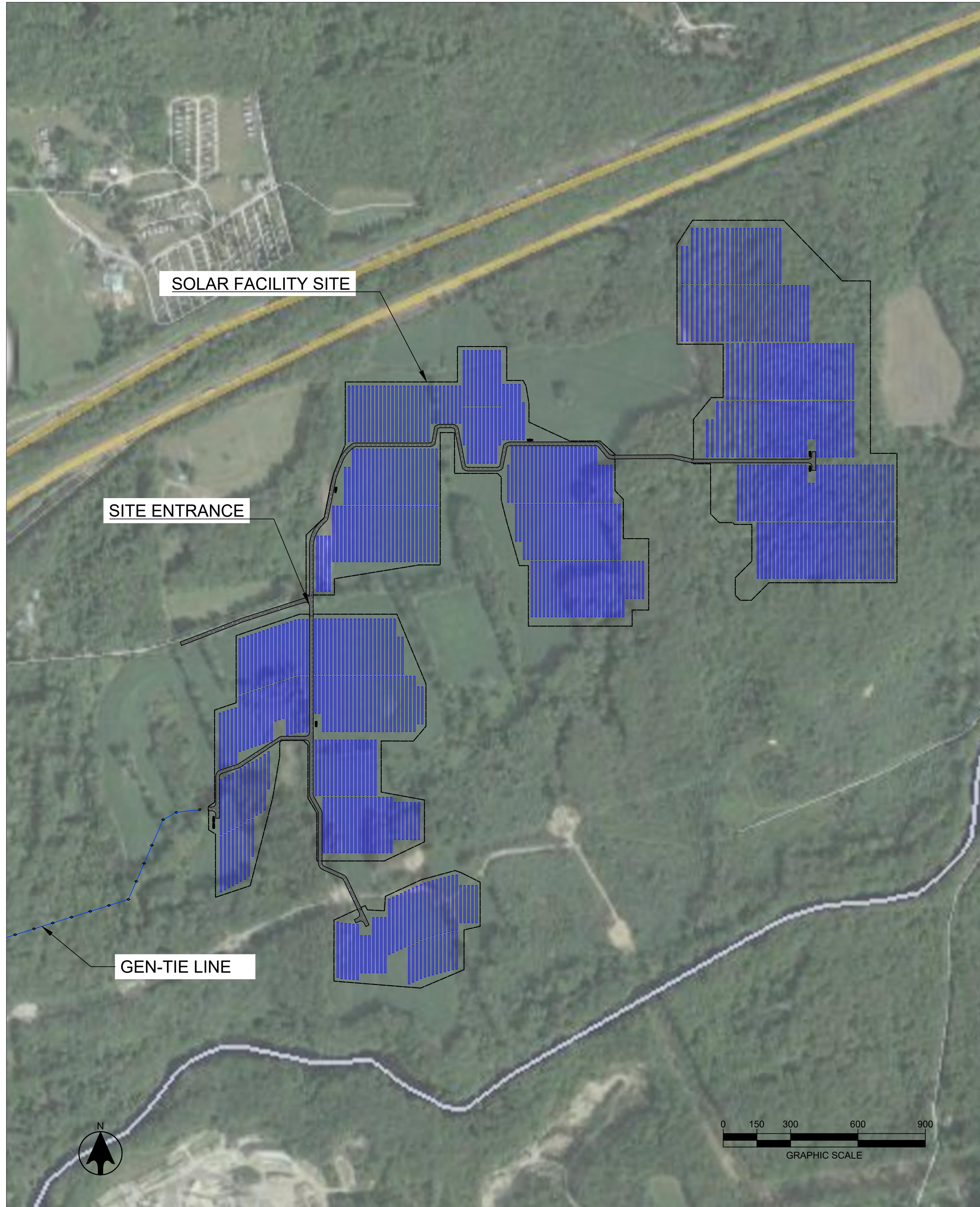


19.97 MW DC / 15 MW AC PHOTOVOLTAIC PROJECT

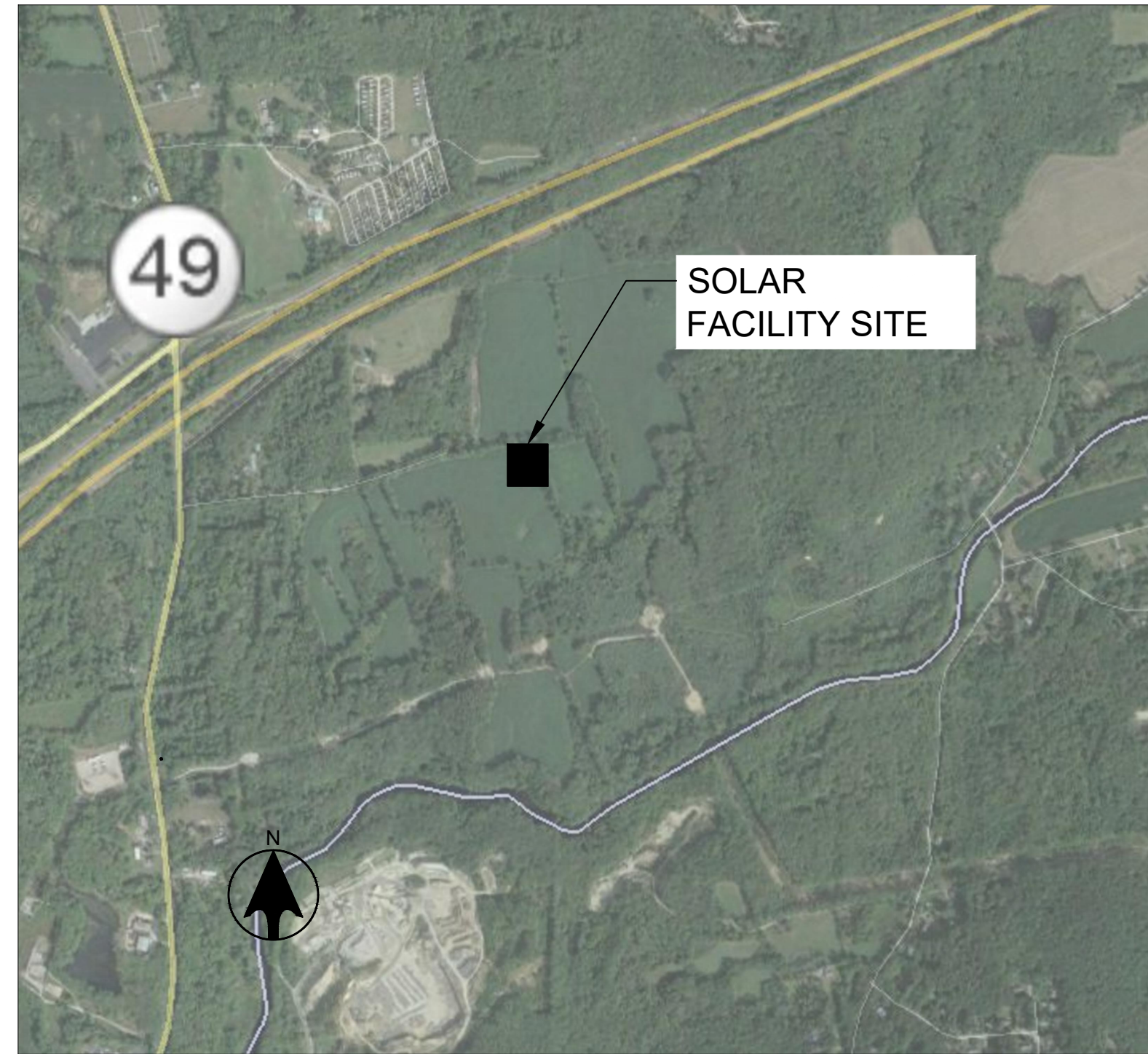
NORTH STONINGTON

ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SITE OVERVIEW



VICINITY MAP



PROJECT INFORMATION

SITE INFORMATION	
PROJECT AREA	143.15 ACRES
FENCE HEIGHT	7 FEET
FENCE PERIMETER	ARRAY 5&6 - 6,425 LINEAR FEET ARRAY 3&4 - 7,910 LINEAR FEET ARRAY 1&2A - 6,435 LINEAR FEET ARRAY 2B - 2,535 LINEAR FEET
SYSTEM INFORMATION	
DC SYSTEM SIZE - MAX POWER	19.978 MW DC
AC SYSTEM SIZE - NAMEPLATE	15 MW AC
MODULES	(45,927) LONGI LR4-72HBD 435M (435 W)
INVERTERS	(6) SUNGROW SG2500U (2500kW)
STRING INFORMATION	
STRING LENGTH	27 MODULES
TOTAL STRINGS	1,701
MAX DC SYSTEM V _{oc}	1500 V
STRUCTURAL INFORMATION	
RACKING COMPANY	NEXTRACKER
CONFIGURATION	81 MODULES PER TABLE
ROW SPACING (PITCH)	21'- 2" & 27'- 0"
GROUND COVERAGE RATIO	33% & 26%
AREA OF PANELS	88 ACRES
ARRAY TILT	TRACKER TYPE
ROTATION ANGLE	-50° TO 50°
