COUNTY OF SAN JOAQUIN

DEPARTMENT OF PUBLIC WORKS
P.O. BOX 1810-1810 E. HAZELTON AVENUE
STOCKTON, CALIFORNIA 95201
(209) 468-3000
FAX # (209) 468-9324

Permit No: **PS-1701270**
Date Issued:
Start Date: 05/08/2017
Exp. Date: 08/31/2017
Project No: PWP7110005
Quad: NW

ENCROACHMENT PERMIT

To: NUANCE ENERGY GROUP
6 CROW CANYON CT, SUITE 200
SAN RAMON, CA 94583

Encroachment Type:

solar panels			

Location:
Flag City storm drain basin located within RV park

In compliance with your request of **05/05/2017** , permission is hereby granted to do work in County right-of-way as shown on attached application and subject to all the terms, conditions and restrictions written below or printed as general or special provisions on any part of this form. See reverse side and attached sheet, if any.

Trench excavations for service connections will not be permitted within ten feet (10') of pavement centerline unless otherwise approved by the Director. Surface of trench patches shall match in kind and be smooth and even with that of abutting surface. Special attention shall be given to depth of utilities through roadside area in anticipation of future drainage facilities, road profile and/or frontage development. All underground utility facilities are to be established and accurately dimensioned on sketches from surveyed centerline of road right of way, or from right of way (border) lines.

Permittee shall call the Department of Public Works, Field Engineering Division (Permit Inspections) at (209)953-7421 at least forty-eight hours prior to beginning any work within the County right of way. All work performed under this permit shall conform to the rules and regulations pertaining to safety established by the California Division of Industrial Safety and Cal-OSHA.

The jobsite shall be kept in a safe condition at all times by the daily removal of any excess dirt or debris which might be a hazard to either pedestrian or automobile traffic. All necessary traffic convenience and warning devices and personnel shall be provided, placed and maintained by and at the sole expense of the Permittee in accordance with the latest edition of the CALTRANS Manual of Traffic Control.

After completion of the work permitted herein, all debris, lumber, barricades, or any excess material shall be removed and the jobsite left in a neat workmanlike manner. Immediately following completion of construction permitted herein, Permittee shall fill out and mail notice of completion (see attached post card) provided by Grantor.

Special Comments:

Installation of solar panels.
Applicant is responsible for repair of any damange incurred to facilities within the basin, including but not limited to storm drain pump equipment and irrigation.

FORMS:

Est. Permit Fee: $5,388.00

KRIS BALAJI, Director
Department of Public Works

By: _____
Permit Section

WHITE	-Permittee
GOLDENROD	-PWD Central File
~~YELLOW~~	~~-Field Inspection~~
PINK	-Permit Section

ENCROACHMENT PERMIT GENERAL PROVISIONS

13-1

1. This permit is issued under and subject to all laws and ordinances of agencies governing the encroachment herein permitted. See the following references:
   STREETS AND HIGHWAYS CODE
   1. Division 1, Chapter 3
   2. Division 2, Chapter 2, Section 942
   3. Division 2, Chapter 4, Section 1126
   4. Division 2, Chapter 5.5 and Chapter 6

   SAN JOAQUIN COUNTY ORDINANCES NUMBERED: 324, 441, 648, 662, 672, 695, 700, 860, 892, 3359, and 3675.

2. It is understood and agreed by the Permittee that the performance of any work under this permit shall constitute an acceptance of all the provisions contained herein and failure on the Permittee's part to comply with any provision will be cause for revocation of this permit. Except as otherwise provided for public agencies and franchise holders, this permit is revocable on five days notice.

3. All work shall be done subject to the supervision of and the satisfaction of the grantor. The Permittee shall at all times during the progress of the work keep the County Highway in as neat and clean condition as is possible and upon completion of the work authorized herein, shall leave the County Highway in a thoroughly neat, clean and usable condition.

4. The Permittee also agrees by the acceptance of this permit to properly maintain any encroachment structure placed by the Permittee on any part of the County Highway and to immediately repair any damage to any portion of the highway, which occurs as a result of the maintenance of the said encroachment structure, until such time as the Permittee may be relieved of the responsibility for such maintenance by the County of San Joaquin.

5. The Permittee also agrees by the acceptance of this permit to make, at its own expense, such repairs as may be deemed necessary by the County Department of Public Works.

6. It is further agreed by the Permittee that whenever construction, reconstruction or maintenance work upon the highway is necessary, the installation provided for herein shall, upon request of the County Department of Public Works, be immediately moved or removed by and at the sole expense of the Permittee.

7. No material used for fill or backfill in the construction of the encroachment shall be borrowed or taken from within the County right of way.

8. All work shall be planned and carried out with as little inconvenience as possible to the traveling public. No material shall be stacked within eight feet (8') of the edge of the pavement or traveled way unless otherwise provided herein. Adequate provision shall be made for the protection of the traveling public. Traffic control standards shall be utilized including barricades; approved signs and lights; and flagmen, as required by the particular work in progress.

9. The Permittee, by the acceptance of this permit, shall assume full responsibility for all liability for personal injury or damage to property which may arise out of the work herein permitted or which may arise out of the failure of the part of the Permittee to properly perform the work provided under this permit. In the event any claim of such liability is made against the County of San Joaquin or any department, official or employee thereof, the Permittee shall defend, indemnify, and hold each of them harmless for such claim.

10. All backfill material is to be moistened as necessary and thoroughly compacted with mechanical means. If required by the County Director of Public Works, such backfill shall consist of gravel or crushed rock. The Permittee shall maintain the surface over structures placed hereunder as may be necessary to insure the return of the roadway to a completely stable condition and until relieved of such responsibility by the County Department of Public Works. Wherever a gravel, crushed rock or asphalt surface is removed or damaged in the course of work related to the permitted encroachment, such material shall either be separately stored and replaced in the roadway as nearly as possible in its original state or shall be replaced in kind, and the roadway shall be left in at least as good a condition as it was before the commencement of operations of placing the encroachment structure.

11. Whenever it becomes necessary to secure permission from abutting property owners for the proposed work, such authority must be secured by the Permittee prior to starting work.

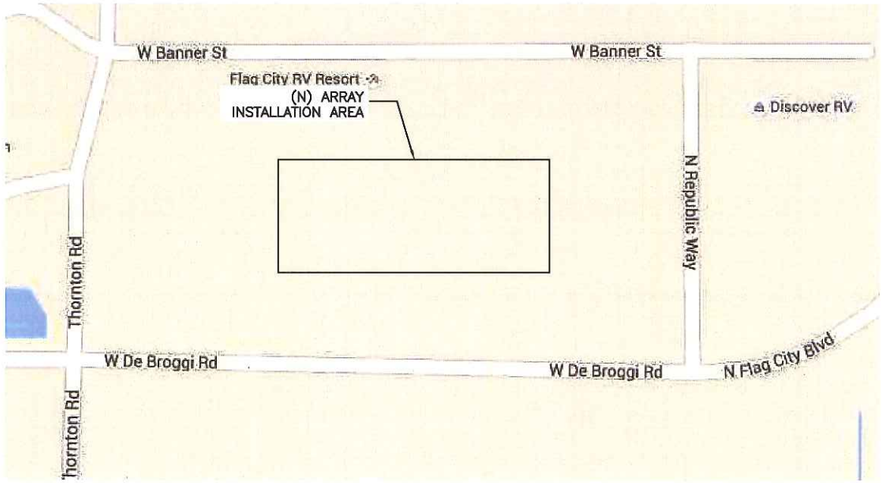
12. The current and future safety and convenience of the traveling public shall be given every consideration in the location and methods of construction utilized.

13. The Permittee is responsible for the preservation of survey monuments located within the area of work herein permitted. Prior to the start of construction, survey monuments that potentially may be disturbed shall be located and referenced by a Licensed Land Surveyor, and a Corner Record filed with the County Surveyor. Any Survey Monuments disturbed during the course of construction shall be reestablished by a Licensed Land Surveyor and another Corner Record filed with the County Surveyor. (Land Surveyors' Act Section 8771)

14. Prior to any excavation, the Permittee shall notify USA North (Underground Service Alert of Northern California and Nevada) at 811 or 800-227-2600 forty-eight (48) hours in advance.

PHOTOVOLTAIC SYSTEM - FLAG CITY DRAINAGE AREA
14790 N THORNTON RD., LODI, CA 95242

Vicinity Map:



System Specifications:

PANEL MODEL	TRINA_SOLAR TSM-350DD14A(II)
NUMBER OF PANELS AT RV RESORT	317
NUMBER OF PANELS AT DRAINAGE AREA	1,172
SYSTEM POWER, KWSTC	521.2
SYSTEM POWER, KWAC	400
ARRAY SQUARE FOOTAGE	6,628
ARRAY WEIGHT (LBS)	18,164
APPLICABLE CODE	CEC 2013
CONSTRUCTION TYPE	COMMERCIAL
ASHRAE STATION	STOCKTON METROPOLITAN ARPT
ASHRAE 2% HIGH DESIGN TEMP. DB	38
ASHRAE MIN MEAN EXTREME ANNUAL DB	-3

SCOPE OF WORK:

ALL ELECTRICITY GENERATED IS FOR CONSUMPTION ON SITE.
SYSTEM ELECTRICAL CONNECTION TO MAIN ELECTRICAL SERVICE IS AT 480Y/277V SWITCHGEAR.
PERMIT SHALL INCLUDE LABOR OF INSTALLING PANELS, RUNNING OF ELECTRICAL CONDUITS, INSTALLATION OF NEW ELECTRICAL EQUIPMENT AND ELECTRICAL CONNECTION TO EXISTING BUILDING SERVICE.
NO BATTERIES REQUIRED AS PART OF THIS PROJECT SCOPE.

Contact Info:

FLAG CITY DRAINAGE AREA
14790 N THORNTON RD.
LODI, CA 95242

GENERAL CONTRACTOR:
NUANCE ENERGY GROUP, INC.
501 CEDAR ST., SUITE E
SANTA CRUZ, CA 95060

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

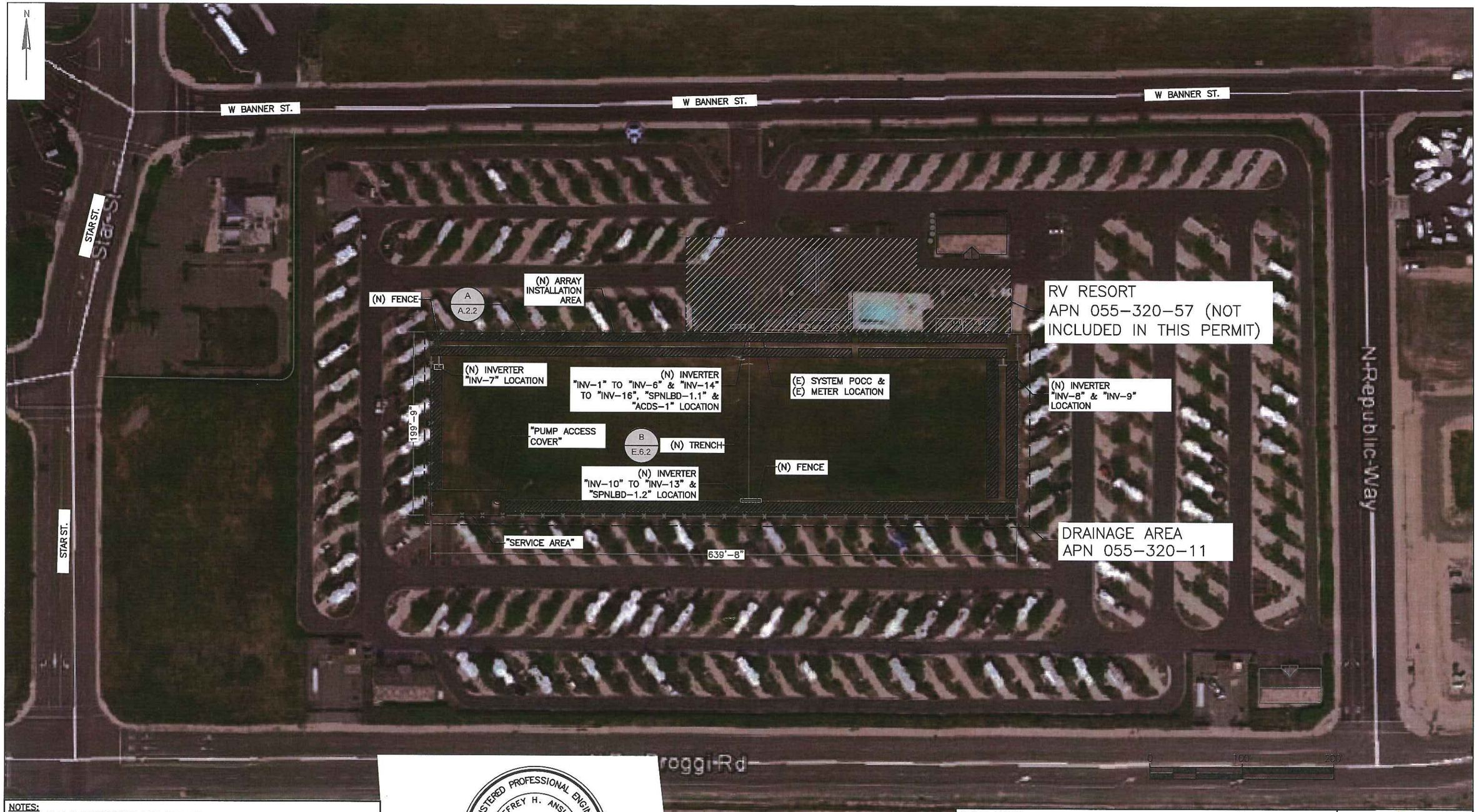
Table of Contents:

REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME: TITLE PAGE

NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07-FEB-17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	T



NOTES:
1. ALL SITE MEASUREMENTS ARE APPROXIMATE & SHALL BE FIELD VERIFIED.
2. ALL PANEL DIMENSIONS INCLUDE 1/2" CLEARANCE.
3. DIMENSIONS ARE SHOWN BASED ON PLAN VIEW PROJECTION.

