABLE, ETHERNET CABLE, AND FIBER OPTIC CABLE.
- SCADA DEVICES SUCH AS DATA ACQUISITION SYSTEM, RTU, RTAC, OR CONTROLLER.
- PROTECTIVE DEVICES INCLUDING: CIRCUIT BREAKERS (INCLUDING TRIP UNITS IF PRESENT), FUSES, AND RELAYS.
- PV EQUIPMENT INCLUDING: SOLAR MODULE, UL2703 SOLAR MOUNTING SYSTEM, TRANSFORMERS, INVERTERS, COMBINER BOXES, RECOMBINER BOXES, AND RAPID SHUTDOWN BOXES. ALSO SUBMIT DEVICES NOT INTEGRAL TO THE SOLAR MODULE MOUNTING SYSTEM, SUCH AS MODULE GROUNDING LUGS OR DEVICES.
- CABLE TRAY INCLUDING WIRE AND TRAY SIZING CALCULATIONS

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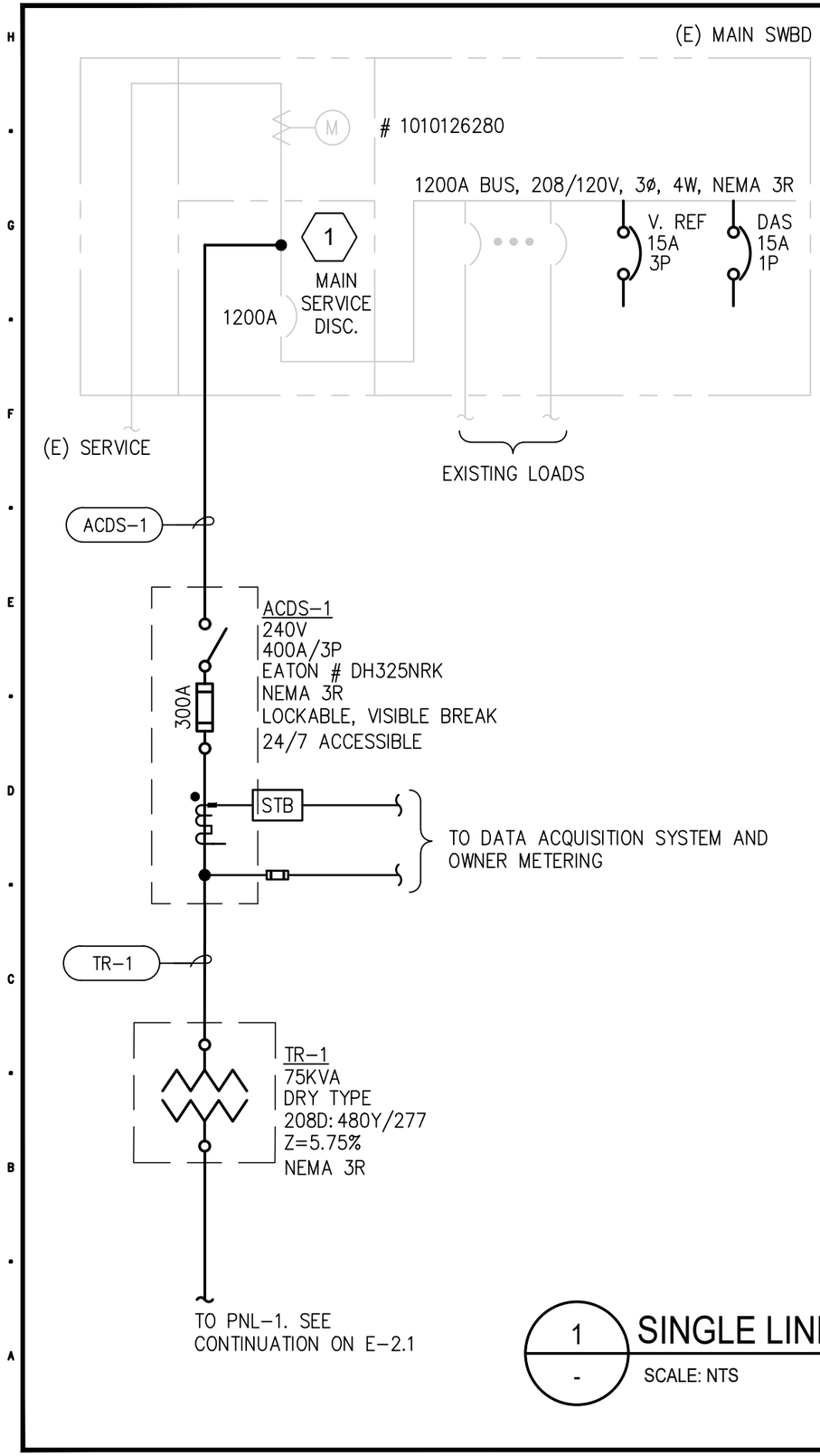
KEY PLAN

SHEET TITLE

ELECTRICAL GENERAL NOTES

SHEET NUMBER

E-1.3



1 - SINGLE LINE DIAGRAM

SCALE: NTS

GENERAL NOTES

1 ALL EQUIPMENT SHALL BE UL LISTED.

2 INSTALLATION SHALL BE IN ACCORDANCE WITH LATEST ELECTRICAL AND BUILDING CODES. AHJ HAS FINAL JURISDICTIONAL AUTHORITY ON CODE APPLICATION AND COMPLIANCE.

3 ALL INVERTER WIRING AND GROUNDING METHODS SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDED PRACTICES. REFER TO PLANNING & INSTALLATION MANUAL FOR THIS GUIDANCE.

4 ALL DISCONNECTS SHALL BE LABELED "WARNING – ELECTRIC SHOCK HAZARD – DO NOT TOUCH TERMINALS" AND "TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION" PER NEC 690.13(B).

5 EXPOSED NON–CURRENT CARRYING METAL PARTS OF MODULE FRAMES, EQUIPMENT AND ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH NEC 250.134 AND 250.136.

6 COORDINATE DATE, TIME, AND LENGTH OF ANY REQUIRED FACILITY SHUTDOWNS WITH OWNER PRIOR TO CONSTRUCTION.

7 LUGS SHALL BE DUAL RATED FOR COPPER/ALUMINUM CONDUCTORS

8 SWITCHGEAR AND SWITCHBOARD BREAKERS SHALL BE ELECTRONIC TRIP

9 REFER TO SHEET(S) E–7.X FOR ELECTRICAL DETAILS
REFER TO SHEET(S) E–9.X FOR WARNING LABELS AND LOCATIONS
REFER TO SHEET(S) E–10.X FOR EQUIPMENT DATASHEETS

10 ALL EQUIPMENT SHALL HAVE ARC FLASH WARNING LABELS WITH APPLICABLE INCIDENT ENERGY LEVELS, WORKING DISTANCES, AND REQUIRED PPE IN ACCORDANCE WITH NFPA 70E.

11 PHOTOVOLTAIC MODULES TO BE GROUNDED USING FACTORY GROUND POINT ONLY, OR OTHER APPROVED UL LISTED MEANS/METHODS.

12 PV SYSTEM AND EQUIPMENT COMPLIANT WITH THE FOLLOWING NEC CODES:
– POINT OF INTERCONNECTION PER NEC 705.11 FOR SUPPLY SIDE CONNECTION
– POINT OF INTERCONNECTION PER NEC 705.12 FOR LOAD SIDE CONNECTION
– INTEGRATED AC DISCONNECT PER NEC 705.20
– LOCATION OF OVERCURRENT PROTECTION PER NEC 705.11(C) FOR SUPPLY SIDE CONNECTION
– DISCONNECTING OF PHOTOVOLTAIC MODULES PER NEC 690.15 FOR INVERTER INTEGRATED DC DISCONNECTS

KEYED NOTES:

1 CONNECT PV SYSTEM OUTPUT TO THE SUPPLY SIDE OF THE SERVICE DISCONNECTING MEANS, AS ALLOWED BY NEC 705.11. CONTRACTOR TO CONFIRM CONDITION AND RATING OF THE EXISTING SWITCHBOARD FOR SUPPLY SIDE INSTALLATION, AND NOTIFY THE ENGINEER IN CASE OF DISCREPANCIES.

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SCALE:	NTS

KEY PLAN

SHEET TITLE

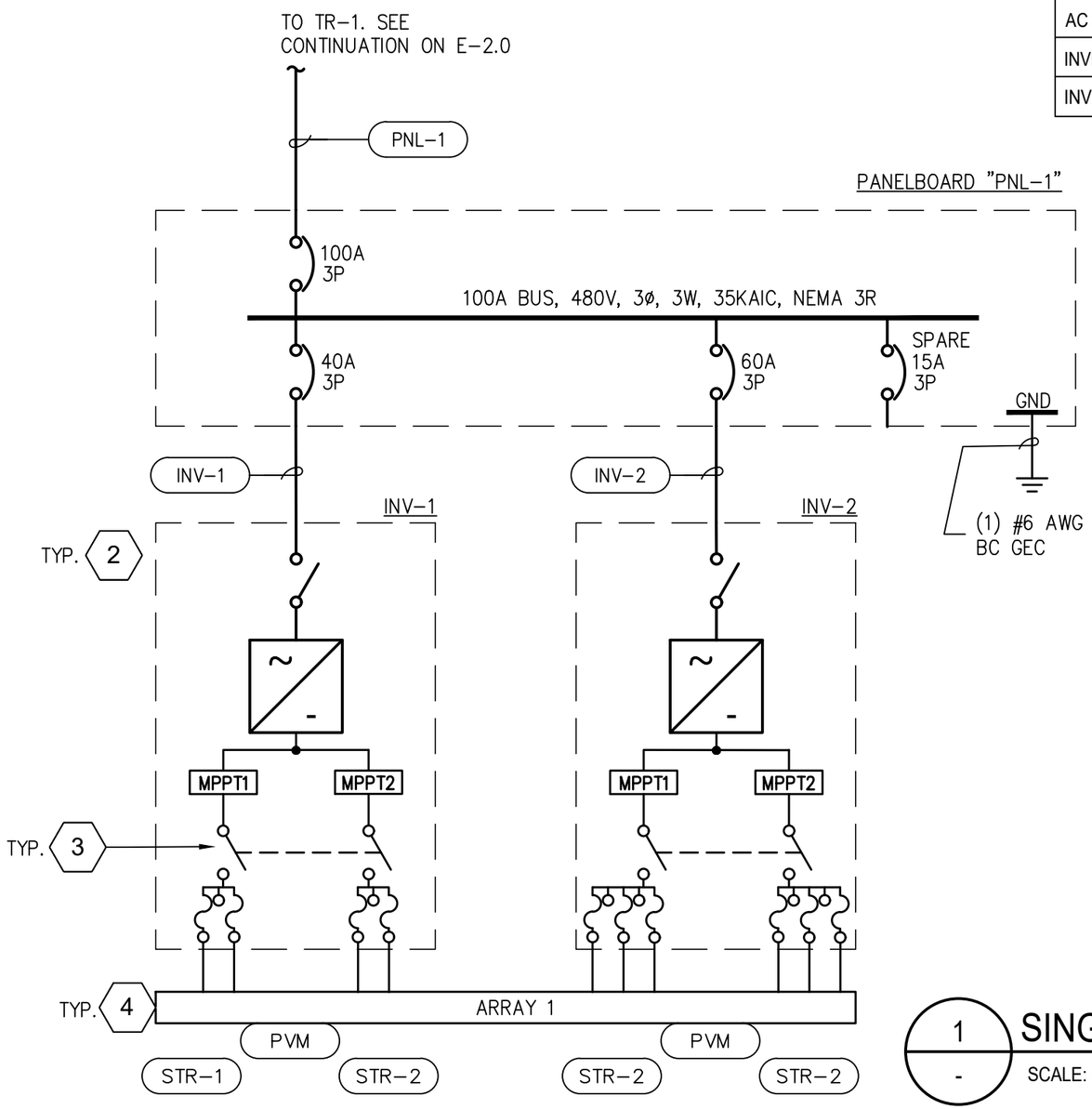
SINGLE LINE DIAGRAM

SHEET NUMBER

E-2.0

SYSTEM SUMMARY

PROJECT LOCATION	15555 SANBORN RD, SARATOGA, CA 95070
MIN DESIGN TEMPERATURE	-2.2°C
MAX 2% DESIGN TEMPERATURE	32.4°C
PV MODULE	JA SOLAR JAM72D30-540/MB
PV MODULE WATTAGE @ STC	540
PV MODULE COUNT	144
DC SYSTEM SIZE	77.76 KW DC
AC SYSTEM SIZE	61 KW / 61 KVA
INVERTER TYPE & COUNT	(1) CPS SCA25KTL-DO/US-480
INVERTER TYPE & COUNT	(1) CPS SCA36KTL-DO/US-480



1 - SINGLE LINE DIAGRAM

SCALE: NTS

KEYED NOTES:

2 INVERTERS: CPS CHINT POWER FOR UNGROUNDED PV ARRAYS.
- 480VAC, 3PH-3W, 1000VDC
- NEMA 3R ENCLOSURE.
- NO ISOLATION TRANSFORMER.
- INTEGRATED AC DISCONNECT
- UL1741 LISTED WITH INTEGRAL ANTI-ISLANDING PROTECTION. UL1741 LISTING INCLUDES COMPLIANCE WITH IEEE519 FOR POWER QUALITY, IEEE929 FOR INTERCONNECTION SAFETY AND NEC REQUIREMENTS.

3 DC DISCONNECT SWITCH
- INTEGRATED GANG OPERATED DC SWITCH FOR ALL MPPTS.
- MIN FUSE SIZE AS INDICATED IN PV MODULE TABLE.
- DC DISCONNECT SWITCH SHALL COMPLY WITH NEC 690.15 REQUIREMENTS
- REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR DETAILS.

4 DIVIDE CONNECTED STRINGS AS EVENLY AS POSSIBLE BETWEEN INVERTER MPPT UNITS. UNDER NO CIRCUMSTANCES SHOULD THE SUM OF STRING Isc CONNECTED TO AN MPPT UNIT EXCEED THE MAXIMUM Isc LISTED ON THE INVERTER DATASHEET.
TOTAL VOLTAGE DROP FOR DC CIRCUITS SHALL NOT EXCEED 2%, OTHERWISE SIZE OF CONDUCTORS MAY HAVE TO BE INCREASED. CONTRACTOR SHALL NOTIFY ENGINEER IF ACTUAL ROUTING EXCEEDS THE DESIGNED MAXIMUM ONE-WAY DISTANCE.

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SCALE:	NTS

KEY PLAN

SHEET TITLE

SINGLE LINE DIAGRAM

SHEET NUMBER

E-2.1

AC SCHEDULE AND CALCULATIONS

* CONDUITS ARE MINIMUM REQUIRED SIZES; INSTALLED SIZES MAY BE LARGER, IF USED
** WIRE AMPACITY BASED ON WIRE TERMINAL TEMPERATURE RATING OR WIRE INSULATION TEMPERATURE RATING (WHICHEVER IS LOWER)

CIRCUIT ID	VOLTAGE	CURRENT	OCP	WIRE MATERIAL	WIRE INSULATION	PARALLEL SETS OF WIRES	PHASE CONDUCTORS PER SET	NEUTRAL CONDUCTOR PER SET	EGC PER SET	**WIRE AMPACITY	*MIN EMT (IN)	*MIN LFMC (IN)	*MIN RMC (IN)	*MIN PVC (IN)	DISTANCE (FT)	% VOLTAGE DROP
INV-1	480	30.5	40	Al	THWN-2	1	(3) #6 AWG	N/A	#8 AWG	50	0.75	0.75	0.75	0.75	35	0.31%
INV-2	480	43.5	60	Al	THWN-2	1	(3) #4 AWG	N/A	#8 AWG	65	1	1	1	1	15	0.12%
PNL-1	480	74.0	100	Al	THWN-2	1	(3) #3/0 AWG	N/A	#3 AWG	155	2	2	1.5	2	420	1.46%
TR-1	208	208.2	300	Al	THWN-2	1	(3) 500 kcmil	N/A	#2 AWG	310	2.5	3	3	3	10	0.08%
ACDS-1	208	208.2	300	Cu	THWN-2	1	(3) 300 kcmil	#4 AWG	#4 AWG	285	2.5	2.5	2.5	2.5	20	0.16%

DC SCHEDULE AND CALCULATIONS

*DESIGN TEMPERATURE BASED OFF OF -2.2°C LOW SITE TEMPERATURE. Voc (#/°C) = -0.275

CIRCUIT ID	# OF MODULES IN STRING	Voc	Vmp	Isc	Imp	KW @ STC	MIN FUSE SIZE	WIRE QTY & SIZE	WIRE AMPACITY AFTER DERATE	WIRE MATERIAL	WIRE INSULATION	MAX ONE-WAY DISTANCE	%VOLTAGE DROP
PVM	N/A	53.3	41.64	15.30	14.267	0.54	N/A	SEE MFR DATASHEET	N/A	SEE MFR DATASHEET	SEE MFR DATASHEET	N/A	N/A
STR-1	16	853.0	666.24	15.30	14.267	8.64	25	(2) #10 AWG (1) AWG #10 EGC	33.6	CU	PV WIRE	100	0.53%
STR-2	14	746.3	582.96	15.30	14.267	7.56	25	(2) #10 AWG (1) AWG #10 EGC	33.6	CU	PV WIRE	100	0.61%

NOTE: MODULE IMP AND ISC ARE INCREASED BY 10% TO ACCOUNT FOR BIFACIAL POWER GAIN

INVERTER CONFIGURATIONS

INVERTER ID	INVERTER ARRAY	INVERTER MAKE & MODEL	INVERTER OCP	INVERTER KW	INVERTER KVA	STR-1 QTY	STR-2 QTY	MODULES PER INVERTER	KW DC PER INVERTER
INV-1	1	CPS SCA25KTL-DO/US-480	40/3P	25	25	2	2	60	32.4
INV-2	1	CPS SCA36KTL-DO/US-480	60/3P	36	36	0	6	84	45.36

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KEY PLAN

SHEET TITLE

SINGLE LINE DIAGRAM

SHEET NUMBER

E-2.2

GENERAL NOTES

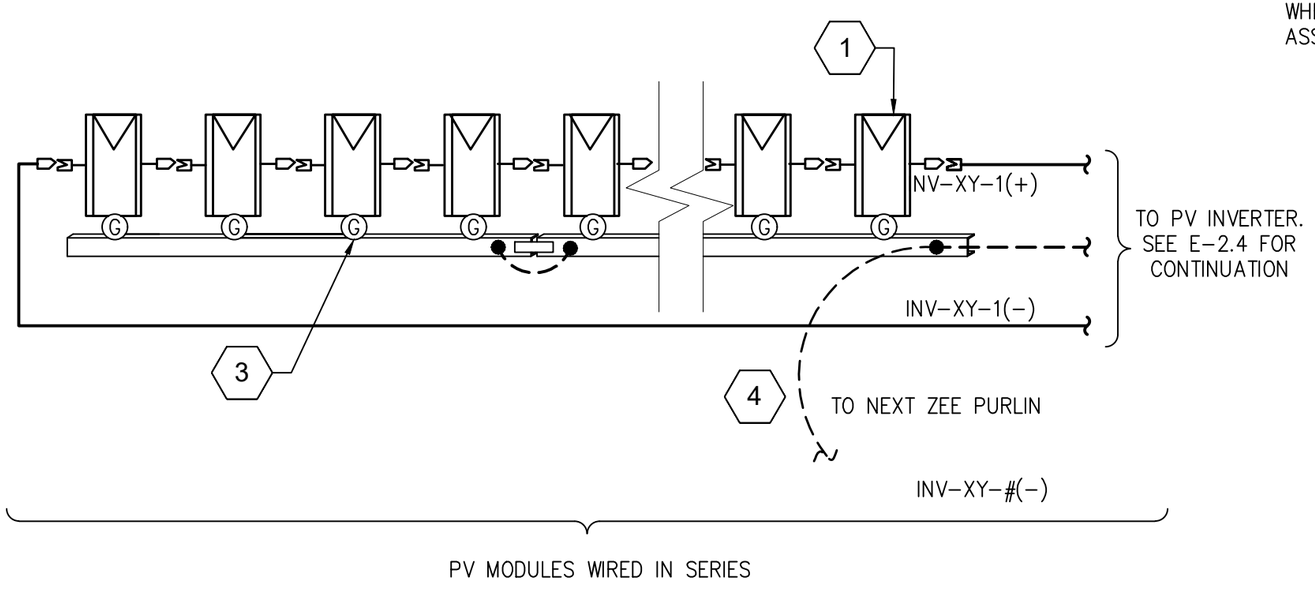
1 THE THREE LINE DIAGRAM IS SHOWN FROM AC DISCONNECT TO THE FIRST INVERTER, AND IS INTENDED TO PROVIDE GENERAL GUIDANCE AND TYPICAL INVERTER DC CONFIGURATION.
REFER TO SINGLE LINE DIAGRAM FOR EQUIPMENT SPECIFICATIONS AND THE FULL SYSTEM REPRESENTATION.

KEYED NOTES:

1 SOLAR PHOTOVOLTAIC MODULES WIRED IN SERIES. EACH MODULE INCLUDES OUTDOOR RATED QUICK CONNECTOR FOR MODULE INTERCONNECTION.
DO NOT REMOVE THE QUICK CONNECTS, OTHERWISE THE MODULE WARRANTY AND U.L. LISTING MAY BE INVALIDATED.

3 GROUND ALL MODULES, USING UL LISTED **"WEEB"** GROUNDING CLIP WASHER AT EACH **"ZEE"** SOLAR MOUNTING CLIP, ALONG THE TOP ROW ONLY. REFER TO INSTALLATION MANUAL.
SEE PARTIAL GND PLAN ON DETAIL **6/E-7.1**.