# OF PILES	TO BE UPDATED PER TRACKER DWGS
PILE LENGTH	TO BE UPDATED PER TRACKER DWGS
EMBEDMENT DEPTH	TO BE UPDATED PER TRACKER DWGS
TYPICAL MODULE HEIGHT	TO BE UPDATED PER TRACKER DWGS
MIN MODULE HEIGHT	TO BE UPDATED PER TRACKER DWGS
MAX MODULE HEIGHT	TO BE UPDATED PER TRACKER DWGS
DESIGN INFORMATION	
WIND SPEED	125 MPH ASCE 7-16
GROUND SNOW LOAD	30 PSF
FROST DEPTH	TBD
ASHRAE WEATHER STATION	WESTERLY STATE AIRPORT, RI, USA
EXTREME MIN	-16.5°C
HIGH TEMP (2%)	29.9°C

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20

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SHEET LIST

ELECTRICAL SET	
Sheet Number	Sheet Title
T-001	COVER SHEET
E-001	GENERAL NOTES SHEET 1
E-002	GENERAL NOTES SHEET 2
E-100	OVERALL SITE PLAN
E-120	OVERALL ARRAY SITE PLAN
E-121	ARRAY PLAN - BLOCK 1
E-122	ARRAY PLAN - BLOCK 2
E-123	ARRAY PLAN - BLOCK 3
E-124	ARRAY PLAN - BLOCK 4
E-125	ARRAY PLAN - BLOCK 5
E-126	ARRAY PLAN - BLOCK 6
E-200	TRENCH PLAN
E-201	TRENCH PLAN - BLOCK 1
E-202	TRENCH PLAN - BLOCK 2