SYSTEM INFO

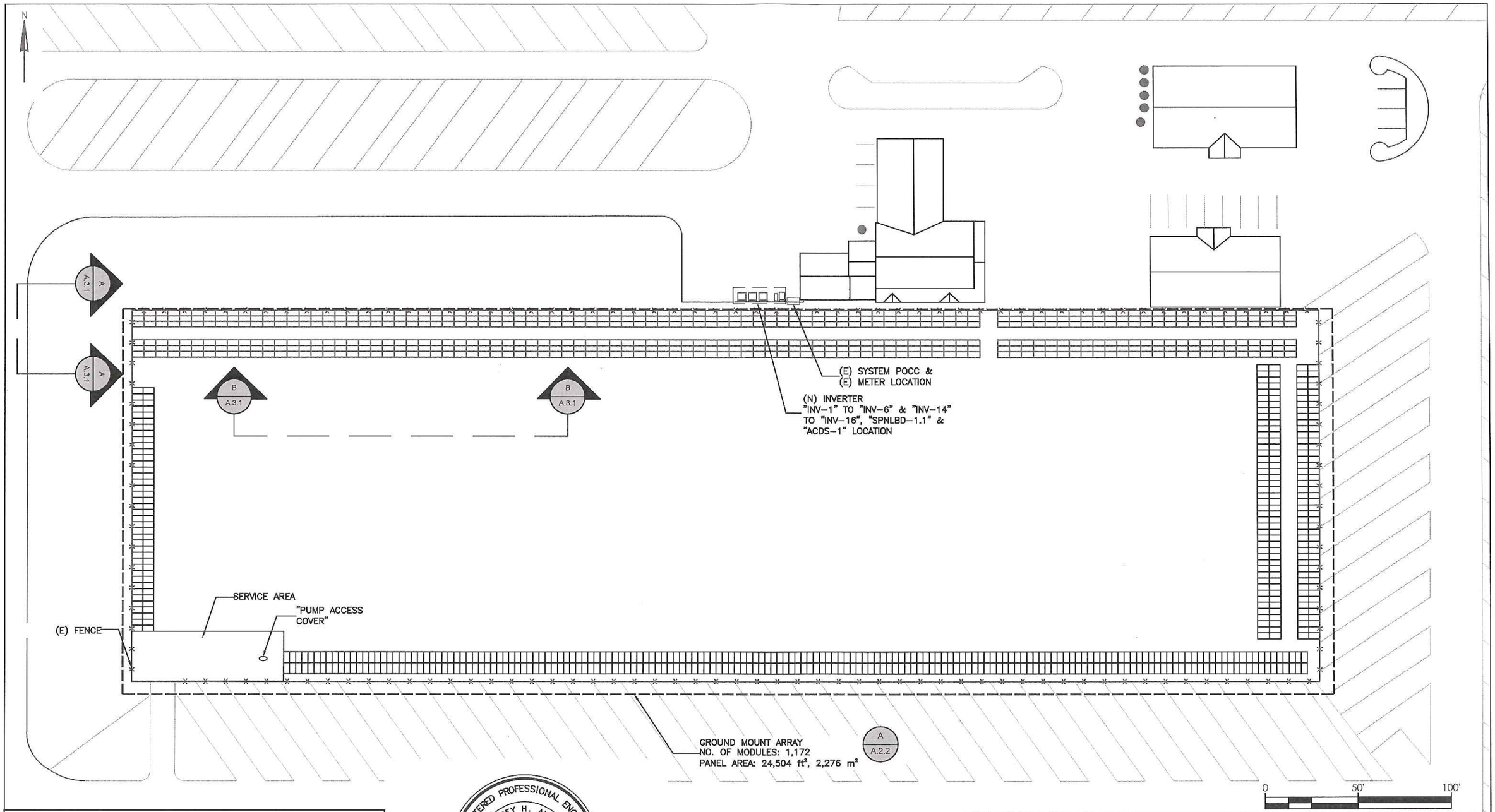
SYSTEM SIZE	: 521.15KWSTC; 400KWAC
PANEL USED	: (1,489) TRINA SOLAR TSM-350 DD14A(II) (350W)
STRING PROPERTIES	: 66 STRINGS OF 16 IN SERIES, 23 STRINGS OF 18 IN SERIES, 1 STRING OF 19 IN SERIES,
TYPE OF INVERTER	: (16) TABUCHI EPW-T250P6-US-T (25KW)

REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME: SITE PLAN

NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07-FEB-17
SCALE: 1"=100'-0"	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	A.1.1



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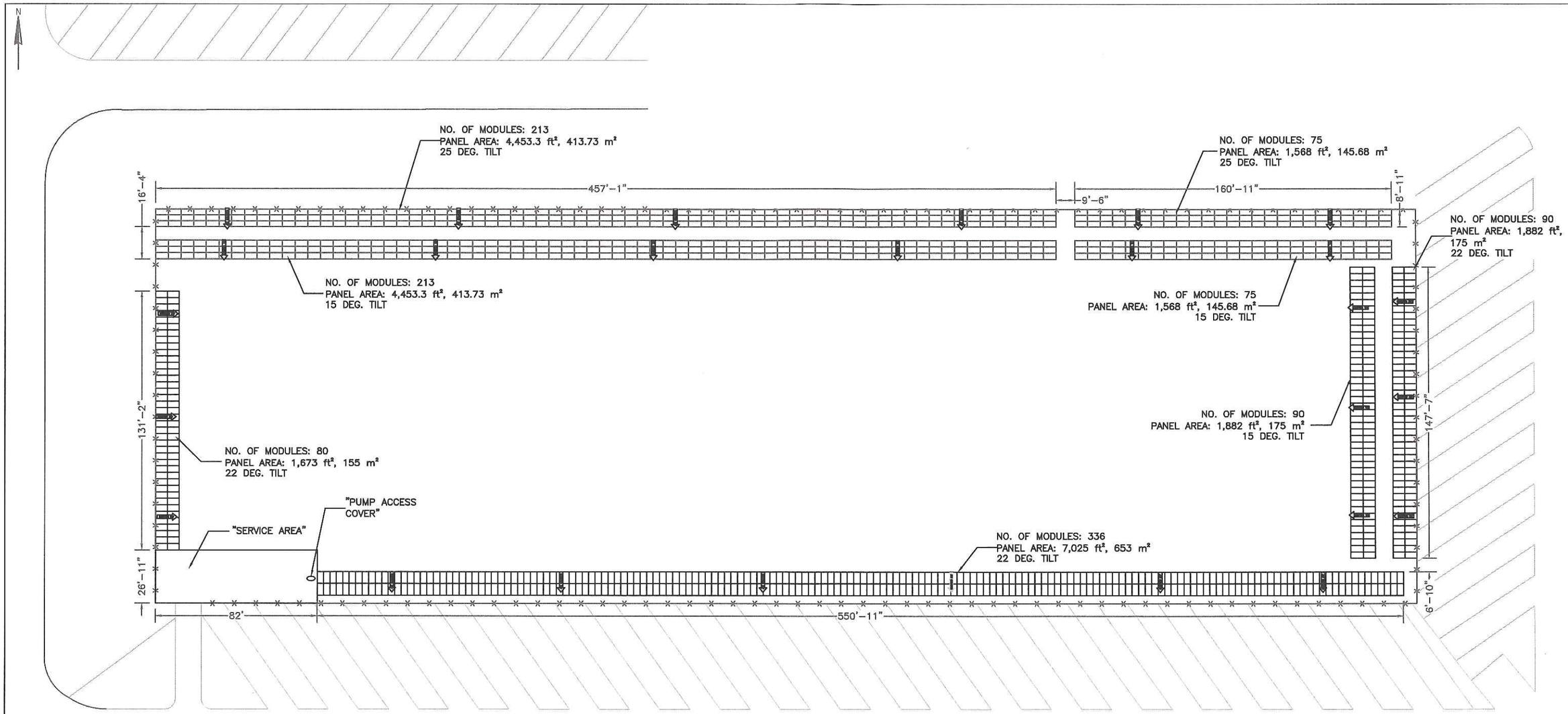
REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME:

ARRAY PLAN

NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07-FEB-17
SCALE: 1"=50'-0"	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	A.2.1



A GROUND MOUNT ARRAY
SCALE: 1"=50'-0"

NOTES:
1. ALL SITE MEASUREMENTS ARE APPROXIMATE & SHALL BE FIELD VERIFIED.
2. ALL PANEL DIMENSIONS INCLUDE 1/2" CLEARANCE.
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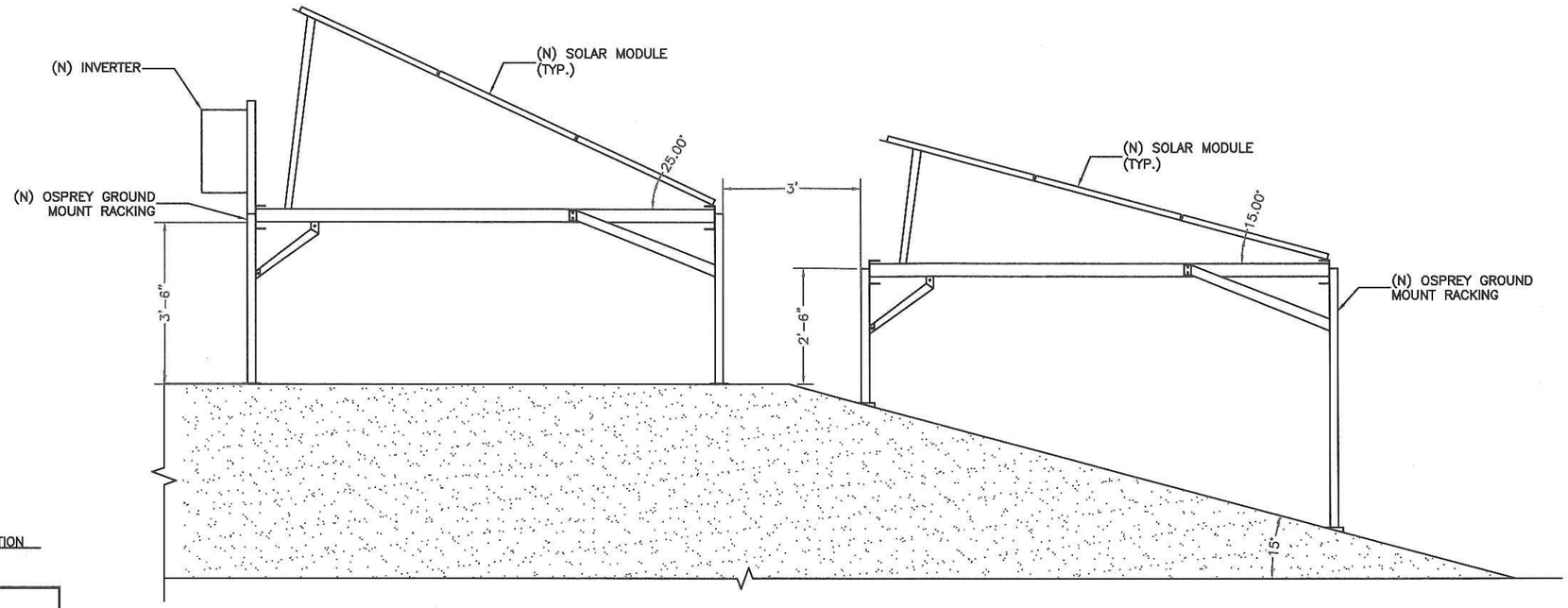
REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME:
DETAILED ARRAY PLAN

NUANCE ENERGY GROUP
Leading Solar Innovation

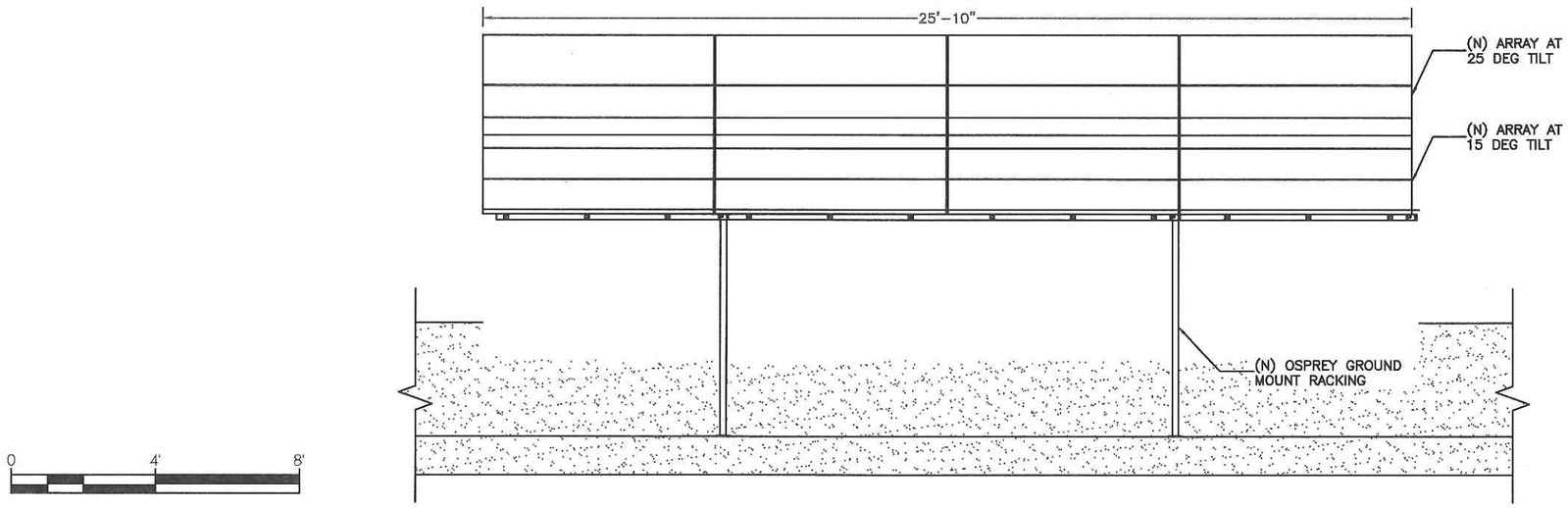
SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07-FEB-17
SCALE: 1"=50'-0"	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	A.2.2



0 3' 6'

A GROUND MOUNT ARRAY EAST ELEVATION
SCALE: 1"=3'-0"

NOTE:
DIMENSIONS ON STRUCTURAL SHEETS SHALL GOVERN.