4 INSTALL BONDING JUMPER #6AWG CU BETWEEN SEPARATE PURLINS. #4AWG CU SHALL BE USED TO BOND INVERTER'S GND TERMINAL, AND ZEE PURLINS IN DIFFERENT ROWS TO THE GE/STRUCTURE; AND WHERE REQUIRED TO BOND OTHER STRUCTURAL MEMBERS, TO ASSURE CONTINUITY OF GND CONNECTION.



1 / - THREE LINE DIAGRAM

SCALE: NTS

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THREE LINE DIAGRAM

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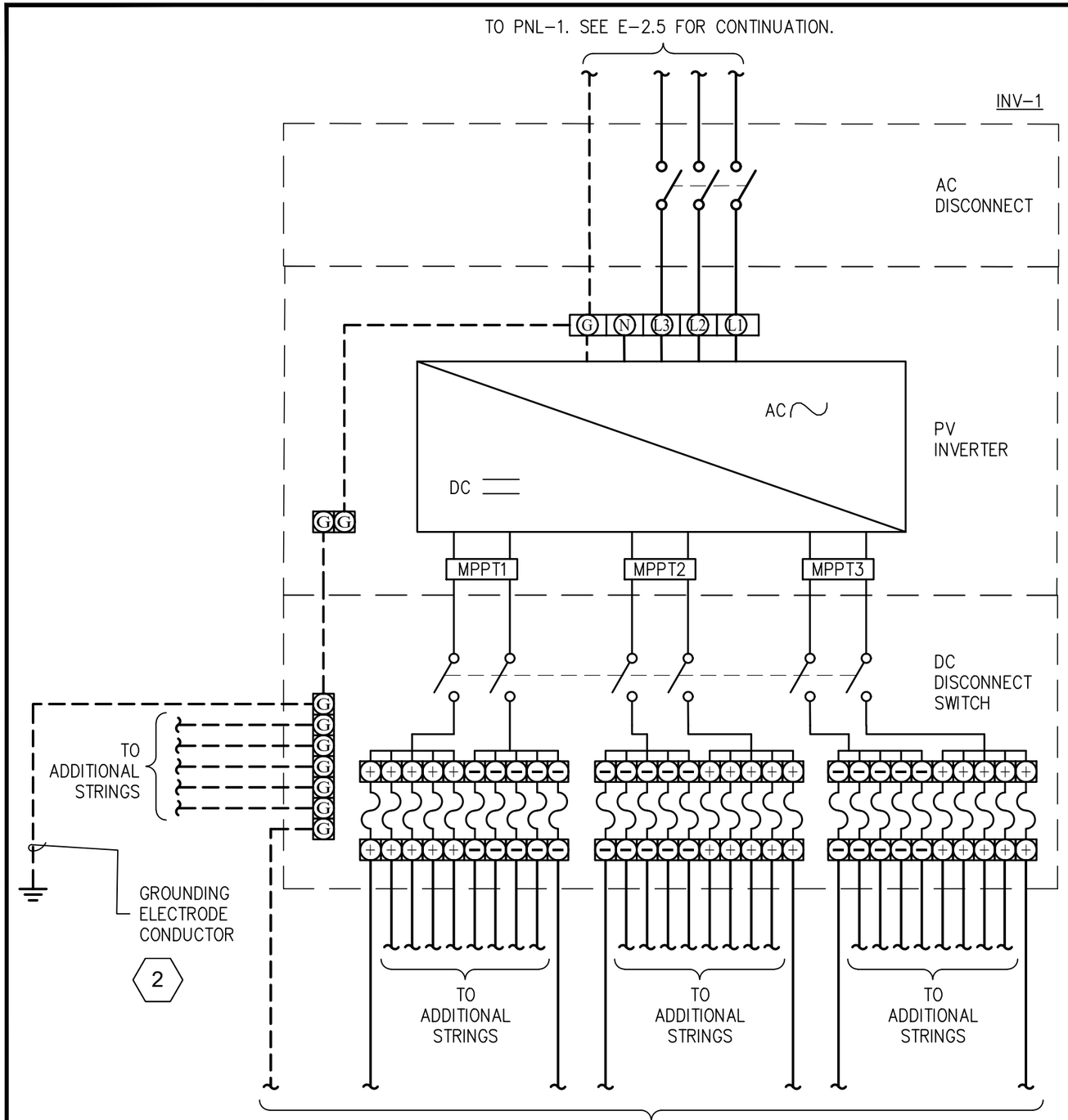
E-2.3



1 THREE LINE DIAGRAM

SCALE: NTS

GENERAL NOTES

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REFER TO SINGLE LINE DIAGRAM FOR EQUIPMENT SPECIFICATIONS AND THE FULL SYSTEM REPRESENTATION.

(#) KEYED NOTES:

2 BOND ELECTRICAL PANELS, AND INVERTER GND TERMINALS TO NEW ELECTRODE. USE UL LISTED IRREVERSIBLE COMPRESSION CONNECTORS OR EXOTHERMIC WELD PROCESS AS APPLICABLE.

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THREE LINE DIAGRAM

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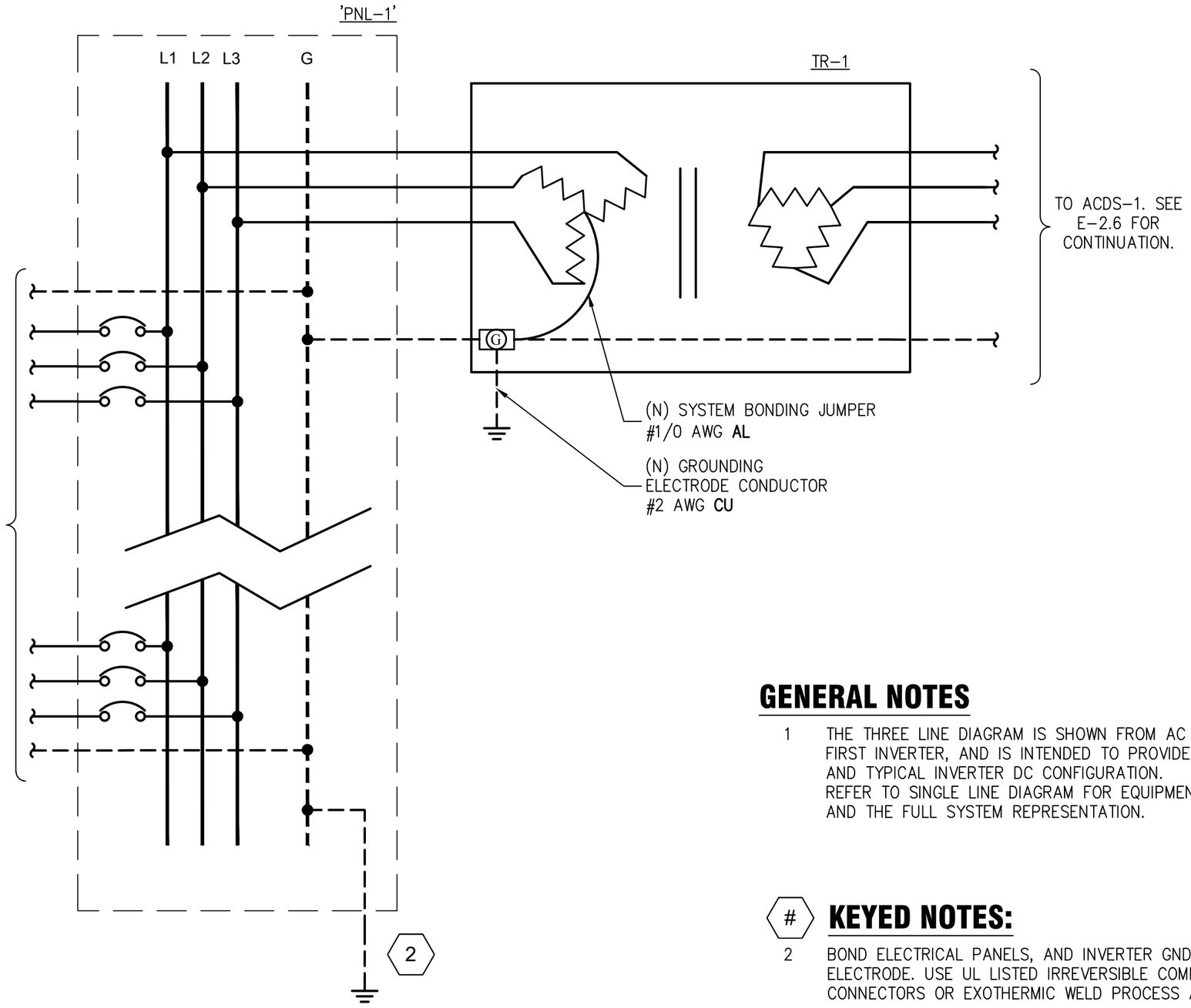
E-2.4



GENERAL NOTES

1 THE THREE LINE DIAGRAM IS SHOWN FROM AC DISCONNECT TO THE FIRST INVERTER, AND IS INTENDED TO PROVIDE GENERAL GUIDANCE AND TYPICAL INVERTER DC CONFIGURATION.
REFER TO SINGLE LINE DIAGRAM FOR EQUIPMENT SPECIFICATIONS AND THE FULL SYSTEM REPRESENTATION.

(#) KEYED NOTES:

2 BOND ELECTRICAL PANELS, AND INVERTER GND TERMINALS TO NEW ELECTRODE. USE UL LISTED IRREVERSIBLE COMPRESSION CONNECTORS OR EXOTHERMIC WELD PROCESS AS APPLICABLE.

1 / - THREE LINE DIAGRAM

SCALE: NTS

CLIENT

Santa Clara County Office of Education

SANTA CLARA COUNTY OFFICE OF EDUCATION

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15555 SANBORN RD
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EXP 06/30/25
ELECTRICAL
STATE OF CALIFORNIA

AGENCY APPROVAL

ISSUE

MARK	DATE	DESCRIPTION
-	02/15/24	30%
-	04/19/24	90%
-	05/17/24	100%
-	05/23/24	REVISED 100%

DESIGNER PROJECT NO.:	223091
DRAWN BY:	JC
CHECKED BY:	JC
SCALE:	NTS

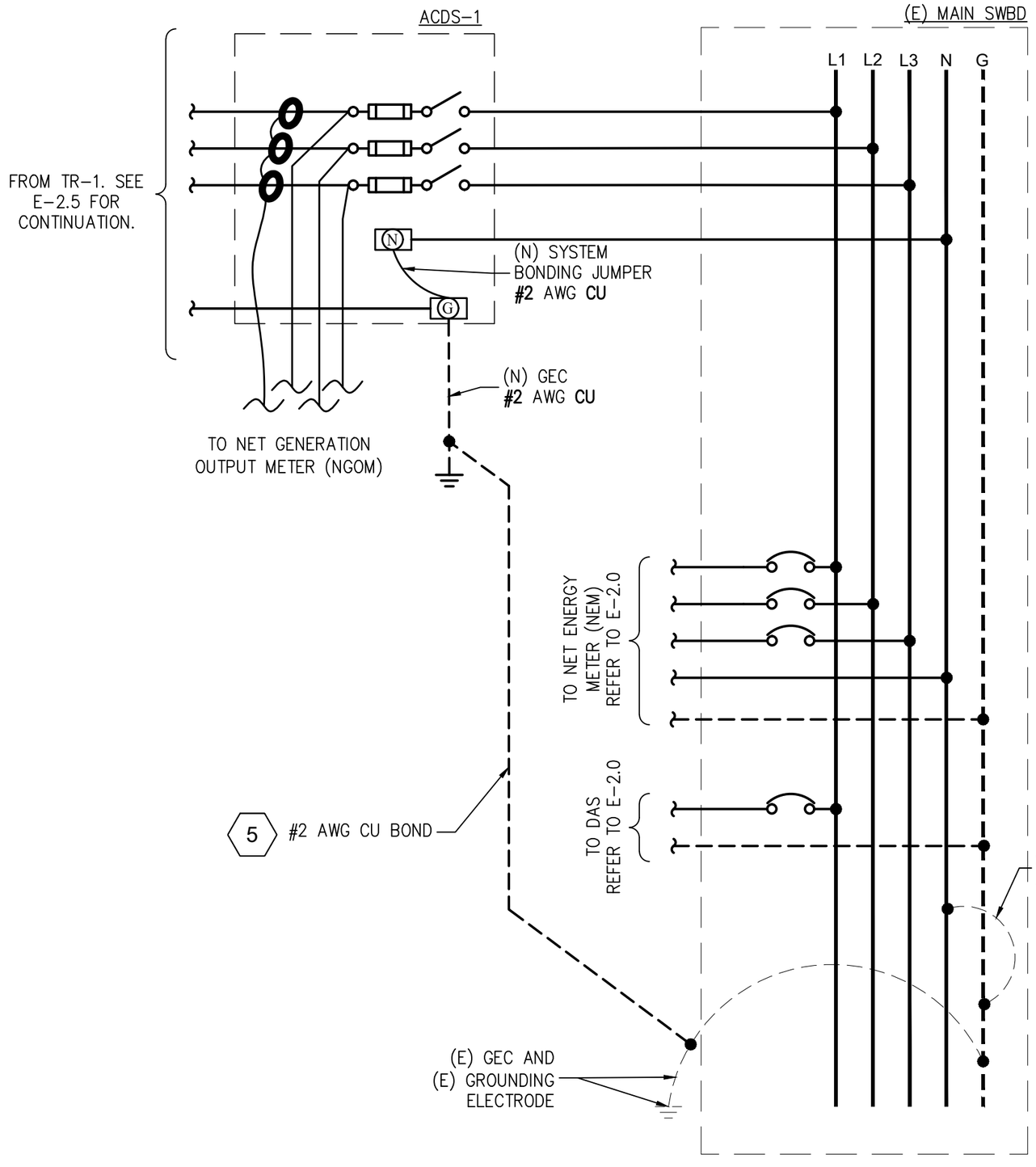
KEY PLAN

SHEET TITLE

THREE LINE DIAGRAM

SHEET NUMBER

E-2.5



GENERAL NOTES

1 THE THREE LINE DIAGRAM IS SHOWN FROM AC DISCONNECT TO THE FIRST INVERTER, AND IS INTENDED TO PROVIDE GENERAL GUIDANCE AND TYPICAL INVERTER DC CONFIGURATION. REFER TO SINGLE LINE DIAGRAM FOR EQUIPMENT SPECIFICATIONS AND THE FULL SYSTEM REPRESENTATION.

(#) KEYED NOTES:

5 BOND AC DISCONNECT GEC TO (E) GROUNDING ELECTRODE AT MAIN SWITCHGEAR. IF GROUNDING ELECTRODE IS NOT ACCESSIBLE, CONNECT THE (N) GEC TO THE (E) GEC OF THE MAIN SWITCHGEAR WITH AN IRREVERSIBLE SPLICE PER DETAIL **6/E-7.0**.

1 / - THREE LINE DIAGRAM

SCALE: NTS

CLIENT

Santa Clara County Office of Education

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SCALE:	NTS

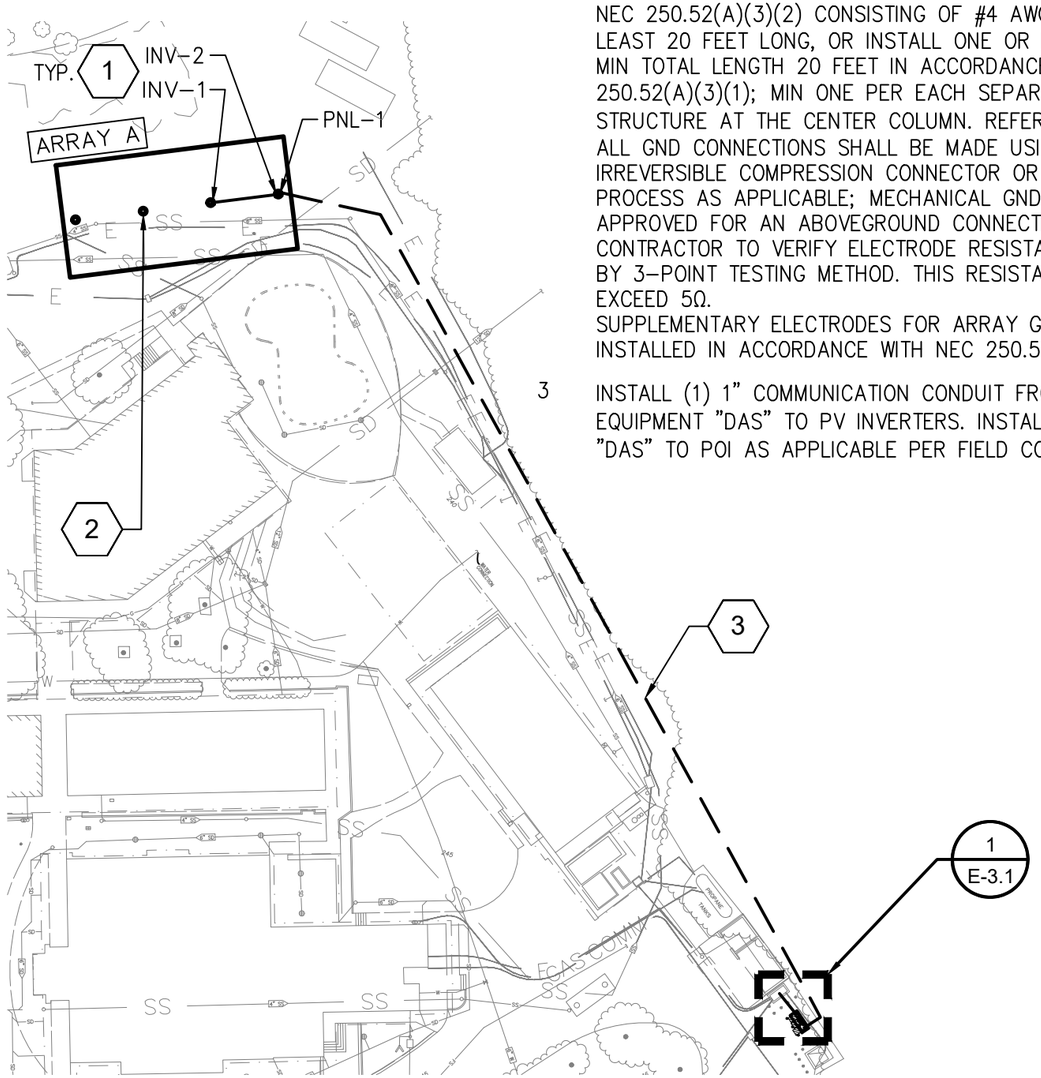
KEY PLAN

SHEET TITLE

THREE LINE DIAGRAM

SHEET NUMBER

E-2.6



1 ELECTRICAL SITE PLAN
SCALE: 1" = 60'-0" 0 15' 30' 60' 120'
1" = 60'-0"

KEYED NOTES:

1 INVERTERS TO BE INSTALLED ON THE COLUMN ON CANOPY STRUCTURE AT THE MAX HEIGHT, TO LIMIT ACCESS TO UNAUTHORIZED PERSONNEL. MAX. 8'-0" FROM TOP OF BOLLARD TO BOTTOM OF INVERTER PER ENGIE O&M REQUIREMENT. OTHERWISE PROTECTING GUARD SHALL BE INSTALLED OVER INVERTER DISCONNECTING MEANS. SEE SHEET **1/E-7.1** AND INSTALLATION MANUAL FOR EXACT DIMENSIONS OF ACCESS, AND MOUNTING DETAILS.

2 INSTALL CONCRETE-ENCASED ELECTRODE IN ACCORDANCE WITH NEC 250.52(A)(3)(2) CONSISTING OF #4 AWG BARE COPPER AT LEAST 20 FEET LONG, OR INSTALL ONE OR MORE GROUND RODS, MIN TOTAL LENGTH 20 FEET IN ACCORDANCE WITH NEC 250.52(A)(3)(1); MIN ONE PER EACH SEPARATE CANOPY STRUCTURE AT THE CENTER COLUMN. REFERENCE DETAIL 5/E-7.0. ALL GND CONNECTIONS SHALL BE MADE USING UL LISTED IRREVERSIBLE COMPRESSION CONNECTOR OR EXOTHERMIC WELD PROCESS AS APPLICABLE; MECHANICAL GND CONNECTORS CAN BE APPROVED FOR AN ABOVEGROUND CONNECTIONS
CONTRACTOR TO VERIFY ELECTRODE RESISTANCE TO THE GROUND BY 3-POINT TESTING METHOD. THIS RESISTANCE SHALL NOT EXCEED 5Ω.
SUPPLEMENTARY ELECTRODES FOR ARRAY GROUNDING SHALL BE INSTALLED IN ACCORDANCE WITH NEC 250.54, 250.52 AND 690.47.

3 INSTALL (1) 1" COMMUNICATION CONDUIT FROM MONITORING EQUIPMENT "DAS" TO PV INVERTERS. INSTALL (1) 2" C. FROM "DAS" TO POI AS APPLICABLE PER FIELD CONDITIONS.

GENERAL NOTES

1 INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED NEC AND NESC CODES AND STANDARDS AND SHALL CONFORM WITH INDUSTRY BEST PRACTICES AND IEEE RECOMMENDATIONS. THE AHJ HAS FINAL JURISDICTIONAL AUTHORITY ON CODE APPLICATION AND COMPLIANCE.

2 ALL EQUIPMENT SHALL BE APPROVED BY OWNER.

3 ALL INVERTER WIRING AND GROUNDING METHODS SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDED PRACTICES.

4 INSTALL PULL ROPES IN EMPTY CONDUITS. USE MONOFILIMENT PLASTIC LINE WITH NOT LESS THAN 200LB TENSILE STRENGTH. LEAVE AT LEAST 12" OF SLACK AT EACH END OF THE PULL WIRE.