E-203	TRENCH PLAN - BLOCK 3
E-204	TRENCH PLAN - BLOCK 4
E-205	TRENCH PLAN - BLOCK 5
E-206	TRENCH PLAN - BLOCK 6
E-250	GROUNDING PLAN
E-300	COMMUNICATION PLAN
E-350	MV SITE PLAN
E-400	SINGLE LINE DIAGRAM SHEET 1
E-401	SINGLE LINE DIAGRAM SHEET 2
E-402	SINGLE LINE DIAGRAM SHEET 3
E-450	CONDUCTOR SCHEDULE 1
E-451	CONDUCTOR SCHEDULE 2
E-452	CONDUCTOR SCHEDULE 3
E-500	COMM. - NETWORK DIAGRAM

ELECTRICAL SET	
Sheet Number	Sheet Title
E-600	DETAILS - EQUIPMENT PAD
E-630	DETAILS - GROUNDING 1
E-631	DETAILS - GROUNDING 2
E-632	DETAILS - GROUNDING 3
E-650	DETAILS - TRENCH & CONDUIT 1
E-680	DETAILS - MISC. SHEET 1
E-681	DETAILS - MISC. SHEET 2
E-682	DETAILS - MISC. SHEET 3
E-683	MISC. - DETAILS - SHEET 4
E-700	WARNING LABELS - SHEET 1
E-701	WARNING LABELS - SHEET 2
E-702	WARNING LABELS - SHEET 3
E-703	WARNING LABELS - SHEET 4
E-800	SPECIFICATION SHEET-MODULE
E-801	SPECIFICATION SHEET-INVERTER
E-802	SPECIFICATION SHEET-TRACKER
E-803	TRANSFORMER NAME PLATE