0 4' 8'

B GROUND MOUNT ARRAY NORTH ELEVATION
SCALE: 1"=4'-0"

NOTE:
DIMENSIONS ON STRUCTURAL SHEETS SHALL GOVERN.

REGISTERED PROFESSIONAL ENGINEER
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Exp: 06/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME: GROUND MOUNT ARRAY ELEVATION

NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07-FEB-17
SCALE: VARIES	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	A.3.1

GENERAL ELECTRICAL NOTES FOR PHOTOVOLTAIC SYSTEM

1. THIS PROPOSED SOLAR ELECTRIC SYSTEM IS INTENDED TO OPERATE IN PARALLEL WITH POWER RECEIVED FROM THE UTILITY SERVICE PROVIDER.

2. THE INVERTER FOR THE PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE IDENTIFIED FOR USE IN SOLAR PHOTOVOLTAIC SYSTEMS. ALL EQUIPMENT SHALL BE UL 1741 APPROVED.

3. THIS SYSTEM IS INTENDED TO CONNECT TO THE EXISTING FACILITY'S POWER SYSTEM AT ONE POINT, POINT OF COMMON COUPLING (POCC). THIS CONNECTION SHALL BE IN COMPLIANCE WITH THE NEC ARTICLE 690.64 "POINT OF CONNECTION".

4. ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION FOR TESTING AND ISOLATION. ALL COMBINER BOXES SHALL HAVE DISCONNECTION MEANS NEAR THE COMBINER FOR ISOLATION AND TESTING.

5. ALL DISCONNECTS AND COMBINERS SHALL BE SECURED FROM UNAUTHORIZED/UNQUALIFIED PERSONNEL BY LOCK OR LOCATION.

6. ALL DISCONNECTS, COMBINERS, PULL/SPLICE BOXES AND ENCLOSURES SHALL BE LISTED FOR ITS PURPOSE.

7. EQUIPMENT SHALL BE INSTALLED IN A SECURE AREA. INVERTER PERFORMANCE MAY BE AFFECTED IF INSTALLED IN DIRECT SUNLIGHT.

8. ALL PARTS SPECIFIED IN THESE DRAWINGS MAY BE REPLACED BY EQUIVALENT PARTS FROM ANOTHER MANUFACTURER.

WIRING AND WIRING METHODS

ALL WIRING METHODS AND INSTALLATION PRACTICES SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LOCAL STATE CODES, AND OTHER APPLICABLE LOCAL CODES.

1. EXPOSED PV SOLAR PANEL WIRING WILL BE PV WIRE, 90 DEGREE C, WET RATED. ALL EXPOSED CABLES, SUCH AS MODULE LEADS SHALL BE SECURED WITH MECHANICAL OR OTHER SUNLIGHT RESISTANT MEANS.

2. ALL GROUNDED CONDUCTORS SHALL BE WHITE AND EQUIPMENT GROUNDING CONDUCTORS SHALL BE GREEN OR BARE. (NEC 200.6)

3. FOR UNGROUNDED DC SYSTEMS PER 690.35, CONDUCTOR OR CONDUCTOR LABEL COLORS SHALL BE RED FOR POSITIVE CONDUCTORS, AND BLACK FOR NEGATIVE CONDUCTORS. DO NOT USE WHITE OR GREY CONDUCTORS OR LABELS WITH UNGROUNDED OR TRANSFORMERLESS DC SYSTEMS.

4. ALL FIELD WIRING LARGER THAN 6 AWG THAT IS NOT COLOR CODED SHALL BE TAGGED AT BOTH ENDS WITH PERMANENT WIRE MAKERS, IDENTIFYING POLARITY AND GROUND.

5. FITTINGS FOR EXTERIOR RUNS OF EMT SHALL BE RAIN-TIGHT COMPRESSION TYPE

6. LIQUID TIGHT FLEXIBLE METAL CONDUIT IS GENERALLY SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO GREATER THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS OR CONDUIT FITTINGS) AND NO GREATER THAN 36 INCHES APART (NEC 351).

7. LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT IS GENERALLY SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO GREATER THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS OR CONDUIT FITTINGS) AND NO MORE THAN 36 INCHES APART (NEC 351).

8. LONG STRAIGHT CONDUIT RUNS, 100 FEET OR MORE, SHALL HAVE EXPANSION FITTINGS.

9. UNLESS MARKED AS UV RESISTANT, PVC IS NOT APPROVED FOR INSTALLATION IN LOCATIONS SUBJECT TO DIRECT SUNLIGHT AND SHALL NOT BE EMPLOYED IN ANY SUCH LOCATION.

10. IF USED, ALL EXPOSED WIRENUTS ARE TO BE SILICONE FILLED. EQUIVALENT TO IDEAL BLUE, AND MUST BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS BY A QUALIFIED/CERTIFIED PERSON.

11. FUSES AND WIRES SUBJECT TO TRANSFORMER INRUSH CURRENT SHALL BE SIZED ACCORDINGLY.

12. ALL DC MATERIALS SHALL BE UL LISTED FOR 600 OR 1000VDC DEPENDING ON THE INVERTER OPERATING VOLTAGE.

13. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM SHALL NOT BE CONTAINED IN THE SAME RACEWAY CABLE TRAY, CABLE, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTINGS AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER.

14. PULL BOXES SHALL BE PROVIDED IN ACCORDANCE WITH NEC 314.28. CONDUIT BODY TYPES T AND L SHALL NOT BE USED FOR 600V LISTED WIRING. CONDUIT BODY TYPES T AND L USED FOR 300V LISTED WIRING SHALL BE METALLIC.

15. CONNECTORS SHALL BE TORQUED PER DEVICE LISTING OR MANUFACTURER'S RECOMMENDATIONS.

16. SPLIT BOLTS/SPLICES/CONNECTORS SHALL BE INSULATED WITH APPROVED MEANS. UL LISTED ELECTRICAL TAPE ALONE IS NOT SUITABLE AS THE ONLY INSULATING MEANS. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR APPLICATION OF INSULATING PRODUCT.

17. ALL CONDUITS ON ROOF MUST BE AT MIN. 3 1/2" ABOVE ROOF.

GROUNDING

SEE ELECTRICAL DIAGRAM AND ELECTRICAL DETAILS FOR MORE GROUNDING INFORMATION.

1. ONLY ONE CONNECTION TO DC CIRCUITS AND ONE CONNECTION TO AC CIRCUITS WILL BE USED FOR SYSTEM GROUNDING (NEC250-21) (REFERENCED TO THE SAME POINT).

2. EQUIPMENT GROUNDING AND SYSTEM GROUNDING CONDUCTORS WILL HAVE AS SHORT A DISTANCE TO GROUND AS POSSIBLE WITH A MINIMUM NUMBER OF TURNS.

3. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER GROUNDING; NOTING THAT TERMINAL LUGS BOLTED ON AN ENCLOSURE'S FINISHED SURFACE MAY BE INSULATED BECAUSE OF PAINT/FINISH. PAINT/FINISH AT POINT OF CONTACT SHALL BE PROPERLY REMOVED.

4. MODULES SHALL BE GROUNDED WITH EQUIPMENT GROUNDING CONDUCTORS BONDED TO A LOCATION APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE.

5. THE CONNECTION TO THE MODULE OR PANEL OF THIS PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE ARRANGED SO THAT REMOVAL OF A MODULE OR A PANEL FROM THE PHOTOVOLTAIC SOURCE CIRCUIT DOES NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER PHOTOVOLTAIC SOURCE CIRCUIT. SETS OF MODULES INTERCONNECTED AS SYSTEMS RATED AT 50 VOLTS OR LESS WITH OR WITHOUT BLOCKING DIODES, AND HAVING A SINGLE OVER CURRENT DEVICE SHALL BE CONSIDERED A SINGLE SOURCE CIRCUIT.

6. GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE INCLUDING BUT NOT LIMITED TO GROUND RODS, GROUNDING LUGS, GROUNDING CLAMPS, ETC. GROUNDING DEVICES EXPOSED TO THE ENVIRONMENT SHALL BE RATED FOR DIRECT BURIAL.

GROUND FAULT PROTECTION

1. PHOTOVOLTAIC INVERTERS SHALL BE EQUIPPED WITH DC GROUND FAULT PROTECTION TO REDUCE FIRE HAZARDS. INVERTERS SHALL BE EQUIPPED WITH ANTI-ISLANDING CIRCUITRY.

DISCONNECTING MEANS

1. MEANS SHALL BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER CONDUCTORS IN THE BUILDING.

2. WHERE A CIRCUIT GROUNDING CONNECTION IS NOT DESIGNED TO BE AUTOMATICALLY INTERRUPTED AS PART OF THE GROUND-FAULT PROTECTION SYSTEM REQUIRED BY SECTION 690-5, A SWITCH OR CIRCUIT BREAKER USED AS A DISCONNECTING MEANS SHALL NOT HAVE A POLE IN THE GROUNDED CONDUCTOR.

3. THE GROUNDED CONDUCTOR MAY HAVE A BOLTED OR TERMINAL DISCONNECTING MEANS TO ALLOW MAINTENANCE OR TROUBLESHOOTING BY QUALIFIED PERSONNEL.

4. THE DISCONNECTING MEANS SHALL NOT BE REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH SECTION 690-17.

5. EQUIPMENT SUCH AS PHOTOVOLTAIC SOURCE CIRCUITS, OVER CURRENT DEVICES, AND BLOCKING DIODES SHALL BE PERMITTED ON THE PHOTOVOLTAIC SIDE OF THE PHOTOVOLTAIC DISCONNECTING MEANS.

6. MEANS SHALL BE PROVIDED TO DISCONNECT EQUIPMENT SUCH AS INVERTERS, BATTERIES, CHARGE CONTROLLERS, AND THE LIKE FROM ALL UNGROUNDED CONDUCTORS OF ALL SOURCES. IF THE EQUIPMENT IS ENERGIZED FROM MORE THAN ONE SOURCE, THE DISCONNECTING MEANS SHALL BE GROUPED AND IDENTIFIED.

7. A SINGLE DISCONNECTING MEANS SHALL BE PERMITTED FOR THE COMBINED AC OUTPUT OF ONE OR MORE INVERTERS IN AN INTERACTIVE SYSTEM.

8. 690-16 FUSES. DISCONNECTING MEANS SHALL BE PROVIDED TO DISCONNECT A FUSE FROM ALL SOURCES OF SUPPLY IF THE FUSE IS ENERGIZED FROM BOTH DIRECTIONS AND ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS. SUCH A FUSE IN PHOTOVOLTAIC SOURCE CIRCUIT SHALL BE CAPABLE OF BEING DISCONNECTED INDEPENDENTLY OF FUSES IN OTHER PHOTOVOLTAIC SOURCE CIRCUITS.

REQUIRED SAFETY SIGNS AND LABELS

REQUIRED SAFETY SIGNS AND LABELS SHALL BE PERMANENTLY ATTACHED BY ADHESIVE OR OTHER MECHANICAL MEANS. LABELS SHALL COMPLY WITH ARTICLE 690 OF THE NEC OR OTHER APPLICABLE STATE AND LOCAL CODES. SEE LABELS AND MARKING PAGE E.8 FOR MORE INFORMATION

1. ANY SWITCH, FUSES, OR CIRCUIT BREAKERS THAT CAN BE ENERGIZED IN EITHER DIRECTION SHALL BE LABELED AS FOLLOWS:

WARNING:
ELECTRICAL SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

2. THIS PHOTOVOLTAIC SYSTEM WILL BE EQUIPPED WITH AN AC DISCONNECT WHICH WILL BE LABELED AS FOLLOWS:

PHOTOVOLTAIC
DISCONNECTING MEANS
AC DISCONNECT

3. A MARKING SPECIFYING THE PHOTOVOLTAIC POWER SOURCE RATED AS FOLLOWS SHALL BE PROVIDED AT AN ACCESSIBLE LOCATION AT THE DISCONNECTION MEANS FOR THE POWER SOURCE:

OPERATING CURRENT
OPERATING VOLTAGE
MAXIMUM SYSTEM VOLTAGE
SHORT CIRCUIT CURRENT
FUSE RATING

MARKINGS

1. ALL INTERACTIVE SYSTEM POINTS OF INTERCONNECTION WITH OTHER SOURCES SHALL BE MARKED AT AN ACCESSIBLE LOCATION AT THE DISCONNECTION MEANS.

2. A PERMANENT PLAQUE OR DIRECTORY SHALL BE PROVIDED IDENTIFYING THE LOCATION OF THE SERVICE DISCONNECTION MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTION MEANS, IF NOT LOCATED AT THE SAME LOCATION.

3. PHOTOVOLTAIC MODULES SHALL BE MARKED TO IDENTIFY LEAD POLARITY, DEVICE RATINGS, AND SPECIFICATIONS FOR VOLTAGE, CURRENT, AND POWER.

GENERAL NOTES FOR PHOTOVOLTAIC INVERTERS

1. CONDUIT AND CONDUCTORS: ALL INTERCONNECT WIRING AND POWER CONDUCTORS INTERFACING THE UNIT MUST BE IN ACCORDANCE WITH THE NEC ANSI/NFPA 70 AND ANY APPLICABLE LOCAL CODES. LARGE GAUGE WIRE MUST CONFORM TO THE MINIMUM BEND RADIUS SPECIFIED IN THE NEC, ARTICLE 373-6B, NINTH EDITION. KEEP ALL WIRE BUNDLES AWAY FROM ANY SHARP EDGES TO AVOID DAMAGE TO WIRE INSULATION. ALL CONDUCTORS SHOULD BE MADE OF COPPER AND RATED FOR 90 DEGREE C MINIMUM. FOR OUTDOOR INSTALLATIONS, ALL INTERCONNECT CONDUITS AND FITTINGS MUST BE NEMA-4 RATED AS REQUIRED BY NEC. FOR WIRE GAUGE, BOLT SIZE, AND TORQUE VALUES FOR THE DC AND AC TERMINALS, SEE INSTALLATION MANUAL.