5 WIRE SHALL BE INSTALLED IN APPROVED RACEWAYS FOR ITS' INTENDED USE. ADEQUATELY STRAP AND SUPPORT ALL RACEWAYS. IN GENERAL, SUPPORT ALL CONDUIT WITHIN THREE (3) FEET OF OUTLET BOX, PANEL, OR ENCLOSURE, AND MAXIMUM TEN (10) FEET THEREAFTER. LFMC AND MC-PVC JACKETED CABLE WITHIN (1) FEET AND (4.5) FEET ADEQUATELY. RACEWAYS TO BE LISTED FOR WET LOCATIONS.

6 ALL EQUIPMENT SHALL BE LOCKABLE OR GUARDED AGAINST ACCESS BY UNQUALIFIED PERSONS.

7 NO CABLE TRAYS SHALL BE INSTALLED

8 EXPOSED NON-CURRENT CARRYING METAL PARTS OF ALL EQUIPMENT AND ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH NEC 250.134 AND 250.136. GROUND INVERTER IN ACCORDANCE WITH LISTING.

9 NO PART OF THIS DRAWING OR SPECIFICATIONS IS INTENDED TO ALLOW A VIOLATION OF PHYSICAL WORKING SPACE REQUIREMENTS AROUND ELECTRICAL EQUIPMENT AS REQUIRED BY NEC 110.26

10 ALL EQUIPMENT SHALL HAVE ARC FLASH WARNING LABELS WITH APPLICABLE INCIDENT ENERGY LEVELS, WORKING DISTANCES, AND REQUIRED PPE IN ACCORDANCE WITH NFPA 70E.

11 CONDUIT ROUTING IS DIAGRAMMATIC IN NATURE. EXACT ROUTING SHALL BE COORDINATED BY THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND INTERFERENCES AND AVOIDING AS NECESSARY.

12 REFER TO SHEET(S) E-2.0 FOR CONDUIT AND FEEDER SPECIFICATIONS
REFER TO SHEET(S) E-7.0, 7.1 FOR ELECTRICAL DETAILS
REFER TO SHEET(S) E-9.0, 9.1 FOR EQUIPMENT LABELING

13 PV MODULES ARE NOT SHOWN FOR CLARITY. REFER TO ELECTRICAL ARRANGEMENT SHEETS FOR WIRING DETAILS

14 PULL-BOX TRAFFIC RATINGS SHALL BE DETERMINED IN FIELD BY CONTRACTOR, AS APPLICABLE PER LOCATION

LEGEND

UNDERGROUND FEEDER

ABOVE GROUND FEEDER

CLIENT
Santa Clara County Office of Education
SANTA CLARA COUNTY OFFICE OF EDUCATION

PROJECT LOCATION
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CHECKED BY:	JC
SCALE:	NTS

KEY PLAN

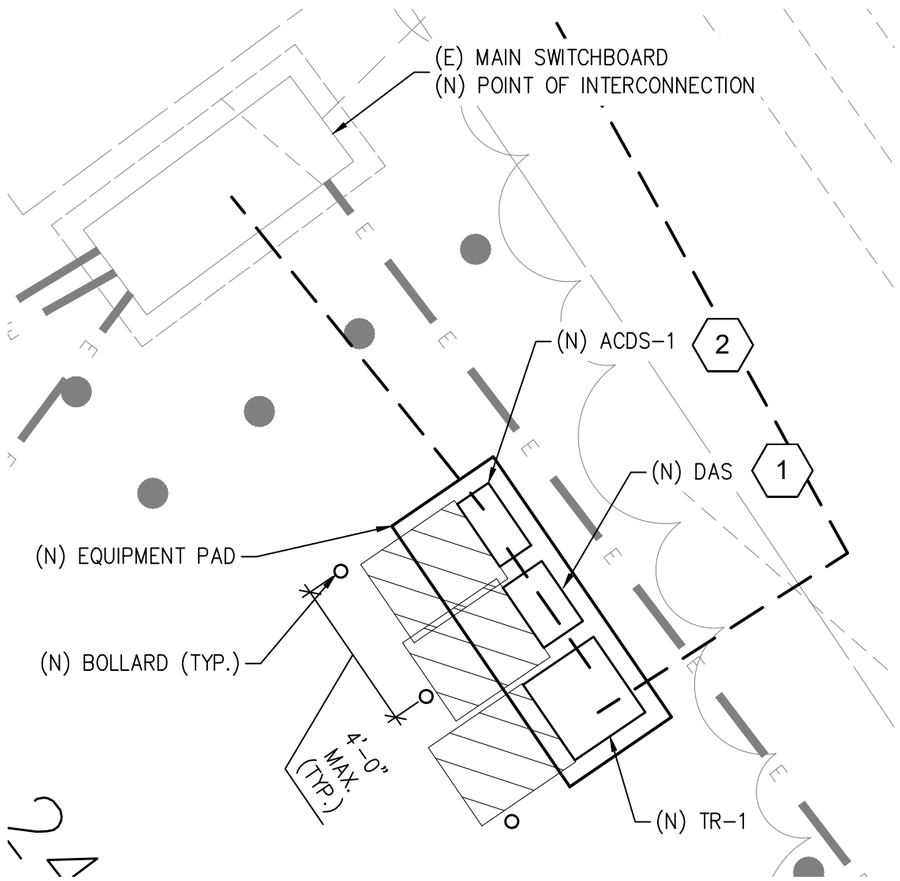
SHEET TITLE
ELECTRICAL SITE PLAN

SHEET NUMBER
E-3.0

KEYED NOTES:

1 RUN ONE (1) 2"C FROM "DAS ENCLOSURE" TO THE NEAREST IDF/MDF LOCATION OR POI, AS APPLICABLE PER FIELD CONDITION.

2 CONTRACTOR SHALL INSTALL UTILITY AC DISCONNECT WITHIN 10 FEET AND LINE OF SIGHT OF (E) UTILITY METER WHERE PRACTICABLE. ALTERNATIVE LOCATIONS MUST BE PROPOSED TO THE ENGINEER OF RECORD, AND WRITTEN UTILITY APPROVAL MUST BE OBTAINED PRIOR TO INSTALLATION OF THE DISCONNECT.



1 / E-3.1 ENLARGED POI PLAN

1/4" = 1'-0"

0 1' 2' 4' 8'

1/4" = 1'-0"

GENERAL NOTES

1 INSTALLATION SHALL BE IN ACCORDANCE WITH 2022 CEC AND NEC CODES AND STANDARDS AND SHALL CONFORM WITH INDUSTRY BEST PRACTICES AND IEEE RECOMMENDATIONS. THE AHJ HAS FINAL JURISDICTIONAL AUTHORITY ON CODE APPLICATION AND COMPLIANCE.

2 ALL EQUIPMENT SHALL BE APPROVED BY OWNER

3 ALL INVERTER WIRING AND GROUNDING METHODS SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDED PRACTICES.

4 INSTALL PULL ROPES IN EMPTY CONDUITS. USE MONOFILIMENT PLASTIC LINE WITH NOT LESS THAN 200LB TENSILE STRENGTH. LEAVE AT LEAST 12" OF SLACK AT EACH END OF THE PULL WIRE.

5 WIRE SHALL BE INSTALLED IN APPROVED RACEWAYS FOR ITS INTENDED USE. ADEQUATELY STRAP AND SUPPORT ALL RACEWAYS. IN GENERAL, SUPPORT ALL CONDUIT WITHIN THREE (3) FEET OF OUTLET BOX, PANEL, OR ENCLOSURE, AND MAXIMUM TEN (10) FEET THEREAFTER. LFMC AND MC-PVC JACKETED CABLE WITHIN (1) FEET AND (4.5) FEET ADEQUATELY. RACEWAYS TO BE LISTED FOR WET LOCATIONS.

6 ALL EQUIPMENT SHALL BE LOCKABLE OR GUARDED AGAINST ACCESS BY UNQUALIFIED PERSONS.

7 IF CONTRACTOR WISHES TO INSTALL CABLE TRAY IN LIEU OF CONDUIT, FULL CABLE TRAY SUBMITTALS SHALL NEED TO BE PROVIDED FOR APPROVAL. THIS INCLUDES A PLAN VIEW, AND TRAY AND CONDUCTOR SIZING CALCULATIONS.

8 EXPOSED NON-CURRENT CARRYING METAL PARTS OF ALL EQUIPMENT AND ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH CEC 250.134 AND 250.136. GROUND INVERTER IN ACCORDANCE WITH LISTING.

9 NO PART OF THIS DRAWING OR SPECIFICATIONS IS INTENDED TO ALLOW A VIOLATION OF PHYSICAL WORKING SPACE REQUIREMENTS AROUND ELECTRICAL EQUIPMENT AS REQUIRED BY CEC 110.26

10 ALL EQUIPMENT SHALL HAVE ARC FLASH WARNING LABELS WITH APPLICABLE INCIDENT ENERGY LEVELS, WORKING DISTANCES, AND REQUIRED PPE IN ACCORDANCE WITH NFPA 70E.

11 CONDUIT ROUTING IS DIAGRAMMATIC IN NATURE. EXACT ROUTING SHALL BE COORDINATED BY THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND INTERFERENCES AND AVOIDING AS NECESSARY.

12 REFER TO SHEET E-7.0 THRU E-7.1 FOR ELECTRICAL DETAILS
REFER TO SHEETS E-9.0 THRU E-9.1 FOR WARNING LABELS AND LOCATIONS
REFER TO SHEET E-10.0 FOR EQUIPMENT DATASHEETS

13 PULL-BOX TRAFFIC RATINGS SHALL BE DETERMINED IN FIELD BY CONTRACTOR, AS APPLICABLE PER LOCATION

LEGEND

UNDER GROUND FEEDER.

ABOVE GROUND FEEDER

CLIENT

Santa Clara County Office of Education

SANTA CLARA COUNTY OFFICE OF EDUCATION

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REGISTERED PROFESSIONAL ENGINEER DOON SUK CHOI E 24039 EXP. 06/30/25 ELECTRICAL STATE OF CALIFORNIA

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DESIGNER PROJECT NO.:	223091
DRAWN BY:	JC
CHECKED BY:	JC
SCALE:	NTS

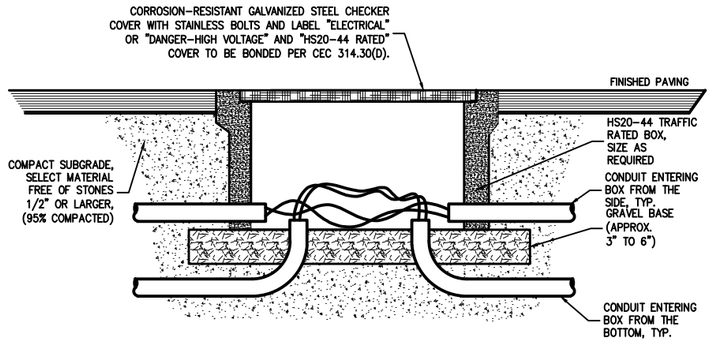
KEY PLAN

SHEET TITLE

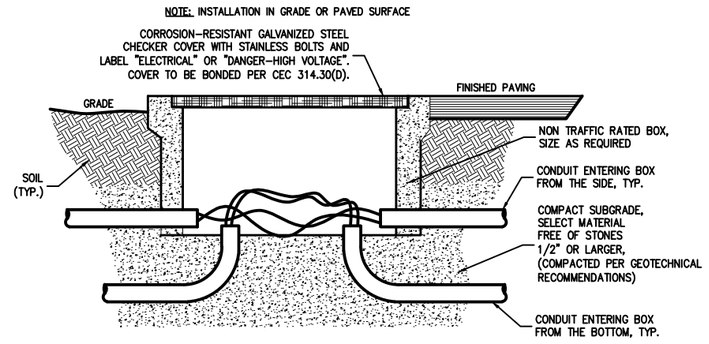
ENLARGED POI PLAN

SHEET NUMBER

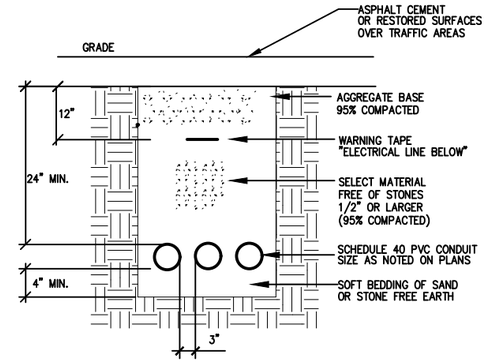
E-3.1



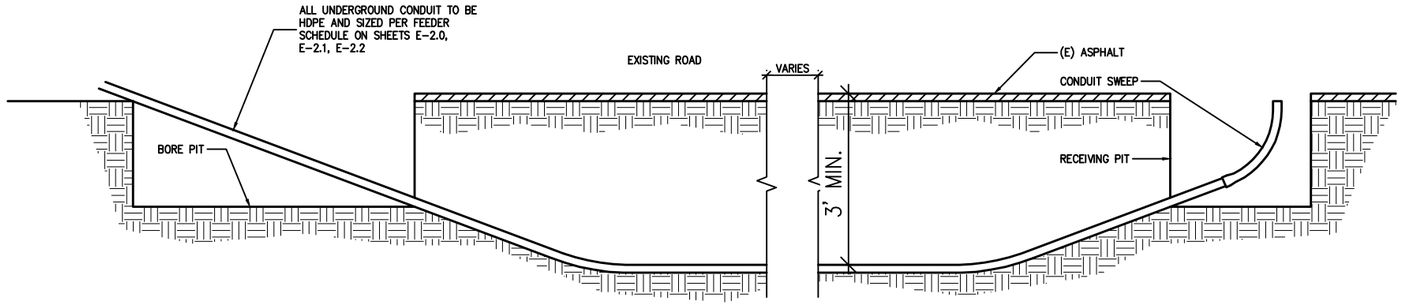
1 - TRAFFIC RATED PULLBOX
SCALE: 1/2" = 1'-0"



2 - NON-TRAFFIC RATED PULL BOX
SCALE: 1/2" = 1'-0"

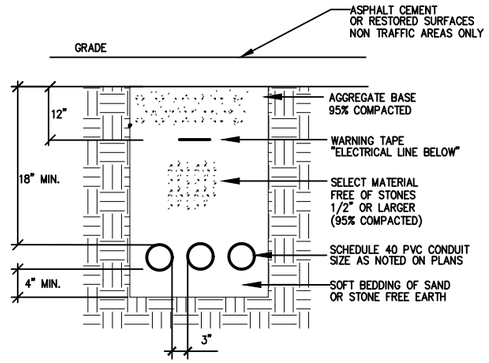


3 - LV TRENCHING DETAIL - OVER TRAFFIC
SCALE: 1/2" = 1'-0"

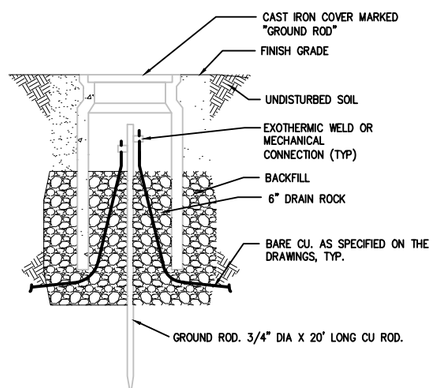


NOTES:
1. 3' CONDUIT DEPTH TO BE MAINTAINED EXCEPT WHERE ELEVATION CHANGES ARE REQUIRED TO AVOID OBSTACLES.
2. LOCATING SERVICE SHALL BE USED ALONG PROPOSED ROUTE. ALL OBSTRUCTIONS SHALL BE POTHOLED TO DETERMINE DEPTH AND LOCATION.
3. BORE AND RECEIVING PIT SHALL BE FILLED. BACKFILL SHOULD BE PLACED IN HORIZONTAL LIFTS AND COMPACTED TO 85% RELATIVE COMPACTION, AS EVALUATED BY ASTM D698. AGGREGATE BASE AND THE UPPER 12" OF SUBGRADE BENEATH PAVEMENT AREAS SHOULD BE COMPACTED TO 95% RELATIVE COMPACTION, AS EVALUATED BY ASTM D698. FINISH SURFACES SHALL MATCH EXISTING.
4. CONDUIT SWEEP TO BE INSTALLED AT ENDS AFTER BORING IS COMPLETE.
5. RECORD DATA IN 10' INTERVALS DURING INSTALLATION FOR AS-BUILT RECORDS REPORTING BORE PATH, DIAMETER, DEPTH, AND CONDUIT CONFIGURATIONS.

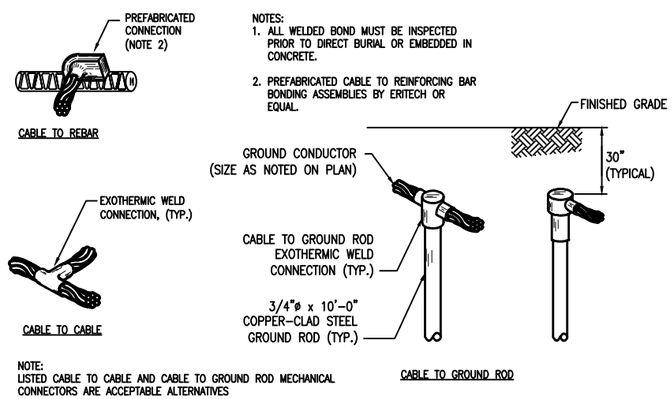
4 - DIRECTIONAL BORING DETAIL
SCALE: NTS



5 - LV TRENCHING DETAIL - NOT OVER TRAFFIC
SCALE: 1/2" = 1'-0"



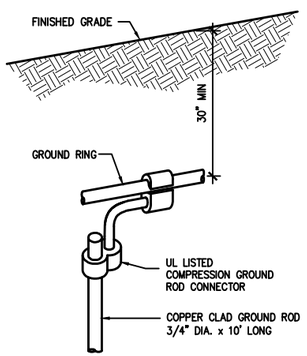
6 - GROUND ROD INSPECTION WELL
SCALE: NTS



NOTES:
1. ALL WELDED BOND MUST BE INSPECTED PRIOR TO DIRECT BURIAL OR EMBEDDED IN CONCRETE.
2. PREFABRICATED CABLE TO REINFORCING BAR BONDING ASSEMBLIES BY ERITECH OR EQUAL.

NOTE:
LISTED CABLE TO CABLE AND CABLE TO GROUND ROD MECHANICAL CONNECTORS ARE ACCEPTABLE ALTERNATIVES

7 - WELDED GROUNDING CONNECTION DETAILS
SCALE: NTS



8 - BURIED GROUND ROD DETAIL (ALTERNATE)
SCALE: NTS

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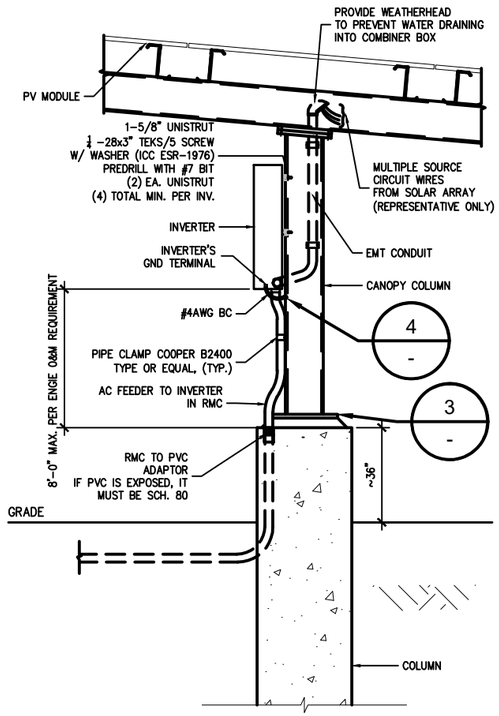
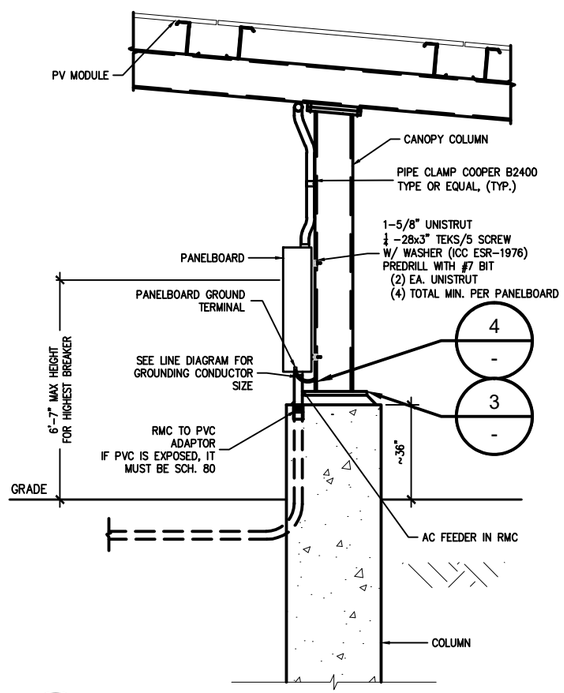
KEY PLAN

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-7.0

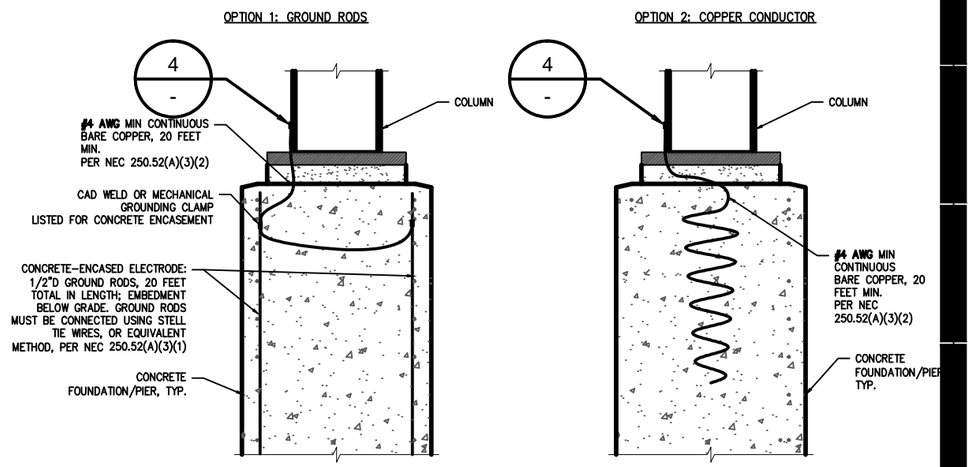


1 - INVERTER MOUNTING DETAIL
SCALE: 1/2" = 1'-0"