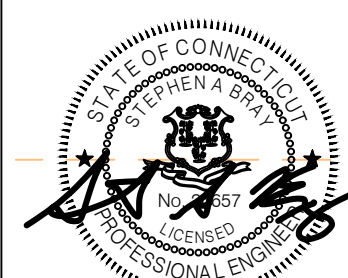
CONTACT INFORMATION

SYSTEM OWNER	UTILITY
PROJECT NAME	PAWCATUCK SOLAR, LLC
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PHONE #	PHONE #
EMAIL	EMAIL
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PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
**ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W**

SEAL:



DATE: **03/09/2020**

PROJECT #: **2000500**

DRAWN BY: **V. PISSAREVSKI**

CHECKED BY: **R. VUDI**

TITLE:
COVER SHEET

SHEET:
T-001

GENERAL NOTES AND SPECIFICATIONS 1.2 BUILDING PENETRATIONS 1.6 WIRE AND CABLE

- A. PROVIDE ALL MATERIALS, LABOR, EQUIPMENT AND SERVICES AND PERFORM ALL OPERATION IN CONNECTION WITH THE ELECTRICAL WORK. IT IS THE INTENT THAT THESE DRAWINGS PROVIDE THE WORK REQUIRED FOR AN ELECTRICAL INSTALLATION THAT IS COMPLETE IN EVERY RESPECT, READY FOR OPERATION.
- B. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL CODES AND THE REQUIREMENTS OF ANY OF THE AUTHORITIES HAVING JURISDICTION. ALL MATERIAL AND EQUIPMENT SHALL BE UL LISTED AND SHALL BEAR THE UL INSPECTION LABEL WHEREVER STANDARDS HAVE BEEN ESTABLISHED AT THE COMPLETION OF THE WORK. SECURE CERTIFICATES OF APPROVAL FROM THE VARIOUS AUTHORITIES HAVING JURISDICTION AND DELIVER SAME TO THE DESIGN PROFESSIONAL.
- C. ALL WORK SHALL COMPLY WITH NECA STANDARD OF INSTALLATION (PUBLISHED BY THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION) AND NFPA 70 - NATIONAL ELECTRICAL CODE (NEC)-2017, CONNECTICUT ELECTRIC CODE AND ALL APPLICABLE SAFETY STANDARDS. COMPLY WITH APPLICABLE STANDARDS THE OWNER HAS DEVELOPED AS THEY PERTAIN TO THIS WORK.
- D. "PROVIDE" MEANS TO SUPPLY, ERECT, INSTALL, TEST, AND CONNECT UP IN COMPLETE READINESS FOR REGULAR OPERATION. THE PARTICULAR WORK REFERRED TO "FURNISH" MEANS TO SUPPLY AND DELIVER TO THE JOB. "INSTALL" MEANS TO RECEIVE, INSTALL AND CONNECT UP IN COMPLETE READINESS FOR REGULAR OPERATION, THE PARTICULAR WORK REFERRED TO. "APPROVED EQUAL" MEANS AN EQUIPMENT OR MATERIAL WHICH, IN THE OPINION OF THE DESIGN PROFESSIONAL, IS EQUAL IN QUALITY, DURABILITY, APPEARANCE, STRENGTH, DESIGN, PERFORMANCE, PHYSICAL DIMENSIONS AND ARRANGEMENT TO THE EQUIPMENT OR MATERIAL SPECIFIED AND WILL FUNCTION ADEQUATELY IN ACCORDANCE WITH THE GENERAL DESIGN.
- E. BEFORE SUBMITTING THE BID, VISIT EACH SITE WHERE WORK IS REQUIRED. SURVEY THE EXISTING CONDITIONS AND BECOME FAMILIAR WITH THE DIFFICULTIES WHICH WILL AFFECT THE EXECUTION AND COMPLETION OF THE WORK. INVESTIGATE THE NATURE AND LOCATION OF THE WORK, THE GENERAL AND LOCAL CONDITIONS, PARTICULARLY THOSE BEARING UPON THE WORK REQUIRED, TRANSPORTATION, DISPOSAL, HANDLING AND STORAGE OF MATERIALS, AVAILABILITY OF LABOR, WATER, ELECTRICAL POWER, ROADS AND PHYSICAL CONDITIONS AT THE SITE NEEDED FOR THE PROSECUTION OF THE WORK AND ALL OTHER MATTERS UPON WHICH INFORMATION IS REASONABLY OBTAINABLE AND WHICH CAN IN ANY WAY AFFECT THE WORK OR THE COST THEREOF UNDER THE CONTRACT.