2. INVERTER ENCLOSURE: INVERTERS ARE INDOOR/OUTDOOR RATED. RUGGED HEAVY GAUGE METAL WITH ENAMEL COATED PAINT ON ALL SURFACES. ALL REMOVABLE INTERNAL PANELS ARE GALVANIZED. ALL SURFACES ARE PAINTED WITH (2) COATS OF RUST INHIBITING PRIMER AND PAINTED WITH UL LISTED RAL 7032.

3. OPERATOR INTERFACE CONTROLS: OPERATOR INTERFACE CONTROLS ARE LOCATED ON THE FRONT OF THE MAIN INVERTER ENCLOSURE. CONSULT THE OPERATIONS AND MAINTENANCE MANUAL FOR INSTRUCTIONS AND CODE REFERENCES.

4. ELECTRICAL SAFETY FEATURES:

E-STOP BUTTON IS LOCATED ON THE OPERATOR INTERFACE PANEL ON THE MAIN DOOR OF THE INVERTER. TRIGGERING OF THE E-STOP WILL RESULT IN IMMEDIATE SHUTDOWN OF THE UNIT. (NOTE: OPENING THE DOOR WILL CAUSE THE UNIT TO TRIP AND THERE WILL BE LIVE PARTS IN THE INPUT AND OUTPUT SECTION.)

DISCONNECTING DEVICES BETWEEN THE SOLAR ARRAY PANELS, THE UTILITY, AND THE UNIT ARE PROVIDED FOR THE INVERTER ENCLOSURE. THESE DISCONNECT SWITCHES ARE TO BE USED FOR ISOLATING THE SOLAR ARRAY PANELS FROM THE UNIT FOR MAINTENANCE PURPOSES AND ARE TO BE USED AS NO-LOAD DISCONNECTING DEVICES ONLY.

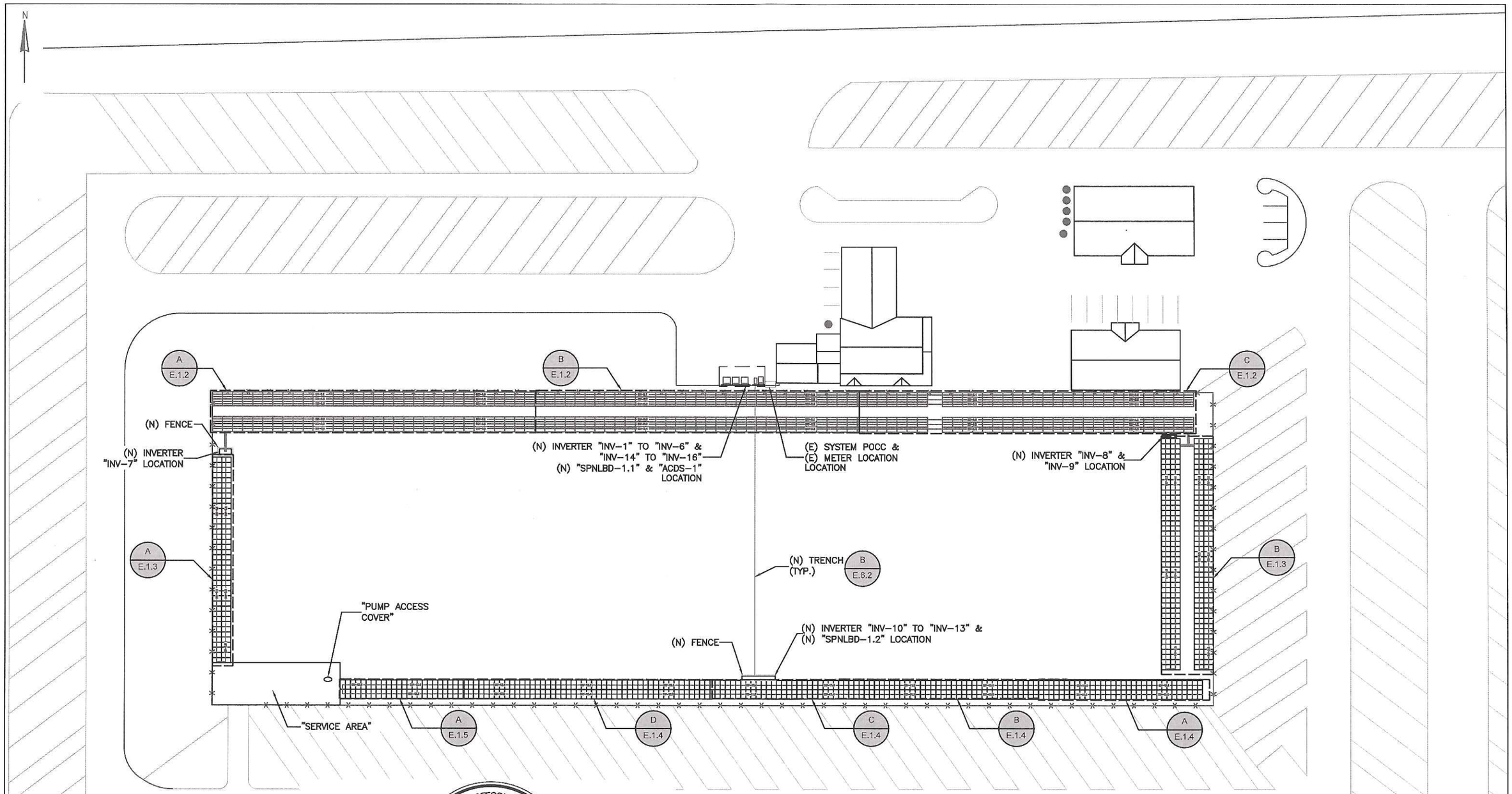
THE UNIT HAS ONLY ONE MODE OF OPERATION, LINE LINKAGE MODE (GRID EXPORT MODE). THE THREE PHASE OUTPUT VOLTAGES AND CURRENTS ARE SINUSOIDAL WITH LOW TOTAL HARMONIC DISTORTION MEETING IEEE 519-1992 HARMONIC STANDARDS.

THE ANTI-ISLANDING TRIP TIME IS LESS THAN (2) SECONDS AS PER UL 1741 STANDARDS. THE INVERTER UNIT WILL AUTOMATICALLY SHUT DOWN WHEN THE LOSS OF GRID POWER IS DETECTED.

5. PV PROTECTION DEVICE

THE UNIT COMES EQUIPPED WITH A UL1741 APPROVED GROUND FAULT CIRCUIT INTERRUPTER ("GFCI"). EQUIPMENT GROUNDING CONDUCTORS SIZED PER TABLE 250.122 IN ACCORDANCE WITH NEC 250.122(F)(2).

SHEET NAME: ELECTRICAL NOTES			NUANCE ENERGY GROUP Leading Solar Innovation
SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07-FEB-17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.0.1



NOTES:–
1. CONTRACTOR TO SUBMIT FOR APPROVAL– A SKETCH DETAILING INTENDED MOUNTING AND ROUTING OF CONDUITS AND TRANSITIONS FROM ROOFS TO WALLS, GROUND–MOUNT RACKING, TRENCHES & FROM ENCLOSURE TO ENCLOSURE.
2. DC AND AC WIRING HOME RUNS FROM STRINGS TO INVERTERS AND INVERTERS TO SPNLBD–1.1 TO BE RUN ABOVE GROUND MOUNTED TO RACKING STRUCTURES EXCEPT BETWEEN STRUCTURES IN TRENCHES AS INDICATED.
3. USE PVC CONDUITS IN TRENCHES.

REGISTERED PROFESSIONAL ENGINEER
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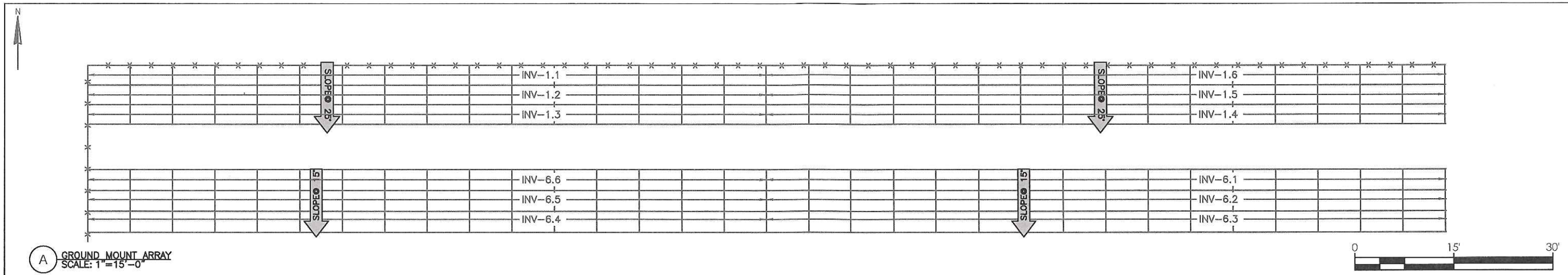
0 60' 120'

SHEET NAME:

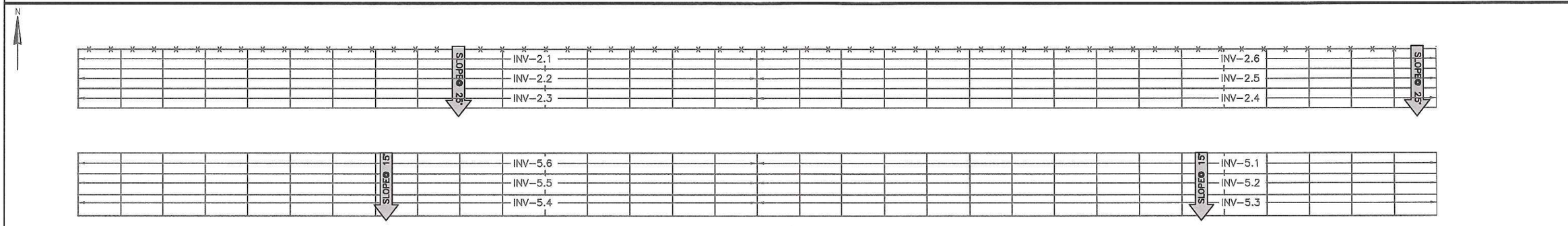
ELECTRICAL SITE PLAN

NUANCE ENERGY GROUP
Leading Solar Innovation

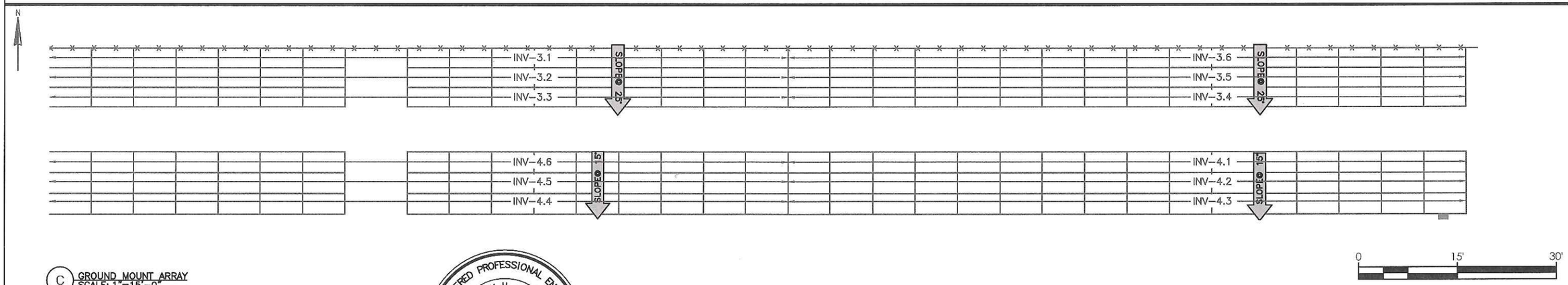
SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07–FEB–17
SCALE: 1"=60'–0"	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.1.1



A GROUND MOUNT ARRAY
SCALE: 1"=15'-0"



B GROUND MOUNT ARRAY
SCALE: 1"=15'-0"



C GROUND MOUNT ARRAY
SCALE: 1"=15'-0"

STRING NAME
INV - # . # STRING NUMBER ASSOCIATED INVERTER

REGISTERED PROFESSIONAL ENGINEER
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Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
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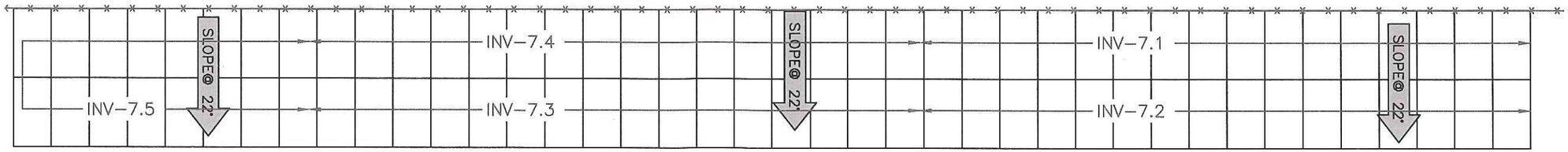
SHEET NAME: DETAILED ELECTRICAL SITE PLAN-1

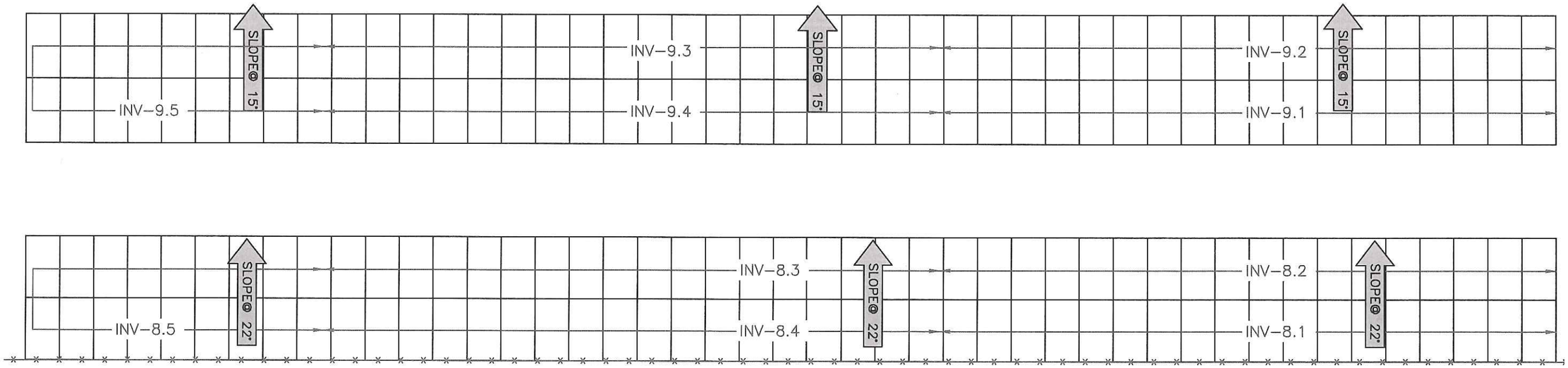
NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07-FEB-17
SCALE: 1"=15'-0"	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.1.2