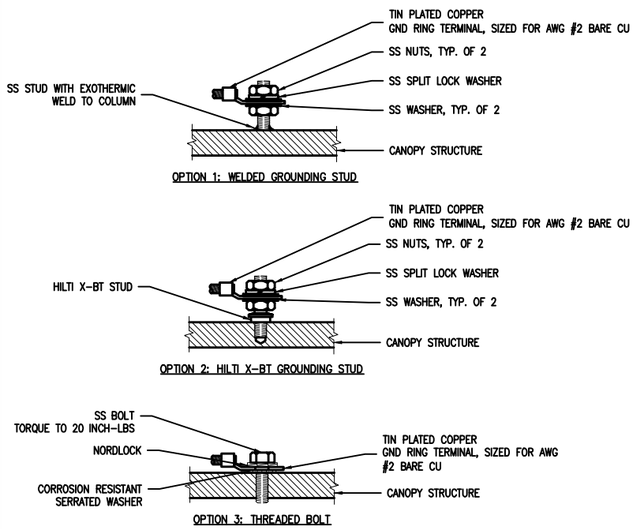
2 - PANELBOARD MOUNTING DETAIL
SCALE: 1/2" = 1'-0"

NOTE:
1. SEE E-3.0 FOR GROUNDED COLUMN LOCATIONS
2. INSTALLERS SHALL CAN USE EITHER OPTIONS TO GROUND THE CANOPY COLUMN
3. ANY GROUNDING CONDUCTOR TO CONDUCTOR CONNECTIONS MUST BE MADE WITH LISTED CABLE TO CABLE MECHANICAL CONNECTORS,

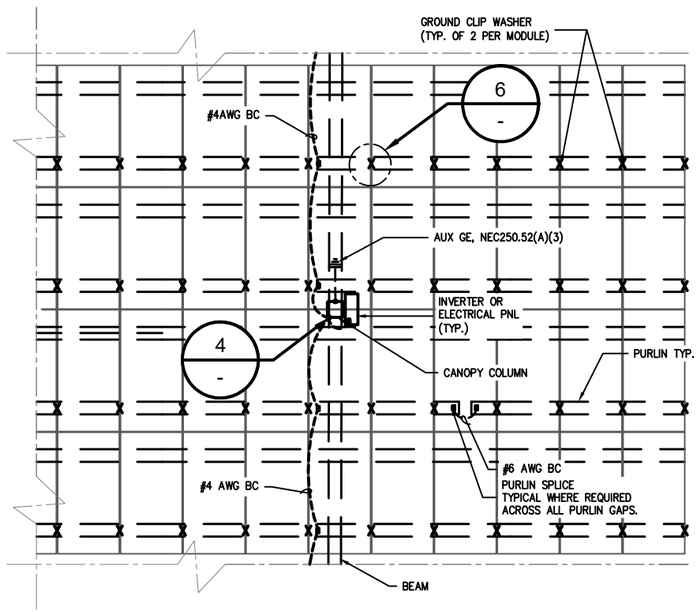


3 - TYPICAL CANOPY COLUMN GROUNDING
SCALE: NTS

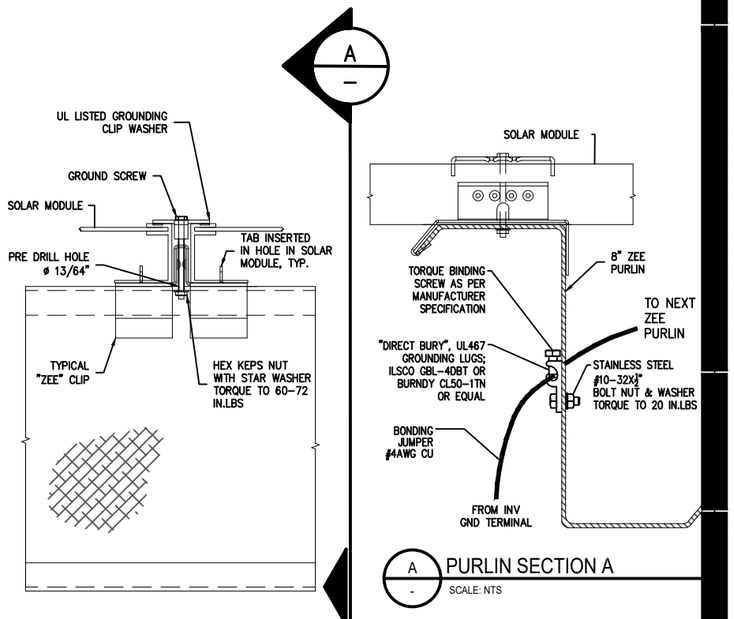
NOTES:
1. INSTALLERS MAY CHOOSE ANY ONE OF THESE OPTIONS FOR CONDUCTOR TO STRUCTURE GROUNDING CONNECTIONS.
2. GROUNDING CONNECTION SHALL COMPLY WITH NEC 250.8(A).
3. WELDS SHALL BE COVERED WITH 'COLD GALVANIZING' COMPOUND.



4 - TYPICAL GROUNDED CONDUCTOR TO STRUCTURE ATTACHMENT
SCALE: NTS



5 - TYPICAL MODULE GROUNDING PLAN
SCALE: NTS



6 - TYPICAL MODULE GROUNDING DETAIL
SCALE: NTS

A - PURLIN SECTION A
SCALE: NTS

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SCALE:	NTS

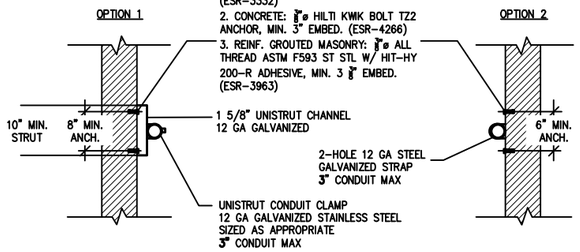
KEY PLAN

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-7.1

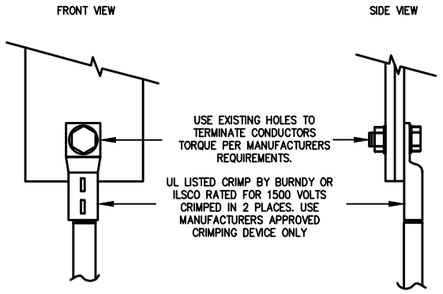
CONNECTION TO (E) WALL:

1. STEEL: #12-24 X 1½" 'TEK' SCREW (ESR-3332)
2. CONCRETE: ⅜"ø HILTI KWIK BOLT TZ2 ANCHOR, MIN. 3" EMBED. (ESR-4266)
3. REINF. GROUTED MASONRY: ⅜"ø ALL THREAD ASTM F593 ST STL W/ HIT-HY 200-R ADHESIVE, MIN. 3 ⅜" EMBED. (ESR-3963)

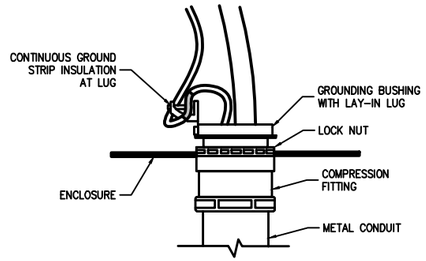


NOTES:
1. ALL CHANGES TO THE LISTED CONNECTION SPECS MUST BE SUBMITTED TO DSA VIA CCD
2. EMT, RGS, CONDUIT SHALL BE SUPPORTED WITHIN (3) FEET OF ANY ENCLOSURE, AND MAXIMUM (10) ON CENTER THEREAFTER. LFMC AND MC-PVC JACKETED CABLE WITHIN (1) FEET AND (4.5) FEET.
3. POST-INSTALLED MASONRY ANCHORS SHALL BE ASTM F593 STAINLESS STEEL ALL THREAD RODS SET IN HILTI HIT-HY 200 ADHESIVE CONFORMING TO ICC ESR 3963.
4. ANCHOR INSTALLATION SHALL BE OBSERVED BY THE PROJECT INSPECTOR OF RECORD FOR COMPLIANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
5. ANCHORS SHALL BE TENSION TESTED BY THE TESTING LABORATORY IN COMPLIANCE WITH CBC 1910A.5.2:
   - 5.1 TEST FREQUENCY: 10%
   - 5.2 TENSION TEST VALUES: TENSION TEST ANCHORS TO 1400 lbf.
   - 5.3 TEST ACCEPTANCE: ANCHORS SHALL MAINTAIN THE TEST LOAD FOR A MINIMUM OF 15 SECONDS AND SHALL EXHIBIT NO DISCERNIBLE MOVEMENT DURING THE TENSION TEST (E.G. LOOSENING OF THE WASHER UNDER THE NUT).
   - 5.4 IF ANY ANCHOR FAILS TESTING, ALL ANCHORS OF THE SAME TYPE, NOT PREVIOUSLY TESTED, WHICH WERE INSTALLED BY THE SAME TRADE SHALL BE TESTED UNTIL TWENTY (20) CONSECUTIVE ANCHORS PASS, THEN RESUME NORMAL FREQUENCY.

1 - CONDUIT SUPPORT
SCALE: NTS

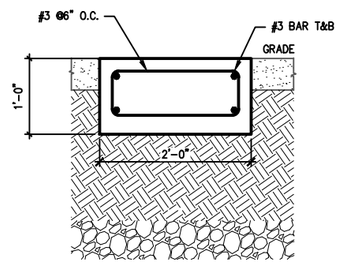


2 - PANEL INTERCONNECTION
SCALE: NTS



3 - METAL CONDUIT GROUNDING
SCALE: NTS

4 - MECHANICAL GROUNDING CONNECTION DETAILS
SCALE: NTS



5 - EQUIPMENT RACK FOUNDATION
NTS

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SANTA CLARA COUNTY OFFICE OF EDUCATION

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ELECTRICAL
STATE OF CALIFORNIA

AGENCY APPROVAL

ISSUE

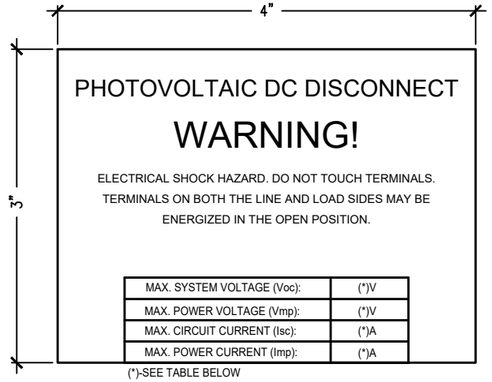
MARK	DATE	DESCRIPTION
-	02/15/24	30%
-	04/19/24	90%
-	05/17/24	100%
-	05/23/24	REVISED 100%

DESIGNER PROJECT NO.: 223091
DRAWN BY: JC
CHECKED BY: JC
SCALE: NTS

KEY PLAN

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-7.2



DC SYSTEM VALUES			
NUMBER OF MODULES PER STRING	16	14	14
MAX. SYSTEM VOLTAGE (Voc)	853.0	746.3	746.3
MAX. POWER VOLTAGE (Vmp)	666.24	582.96	582.96
NUMBER OF STRINGS PER MPPT	1	2	1
MAX. CIRCUIT CURRENT (Isc)	15.3	30.5	15.3
MAX. POWER CURRENT (Imp)	14.3	28.5	14.3

NOTES:

1. PLACE SIGN ADJACENT TO COMBINER BOX DISCONNECT SWITCH.
2. RED BACKGROUND, WHITE LETTERING
3. TEXT: 0.16", .25", AND 0.08" HEIGHT, ALL CAPITAL LETTERS ARIAL OR SIMILAR FONT, NON-BOLD
4. MATERIAL: TEXT PRINTED ON ALUMINUM BACKING WITH UV-RATED PLASTIC LAMINATE COATING AND OUTDOOR RATED ADHESIVE.
5. MAXIMUM CURRENT AND VOLTAGES DIFFER BETWEEN COMBINER BOXES. REFER TO DC SYSTEM TABLE FOR EXACT VALUES.
6. APPLICABLE NEC SECTIONS: 690.15 AND 690.53

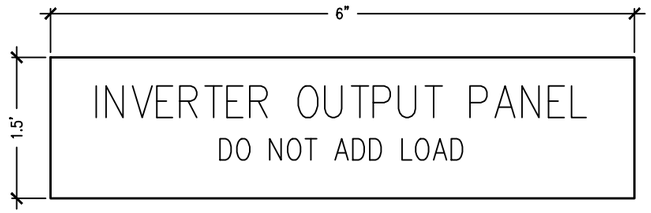
1 PV SYSTEM SOURCE DC DISCONNECT

SCALE: NTS

EQUIPMENT LABELS	
EQUIPMENT NAME	ID
PANEL	PNL-1
PV INVERTER	INV-#
AC DISCONNECT	ACDS-1

2 EQUIPMENT LABEL

SCALE: NTS

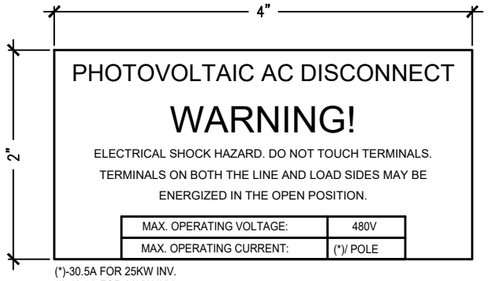


NOTE:

1. INVERTER IDENTIFICATION LABEL
2. BLACK BACKGROUND
3. WHITE LETTERING
4. MATERIAL NOTE: ENGRAVED ON OUTDOOR-RATED PLASTIC LAMINATE WITH ADHESIVE BACKING SUITABLE ENVIRONMENT.
5. SHANNON OR SIMILAR FONT, NON-BOLD

4 INVERTER PANELBOARD LABEL

SCALE: NTS



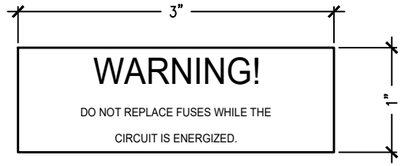
(*)-30.5A FOR 25KW INV.
(*)-43.5A FOR 36KW INV.

NOTES:

1. PLACE SIGN ON OR ADJACENT TO INVERTER AC DISCONNECT.
2. RED BACKGROUND, WHITE LETTERING
3. TEXT: 0.25", 0.16", AND 0.08" HEIGHT, ALL CAPITAL LETTERS ARIAL OR SIMILAR FONT, NON-BOLD
4. MATERIAL: TEXT PRINTED ON ALUMINUM BACKING WITH UV-RATED PLASTIC LAMINATE COATING AND OUTDOOR RATED ADHESIVE.
5. NEC 690.15

3 PV INVERTER AC DISCONNECT

SCALE: NTS

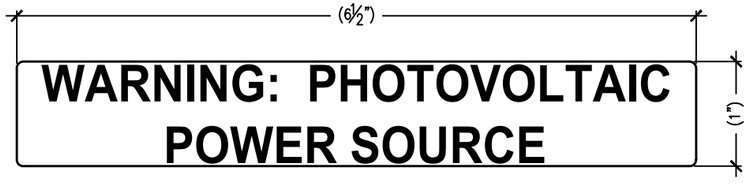


NOTES:

1. PLACE LABEL ADJACENT TO INVERTER AND FUSIBLE AC DISCONNECT.
2. RED BACKGROUND, WHITE LETTERING
3. TEXT: MIN. 0.25" AND 0.08" HEIGHT, ALL CAPITAL LETTERS ARIAL OR SIMILAR FONT, NON-BOLD
4. MATERIAL: REFLECTIVE, WEATHER AND UV RESISTANT WITH DURABLE ADHESIVE SUITABLE FOR THE ENVIRONMENT.

5 FUSE WARNING SIGN

SCALE: NTS

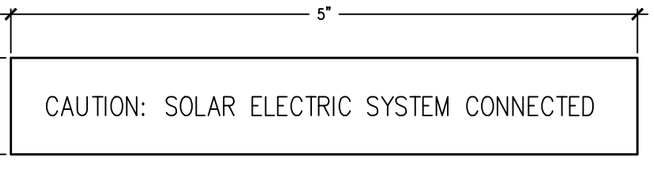


NOTES:

1. PLACE LABEL ON: EXPOSED DC CONDUIT, RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS. COVERS OR ENCLOSURES OF PULL BOXES AND JUNCTION BOXES. SPACING BETWEEN LABELS NOT TO EXCEED 10 FT.
2. RED BACKGROUND, WHITE LETTERING
3. TEXT: MIN. 3/8" HEIGHT, ALL CAPITAL LETTERS, ARIAL OR SIMILAR FONT, NON-BOLD
4. MATERIAL: REFLECTIVE, WEATHER AND UV RESISTANT WITH DURABLE ADHESIVE SUITABLE FOR THE ENVIRONMENT.
5. NEC 690.31(B) AND (G)

6 PV SOURCE ENCLOSURE AND RACEWAY LABEL

SCALE: NTS



NOTE:

1. LOCATED AT POINT OF INTERCONNECTION
2. RED BACKGROUND, WHITE LETTERING, MINIMUM 3/8" LETTER HEIGHT
3. ALL CAPITAL LETTERS
4. REFLECTIVE WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT. (DURABLE ADHESIVE MATERIALS MAY MEET THIS REQUIREMENT)

7 MARKING FOR MAIN SERVICE POI

SCALE: NTS

CLIENT

Santa Clara County Office of Education

SANTA CLARA COUNTY OFFICE OF EDUCATION

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DESIGNER PROJECT NO.:	223091
DRAWN BY:	JC
CHECKED BY:	JC
SCALE:	NTS

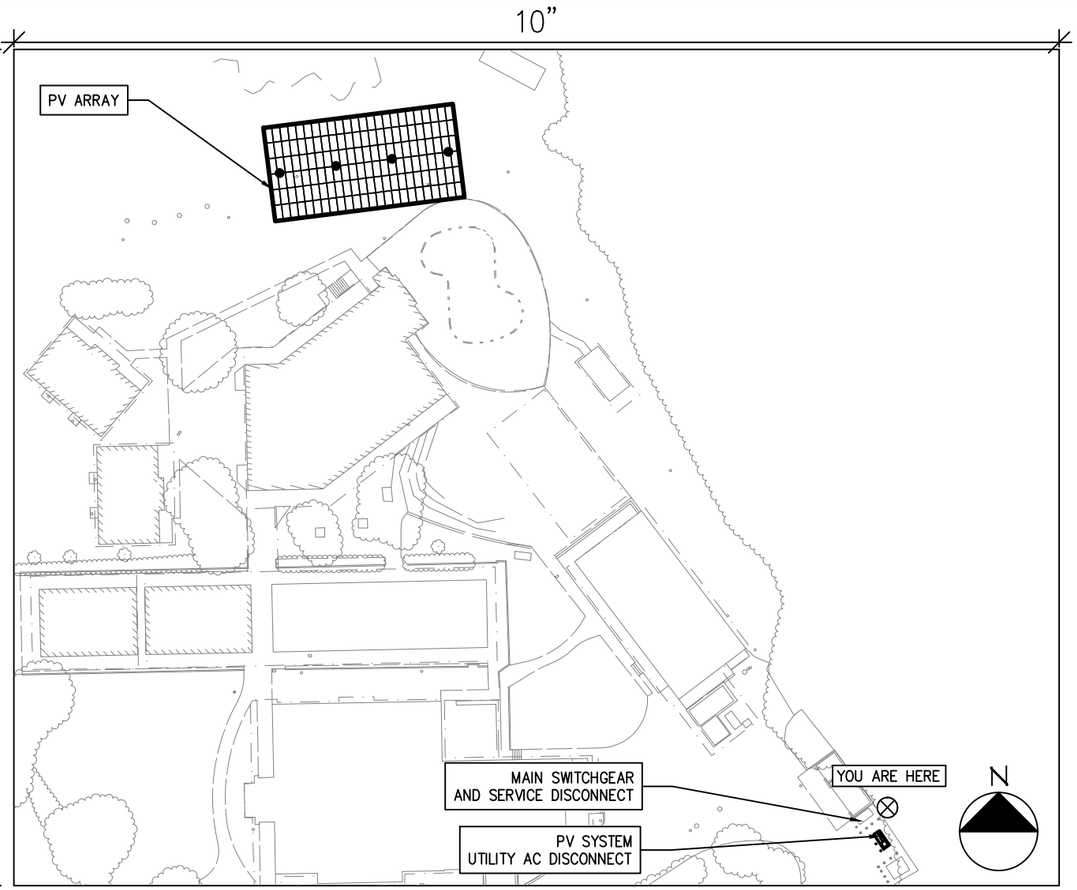
KEY PLAN

SHEET TITLE

WARNING LABELS

SHEET NUMBER

E-9.0

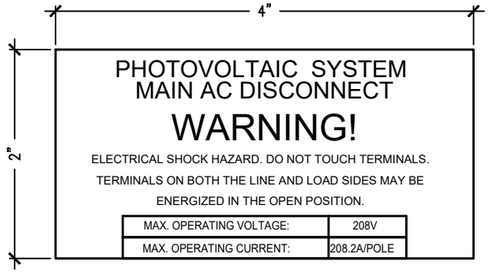


NOTES:

1. PLACE POWER SOURCE DIRECTORY ON AT MAIN SWITCHGEAR AND AC DISCONNECTS
3. TEXT: MIN. 3/8" AND 1/4" HEIGHT, ALL CAPITAL LETTERS ARIAL OR SIMILAR FONT, NON-BOLD
4. MATERIAL: WEATHER AND UV RESISTANT VINYL WITH DURABLE ADHESIVE SUITABLE FOR THE ENVIRONMENT.

1 / - POWER SOURCE DIRECTORY

SCALE: 1:1

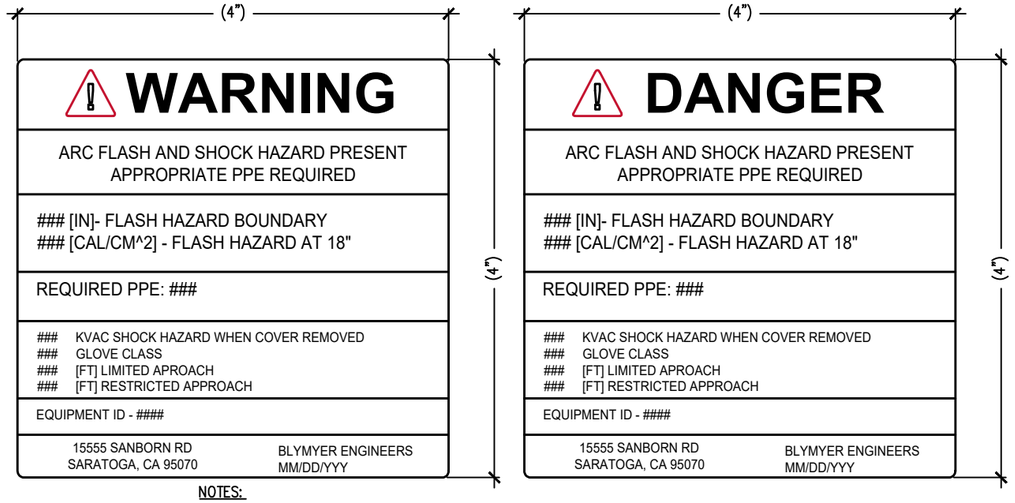


NOTES:

1. PLACE SIGN ON OR ADJACENT TO SERVICE RATED UTILITY AC DISCONNECT (NEC 690.13)
2. RED BACKGROUND, WHITE LETTERING
3. TEXT: 0.25", 0.16", AND 0.08" HEIGHT, ALL CAPITAL LETTERS ARIAL OR SIMILAR FONT, NON-BOLD
4. MATERIAL: TEXT PRINTED ON ALUMINUM BACKING WITH UV-RATED PLASTIC LAMINATE COATING AND OUTDOOR RATED ADHESIVE.

2 / - PV SYSTEM UTILITY AC DISCONNECT

SCALE: NTS



NOTES:

1. RED BACKGROUND & WHITE LETTERING
2. TEXT HEIGHT: 3/8", 1/8" & ALL CAPITAL LETTERS
3. REFLECTIVE WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT.
4. MARKING FOR EACH INVERTER, PANELBOARD, SWITCHBOARD, DISCONNECT, AND POINT OF INTERCONNECTION

3 / - ARC FLASH HAZARD WARNING

SCALE: NTS

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SANTA CLARA COUNTY OFFICE OF EDUCATION

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DESIGNER PROJECT NO.:	223091
DRAWN BY:	JC
CHECKED BY:	JC
SCALE:	NTS

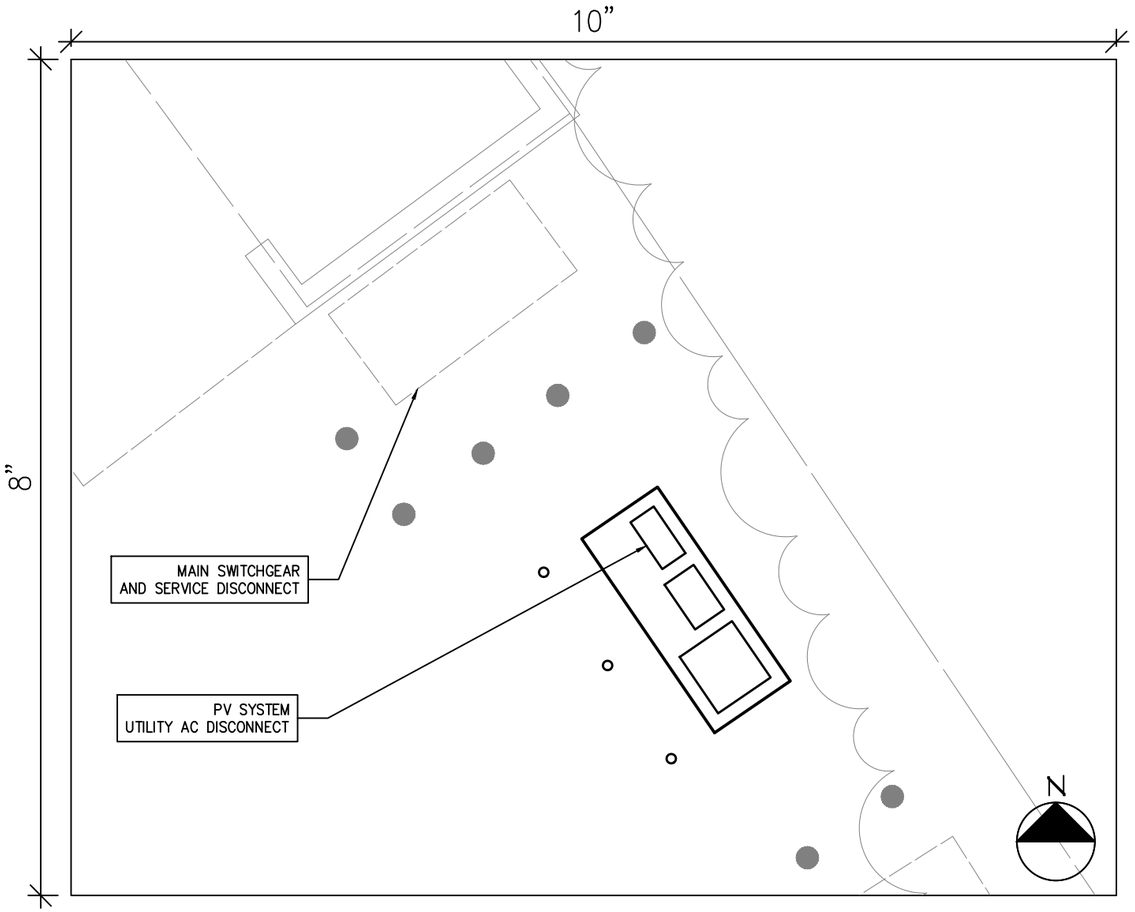
KEY PLAN

SHEET TITLE

WARNING LABELS

SHEET NUMBER

E-9.1



NOTES:

1. PLACE POWER SOURCE DIRECTORY ON AT MAIN SWITCHGEAR AND AC DISCONNECTS
3. TEXT: MIN. 3/8” AND 1/4” HEIGHT, ALL CAPITAL LETTERS ARIAL OR SIMILAR FONT, NON-BOLD
4. MATERIAL: WEATHER AND UV RESISTANT VINYL WITH DURABLE ADHESIVE SUITABLE FOR THE ENVIRONMENT.

1 / - POWER SOURCE DIRECTORY

SCALE: 1:1

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KEY PLAN

SHEET TITLE

WARNING LABELS

SHEET NUMBER

E-9.2

- Higher output power
- More reliable, more stable power generation
- Less shading effect
- Lower temperature coefficient

Superior Warranty

- 12-year product warranty
- 30-year linear power output warranty

0.45% Annual Degradation Over 30 years

Bifacial double glass module linear power warranty

Standard module linear power warranty

Comprehensive Certificates

- IEC 61215, IEC 61730,UL 61215, UL 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval

JA SOLAR

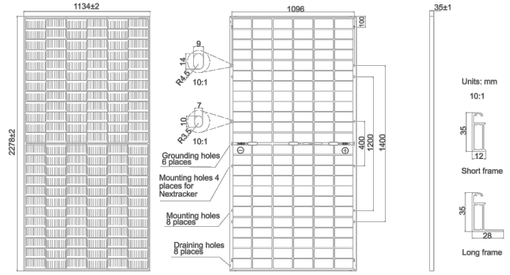
www.jasolar.com

Specifications subject to technical changes and tests.
JA Solar reserves the right of final interpretation.

JA SOLAR

JAM72D30 525-550/MB Series

MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono
Weight	31.8kg±3%
Dimensions	2278±2mm×1134±2mm×35±1mm
Cable Cross Section Size	4mm² (IEC), 12 AWG(UL)
No. of cells	144(6×24)
Junction Box	IP68, 3 diodes
Connector	QC 4.10-35
Cable Length (Including Connector)	Portrait:300mm(+)/400mm(-); Landscape:1300mm(+)/1300mm(-)
Front Glass/Back Glass	2.0mm/2.0mm
Packaging Configuration	31pcs/Pallet 589pcs/40HQ Container

ELECTRICAL PARAMETERS AT STC

TYPE	JAM72D30 -525/MB	JAM72D30 -530/MB	JAM72D30 -535/MB	JAM72D30 -540/MB	JAM72D30 -545/MB	JAM72D30 -550/MB
Rated Maximum Power(Pmax) [W]	525	530	535	540	545	550
Open Circuit Voltage(Voc) [V]	49.15	49.30	49.45	49.60	49.75	49.90
Maximum Power Voltage(Vmp) [V]	41.15	41.31	41.47	41.64	41.80	41.96
Short Circuit Current(Isc) [A]	13.65	13.72	13.79	13.86	13.93	14.00
Maximum Power Current(Imp) [A]	12.76	12.83	12.90	12.97	13.04	13.11
Module Efficiency [%]	20.3	20.5	20.7	20.9	21.1	21.3
Power Tolerance	0~+5W					
Temperature Coefficient of Isc(α_Isc)	+0.045%/℃					
Temperature Coefficient of Voc(β_Voc)	-0.275%/℃					
Temperature Coefficient of Pmax(γ_Pmp)	-0.350%/℃					
STC	Irradiance 1000W/m², cell temperature 25°C, AM1.5G					

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

ELECTRICAL CHARACTERISTICS WITH 10% SOLAR IRRADIATION RATIO

TYPE	JAM72D30 -525/MB	JAM72D30 -530/MB	JAM72D30 -535/MB	JAM72D30 -540/MB	JAM72D30 -545/MB	JAM72D30 -550/MB
Rated Max Power(Pmax) [W]	562	567	572	578	583	589
Open Circuit Voltage(Voc) [V]	49.54	49.67	49.80	49.93	50.03	50.21
Max Power Voltage(Vmp) [V]	41.14	41.31	41.47	41.65	41.78	41.95
Short Circuit Current(Isc) [A]	14.61	14.68	14.76	14.83	14.91	14.98
Max Power Current(Imp) [A]	13.65	13.73	13.80	13.88	13.95	14.03
Irradiation Ratio(rear/front)	10%					

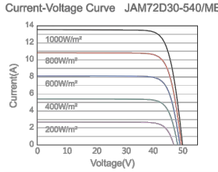
*For NexTracker installations, Maximum Static Load, Front is 2400Pa while Maximum Static Load, Back is 2400Pa.
**Bifaciality=Pmax,rear/Rated Pmax,front

OPERATING CONDITIONS

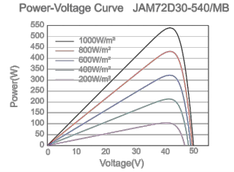
Maximum System Voltage	1500V DC
Operating Temperature	-40°C~+85°C
Maximum Series Fuse Rating	30A
Maximum Static Load,Front* Maximum Static Load,Back*	5400Pa(112 lb/ft²) 2400Pa(50 lb/ft²)
NOCT	45±2°C
Bifaciality**	70%±10%
Fire Performance	UL Type 29

CHARACTERISTICS

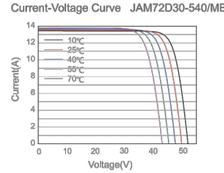
Current-Voltage Curve JAM72D30-540/MB



Power-Voltage Curve JAM72D30-540/MB



Current-Voltage Curve JAM72D30-540/MB



Premium Cells, Premium Modules

Version No. : Global_EN_20211129A

1 / - PHOTOVOLTAIC MODULE - CS6W-540MB-AG

CLIENT

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DESIGNER PROJECT NO.: 223091
DRAWN BY: JC
CHECKED BY: JC
SCALE: NTS

KEY PLAN

SHEET TITLE

EQUIPMENT SPECIFICATIONS

SHEET NUMBER

E-10.0

Datasheet

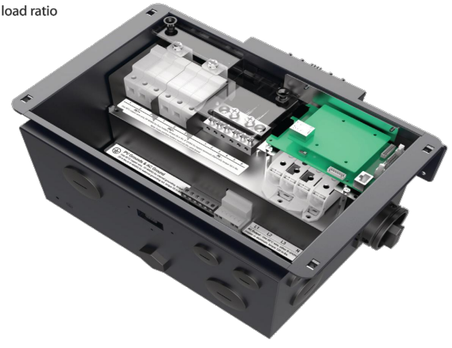
25 kW, 480 Vac, 1000 Vdc String Inverters for North America

The 25 kW (480 V) CPS three phase string inverter is designed for rooftop and carport applications. These units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 98.5% peak and 98.0% 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 25 kW (480 V) product ships with a Rapid Shutdown Wire-box, 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 PVRSS-certified module-level rapid shutdown when used with APS RSD-S-PLC/RSD-D products. The CPS FlexOM Gateway enables monitoring, controls and remote product upgrades.

CPS SCA25KTL-DO-R/US-480

Key Features

- NEC 2017/2020 PVRSS-certified rapid shutdown
- NEC 2017/2020-compliant & UL-listed arc-fault circuit protection
- 15-90° mounting orientation for low profile roof installs
- 15° tilt Inverter Rack Assembly available from CPS
- Optional FlexOM Gateway enables remote firmware upgrades
- Integrated AC & DC disconnect switches
- 2 MPPTs with 3 inputs each for maximum flexibility
- Copper and Aluminum compatible AC connections
- NEMA Type 4X outdoor rated, tough tested enclosure
- UL 1741-SA certified to CA Rule 21, including SA14 - SA18
- UL 1741-SB and IEEE 1547-2018 certified
- Separable wire-box design for fast service
- Standard 10-year warranty with extensions to 20 years
- Generous 1.5 DC/AC inverter load ratio



SCA25KTL (480V) Rapid Shutdown Wire-box

Intertek 4004522 Conforms to UL Std. 1741 Certs to CSA Std.C22.2 No.107.1-01

This device complies with part 15 of the FCC Rules

Chint Power Systems America
1380 Presidential Drive, Suite 100, Richardson, TX 75081
Tel: 855-584-7168 Mail: AmericaSales@chintpower.com Web: www.chintpowersystems.com

Technical Data

Model Name	CPS SCA25KTL-DO-R/US-480
DC Input	
Max. PV power	37.5 kW (22 kW per MPPT)
Max. DC input voltage	1000 Vdc
Operating DC input voltage range	200-950 Vdc
Start-up DC input voltage / power	330 V / 80 W
Number of MPP trackers	2
MPPT voltage range @ PF>0.99[1]	560-850 Vdc
Max. PV short-circuit current (Isc x 1.25)	90 A (45 A per MPPT)
Number of DC inputs	6 inputs, 3 per MPPT
DC disconnection type	Load-rated DC switch
DC surge protection	Type II MOV
AC Output	
Rated AC output power @ PF=1	25 kW
Max. AC apparent power	25 kVA
Rated output voltage	480 Vac
Output voltage range[2]	422 - 528 Vac
Grid connection type	3Φ / PE / N (neutral optional)
Max. AC output current @ 480 Vac	30.5 A
Rated output frequency	60 Hz
Output frequency range[2]	57 - 63 Hz
Power factor	>0.99 (±0.8 adjustable)
Current THD @ rated load	<3%
Max. fault current contribution (1 cycle RMS)	31 A (1.02 PU)
Max. OCPD rating	50 A
AC disconnection type	Load-break rated AC switch
AC surge protection	Type II MOV
System and Performance	
Topology	Transformerless
Max. efficiency	98.5%
CEC efficiency	98.0%
Stand-by / night consumption	<1 W
Environment	
Enclosure protection degree	NEMA Type 4X
Cooling method	Variable speed cooling fans
Operating temperature range	-22°F to +140°F / - 30°C to +60°C
Non-operating temperature range[3]	No low temp minimum to +158°F / +70°C maximum
Operating humidity	0 to 100%
Operating altitude	13123 ft / 4000 m (derating from 9843 ft / 3000 m)
Audible noise	<50 dBA @ 1 m
Display and Communication	
User interface and display	LED indicators, Wifi + APP
Inverter monitoring	SunSpec, Modbus RS485
Site-level monitoring	CPS FlexOM Gateway (1 per 32 inverters)
Modbus data mapping	CPS
Remote diagnostics / firmware upgrade functions	Standard / (with FlexOM Gateway)
Mechanical	
Dimensions (H x W x D)	Inverter: 15.95 x 15.75 x 7.87 in (405 x 400 x 200 mm) Wire-box: 10.24 x 15.75 x 7.87 in (260 x 400 x 200 mm)
Weight	Inverter: 48.5 lbs (22 kg); Wire-box: 13.23 lbs (6 kg)
Mounting / installation angle	15 to 90 degrees from horizontal (vertical or angled)
AC termination	Screw clamp (wire range: #8 - #2 AWG CU/AL)
DC termination[4]	Screw clamp (wire range: #14 - #8 AWG CU)
Fused string inputs (3 per MPPT)[5]	20 A fuses provided (fuse values up to 30 A acceptable)
Safety	
Certifications and standards	UL 1741-SA/SB Ed. 3, UL 1699B, CSA-C22.2 NO.107.1-01, IEEE 1547a-2014, FCC PART15
Selectable grid standard	IEEE 1547a-2014, IEEE 1547-2018[6], CA Rule 21, ISO-NE
Smart-grid features	Volt-RideThru, Freq-RideThru, Ramp-Rate, Specified-PF, Volt-VAR, Freq-Watt, Volt-Watt
Warranty	
Standard	10 years
Extended terms	15 and 20 years

1) See user manual for information regarding MPPT voltage range when operating at non-unity PF.
2) The "output voltage range" and "output frequency range" may differ according to the specific grid standard.
3) See user manual for further requirements regarding non-operating conditions.
4) Wire-box only includes fuses and fuse holders on the positive polarity, compliant with NEC 2017/2020 Section 690.9(C).
5) Fuse values above 20 A have additional spacing requirements or require the use of the Y-Comb Terminal Block. See user manual for further details.
6) Firmware version 5.00 or later required.

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PHOTOVOLTAIC INVERTERS - CHINT POWER SYSTEMS - 25KW

CLIENT

Santa Clara County Office of Education

SANTA CLARA COUNTY OFFICE OF EDUCATION

PROJECT LOCATION

WALDEN WEST
15555 SANBORN RD
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DESIGNER

ENGIE SERVICES, U.S.
500 12TH STREET, SUITE 300
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CONSULTANT

BLYMYER ENGINEERS
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ENGINEERING APPROVAL

REGISTERED PROFESSIONAL ENGINEER DOON SUK CHOI E 24039 EXP. 06/30/25 ELECTRICAL STATE OF CALIFORNIA

AGENCY APPROVAL

ISSUE

MARK	DATE	DESCRIPTION
-	02/15/24	30%
-	04/19/24	90%
-	05/17/24	100%
-	05/23/24	REVISED 100%

DESIGNER PROJECT NO.: 223091
DRAWN BY: JC
CHECKED BY: JC
SCALE: NTS

KEY PLAN

SHEET TITLE

EQUIPMENT SPECIFICATIONS

SHEET NUMBER

E-10.1

Datasheet

36 kW V2, 1000 Vdc String Inverters for North America

The new, V2 version of the 36 kW (36 kVA) CPS three-phase string inverter is designed for 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 97.4% 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.

CPS 36KTL V2 ships 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 PVRSS certified module-level rapid shutdown when used with APS RSD-S-PLC/RSD-D products. The CPS FlexOM Gateway enables monitoring, controls and remote product upgrades.