A GROUND MOUNT ARRAY
SCALE: 1"=15'-0"

0 15' 30'



0 10' 20'

STRING NAME
INV – # . # (STRING NUMBER / ASSOCIATED INVERTER)

B GROUND MOUNT ARRAY
SCALE: 1"=10'-0"

REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
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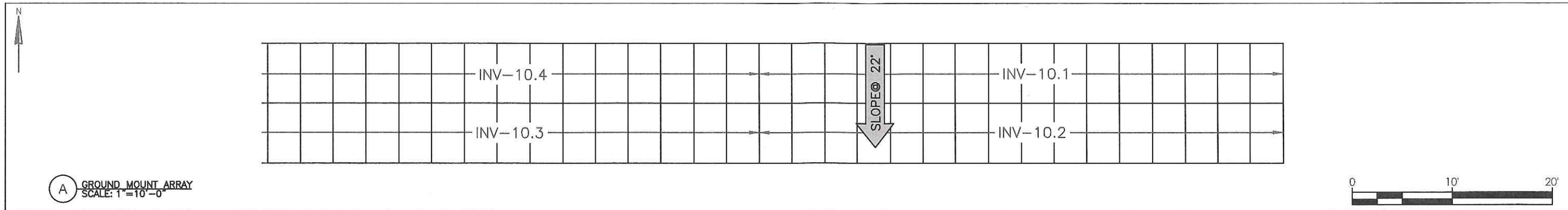
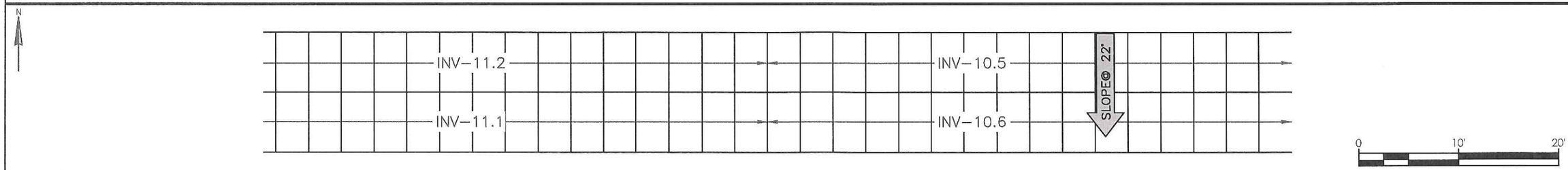
SHEET NAME: DETAILED ELECTRICAL SITE PLAN–2

NUANCE ENERGY GROUP
Leading Solar Innovation

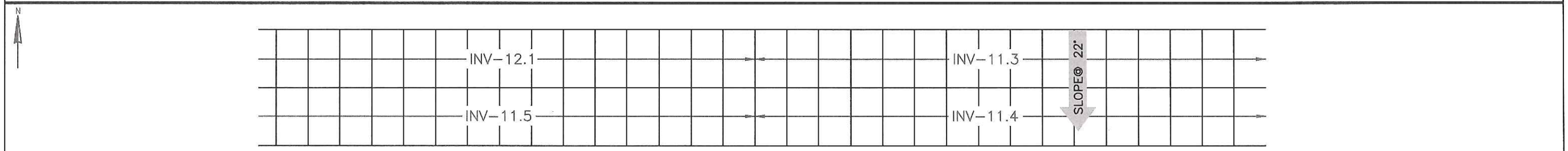
SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07–FEB–17
SCALE: VARIES	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.1.3



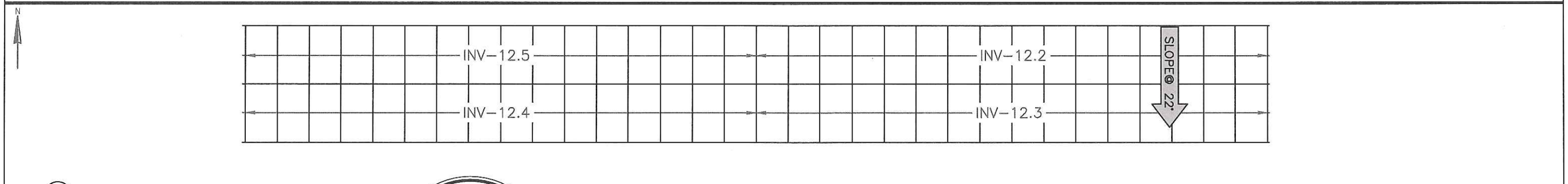
A GROUND MOUNT ARRAY
SCALE: 1"=10'–0"



B GROUND MOUNT ARRAY
SCALE: 1"=10'–0"



C GROUND MOUNT ARRAY
SCALE: 1"=10'–0"



D GROUND MOUNT ARRAY
SCALE: 1"=10'–0"

STRING NAME
INV – # . # STRING NUMBER ASSOCIATED INVERTER

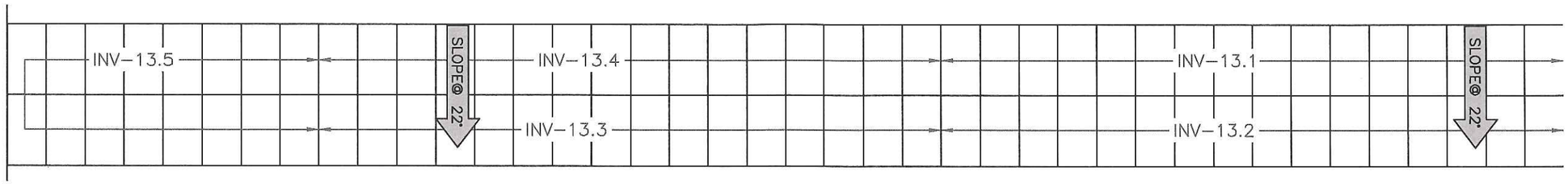
REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME: DETAILED ELECTRICAL SITE PLAN–3

NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07–FEB–17
SCALE: 1"=10'–0"	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.1.4

N



A GROUND MOUNT ARRAY
SCALE: 1"=10'–0"

0 10' 20'

STRING NAME
INV – # . # STRING NUMBER ASSOCIATED INVERTER

REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 09/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME: DETAILED ELECTRICAL SITE PLAN–4			NUANCE ENERGY GROUP Leading Solar Innovation
SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07–FEB–17
SCALE: 1"=10'–0"	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.1.5

(13) 25KW (480V) TABUCHI ELECTRIC INVERTER
421.4KWSTC; 325KWAC
1,204 MODULES, TRINA SOLAR TSM-350 DD14A(II) (350W)
16 MODULES PER STRING, 64 STRINGS
STRING VOLTAGE: 548.7V VMP HIGH TEMP, 811.3V VOC MAX.
18 MODULES PER STRING, 10 STRINGS
STRING VOLTAGE: 617.3V VMP HIGH TEMP, 912.7V VOC MAX.
STRING AMPERAGE: 9.09A IMP, 9.60A ISC

NORTH ARRAY (576 MODULES)		WEST ARRAY (80 MODULES)	EAST ARRAY & R-2 (212 MODULES)		SOUTH ARRAY (336 MODULES)		
6 STRINGS 16 MODULES	6 STRINGS 16 MODULES	5 STRINGS 16 MODULES	5 STRINGS 16 MODULES(FAST ARRAY) 1 STRING 16 MODULES(R-2)	5 STRINGS 18 MODULES(FAST ARRAY) 1 STRING 16 MODULES(R-2)	6 STRINGS 16 MODULES	5 STRINGS 16 MODULES	5 STRINGS 16 MODULES

E.4.1
TABLE A1

"INV-1" "INV-6" "INV-7" "INV-8" "INV-9" "INV-10" "INV-11" "INV-13"

TABUCHI ELECTRIC EMVAS (25KW)
480V INVERTER SYSTEM
(6 INDEPENDENT MPPTS FOR EACH INPUT)
DC LUGS – 12 AWG (MIN.)
4 AWG (MAX.)
AC LUGS– 6 AWG (MIN.)
4 AWG (MAX.)
(TYPICAL 1 OF 13)

AC1.1	AC1.6	AC1.7	AC1.8	AC1.9	AC1.10	AC1.11	AC1.13
1 - 1" EMT	1 - 1" EMT	1 - 1-1/2" EMT	1 - 1-1/2" EMT	1 - 1-1/2" EMT	1 - 1" EMT	1 - 1" EMT	1 - 1" EMT
4 - 6 AWG, CU-THWN-2	4 - 6 AWG, CU-THWN-2	4 - 2 AWG, CU-THWN-2	4 - 2 AWG, CU-THWN-2	4 - 2 AWG, CU-THWN-2	4 - 6 AWG, CU-THWN-2	4 - 6 AWG, CU-THWN-2	4 - 6 AWG, CU-THWN-2
1 - 8 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2

(N) SOLAR PANELBOARD
"SPNLBD-1.2"
200A, 480Y/277V, 3ø, 4W
10KAIC
SEE NOTE #1

40AF 40AT 3P | 40AF 40AT 3P | 40AF 40AT 3P

AC1.17
1 - 2-1/2" PVC
4 - 3/0 AWG, CU-THWN-2
1 - 2 AWG, CU-THWN-2

TO "SPNLBD-1.1" REFER
SHEET E.2.2

REGISTERED PROFESSIONAL ENGINEER
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Exp: 09/30/2017
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STATE OF CALIFORNIA

NOTES:

1. ADD NOTE ON PERMANENTLY AFFIXED LABEL FOR PANEL:
"ENERGY SYSTEM SUPPLY CIRCUITS ONLY, NO LOAD CIRCUITS ALLOWED".

SHEET NAME: SINGLE LINE DIAGRAM –1

NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07–FEB–17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.2.1

(03) 25 KW (480V) TABUCHI ELECTRIC INVERTER
99.75KWSTC; 75KWAC
285 MODULES, TRINA SOLAR TSM-350 DD14A(II) (350W)
16 MODULES PER STRING, 2 STRINGS
STRING VOLTAGE: 548.7V VMP HIGH TEMP, 811.3V VOC MAX.
18 MODULES PER STRING, 13 STRINGS
STRING VOLTAGE: 617.3V VMP HIGH TEMP, 912.7V VOC MAX.
19 MODULES PER STRING, 1 STRING
STRING VOLTAGE: 651.6V VMP HIGH TEMP, 963.5V VOC MAX.
STRING AMPERAGE: 8.99A IMP, 9.78A ISC

CARPORT "C-1" - 162 MODULES & ARRAY "R1" - 123 MODULES

CARPORT "C-1"
5 STRINGS
18 MODULES

5 STRINGS OF 18 MODULES
(4 STRINGS FROM CARPORT "C-1")
(1 STRING FROM ARRAY "R1")

ARRAY "R1"
2 STRINGS, 16 MODULES
3 STRINGS, 18 MODULES
1 STRING, 19 MODULES

E.4.1
TABLE A1

"JB-1"

"JB-2"

"INV-14"

"INV-16"

TABUCHI ELECTRIC EMVAS (25KW)
480V INVERTER SYSTEM
(6 INDEPENDENT MPPTS FOR EACH INPUT)
DC LUGS - 12 AWG (MIN.), 4 AWG (MAX.)
AC LUGS- 6 AWG (MIN.), 4 AWG (MAX.)
(TYPICAL 1 OF

AC1.15
1 - 1" PVC
4 - 6 AWG, CU-THWN-2
1 - 8 AWG, CU-THWN-2

AC1.16
1 - 1-1/4" PVC
4 - 2 AWG, CU-THWN-2
1 - 8 AWG, CU-THWN-2

- 8 AWG, CU-THWN-2

FROM "SPNLBD-1.2" REFER E.2.1
FROM "INV-9" REFER E.2.1
FROM "INV-7" REFER E.2.1
FROM "INV-6" REFER E.2.1
FROM "INV-1" REFER E.2.1

(N) SOLAR PANELBOARD
"SPNLBD-1.1"
800A, 480Y/277V, 3ø, 4W
65KAIC, NEMA 3R
SEE NOTE #1

40AF 40AT 3P | 40AF 40AT 3P | 40AF 40AT 3P | 40AF 40AT 3P | 125AF 125AT 3P | 40AF 40AT 3P | 40AF 40AT 3P | 40AF 40AT 3P

AC1.18
2 - 3-1/2" EMT
4 - 600 MCM, CU-THWN-2
1 - 3/0 AWG, CU-THWN-2

(E) MAIN SWITCHBOARD "MSB"
2000A BUSBAR, 480Y/277V, 3ø, 4W, 65KAIC

TO UTILITY

MAIN BREAKER 2000A

M METER

(E) LOAD | (E) LOAD | (E) LOAD

AC1.19
2 - 3-1/2" EMT
4 - 600 MCM, CU-THWN-2
1 - 3/0 AWG, CU-THWN-2

"ACDS-1"
UTILITY LOCKABLE FUSED AC DISCONNECT
SQUARE D H367NR
DISCONNECT: 800A
OR EQUIVALENT
FUSE: 700A
TERMINAL LUGS:
(2) 500KCMIL (MAX); (2) #3/0 AWG (MIN)
AL OR CU

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NOTES:

1. ADD NOTE ON PERMANENTLY AFFIXED LABEL FOR PANEL: "ENERGY SYSTEM SUPPLY CIRCUITS ONLY, NO LOAD CIRCUITS ALLOWED".

SHEET NAME: SINGLE LINE DIAGRAM -2

NUANCE ENERGY GROUP
Leading Solar Innovators

SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07-FEB-17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.2.2

REFERENCE NOTES:

(A1) SEE TABLE "A1" ON SHEET E.4.1 FOR CONDUCTOR SIZES.