CPS SCA36KTL-DO/US-480

Key Features

- NEC 2017/2020 PVRSS certified for rapid shutdown
- NEC-compliant & UL listed arc-fault circuit protection
- 15-90° mounting orientation for low-profile roof installs
- Optional FlexOM Gateway enables remote firmware upgrades
- Integrated AC and DC disconnect switches
- Copper- and Aluminum-compatible AC connections
- 3 MPPTs with 5 inputs each for maximum flexibility
- NEMA Type 4X outdoor rated enclosure
- UL 1741-SA certified to CA Rule 21, including SA8-SA18 VW
- UL 1741-SB and IEEE 1547-2018 certified
- Separable wire-box design for fast service
- Standard 10-year warranty with extensions up to 20 years

36/50/60KTL Standard Wire-box

36/50/60KTL Rapid Shutdown Wire-box

Chint Power Systems America
1380 Presidential Drive, Suite 100, Richardson, TX 75081
Tel: 855-584-7168 Mail: AmericaSales@chintpower.com Web: www.chintpowersystems.com

Technical Data

Model Name	CPS SCA36KTL-DO/US-480
DC Input	
Max. PV power	61.2 kW (22.4 kW per MPPT)
Max. DC input voltage	1000 Vdc
Operating DC input voltage range	200-950 Vdc
Start-up DC input voltage / power	330 V / 80 W
Number of MPP trackers	3
MPPT voltage range @ PF>0.99	400-850 Vdc
Max. PV short-circuit current (Isc x 1.25)	204 A (68 A per MPPT)
Number of DC inputs	15 inputs, 5 per MPPT
DC disconnection type	Load-rated DC switch
DC surge protection	Type II MOV
AC Output	
Rated AC output power @ PF>0.99	36 kW
Max. AC apparent power (selectable)	36 kVA
Rated output voltage	480 Vac
Output voltage range[1]	422 - 528 Vac
Grid connection type	3Φ / PE / N (neutral optional)
Max. AC output current @ 480 Vac	43.5 A
Rated output frequency	60 Hz
Output frequency range[1]	57 - 63 Hz
Power factor	>0.99 (±0.8 adjustable)
Current THD @ rated load	<3%
Max. fault current contribution (1 cycle RMS)	73.2 A (1.68 PU)
Max. OCPD rating	125 A
AC disconnection type	Load-break rated AC switch
AC surge protection	Type II MOV
System and Performance	
Topology	Transformerless
Max. efficiency	98.8%
CEC efficiency	97.4%
Stand-by / night consumption	<3 W
Environment	
Enclosure protection degree	NEMA Type 4X
Cooling method	Variable speed cooling fans
Operating temperature range[2]	-22°F to +140°F / - 30°C to +60°C
Non-operating temperature range[3]	No low temp minimum to +158°F / +70°C maximum
Operating humidity	0 to 100%
Operating altitude	13123 ft / 4000 m (derating from 9843 ft / 3000 m)
Audible noise	<60 dBA @ 1 m and 25°C
Display and Communication	
User interface and display	LCD + LED
Inverter monitoring	SunSpec, Modbus RS485
Site-level monitoring	CPS FlexOM Gateway (1 per 32 inverters)
Modbus data mapping	CPS
Remote diagnostics / firmware upgrade functions	Standard / (with FlexOM Gateway)
Mechanical	
Dimensions (H x W x D)	39.4 x 23.6 x 10.24 in (1000 x 600 x 260 mm)
Weight	Inverter: 123.5 lbs (56 kg); Wire-box: 33 lbs (15 kg)
Mounting / installation angle[4]	15 to 90 degrees from horizontal (vertical or angled)
AC termination	M8 stud type terminal block (wire range: #6 - 3/0 AWG CU/AL; lugs not supplied)
DC termination[5]	Screw clamp, neg. busbar (RSD version[5]) wire range: #14 - #6 AWG CU
Fused string inputs (5 per MPPT)[6]	20 A fuses provided (fuse values up to 30 A acceptable)
Safety	
Certifications and standards	UL 1741-SA/SB Ed. 3, UL 1699B, UL 1998, CSA-C22.2 NO.107.1-01, IEEE 1547-2018, FCC PART15
Selectable grid standard	IEEE 1547a-2014, IEEE 1547-2018[7], CA Rule 21, ISO-NE, HECO
Smart-grid features	Volt-RideThru, Freq-RideThru, Ramp-Rate, Specified-PF, Volt-VAR, Freq-Watt, Volt-Watt
Warranty	
Standard	10 years
Extended terms	15 and 20 years

1) The output voltage and frequency ranges may differ according to the specific grid standard.
2) Active power derating begins at 45°C when PF=1 and MPPT≥Vmin, and at 50°C when PF=1 and MPPT≥700 Vdc.
3) See user manual for further requirements regarding non-operating conditions.
4) Shade Cover accessory required for installation angles of 75 degrees or less.
5) RSD wire-box only includes fuses and fuse holders on the positive polarity, compliant with NEC 2017/2020 Section 690.9(C).
6) Fuse values above 20 A have additional spacing requirements or require the use of the Y-Comb Terminal Block. See the user manual for further details.
7) Firmware version 18.0 or later required.

CLIENT

Santa Clara County Office of Education

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PROJECT LOCATION

WALDEN WEST
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DESIGNER

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500 12TH STREET, SUITE 300
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CONSULTANT

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ENGINEERING APPROVAL

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DESIGNER PROJECT NO.: 223091
DRAWN BY: JC
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SCALE: NTS

KEY PLAN

SHEET TITLE

EQUIPMENT SPECIFICATIONS

SHEET NUMBER

E-10.2

3
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PHOTOVOLTAIC INVERTERS - CHINT POWER SYSTEMS - 36KW

GENERAL

1. THE JOB SITE SHALL BE MAINTAINED IN A CLEAN, ORDERLY CONDITION FREE OF DEBRIS AND LITTER. SHALL NOT BE UNREASONABLY ENCUMBERED WITH ANY MATERIALS OR EQUIPMENT AND SHALL BE CLEANED AT THE END OF EACH WORKING DAY.

2. CONSTRUCTION AND MATERIALS SHALL BE AS SPECIFIED AND AS REQUIRED BY THE LATEST EDITION OF THE CALIFORNIA BUILDING CODE (CBC) AND LOCALLY ENFORCED CODES AND AUTHORITIES. ALL ARTICLES, MATERIALS AND EQUIPMENT SHALL BE INSTALLED, APPLIED AND CONNECTED AS DIRECTED BY THE MANUFACTURER'S LATEST WRITTEN SPECIFICATIONS EXCEPT WHERE OTHERWISE NOTED. MATERIAL NOTES ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER THESE SPECIFICATIONS.

3. IN THE EVENT CERTAIN FEATURES OF THE CONSTRUCTION ARE NOT FULLY SHOWN, THEIR CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR FEATURES. ALL DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE SHOWN ON THE PLANS.

4. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SHORING, BRACING AND FORMWORK AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION.

5. MATERIALS STORED ON THE SITE SHALL BE PROPERLY STACKED AND PROTECTED TO PREVENT DAMAGE AND DETERIORATION UNTIL USE. FAILURE TO PROTECT MATERIALS MAY BE CAUSE FOR REJECTION OF WORK.

EARTHWORK

1. CONTRACTOR SHALL CAREFULLY EXCAVATE ALL MATERIALS NECESSARY FOR CONSTRUCTION OF THE WORK. ANY MATERIAL OF AN UNSUITABLE OR DELETERIOUS NATURE DISCOVERED BELOW THE BOTTOMS OF THE FOUNDATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE GEOTECHNICAL ENGINEER.

2. CONTRACTOR SHALL READ FULL APPROVED GEOTECHNICAL REPORT PRIOR TO STARTING ANY WORK.

CAST-IN-PLACE CONCRETE PIERS

1. DRILLED HOLES FOR CAST-IN-PLACE CONCRETE PIERS SHALL BE DRILLED TO THE DIAMETERS AND DEPTHS SHOWN ON THE PLANS.

2. DRILLED HOLES SHALL BE EXAMINED FOR STRAIGHTNESS AND ANY HOLE SHOWING AN OUT OF PLUMB TOLERANCE IN EXCESS OF 2% OF THE TOTAL HOLE DEPTH SHALL BE REJECTED. IF THE TOLERANCES NOTED HEREIN ARE EXCEEDED, THE CONTRACTOR SHALL FURNISH AND PAY FOR ANY CORRECTIVE DESIGN AND CONSTRUCTION THAT MAY BE REQUIRED. SUITABLE CASINGS SHALL BE FURNISHED AND PLACED WHEN NECESSARY TO CONTROL WATER OR TO PREVENT CAVING OF THE HOLE.

3. LOOSE MATERIAL EXISTING AT THE BOTTOM OF THE HOLE AFTER DRILLING OPERATIONS HAVE BEEN COMPLETED SHALL BE REMOVED BEFORE PLACING REINFORCING STEEL OR CONCRETE IN THE HOLE. SURFACE WATER SHALL NOT BE PERMITTED TO ENTER THE HOLE AND ALL WATER WHICH MAY HAVE INFILTRATED INTO THE HOLE SHALL BE REMOVED PRIOR TO PLACING CONCRETE THEREIN.

4. CASING, IF USED IN DRILLING OPERATIONS, SHALL BE REMOVED FROM THE HOLE AS CONCRETE IS PLACED THEREIN. THE BOTTOM OF THE CASING SHALL BE MAINTAINED A MINIMUM OF FOUR FEET BELOW TOP OF THE CONCRETE DURING WITHDRAWAL AND PLACING OPERATIONS. SEPARATION OF THE CONCRETE BY HAMMERING OR OTHERWISE VIBRATING THE CASING DURING WITHDRAWAL OPERATIONS SHALL BE AVOIDED.

5. CARE SHOULD BE EXERCISED TO ENSURE THAT ANY CONCRETE SPILLS DURING THE CONCRETE PLACEMENT ARE REMOVED, AND NO "MUSHROOMING" EFFECTS ARE ALLOWED TO REMAIN AROUND THE TOP OF THE PIER.

6. REMOVAL OF SHORING SHALL COMPLY WITH ACI, ACI 301, AND RECOMMENDATIONS IN ACI 347R.

7. STEEL COLUMNS, BEAMS, AND PURLINS MAY BE ERECTED 24 HOURS AFTER FOUNDATION PLACEMENT OR AFTER CONCRETE REACHES A COMPRESSIVE STRENGTH OF 1000 PSI, WHICHEVER COMES FIRST.

CONCRETE

1. WORK DONE UNDER THIS SECTION SHALL CONFORM WITH THE APPLICABLE PORTIONS OF ACI 318, LATEST EDITION.

2. POURED IN PLACE CONCRETE WORK SHALL BE CONSTRUCTED OF NORMAL WEIGHT, PORTLAND CEMENT CONCRETE, HAVING A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. SEE MATERIAL SPECS FOR SPECIFIC TYPE AND STRENGTH. PORTLAND CEMENT CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION. THE CONCRETE SHALL BE PLACED WITH A MAXIMUM OF 312 POUNDS OF WATER PER CUBIC YARD. CONCRETE SHALL HAVE CLASS N OR F FLY-ASH CONTENT EQUAL TO 25% OF THE TOTAL CEMENTITIOUS MATERIALS. MAXIMUM CONCRETE SLUMP SHALL BE 4 TO 6 INCHES. THE USE OF ANY ADMIXTURE IN THE CONCRETE MUST BE APPROVED BY THE ENGINEER.

3. AGGREGATES: COARSE AGGREGATES SHALL CONFORM TO ASTM C 33 SIZE 57 (1" MAX), PEA GRAVEL AGGREGATES SHALL NOT BE USED.

4. NEWLY PLACED CONCRETE SHALL BE CURED IN ACCORDANCE WITH THE PROVISIONS IN ACI 308, "STANDARD PRACTICE FOR CURING CONCRETE " LATEST EDITION. METHOD OF CURING SHALL BE AT THE OPTION OF THE CONTRACTOR WITH APPROVAL OF THE OWNER AND ENGINEER.

5. METAL ANCHORAGE DEVICES, ANCHOR RODS, ETC. SHALL BE SECURED IN PLACE AND INSPECTED PRIOR TO PLACING CONCRETE. WET SETTING EMBEDDED DEVICES IS NOT ACCEPTABLE.

6. CONCRETE COVERAGE AROUND ALL APPURTENANCES (IE CONDUIT, REBAR, ANCHORS) SHALL HAVE A MINIMUM OF 3" CLEARANCE WHERE EXPOSED TO EARTH, AND 2" AT ALL OTHER AREAS UNLESS NOTED OTHERWISE.

7. REFER TO ACI 318 TABLES 4.2.1 AND 4.3.1 FOR CONCRETE SPECIFICATIONS TO ADDRESS DIFFERENT EXPOSURE CLASSES INDICATED IN SITE SPECIFIC GEOTECHNICAL REPORT. TYPE V AND 4500 PSI CONCRETE MAY NEED TO USED FOR CORROSIVE SOILS. CONCRETE MIX DESIGN TO BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR APPROVAL.

EMBEDMENTS IN CONCRETE

1. CONDUITS AND PIPES, WITH THEIR FITTINGS, EMBEDDED WITHIN A COLUMN SHALL NOT DISPLACE MORE THAN 4 PERCENT OF THE AREA OF CROSS SECTION ON WHICH STRENGTH IS CALCULATED OR WHICH IS REQUIRED FOR FIRE PROTECTION.

2. CONDUITS AND PIPES SHALL HAVE AN OUTSIDE DIAMETER NO GREATER THAN 3 ⅓" AND SPACED NO LESS THAN 1" CLEAR FROM EACH OTHER OR THE REINFORCEMENT.

3. CONDUITS AND PIPES SHALL BE SPACED A MINIMUM OF 3 BAR DIAMETERS OR 2 ½" ON CENTER FROM REBAR.

4. SPECIFIED CONCRETE COVER FOR PIPES, CONDUITS, AND FITTINGS SHALL NOT BE LESS THAN 1 ½" FOR CONCRETE EXPOSED TO EARTH OR WEATHER, NOR LESS THAN ¾ INCH FOR CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND.

5. PIPING AND CONDUIT SHALL BE FABRICATED AND INSTALLED THAT CUTTING, BENDING, OR DISPLACEMENT OF REINFORCEMENT FROM ITS PROPER LOCATION WILL NOT BE REQUIRED.

6. THE WORKABILITY AND METHODS OF CONSOLIDATION OF THE CONCRETE SHALL BE SUCH THAT THE CONCRETE CAN BE PLACED WITHOUT HONEYCOMBS OR VOIDS.

7. SEE DETAIL 6/S4.0 FOR EMBEDMENT CONFIGURATIONS

8. STEEL COLUMNS, BEAMS, AND PURLINS MAY BE ERECTED 24 HOURS AFTER FOUNDATION PLACEMENT OR AFTER CONCRETE REACHES A COMPRESSIVE STRENGTH OF 1000 PSI, WHICHEVER COMES FIRST.

REINFORCEMENT

1. USE GRADE 40 DEFORMED REINFORCING FOR #4 AND SMALLER BARS AND GRADE 60 FOR #5 AND LARGER BARS CONFORMING TO THE REQUIREMENTS OF ASTM A615, STAGGER ALL REINFORCING BAR CONTACT SPLICES 5'-0". SUPPORT HORIZONTAL STEEL AT BOTTOM ON MORTAR BLOCKS. MINIMUM 3-INCH CLEARANCE FOR SURFACES POURED AGAINST EARTH; MINIMUM 1-1/2 INCH ELSEWHERE UNLESS NOTED OTHERWISE.

2. ALL REINFORCING, AND OTHER EMBEDMENTS SHALL BE SECURED IN PLACE AND INSPECTED PRIOR TO PLACING ANY CONCRETE.

3. WORK DONE UNDER THIS SECTION SHALL CONFORM WITH THE APPLICABLE PORTIONS OF ACI 318, LATEST EDITION, AND CBC CHAPTER 18, LATEST EDITION.

NON-SHRINK GROUT

1. NON-SHRINK, NON-METALLIC (NSNM) GROUT SHALL BE COMPOSED OF PORTLAND CEMENT, SAND, AND WATER. USE SPECGROUT SC MULTI PURPOSE GROUT BY SPECHEM OR APPROVED EQUAL. THE NSNM GROUT SHALL BE INSTALLED PER MANUFACTURER RECOMMENDATIONS

2. CONCRETE AREAS TO BE IN CONTACT WITH THE NSNM GROUT SHALL BE CLEANED OF ALL LOOSE OR FOREIGN MATERIAL THAT WOULD IN ANY WAY PREVENT BOND BETWEEN THE NSNM GROUT AND THE CONCRETE AND STEEL SURFACES AND SHALL BE FLUSHED WITH WATER AND ALLOWED TO DRY TO A SURFACE DRY CONDITION IMMEDIATELY PRIOR TO PLACING THE NSNM GROUT.

STRUCTURAL STEEL & MISCELLANEOUS IRON

1. WORK DONE UNDER THIS SECTION SHALL CONFORM TO THE REQUIREMENTS OF THE AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE, LATEST EDITION.

2. ALL STEEL MATERIAL AND ASSEMBLIES EXPOSED TO EARTH IN THE COMPLETED STRUCTURE SHALL BE GALVANIZED OR SHOP PAINTED.

3. WELDING SHALL BE DONE BY WELDERS CERTIFIED FOR THE WELDS TO BE MADE USING E70XX ELECTRODES IN CONFORMANCE WITH THE REQUIREMENTS OF AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE OR AWS "STRUCTURAL WELDING CODE."

4. WHEN FABRICATING BEAMS, PLACE NATURAL CAMBER UP.

5. WELDING SHALL BE DONE BY WELDERS CERTIFIED FOR THE WELDS TO BE MADE USING E70XX ELECTRODES IN CONFORMANCE WITH THE REQUIREMENTS OF AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE OR AWS "STRUCTURAL WELDING CODE." FULL PENETRATION WELDS ARE TO BE INSPECTED DURING WELDING BY A SPECIAL INSPECTOR.

6. COMPLETE JOINT PENETRATION GROOVE WELDS SHALL HAVE FILLER METAL WITH A V-NOTCH TOUGHNESS OF 20-FT/LBS. AVERAGE AT 70 DEGREES FAHRENHEIT.

7. TO ASSURE THE PROPER AMPERAGE AND VOLTAGE OF THE WELDING PROCESS, THE USE OF A HAND HELD CALIBRATED AMP AND VOLTMETER SHALL BE USED. THE FABRICATOR, ERECTOR AND THE INSPECTORS SHALL USE THIS EQUIPMENT. AMPERAGE AND VOLTAGE SHALL BE MEASURED AT THE ARC WITH THIS EQUIPMENT. TRAVEL SPEED AND ELECTRODE STICK OUT SHALL BE VERIFIED TO BE IN COMPLIANCE WITH THE ELECTRODE MANUFACTURER'S RECOMMENDATIONS.

8. WHERE MINIMUM AISC FILLET WELD THICKNESS REQUIREMENT EXCEEDS WELDS SHOWN ON DETAILS, PROVIDE MINIMUM AISC WELD.

9. AFTER FABRICATION, ALL STEEL SHALL BE CLEANED FREE OF RUST, LOOSE MILL, SCALE AND OIL.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF ALL ERECTION PROCEDURES AND SEQUENCES WITH RELATION TO TEMPERATURE DIFFERENTIALS AND WELD SHRINKAGE.

11. ALL BOLTS THAT ARE PART OF THE MOMENT RESISTING BEAM TO COLUMN CONNECTION SHALL BE PRETENSION HIGH STRENGTH BOLTS AND SHALL MEET THE REQUIREMENT FOR AISC 341 SECTION D2.2 SLIP CRITICAL FAYING SURFACES WITH A CLASS A SURFACE OR HIGHER.

12. A STANDARD SCREW GUN WITH A DEPTH SENSITIVE NOSE PIECE SHALL BE USED TO INSTALL 'TEK' SCREWS. THE SCREW GUN SHALL BE A MINIMUM OF 6 AMPS AND HAVE AN RPM RANGE OF 0-2500.

13. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO THE FABRICATION OF ANY PARTS OR ASSEMBLIES.

SPECIAL INSPECTION

1. SPECIAL INSPECTOR IN THE REQUIRED CATEGORY OF WORK MUST BE CERTIFIED BY CITY OF SARATOGA.

2. SPECIAL INSPECTION PER CHAPTER 17 OF THE CALIFORNIA BUILDING CODE WILL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY APPROVED BY LOCAL JURISDICTION AND PAID BY THE OWNER.

3. ALL MATERIALS SHALL CONFORM TO CBC CHAPTER 17 INSPECTION REQUIREMENTS

REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC
MATERIAL VERIFICATION OF HIGH STRENGTH BOLTS, NUTS AND WASHERS:	–	X
A. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	–	X
B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	–	X
INSPECTION OF HIGH STRENGTH BOLTING:		
B. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-THE NUT WITH MATCHMARKING, TWIST-OF-NUT OR DIRECT TENSION INDICATOR METHODS OF INSTALLATION.	–	X
MATERIAL VERIFICATION OF STRUCTURAL STEEL		
A. FOR STRUCTURAL STEEL, IDENTIFICATION MARKINGS TO CONFORM TO AISC 360.	–	X
B. FOR OTHER STEEL, IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	–	X
C. MANUFACTURER'S CERTIFIED TEST REPORTS	–	X
MATERIAL VERIFICATION OF WELD FILLER MATERIALS:		
A. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.	–	X
B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	–	X
INSPECTION OF WELDING:		
A. STRUCTURAL STEEL		
1. COMPLETE AND PARTIAL JOINT PENETRATION GROOVE WELDS.	X	–
2. MULTIPASS FILLET WELDS	X	–
3. SINGLE-PASS FILLET WELDS > 5/16"	X	–
4. PLUG AND SLOT WELDS	–	X
5. SINGLE-PASS FILLET WELDS ≤ 5/16"	–	X

REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC
INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT	–	X
INSPECT ANCHORS CAST IN CONCRETE.	–	X
VERIFYING USE OF REQUIRED MIX DESIGN.	–	X
PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	–
INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	–

REQUIRED SPECIAL INSPECTIONS AND TEST OF SOILS

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	–	X

REQUIRED SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC
INSPECT DRILLING, OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT.	X	–
VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM ELEMENT DIAMETERS, BELL DIAMETERS (IF APPLICABLE), LENGTHS, EMBEDMENT INTO BEDROCK (IF APPLICABLE), AND ADEQUATE END BEARING STRATA CAPACITY. RECORD CONCRETE AND GROUT VOLUMNS.	X	–
FOR CONCRETE ELEMENTS, PERFORM TESTS AND ADDITIONAL SPECIAL INSPECTIONS IN ACCORDANCE WITH SECTION 1705.3.	–	–

STRUCTURAL DESIGN CRITERIA

ALL WORK SHALL COMPLY WITH THE 2022 CALIFORNIA BUILDING CODE (CBC)

RISK CATEGORY	II

GRAVITY LOADS:

PHOTOVOLTAIC MODULES	2.52 PSF
LIVE LOAD	300 LBS (CONCENTRATED)

WIND LOADS:

BASIC WIND SPEED (3 SECOND GUST), V	91 MPH
WIND EXPOSURE CATEGORY,	C
WIND DIRECTIONAL FACTOR,Kd	0.85
TOPOGRAPHIC FACTOR, Kzt	1.0
WIND VELOCITY PRESSURE EXPOSURE, Kh, Kz	0.85

SEISMIC LOADS:

MAPPED SPECTRAL RESPONSE ACCELERATION, Ss	2.472
MAPPED SPECTRAL RESPONSE ACCELERATION, S1	1.035
DESIGN SPECTRAL RESPONSE ACCELERATION, SDS	1.977
DESIGN SPECTRAL RESPONSE ACCELERATION, SD1	0.966
SEISMIC DESIGN CATEGORY	D
SITE CLASS	C
RESPONSE MODIFICATION FACTOR, R	1.25 (CANTILEVERED COLUMN)
OVER STRENGTH FACTOR	1.25
REDUNDANCY FACTOR, ρ	1.3
SEISMIC BASE SHEAR, Cs	0.XX (STRENGTH LEVEL)
ρCs	0.XX (STRENGTH LEVEL)

GEOTECHNICAL REPORT:

BSK ASSOCIATES, INC.
PROJECT NO: G00001735
APRIL 22, 2024

SOIL PARAMETERS:
VERTICAL CAPACITY AND RESISTANCE TO LATERAL LOADS WERE EVALUATED USING COMPUTER PROGRAM SHAFT 2017 AND LPILE 2018, RESPECTIVELY. BASED ON THE RESULTS OF THE VERTICAL AND LATERAL ANALYSIS AND THE LIQUIFACTION CALCULATIONS, RECOMMENDED PIER DEPTH IS SHOWN BELOW. THIS VALUE TAKES INTO ACCOUNT ONE FOOT NEGELCT FOR VERTICAL AND LATERAL ANALYSIS.

MINIMUM PIER DEPTH	16.5 FEET

MATERIAL SPECIFICATIONS

1. ALL MATERIALS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

HOLLOW STRUCTURAL STEEL	ASTM A500 GRADE B, MIN Fy = 46 KSI
LIGHT GAUGE STEEL	ASTM A653, MIN Fy= 50 KSI
WELD TAB AND END CAP	ASTM A36, MIN Fy = 36 KSI
PLATES	ASTM A572, MIN Fy = 50 KSI
BOLTS	ASTM A325
ANCHOR RODS	ASTM F1554 GRADE 55
WELDING ELECTRODES	E70XX
CONCRETE	Type II, F'c=3,000 PSI MIN
NON-SHRINK GROUT	F'c=5,000 PSI
REBAR	ASTM A615 GRADE 60
FASTENERS	ITW BUILDEX, ESR 1976 DEWALT DRIL-FLEX, ESR 4367 (MODULE CONNECTION)

2. STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED (MINIMUM ASTM A123 OR A153, CLASS D) OR PAINTED WITH ZINC-RICH PRIMER, UNDERCOAT, AND FINISH COAT; OR EQUIVALENT PAINT SYSTEM.

3. ALL BOLTS USED FOR BEAM TO COLUMN CONNECTIONS AND PART OF THE SEISMIC LOAD RESISTING SYSTEM (SLRS) SHALL BE PRETENSION HIGH-STRENGTH BOLTS WITHOUT CLASS A FAYING SURFACE REQUIREMENT.

4. COLD-FORMED STEEL MEMBERS SHALL BE 55% ALUMINUM-ZINC ALLOY COATED PER ASTM A792/A792M STANDARD IN ACCORDANCE TO AISI S200 TABLE A4-1, CP 90 COATING DESIGNATION.

5. ALL EXPOSED STEEL FASTENERS, INCLUDING CAST-IN-PLACE ANCHOR BOLTS/ RODS, SHALL BE STAINLESS STEEL (TYPE 304 MINIMUM), HOT-DIP GALVANIZED (ASTM A153, CLASS D MINIMUM OR ASTM F2329), OR PROTECTED WITH CORROSION-PREVENTIVE COATING THAT DEMONSTRATED NO MORE THAN 2% OF RED RUST IN MINIMUM OF 1,000 HOURS OF EXPOSURE IN SALTY SPRAY TEST PER ASTM B117. ZINC-PLATED FASTENERS DO NOT COMPLY WITH THIS REQUIREMENT.

6. ANCHOR RODS AND ASSEMBLY SHALL BE WEATHER PROTECTED USING SAP SEAL BOLT CAPS.

SHEET INDEX

CLIENT

Santa Clara County Office of Education

SANTA CLARA COUNTY OFFICE OF EDUCATION

PROJECT LOCATION

WALDEN WEST
15555 SANBORN RD
SARATOGA, CA 95070

DESIGNER

ENGIE SERVICES, U.S.
500 12TH STREET, SUITE 300
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CONSULTANT

MBL-ENERGY
954 HAMPSWOOD WAY
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MBL-ENERGY SINCE 2008

ENGINEERING APPROVAL

REGISTERED PROFESSIONAL ENGINEER ALI HAJIHASHEMI C 84486 CIVIL STATE OF CALIFORNIA
EXP. 09/30/2025

AGENCY APPROVAL

ISSUE

MARK	DATE	DESCRIPTION
1	05/22/2024	PERMIT SUBMITTAL

DESIGNER PROJECT NO.:
DRAWN BY: DG
CHECKED BY: RO
SCALE:

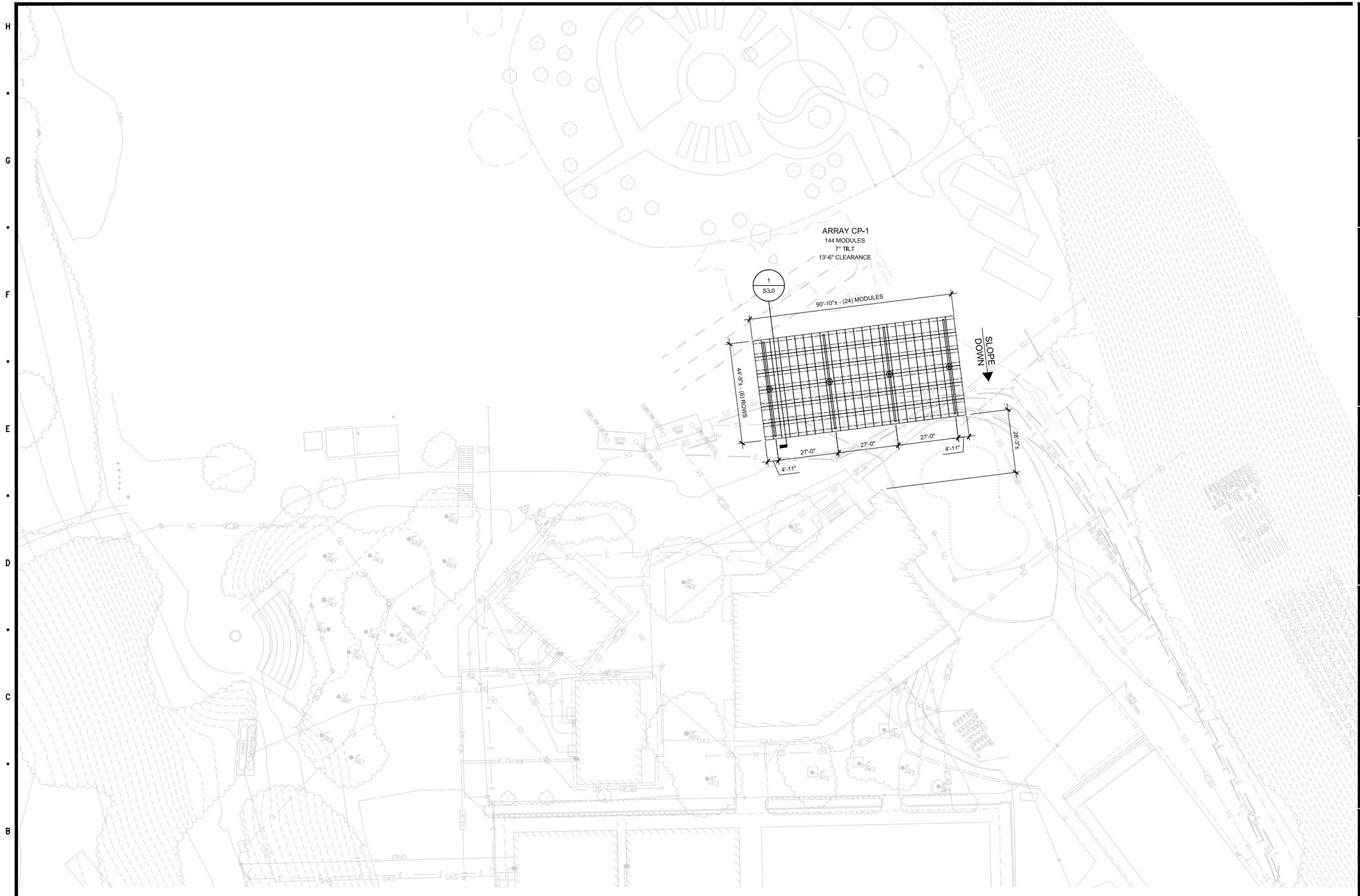
KEY PLAN

SHEET TITLE

PV CANOPY NOTES AND SPECS

SHEET NUMBER

S0.1



NORTH

0 5' 10' 20' 40'

SCALE: 1" = 20'-0"

PV CANOPY LAYOUT PLAN

SCALE: 1"=20'

LEGEND

- SOLAR MODULE JAM72D30 540/MB, (144) TOTAL
- ZEE PURLIN
- 6 HIGH TALL FULL SOLAR STRUCTURES AT 27'-0" MAX, (4) TOTAL SEE DETAIL 1/S3,0

CLIENT

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PROJECT LOCATION

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ENGINEERING APPROVAL

REGISTERED PROFESSIONAL ENGINEER
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CIVIL
STATE OF CALIFORNIA
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AGENCY APPROVAL

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CHECKED BY: RO

SCALE:

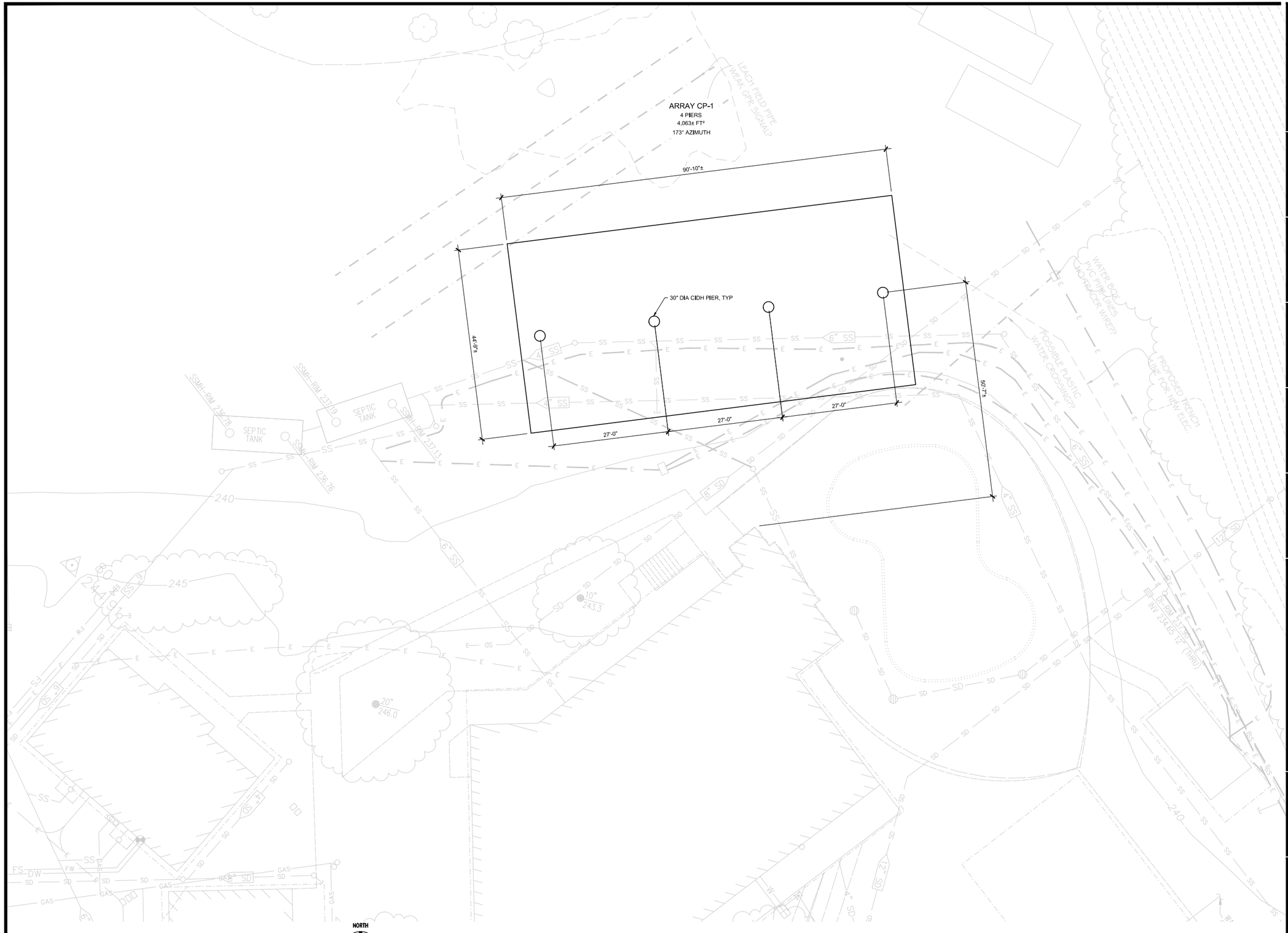
KEY PLAN

SHEET TITLE

PV CANOPY LAYOUT PLAN

SHEET NUMBER

S1.0



PV CANOPY FOUNDATION PLAN

SCALE: 1"=10'

LEGEND

○ 30" DIA CIDH CONCRETE PIER W/ ABOVE GRADE BOLLARD, TYP.

CLIENT

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ENGINEERING APPROVAL

REGISTERED PROFESSIONAL ENGINEER — ALI HAJIHASHEMI — C 84486 — CIVIL — STATE OF CALIFORNIA

EXP. 09/30/2025

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CHECKED BY: RO
SCALE:

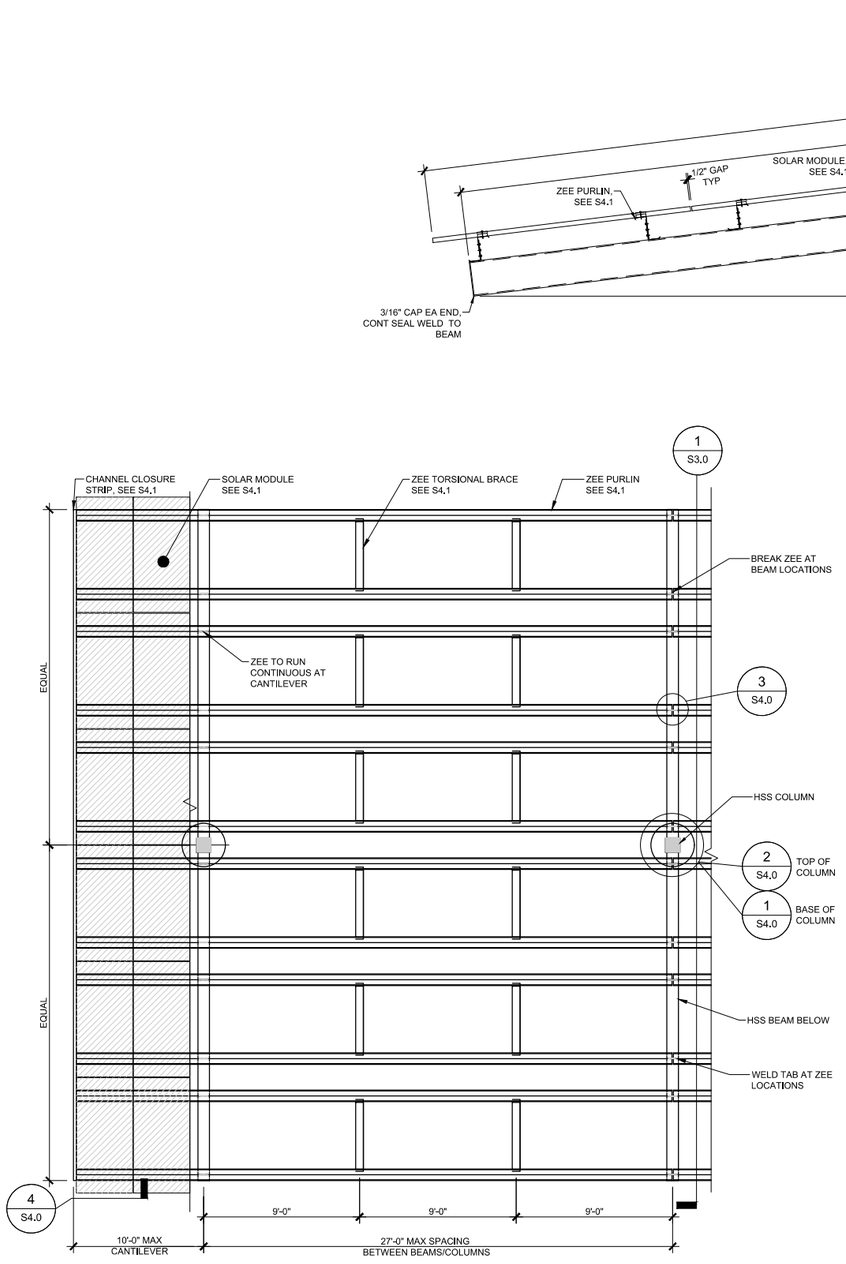
KEY PLAN

SHEET TITLE

PV CANOPY FOUNDATION PLAN

SHEET NUMBER

S2.0

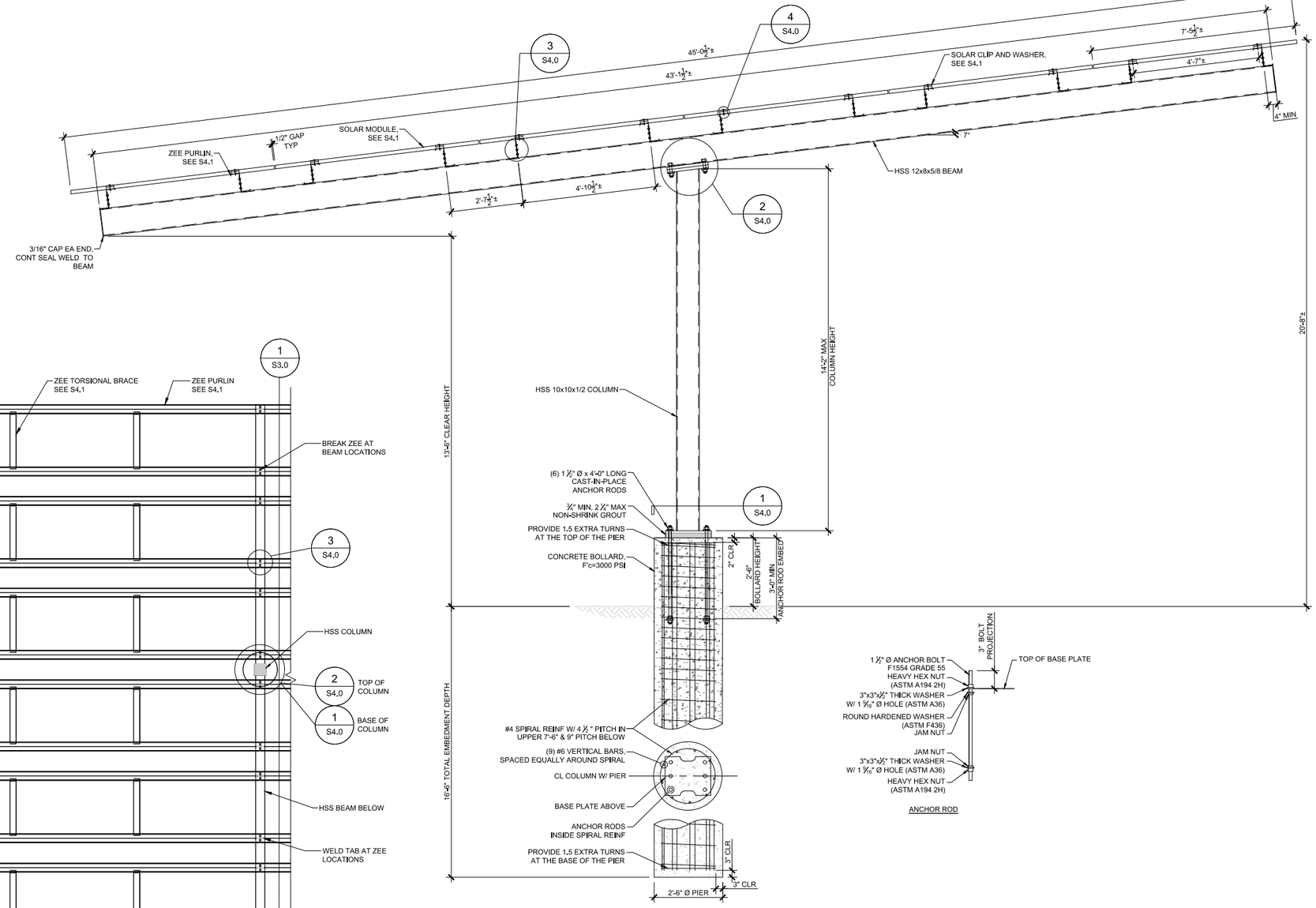


NOTES:
1. 10'-0" CANTILEVER IS MAXIMUM PURLIN CANTILEVER FOR ALL STRUCTURES.
2. PROVIDE BLOCKING AT 9'-0" OC MAX AT ALL SPANS.
3. USE END CLOSURE AT BOTH SIDES OF STRUCTURES FOR ALL STRUCTURES
4. ATTACH END CLOSURE W/ #12-14X1" 'TEK' SCREW TOP & BOT, (2) TOTAL PER ESR 1976
5. 3"x6"x12 GA BRIDGE PLATE WHEN SCREW IS LESS THAN 1" FROM END OF ZEE
6. SPACING MAY VARY DEPENDING ON LOCATION OF PARKING AND UNDERGROUND UTILITIES AND OTHER ON SITE OBSTRUCTIONS.