KEYED NOTES:

(1) (N) TRINA SOLAR TSM–350 DD14A(II) (350W) MODULES (TYPICAL OF 1,489)

(2) EGC IS SIZED PER 250.122. IN CASES WHERE EGC IS EXPOSED TO MECHANICAL DAMAGE AFTER INSTALLATION, IT SHALL BE #6 AWG MINIMUM. USE THE "LAY–IN" LUGS OR EQUIVALENT WEEB GROUNDING CLIP REQUIRED PER NEC 690 FOR MODULE EQUIPMENT GROUNDING. USE THE MODULE RECOMMENDED METHODS FOR GROUNDING. THE MODULE EQUIPMENT GROUND SHALL GROUND ALL OTHER EQUIPMENT AND SHALL TERMINATE IN THE INVERTER CABINET.

(C1) SEE TABLE "C1" ON SHEET E.4.1 FOR CONDUCTOR SIZES.

(3) GEC IS SIZED PER TABLE 250.66. CONDUCTOR MAY BE DOWNSIZED IF EXCEPTION A,B, OR C APPLIES

(4) (N) TABUCHI ELECTRIC EMVAS 25KW INVERTER (TYP. OF 16)

(5) (N) SOLAR PANELBOARD "SPNLBD–1.2".

(6) (N) CIRCUIT BREAKER

(7) (N) CIRCUIT BREAKER

(8) (N) SOLAR PANELBOARD "SPNLBD–1.1".

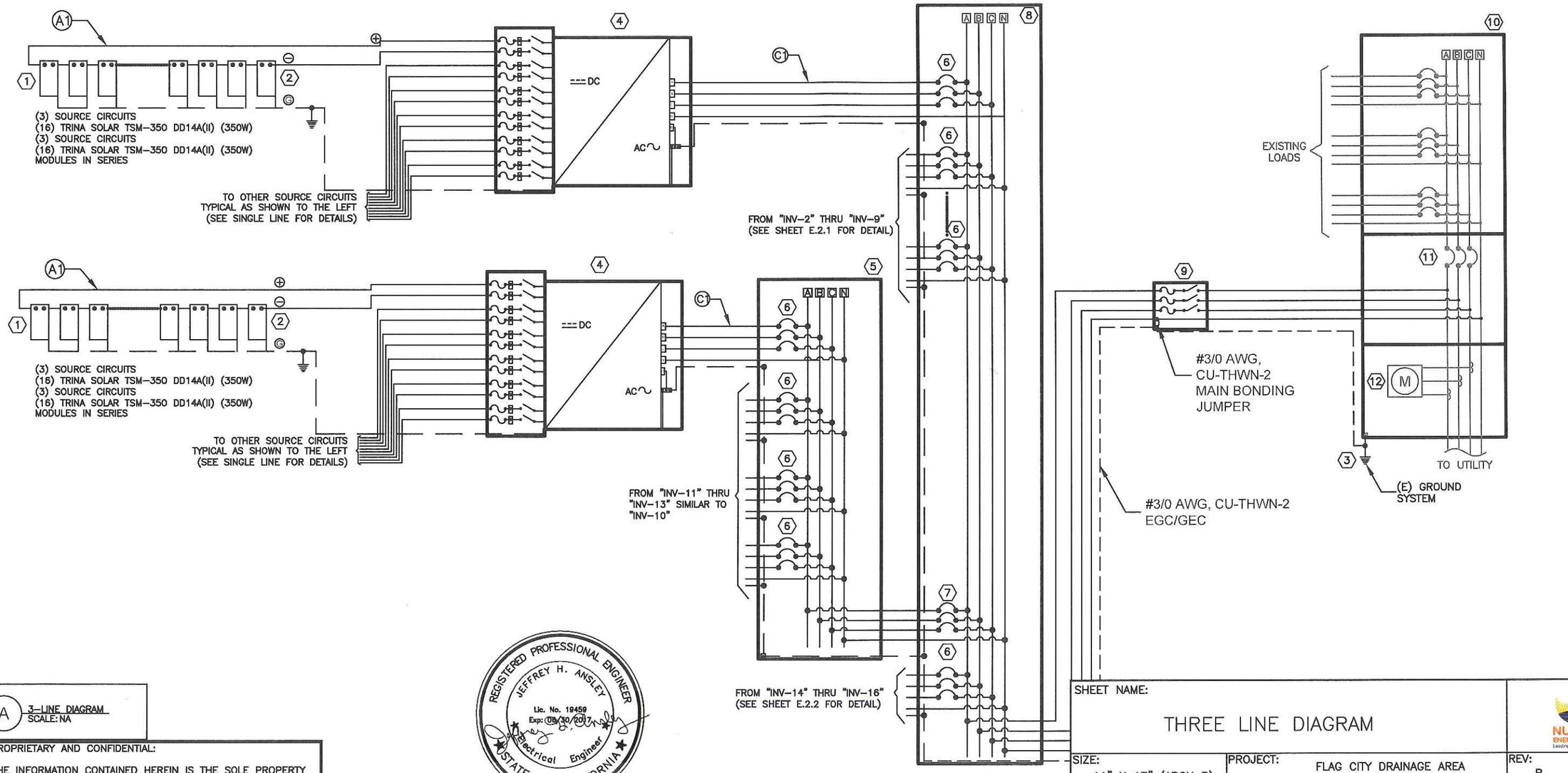
(9) (N) UTILITY LOCKABLE FUSED AC DISCONNECT "ACDS–1"

(10) (E) MAIN SWITCHBOARD "MSB"

(11) (E) MAIN BREAKER.

(12) (E) METER.

B REFERENCE TABLE & NOTES
SCALE: NA



A 3–LINE DIAGRAM
SCALE: NA

REGISTERED PROFESSIONAL ENGINEER
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Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME: THREE LINE DIAGRAM			NUANCE ENERGY GROUP Leading Solar Innovation
SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07–FEB–17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.3.1

TABLE A1: SOURCE CIRCUIT CONDUCTOR AND CONDUIT IDENTIFICATION

CONDUCTOR LOCATION	NUMBER OF MODULES IN SERIES	Isc (A)	Imp (A)	Voc (VDC)	Vmp (VDC)	ONE WAY LENGTH (FT)	VOLTAGE DROP %	CURRENT CARRYING CONDUCTOR	BONDING CONDUCTOR SIZE (AWG)	CONDUIT	NOTES
MODULE TO INV-1 THROUGH INV-13	16	9.6	9.09	750.4	548.73	300	1.23%	10 AWG, PV WIRE	10	FREE-AIR OR 1/2" EMT MIN	
MODULE TO INV-8 & INV-9	18	9.6	9.09	844.2	617.32	150	0.55%	10 AWG, PV WIRE	10	FREE-AIR OR 1/2" EMT MIN	

TABLE A2: SOURCE CIRCUIT CONDUCTOR AND CONDUIT IDENTIFICATION

CONDUCTOR LOCATION	NUMBER OF MODULES IN SERIES	Isc (A)	Imp (A)	Voc (VDC)	Vmp (VDC)	ONE WAY LENGTH (FT)	VOLTAGE DROP %	CURRENT CARRYING CONDUCTOR	BONDING CONDUCTOR SIZE (AWG)	CONDUIT	NOTES

NOT INCLUDED IN THIS PERMIT

TABLE C1: AC OUTPUT CIRCUIT CONDUCTOR AND CONDUIT IDENTIFICATION

INITIAL CONDUCTOR LOCATION	FINAL CONDUCTOR LOCATION	RACEWAY NAME	CIRCUIT ID	RACEWAY SIZE OR DIRECT BURIAL	# OF PARALLEL CIRCUITS	# OF CONDUCTORS IN RACEWAY OR BURIAL BUNDLE	% OF MAX CONDUIT FILL	310.15 and 310.16 Temp Correction Factor	310.15 Fill Adjustment Factor	690.8 (A)(3) Adjustment Factor	OPERATING LINE CURRENT	DESIGN LINE CURRENT	TERMINAL TEMP LIMIT	TEMP LIMIT AMPACITY 30C AMB	OCPD	MINIMUM CORRECTED AMPACITY	CONDUCTOR CORRECTED AMPACITY	ONE WAY LENGTH (FT)	VOLTAGE DROP %	CURRENT CARRYING CONDUCTOR TYPE AND SIZE (AWG)	GROUNDING CONDUCTOR SIZE (AWG)	NOTES
INV-1	SPNLBD-1.1	AC1.1	AC1.1-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-2	SPNLBD-1.1	AC1.2	AC1.2-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-3	SPNLBD-1.1	AC1.3	AC1.3-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-4	SPNLBD-1.1	AC1.4	AC1.4-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-5	SPNLBD-1.1	AC1.5	AC1.5-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC

NOT INCLUDED IN THIS PERMIT

INV-9	SPNLBD-1.1	AC1.9	AC1.9-1	1-1/2" EMT	1	5	61%	0.91	0.80	1.25	31	39	Cu-60C	95	40	39	95	380	0.82%	4 - 2 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-10	SPNLBD-1.2	AC1.10	AC1.10-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-11	SPNLBD-1.2	AC1.11	AC1.11-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-12	SPNLBD-1.2	AC1.12	AC1.12-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-13	SPNLBD-1.2	AC1.13	AC1.13-1	1" EMT	1	5	69%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	120	0.66%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-14	SPNLBD-1.1	AC1.14	AC1.14-1	1-1/4" EMT	1	5	71%	0.91	0.80	1.25	31	39	Cu-60C	85	40	39	80	20	0.05%	4 - 3 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-15	SPNLBD-1.1	AC1.15	AC1.15-1	1" PVC	1	5	72%	0.91	0.80	1.25	31	39	Cu-60C	55	40	39	55	20	0.11%	4 - 6 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
INV-16	SPNLBD-1.1	AC1.16	AC1.16-1	1-1/4" PVC	1	5	86%	0.91	0.80	1.25	31	39	Cu-60C	95	40	39	95	60	0.13%	4 - 2 AWG, CU-THWN-2	1 - 8 AWG, CU-THWN-2	EGC/GEC
SPNLBD-1.2	SPNLBD-1.1	AC1.17	AC1.17-1	2-1/2" PVC	1	5	63%	0.91	0.80	1.25	120	150	Cu-75C	200	150	150	164	220	0.73%	4 - 3/0 AWG, CU-THWN-2	1 - 2 AWG, CU-THWN-2	EGC/GEC
SPNLBD-1.1	ACDS-1	AC1.18	AC1.18-1	3-1/2" EMT	2	5	81%	0.91	0.80	1.25	481	601	Cu-75C	840	700	601	892	10	0.02%	4 - 600 MCM, CU-THWN-2	1 - 3/0 AWG, CU-THWN-2	EGC/GEC
ACDS-1	MSB	AC1.19	AC1.19-1	3-1/2" EMT	2	5	81%	0.91	0.80	1.25	481	601	Cu-75C	840	700	601	892	10	0.02%	4 - 600 MCM, CU-THWN-2	1 - 3/0 AWG, CU-THWN-2	GEC

AC CONDUITS (For 3-Phase system)	3 PHASE AC VOLTAGE DROP	DESIGN LINE CURRENT	MINIMUM CORRECTED AMPACITY	CONDUIT FILL	CONDUCTOR CORRECTED AMPACITY
CONDUIT NAME	1.732*ONE WAY LENGTH*RESISTANCE PER 1000FT*PHASE CURRENT/1000 FT/OPERATING VOLTAGE/# WIRES PER PHASE) = VOLTAGE DROP IN CONDUIT	OPERATING CURRENT*1.25	OPERATING CURRENT*1.25	100*(TOTAL CONDUCTOR AREA)/((CONDUIT AREA)*(PERCENT ALLOWED FILL)) = PERCENT MAXIMUM FILL	CONDUCTOR AMPACITY AT 30C * CONDUCTOR PER PHASE * TEMP. CORRECTION FACTOR * FILL ADJUSTMENT FACTOR = CONDUCTOR CORRECTED AMPACITY
AC1.1	(1.732*54.6 * 0.491 * 31 / 1000FT / 480 / 1)=0.11%	(31 * 1.25) = 38.75	(31 * 1.25) = 38.75	100 * 0.24 / (0.86 * 0.4) = 69%	(75*1*0.91*0.8) = 54.6

STRING VOC CALCULATION	
PANEL VOC, 25C	46.9
NUMBER IN SERIES	18
STRING VOC STC	844.2
DESIGN LOW, (ASHRAE) C	-3
TEMP COEFFICIENT, %/C	-0.29%
PANEL VOC * NUMBER IN SERIES * (1 - (25 - DESIGN LOW TEMP)* VOC TEMP COEFFICIENT) = MAX VOC AT DESIGN LOW	
(46.9 * 18 * (1-(25-(-3)* (-0.0029)) = 912.75	

Circuit Voltage Drop																	
		INV-1	INV-2	INV-3	INV-4	INV-5	INV-6	INV-7	INV-8	INV-9	INV-10	INV-11	INV-12	INV-13	INV-14	INV-15	INV-16
Total DC drop		1.23%	1.23%	1.23%	1.23%	1.23%	1.23%	1.23%	1.23%	1.23%	1.23%	1.23%	1.23%	1.23%	NOT INCLUDED IN THIS PERMIT		
Total AC drop		0.15%	0.15%	0.15%	0.15%	0.15%	0.88%	1.59%	1.59%	0.86%	0.88%	0.88%	0.88%	1.43%			
Total voltage drop		1.38%	1.38%	1.38%	1.38%	1.38%	2.11%	2.82%	2.82%	2.09%	2.11%	2.11%	2.11%	2.66%			

STRING VOC CALCULATION	
PANEL VOC, 25C	46.9
NUMBER IN SERIES	19
STRING VOC STC	891.1
DESIGN LOW, (ASHRAE) C	-3
TEMP COEFFICIENT, %/C	-0.29%
PANEL VOC * NUMBER IN SERIES * (1 - (25 - DESIGN LOW TEMP)* VOC TEMP COEFFICIENT) = MAX VOC AT DESIGN LOW	
(46.9*19*(1-(25-(-3)-(-0.0029)) =963.46	