6 HIGH FULL STRUCTURE PARTIAL LAYOUT

SCALE: 1/4" = 1'-0"

2



NOTES:
1. ALTERNATE DIRECTION OF ZEE FLANGES SO TOP FLANGES FACE TOWARD EACH OTHER EVERY OTHER BAY.
2. POSITION REINFORCEMENT BARS TO AVOID CONFLICT W/ ANCHOR RODS.
3. CARE SHOULD BE EXERCISED TO ENSURE THAT ANY CONCRETE SPILLS DURING THE CONCRETE PLACEMENT ARE REMOVED, AND NO "MUSHROOMING" EFFECTS ARE ALLOWED TO REMAIN AROUND THE TOP OF THE PIER.
4. THERE WILL BE NO SPLICE IN THE VERTICAL BARS OR SPIRAL REINFORCING TIES.
5. A CONCRETE ENCASED ELECTRODE PER CEC 250.52 (3) WILL NEED TO BE ADDED TO ONE FOUNDATION PER ARRAY TO GROUND THE STRUCTURE TO EARTH.
6. SEE DETAIL 5/S4.0 FOR COLUMN MOUNTED EQUIPMENT ANCHORAGE.

6 HIGH FULL SOLAR STRUCTURE ELEVATION

SCALE: 1/2" = 1'-0"

1

CLIENT

Santa Clara County Office of Education

SANTA CLARA COUNTY OFFICE OF EDUCATION

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MBL-ENERGY SINCE 2002

ENGINEERING APPROVAL

REGISTERED PROFESSIONAL ENGINEER
ALI HAJIHASHEMI
C 84486
CIVIL
STATE OF CALIFORNIA
EXP. 09/30/2025

AGENCY APPROVAL

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CHECKED BY: RO
SCALE:

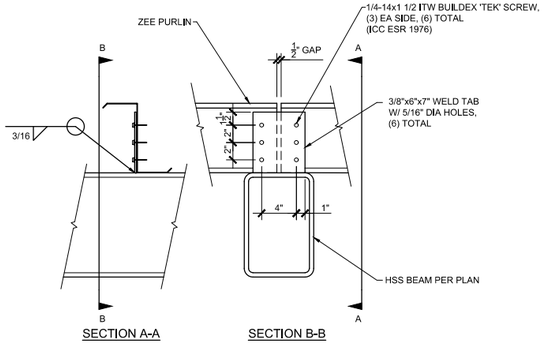
KEY PLAN

SHEET TITLE

PV CANOPY ELEVATION & LAYOUT

SHEET NUMBER

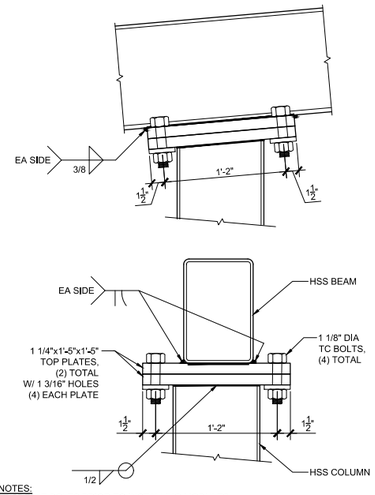
S3.0



NOTES:
1. DO NOT BREAK ZEE PURLIN WHERE PURLIN CANTILEVERS BEYOND SUPPORT BEAM.

WELD TAB CONNECTION TO BEAM 3

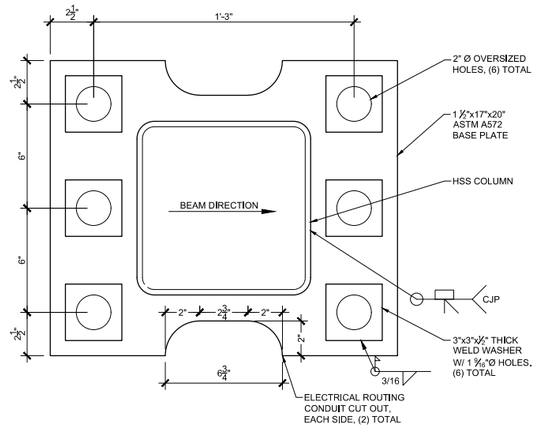
SCALE: 1 1/2" = 1'-0"



NOTES:
1. TORQUE BOLTS PRIOR TO INSTALLING MODULES.
2. ALL WELDS GREATER THAN THE MATERIAL THICKNESS OF THINNER PART JOINED SHALL BE BUILT OUT TO OBTAIN FULL-THROAT THICKNESS PER LATEST AISC SPECIFICATIONS.
3. BOLTED CONNECTION IS SNUG-TIGHT CONNECTION PER AISC 360-16.

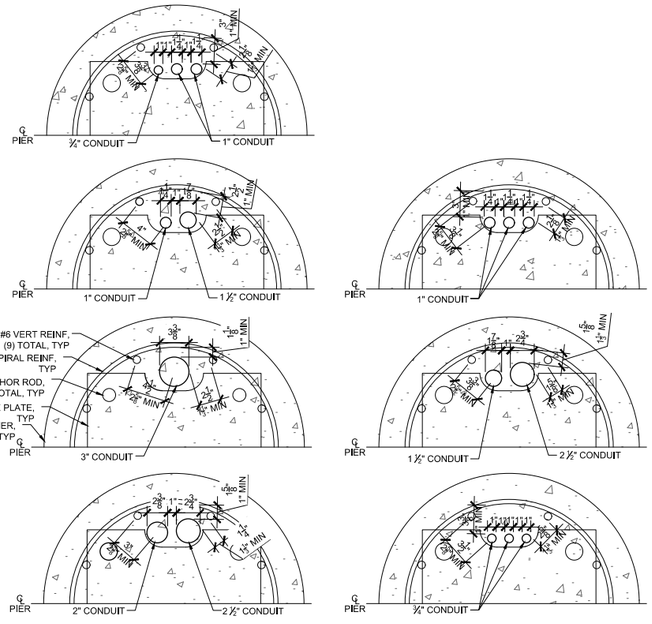
BEAM TO COLUMN CONNECTION 2

SCALE: 1 1/2" = 1'-0"



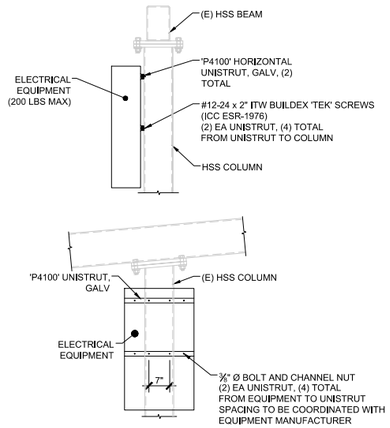
COLUMN BASE PLATE 1

SCALE: 3" = 1'-0"



EMBEDMENTS IN CONCRETE 6

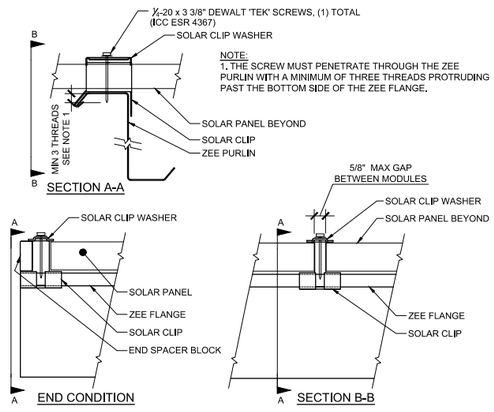
SCALE: 1 1/2" = 1'-0"



NOTES:
1. COORDINATE EQUIPMENT DIMENSIONS AND UNISTRUT LOCATIONS WITH EQUIPMENT USED ON ELECTRICAL DRAWINGS.
2. OBJECTS MOUNTED ON POSTS BETWEEN 27"-80" ABOVE FINISHED GRADE SHALL OVERHANG CIRCULATION PATHS 12" MAX

COLUMN MOUNTED EQUIPMENT ANCHORAGE 5

SCALE: 1/2"=1'-0"



SOLAR CLIP TO ZEE CONNECTION 4

SCALE: 3" = 1'-0"

CLIENT

Santa Clara County Office of Education

SANTA CLARA COUNTY OFFICE OF EDUCATION

PROJECT LOCATION

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MBL-ENERGY SINCE 2002

ENGINEERING APPROVAL

REGISTERED PROFESSIONAL ENGINEER ALI HAJIHASHEMI C 84486 CIVIL STATE OF CALIFORNIA
EXP. 09/30/2025

AGENCY APPROVAL

ISSUE

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DESIGNER PROJECT NO.:
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CHECKED BY: RO
SCALE:

KEY PLAN

SHEET TITLE

PV CANOPY CONNECTION DETAILS

SHEET NUMBER

S4.0

Santa Clara County Office of Education

CLIENT
SANTA CLARA COUNTY OFFICE OF EDUCATION

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ENGINEERING APPROVAL
REGISTERED PROFESSIONAL ENGINEER ALI HAJIHASHEMI C 84486 CIVIL STATE OF CALIFORNIA
EXP. 09/30/2025

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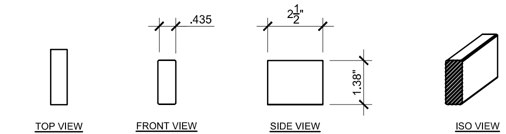
KEY PLAN

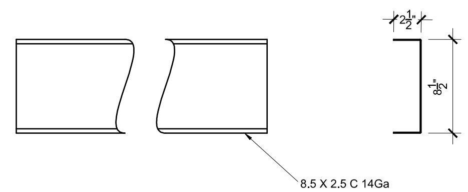
SHEET TITLE
PV CANOPY PART DETAILS

SHEET NUMBER
S4.1



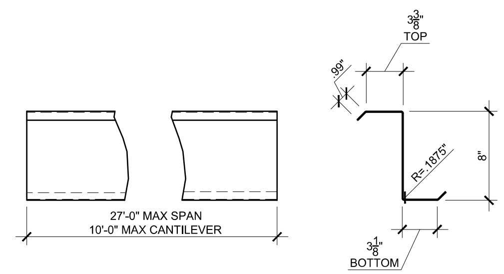
NOTES:
1. REPLACES MODULE AT THE END OF ARRAYS

BEACON TECHNOLOGIES
SOLAR CLIP END SPACER BLOCK
MATL: ASTM 6061

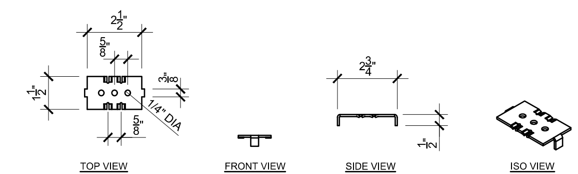


NOTES:
1. USE AT BOTH END OF STRUCTURES.
2. ATTACH W/ #12-14 x 1 'TEK' SCREWS, TOP AND BOTTOM, (2) TOTAL. (ICC ESR 1976)

BEACON TECHNOLOGIES
CLOSURE STRIP, 14 GA
MATL: ASTM A653, Fy=50 KSI
FINISH: G-90
SCALE 3" = 1'-0"

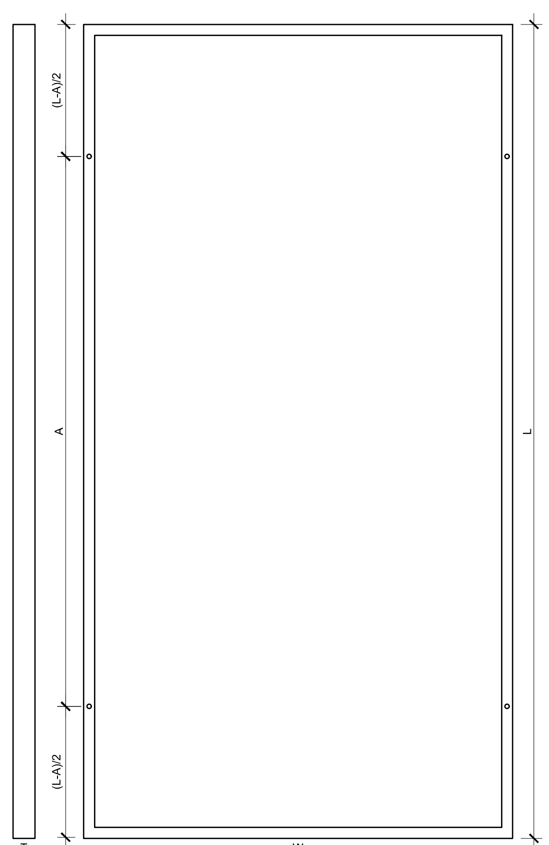


BEACON TECHNOLOGIES
ZEE PURLIN, 12 GA
MATL: ASTM A653, Fy=50 KSI, Fu=70 KSI
FINISH: G-90
SCALE: 1 ½" = 1'-0"



NOTES:
1. USE (1) #10-32 3" SERIES 300 SS GROUNDING SCREW W/ NUT AND INTEGRATED EXTERNAL TOOTH LOCK WASHER
2. SEE SOLAR CLIP TO ZEE CONNECTION DETAIL FOR TEK SCREW ATTACHMENT TO ZEE PURLIN.

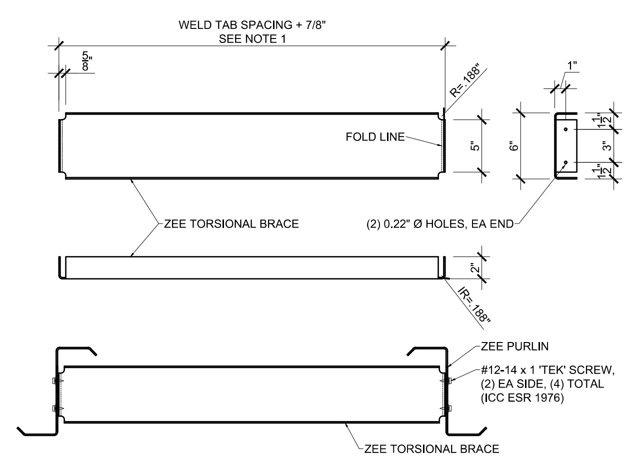
BEACON TECHNOLOGIES
SOLAR CLIP WASHER
MATL: TYPE 304, .09", Fy=49 KSI
FINISH: STAINLESS STEEL
SCALE 3" = 1'-0"



MODULE DIMENSIONS

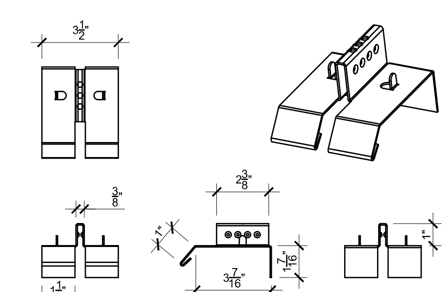
L	=	89.69"
W	=	44.65"
A	=	55.12"
T	=	1.38"

JA SOLAR
JAM72D30-540/MB
MATL: ALUMINUM



NOTES:
1. VERIFY WELD TAB SPACING PRIOR TO BRACE FABRICATION

BEACON TECHNOLOGIES
ZEE BRACE, 14 GA
MATL: ASTM A653, Fy=50 KSI
FINISH: G-90
SCALE: 1 ½" = 1'-0"



BEACON TECHNOLOGIES
SOLAR ZEE CLIP
MATL: ASTM A653, 16 GA, Fy=50 KSI
FINISH: G-90
SCALE 3" = 1'-0"

BEACON TECHNOLOGIES
Connection Components for Solar Success

THE BEACON SOLUTION

The Beacon Racking and Bonding Assembly are listed to ul 2703, a standard which covers the module mounting assembly for both structural and bonding functionality. This allows for the dual purpose use of the module clip with grounding washer; mechanical attachment of module to structural framing, module-to-module, and module-to-metal component conductivity without the use of ground lugs and copper wire on each module. The grounding washer addition to the module clip is designed to equalize the potential of the racking system.

The clip is a (2) part assembly and can be used with any module up to a 2" frame width. The base clip acts as a jig to hold the module in place using the locating tabs, which can be adjusted to align with the mounting holes on the module frame. The top-down stainless steel grounding washer and screws are designed to both secure the module to the racking and provide a path to ground using the racking of the structure as the grounding conductor.

There are (3) openings for screws along the top rib of the clip. Allowing as many as two openings to be used for the structural connection based on the various design criteria leaving the third opening for the stainless steel grounding screw. When the top grounding washer is tightened to the module frame within the specified torque, the barbs pierce the anodized aluminum frame thereby establishing continuity with the metal structure.

For electrical bonding of the anodized frame to the steel structure, only one row of clips of the module attachment to purlin are required to utilize the grounding screw. The grounding screw is a 300 series stainless steel #10-32 3" screw. a #10-32 stainless steel hex nut with integrated external tooth star washer is used on the back of the grounding screw to increase surface contact at the purlin. The individual purlins are then bonded together using a UL467 approved grounding method and then at the end of the structure also bonded to the GEC with the UL467 approved grounding method.

It is the installer's responsibility to consult and comply with national and local building code(s) for complete grounding requirements specific to the installation. Purlins used for the ground path within the Array are required to be electrically bonded to other DC grounding paths via the use of bonding jumpers and a compatible UL467 listed grounding devise acting as a Grounding Equipment Conductor (GEC). All ungrounded source or branch circuits are to be fused with an over current protection device no greater than 20A to prevent a reverse current from being imposed on the racking assembly in the event of a fault.

BEACON TECHNOLOGIES
Connection Components for Solar Success

INSTALLATION INSTRUCTIONS

Step One – Place clip onto the installed sub-purlin
Step Two – Place module onto the clip so that the module mounting holes go over the tabs on the clip. Repeat this step until the row is complete.
Step Three – Place the stainless steel grounding washer over the module above the clip and attach to sub-purlin with the specified structural screw in one or two of the screw openings at the top of the rib with a standard screw gun with depth sensitive nose-piece with 1800 RPMs.
Step Four – At each clip along the top row only, pre drill for (1) #10-32 x 3" stainless steel grounding screw in one of the available holes using a 13/64" drill bit. thread the hex nut with star washer to the backside of the purlin and torque to 5-6 ft/lbs or 60-72 in/lbs.
Step Five – Bond each separate purlin together using a UL467 approved grounding method (shown in Illustration E). then bond one end of the structure to the GEC also using the UL467 approved grounding method.
***End of Module Condition** – When you get to the last module along a row, use the sameclip with the end spacer block on the opposite side of the module (shown in Illustration E). The grounding washer, structural screw and stainless steel screw assembly are then used in the same fashion as the mid-clip.
***Note:** Every independent Array section must include at least one grounding device

Tools Required
-Torque Wrench (Calibrated to ft/lbs or in/lbs)
- Drill and 13/64" drill bit
- 5/16" Socket Wrench
- Standard screw gun, depth sensitive nose-piece

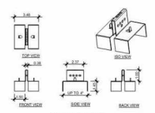
Safety While Servicing/Removing
When removing a module within a bonded assembly, ensure that the clip on both of the other sides of the removed module remains in contact.

The designer and installer are solely responsible for:
- Complying with all applicable local or national building codes, including any that may supersede this manual
- Ensuring that products are appropriate for the installation criteria and conditions
- The racking system is rated for use a mechanical design load of 50 psf downward pressure, 33.3 psf upward pressure and 5 psf sloped load
- Ensuring correct and appropriate design parameters are used in determining the loading specific to the installation
- Using only parts specified for their intended purpose
- Ensuring that the installation does not conflict with other components' manufacture recommendations and warranties
- Beacon limited warranty covers only its products and not any related items
- Always following safety procedures when installing or servicing PV system
-The grounding washer is for "single use only"
-Periodic re-inspection of the installation for loose components, loose fasteners and any corrosion, such that if found, the affected components are to replaced immediately

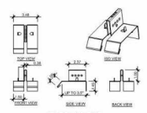
BEACON TECHNOLOGIES | 1698 ROGERS AVE, SAN JOSE, CA 95112 BEACON TEC-INOLOGIES | 1698 ROGERS AVE, SAN JOSE, CA 95112 | WWW.BEACON-TEK.COM

BEACON
TECHNOLOGIES
Connection Components for Solar Success

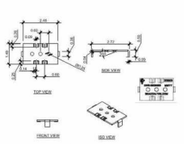
ILLUSTRATIONS



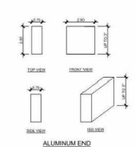
"C" SOLAR CLIP
ILLUSTRATION A



"Z" SOLAR CLIP
ILLUSTRATION A



GROUNDING
CLIP WASHER
ILLUSTRATION B



ALUMINUM END
SPACER BLOCK
ILLUSTRATION C

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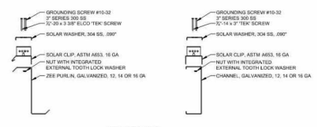
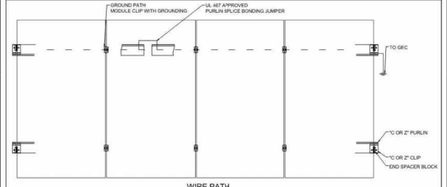
Connection Components for Solar Success

ILLUSTRATIONS



Z & C ASSEMBLY
ILLUSTRATION D



WIRE PATH
ILLUSTRATION E

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Santa Clara County Office of Education

SANTA CLARA COUNTY OFFICE OF EDUCATION

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ENGINEERING APPROVAL

REGISTERED PROFESSIONAL ENGINEER
ALI HAJIHASHEMI
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CIVIL
STATE OF CALIFORNIA
EXP. 09/30/2025

AGENCY APPROVAL

ISSUE

MARK	DATE	DESCRIPTION
1	05/22/2024	PERMIT SUBMITTAL

DESIGNER PROJECT NO.:
DRAWN BY: DG
CHECKED BY: RO
SCALE:

KEY PLAN

SHEET TITLE

BEACON INSTALL GUIDE

SHEET NUMBER

S5.0