STRING VOC CALCULATION	
PANEL VOC, 25C	46
NUMBER IN SERIES	16
STRING VOC STC	736
DESIGN LOW, (ASHRAE) C	-3
TEMP COEFFICIENT, %/C	-0.34%
PANEL VOC * NUMBER IN SERIES * (1 - (25 - DESIGN LOW TEMP)* VOC TEMP COEFFICIENT) = MAX VOC AT DESIGN LOW	
(46 * 16 * (1-(25-(-3)* (-0.00335)) = 805.04	

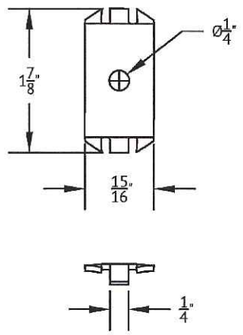
REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME:
WIRING SCHEDULE

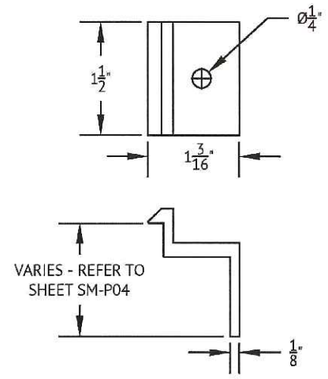
NUANCE ENERGY GROUP
Leading Solar Innovation

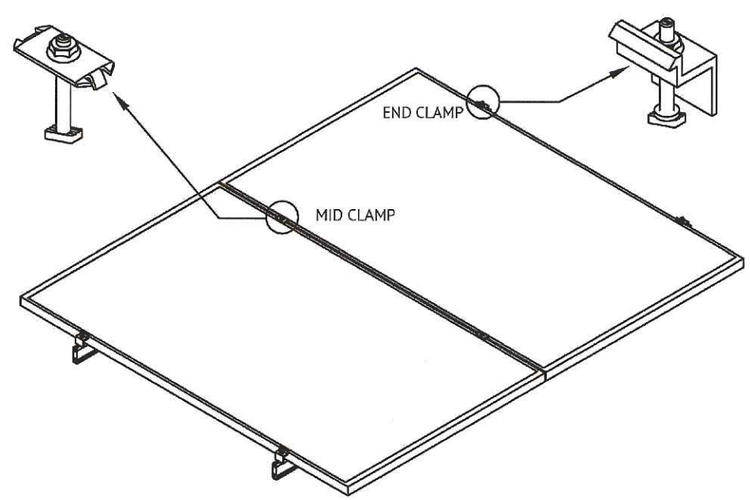
SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07-FEB-17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.4.1

BONDING SM MID CLAMP



BONDING SM END CLAMP



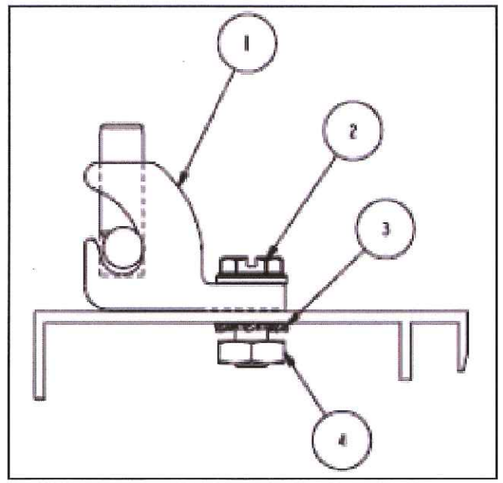


A MODULE GROUNDING DETAIL
SCALE: NTS

EQUIPMENT GROUNDING:

- WHERE COMMON GROUNDING HARDWARE (NUTS, BOLTS, STAR WASHERS, SPLIT–RING LOCK WASHERS, FLAT WASHERS AND THE LIKE) IS USED TO ATTACH A LISTED GROUNDING/BONDING DEVICE, THE ATTACHMENT MUST BE MADE IN CONFORMANCE WITH THE GROUNDING DEVICE MANUFACTURER'S INSTRUCTIONS.
- COMMON HARDWARE ITEMS SUCH AS NUTS, BOLTS, STAR WASHERS, LOCK WASHERS AND THE LIKE HAVE NOT BEEN EVALUATED FOR ELECTRICAL CONDUCTIVITY OR FOR USE AS GROUNDING DEVICES AND SHOULD BE USED ONLY FOR MAINTAINING MECHANICAL CONNECTIONS AND HOLDING ELECTRICAL GROUNDING DEVICES IN THE PROPER POSITION FOR ELECTRICAL CONDUCTIVITY. SUCH DEVICES, WHERE SUPPLIED WITH THE MODULE AND EVALUATED THROUGH THE REQUIREMENTS IN UL 1703, MAY BE USED FOR GROUNDING CONNECTIONS IN ACCORDANCE WITH THE INSTRUCTIONS PROVIDED WITH THE MODULE.
- EARTH CONDUCTORS SHOULD BE LARGE ENOUGH FOR LET–THROUGH ENERGY.
- WHEN USING A SELF–TAPPING SCREW TO MAKE BONDING CONNECTION ENSURE AT LEAST TWO FULL THREADS ENGAGE IN THE METAL.
- DO NOT USE BARE COPPER GROUNDING LUG.

USE OF GROUNDING LUG WITH NUT:



B RACKING GROUNDING DETAIL
SCALE: NTS

SHEET NAME: ELECTRICAL DETAILS–1

NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07–FEB–17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.6.1

Flag City

Nuance Energy

Available Fault Current Calculation

by:John Sokolik Ver. 7.1

jmp1jds@comcast.net

Utility Fault Current 65,000 amperes

kVA =

E = 480

I = kVA x 1000 = trans. FLA
E x 1.732

trans. FLA = 0

Isca = trans. FLA x 100 x PF / transformer Z =

PF =

Z =

Isca = ampere short-circuit current RMS symmetrical.

Isca = 0 amperes

Point to Point Method

Three Phase 480/277

Length (distance) (ASC) FEET — L = 100

Aluminum in Nonmetallic Raceway

'f ' factor = 1.732 x L x I / N x C x E L-N

Isca = 65,000

conductors per phase — N = 7

Phase conductor constant — C = 28,779 **Phase Conductor** 1000 kcmil

Volt Line to Line — E L-L = **480** Volt

f = 0.116

Neutral conductor constant — C = 22,796 **Neutral Conductor** 350 kcmil

Volt Line to Neutral — E L-N = **277** Volt

Multiplier

f = 0.382

M = 1 / 1 + f

Line to Line — M = 0.896

Line to Neutral — M = 0.724

Fault Current at Service Equipment

Isca x M = fault current at terminals of main disconnect L- L = → 58,222 amperes

Isca x M = fault current at terminals of main disconnect L- N = → 47,032 amperes

Fault Current from Service Equipment to SPNLBD-1.1 — Copper in Metal Raceway — Three Phase

Three Phase Feeder

Length (distance) (ASC) — L = 20

'f ' factor = 1.732 x L x I / N x C x E L-N

Isca = 58,222 Phase 47,032 Neutral

conductors per phase — N = 2

Phase conductor constant — C = 22,965 **Phase Conductor** 600 kcmil

Volt Line to Line — E L-L = **480** Volt

f = 0.091

Neutral conductor constant — C = 22,965 **Neutral Conductor** 600 kcmil

Volt Line to Neutral — E L-N = **277** Volt

Multiplier

f = 0.128

M = 1 / 1 + f

Line to Line — M = 0.916

Line to Neutral — M = 0.886

Isca x M = fault current at terminal of the panel L- L = 53,342 amperes

Isca x M = fault current at terminal of the panel L- N = 41,693 amperes

Calculation does not include motor contribution

A FAULT CURRENT CALCULATION
SCALE: NTS

Branch Circuit Fault from FROM SPNLBD-1.1 TO SPNLBD-1.2 — Copper in Nonmetallic Raceway — Three Phase

Three Phase Branch

Length (distance) (ASC) — L = 220

'f ' factor = 1.732 x L x I / N x C x E L-N

Isca = 53,342 Phase 41,693 Neutral

conductors per phase — N = 1

Phase conductor constant — C = 13,923 **Phase Conductor** 3/0

Volt Line to Line — E L-L = **480** Volt

f = 3.041

Neutral conductor constant — C = 13,923 **Neutral Conductor** 3/0

Volt Line to Neutral — E L-N = **277** Volt

Multiplier

f = 4.119

M = 1 / 1 + f

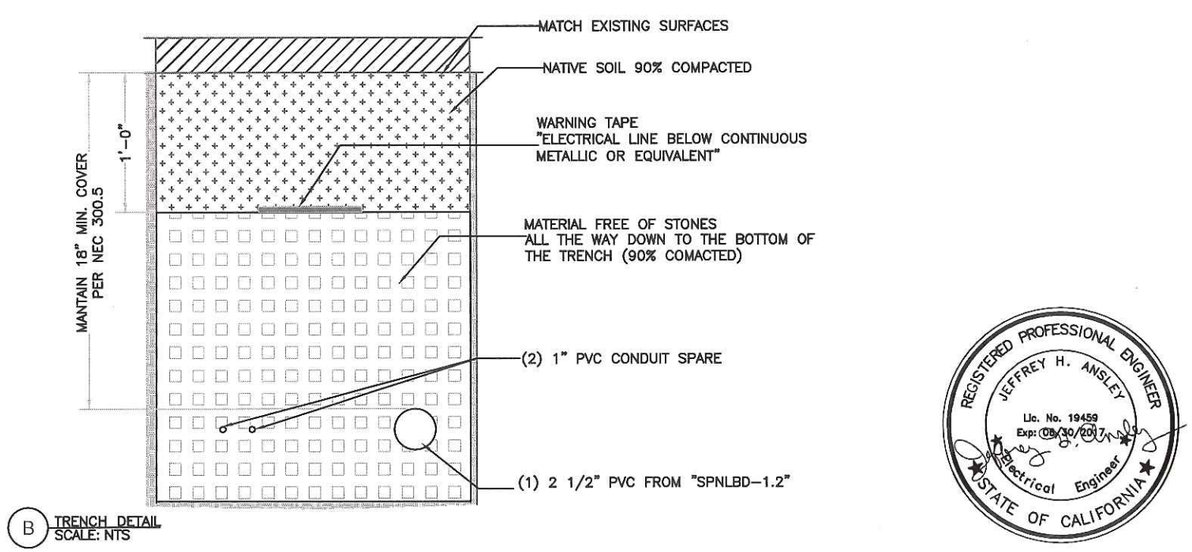
Line to Line — M = 0.247

Line to Neutral — M = 0.195

Isca x M = fault current at terminal of the panel L- L = 13,199 amperes

Isca x M = fault current at terminal of the panel L- N = 8,144 amperes

Calculation does not include motor contribution



B TRENCH DETAIL
SCALE: NTS

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SHEET NAME: ELECTRICAL DETAILS–2

NUANCE ENERGY GROUP

SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07–FEB–17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.6.2

LABELS AND MARKINGS LEGEND:

(A) PROVIDES THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC DISCONNECTING MEANS. THIS PLACE SHALL BE APPLIED TO THE MAIN SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC DISCONNECTING MEANS.

(B) LABEL FOR UTILITY AC DISCONNECT

(C) UTILITY AC DISCONNECT WARNING LABEL WITH SYSTEM SPECIFICATIONS.

(D) MARKING CONTENT : "CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED".
RED BACKGROUND
WHITE LETTERING
MINIMUM 3/8" LETTER HEIGHT
ALL CAPITAL LETTERS
ARIAL OR SIMILAR FONT, NON BOLD
REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT
(DURABLE ADHESIVE MATERIALS MEET THIS REQUIREMENT)

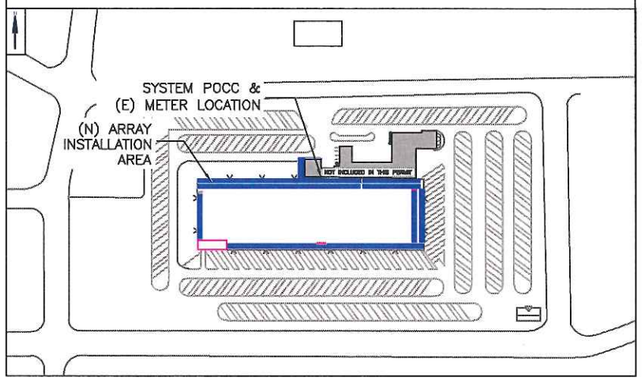
(E) MARKING CONTENT : "CAUTION: SOLAR CIRCUIT".
RED BACKGROUND
WHITE LETTERING
MINIMUM 3/8" LETTER HEIGHT
ALL CAPITAL LETTERS
ARIAL OR SIMILAR FONT, NON BOLD
REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT
(DURABLE ADHESIVE MATERIALS MEET THIS REQUIREMENT)

(F) ARC FLASH LABEL

(A)

CAUTION

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



(B) UTILITY AC DISCONNECT

(C)

PHOTOVOLTAIC SYSTEM
SERVICE DISCONNECT SWITCH
"ACDS-1"

WARNING:
ELECTRIC SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

AC DISCONNECT RATINGS:
OPERATING CURRENT: 481 AMPS
OPERATING VOLTAGE: 480 VOLTS AC
CURRENT RATING: 800 AMPS
FUSE RATING: 700 AMPS
VOLTAGE RATING: 600 VOLTS AC

(D) CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

(E) CAUTION: SOLAR CIRCUIT

(F)

WARNING
Arc-Flash and Shock Hazard
Appropriate PPE Required

REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 08/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME: LABELS & MARKINGS

NUANCE ENERGY GROUP
Leading Solar Innovation

SIZE:	PROJECT:	REV:	DATE:
11" X 17" (ARCH B)	FLAG CITY DRAINAGE AREA	B	07-FEB-17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.7.1

Mono Multi Solutions

THE TALLMAX® PLUS MODULE

72 CELL
MONOCRYSTALLINE MODULE

330-355W
POWER OUTPUT RANGE

18.3%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

As a leading global manufacturer of next generation photovoltaic products, we believe close cooperation with our partners is critical to success. With local presence around the globe, Trina is able to provide exceptional service to each customer in each market and supplement our innovative, reliable products with the backing of Trina as a strong, bankable partner. We are committed to building strategic, mutually beneficial collaboration with installers, developers, distributors and other partners as the backbone of our shared success in driving Smart Energy Together.

Trina Solar Limited
www.trinasolar.com

Trinasolar
Smart Energy Together

Maximize limited space with top-end efficiency
- Up to 183 W/m² power density
- Low thermal coefficients for greater energy production at high operating temperatures

Highly reliable due to stringent quality control
- Over 30 in-house tests (UV, TC, HF, and many more)
- In-house testing goes well beyond certification requirements
- 100% EL double inspection

Certified to withstand challenging enviromental conditions
- 2400 Pa wind load
- 5400 Pa snow load
- 35 mm hail stones at 97 km/h

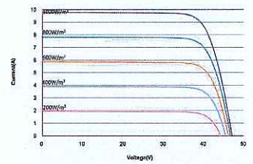
Comprehensive products and system certificates
- IEC 61215/ IEC 61730/ UL 1703/ IEC 61701/IEC 62716
- ISO 9001: Quality Management System
- ISO 14001: Environmental Management System
- ISO 14064: Greenhouse Gases Emissions Verification
- OHSAS 18001: Occupation Health and Safety Management System

THE TALLMAX® PLUS MODULE

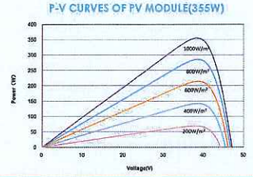
TSM-DD14A(II)

DIMENSIONS OF PV MODULE
unit:mm/inches

I-V CURVES OF PV MODULE(355W)



P-V CURVES OF PV MODULE(355W)



ELECTRICAL DATA (STC)

Peak Power Watts-P_{MAX} (Wp)*	330	335	340	345	350	355
Power Output Tolerance-P_{MAX} (W)	0~+5					
Maximum Power Voltage-V_{MPP} (V)	37.8	37.9	38.2	38.4	38.5	38.7
Maximum Power Current-I_{MPP} (A)	8.73	8.84	8.90	9.00	9.09	9.17
Open Circuit Voltage-Voc (V)	46.2	46.3	46.5	46.7	46.9	47.0
Short Circuit Current-Isc (A)	9.27	9.36	9.45	9.50	9.60	9.69
Module Efficiency η_m (%)	17.0	17.3	17.5	17.8	18.0	18.3

STC: Irradiance 1000 W/m², Cell Temperature 25°C, Air Mass AM1.5.
*Test tolerance: ±3%.

ELECTRICAL DATA (NOCT)

Maximum Power-P_{MAX} (Wp)	246	250	253	257	261	264
Maximum Power Voltage-V_{MPP} (V)	34.9	35.1	35.2	35.5	35.6	35.8
Maximum Power Current-I_{MPP} (A)	7.04	7.12	7.19	7.25	7.33	7.40
Open Circuit Voltage-Voc (V)	43.0	43.1	43.2	43.4	43.5	43.7
Short Circuit Current-Isc (A)	7.49	7.56	7.63	7.67	7.75	7.82

NOCT: Irradiance at 800 W/m², Ambient Temperature 20°C, Wind Speed 1 m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline 156 × 156 mm (6 inches)
Cell Orientation	72 cells (6 × 12)
Module Dimensions	1956 × 992 × 40 mm (77.0 x 39.1 x 1.57 inches)
Weight	26.0 kg (57.3 lb)
Glass	4.0 mm (0.15 inches), High Transmission, AR Coated Tempered Glass
Backsheet	White
Frame	Silver Anodized Aluminium Alloy
J-Box	IP 67 or IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²), 1200 mm (47.2 inches)
Connector	MC4 Compatible or Amphenol H4/UTX
Fire Type	Type 1 or Type 2

TEMPERATURE RATINGS

Nominal Operating Cell Temperature (NOCT)	44°C(± 2°C)
Temperature Coefficient of P_{MAX}	- 0.39%/°C
Temperature Coefficient of Voc	- 0.29%/°C
Temperature Coefficient of Isc	0.05%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1000V DC (IEC) 1000V DC (UL)
Max Series Fuse Rating	15A

WARRANTY
10 year Product Workmanship Warranty
25 year Linear Power Warranty
(Please refer to product warranty for details)

PACKAGING CONFIGURATION
Modules per box: 26 pieces
Modules per 40' container: 572 pieces

TSM_EN_2016_B

Trinasolar
Smart Energy Together

REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 08/31/2017
Electrical Engineer
STATE OF CALIFORNIA

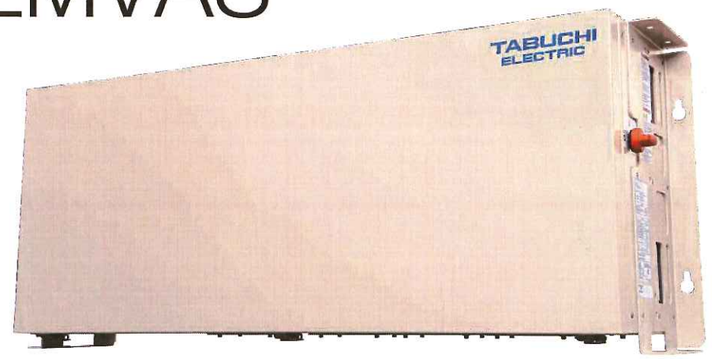
SHEET NAME: SPEC SHEETS–1		NUANCE ENERGY GROUP Leading Solar Innovation	
SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07–FEB–17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.8.1

TABUCHI ELECTRIC

EneTelus

Mega Value System

EMVAS



Three-phase 25kW Solar Inverter

Designed for Distributed Solar

- Individual MPPT DC Input Strings – 4.2kW input DC/DC Converter x 6 Strings
- 97.3% (Maximum 97.8%) Efficiency – High efficiency is realized by SiC Power Semiconductor - 3 Level Inverter
- Three-phase 480V AC Output – Separate installation of transformers reduces use of heavy cables
- Highly corrosion-resistant enclosure
- Fanless model provides passive cooling
- Eliminates the need for combiner boxes – All PV module strings terminate at the Inverter
- Remote setup and monitoring

TABUCHI ELECTRIC

Three-phase 25kW Solar Inverter

Input (DC)	
Max. input voltage	1000V
Rated input voltage	700V
MPPT voltage range	500V to 800V
Min. input voltage / initial input voltage	150V
Max input current per string	10A
PV connection method	Multi string system
Number of independent MPP inputs	6

Output (DC)	
Rated output power	25000W
Electrical mode	3 phases, 3 wire system
Conversion method	Vector control method
Nominal AC voltage	480V
Rated power frequency	60Hz
Max. output current	31A
Power factor at rated power	> 0.99

Efficiency	
Max. efficiency	97.3%

Islanding Operation Detection	
Islanding Operation Detection: Active	Reactive power fluctuation method
Islanding Operation Detection: Passive	Voltage phase jump detecting method

Features	
Dimensions W x H x D	1350mm x 545mm x 300mm
Weight	86kg
Operating temperature range	-20°C to +50°C (Rated output until 40°C)
Internal consumption	20W TYP
Cooling concept	Natural cooled system
Degree of protection	Equipment to NEMA 3R
Interface	EneTelus Master Box (RS485)
Certifications	UL 1741, CAN/CSA C22.2 No. 107.1-01 IEEE 1547 A, FCC class A
Topology	Tranformer less

Some specifications or aspects of appearance may be changed without notice to improve the product.

TABUCHI ELECTRIC

SEIA Solar Energy Industries Association® Member

TABUCHI ELECTRIC COMPANY OF AMERICA, LIMITED

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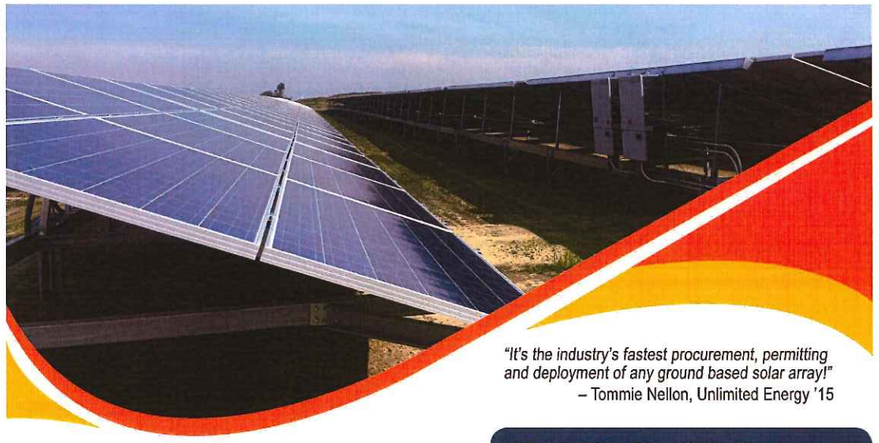
EMVAS-US.2015.03.SK-2

REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 09/30/2017
Electrical Engineer
STATE OF CALIFORNIA

SHEET NAME: SPEC SHEETS–2			NUANCE ENERGY GROUP Leading Solar Innovation
SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07–FEB–17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.8.2



"It's the industry's fastest procurement, permitting and deployment of any ground based solar array!"
– Tommie Nellon, Unlimited Energy '15

Ground Mount Solar Racking Structures

Nuance Energy Group, Inc. is a U.S. solar manufacturer based in California's Central Valley. We design and engineer pragmatic ground mount solar racking systems for worldwide distribution. Our proprietary Osprey PowerPlatform® is a versatile solar racking structure that is revolutionizing the solar industry. Pre-fabricated steel assembles quickly and easily into modular and portable (units) solar arrays. Units install practically anywhere, on any ground surface using low-cost labor and a minimal penetrating, earth anchor application. "Plug-n-Play" engineering allows these unique solar power platforms to deploy and power up in just a few hours saving solar contractors, EPC and solar development firms valuable time and money.

Modular Osprey PowerPlatform® units scale from one to thousands and are the ideal ground based solar solution for small utility scale solar development, commercial & industrial, community solar farms, energy storage, landfills, off-grid, agriculture and rural residential solar projects.

- Made in U.S.A. of Recycled Steel
- Modular, Portable and Scalable
- 2012 IBC and 2013 CBC Compliant
- Pending ETL/UL 2703 Certification
- No Geotechnical Report Required
- No Concrete Needed
- Install Earth Anchors without Heavy Equipment
- Mount any Size Solar Panel; Technology Neutral
- Reduce Labor Cost on Prevailing Wage Projects
- "Turnkey Installation" Services Available
- 25 Year Product Warranty

Made in U.S.A.

877-537-2221

OSPREY POWERPLATFORM®
Revolutionary Modular Solar Structures

Sales: info@ospreypowerplatform.com
www.ospreypowerplatform.com
Service: info@nuanceenergy.com
www.nuanceenergy.com

REGISTERED PROFESSIONAL ENGINEER
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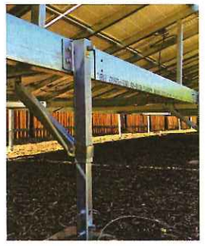
Electrical Engineer
STATE OF CALIFORNIA

The Osprey PowerPlatform® is an industry changing solar racking structure, designed and engineered to help lower the overall cost of solar systems from feasibility analysis through installation. Utility Patent Pending. ASME and IBC compliant in all 50 states.

OSPREY POWERPLATFORM®
Revolutionary Modular Solar Structures



KEY PRODUCT FEATURES

- Power Output up to 5.2kW
- Wind Loads from 100mph to 150mph
- Snow Loads up to 90+ psf.
- Fixed Tilt (15° to 25°)
- Independent Power Adjustable Legs
- Engineered to 12° Slope
- Custom Engineering to 23°
- Galvanized (G90) Finish; Other Options Available
- Self-Bonding Mid Clamps
- Ideal for Mounting Inverters
- Tamper Proof Module Fasteners (Optional)

QUICK & EASY INSTALLATION

Installation is blazing fast with six main steel components to assemble. Osprey PowerPlatform® solar structures assemble onsite using standard power hand tools.

Eliminate the higher cost of skilled labor and heavy machinery. No excavation, concrete, cutting, drilling, welding, site prep and cleanup. Industry leading installation time.

SUSTAINABLE SOLUTION

No geotechnical report or third party special inspections required. Real-time soil verification and load (pull) test is achieved through proprietary use of earth anchors during installation. Anchors act like underground toggle bolts to secure structure to ground.

Up to 30 cubic feet of earth and sediment above each earth anchor support and ballast these dynamic solar racking structures.

STRUCTURAL ENGINEERING

A site specific Structural Calculation and Engineering Report complete with vertical and lateral analysis (dead load, live load, wind load and seismic load, etc.) is provided.

TIME STUDY

Unit Base Frame & Rack Assembly, Solar Panels & Grounding, Earth Anchors & Real-Time Load Test

- 65 Minutes per Unit
- 3960 Watts (12 x 330w)
- 60+ Watts per Minute
- 3 Men/$45 Hour
- $.012/Watt Labor Cost

Osprey Model #	Size	Solar Panel Configuration	Orientation
OSP60 - STD	10' x 22'	(12) 3 x 4; (8) 2 x 4	Landscape
OSP72 - STD	10' x 26'	(12) 3 x 4; (8) 2 x 4	Landscape
OSP60 - HD	10' x 22'	(12) 3 x 4; (8) 2 x 4	Landscape
OSP72 - HD	10' x 26'	(12) 3 x 4; (8) 2 x 4	Landscape
OSP-SPR12 - STD	10' x 22'	(12) 3 x 4; (16) 4 x 4	Landscape
OSP-SPR12 - HD	10' x 22'	(12) 3 x 4; (16) 4 x 4	Landscape
OSP-SPR15 - STD	10' x 26'	(15) 3 x 5	Landscape
OSP-SPR15 - HD	10' x 26'	(15) 3 x 5	Landscape

NUANCE ENERGY GROUP®
Leading Solar Innovation

SHEET NAME: SPEC SHEETS–3			NUANCE ENERGY GROUP Leading Solar Innovation
SIZE: 11" X 17" (ARCH B)	PROJECT: FLAG CITY DRAINAGE AREA	REV: B	DATE: 07–FEB–17
SCALE: NTS	SITE ADDRESS: 14790 N. THORNTON RD., LODI, CA 95242	SHEET #	E.8.3