- F. PROCURE AND PAY FOR ALL CERTIFICATES, FEES, TESTS, INSPECTIONS, BONDS, DEPOSITS AND ESCROW ACCOUNTS REQUIRED FOR COMPLETE INSTALLATION OF THE WORK. GIVE ALL NOTICES REQUIRED BY LAW, ORDINANCES OR THE RULES AND REGULATIONS OF THE VARIOUS AUTHORITIES. COMPLY WITH ALL ORDERS OF THE CONNECTICUT DEPARTMENT OF ENERGY PROTECTION, LOCAL DEPARTMENT OF BUILDINGS, COUNTY DEPARTMENTS OF HEALTH, FIRE MARSHAL, ETC. DELIVER TO THE OWNER'S REPRESENTATIVE ALL PERMITS AND CERTIFICATES OF APPROVAL ISSUED BY ALL TOWN, COUNTY AND STATE AGENCIES HAVING JURISDICTION IN CONNECTION WITH THIS WORK BEFORE THE CERTIFICATE FOR THE FINAL PAYMENT IS ISSUED.
- G. NO WORK SHALL BE COVERED OVER UNTIL TEST HAVE BEEN PERFORMED AND THE AUTHORITIES HAVING JURISDICTION HAVE EXAMINED, INSPECTED AND APPROVED THE TESTS AND THE WORK. PROVIDE ALL CONTROLLED INSPECTIONS CONTROLLED REQUIRED BY THE REGULATIONS OF TOWN, COUNTY AND STATE. THE CONTROLLED INSPECTIONS SHALL BE MADE BY AN INSPECTOR MEETING THE PROFESSIONAL REQUIREMENTS SET FORTH BY STATE AND LOCAL LAWS AND SHALL BE CARRIED OUT IN ACCORDANCE WITH APPLICABLE TOWN, COUNTY AND STATE BUILDING CODES.
- H. PROVIDE ALL NECESSARY INSURANCE, FREE OF EXTRA CHARGE AND AGREE TO INDEMNIFY AND SAVE HARMLESS THE PARTY CONTRACTING FOR SERVICES AGAINST LOSS OR EXPENSE.
- I. THE DRAWINGS DO NOT UNDERTAKE TO ILLUSTRATE OR SET FORTH EVERY ITEM NECESSARY FOR THE WORK, AS IT IS ASSUMED THAT WITH THIS BID SUBMISSION, THE CONTRACTOR ACKNOWLEDGES THAT HE/SHE IS EXPERT IN THE SEVERAL LINES OF THE WORK AND IS CAPABLE OF INTERPRETING THEM. WHERE NO SPECIFIED MANUFACTURER OR QUALITY OF MATERIAL IS GIVEN, A FIRST-CLASS STANDARD ARTICLE AS APPROVED BY THE DESIGN PROFESSIONAL SHALL BE FURNISHED.
- J. THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ARE INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, CONDUITS, PANELS, FIXTURES, ETC. THE LOCATION OF ALL ITEMS SHOWN THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED AT THE PROJECT AND SHALL HAVE THE APPROVAL OF THE DESIGN PROFESSIONAL BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
- K. MAINTAIN AND PROTECT ALL EQUIPMENT, MATERIALS AND TOOLS FROM LOSS OR DAMAGE FROM ALL CAUSES UNTIL FINAL ACCEPTANCE BY THE OWNER.
- L. IT IS REQUIRED THAT THE WORK INDICATED BE CARRIED OUT WITH A MINIMUM OF INTERFERENCE TO THE ESTABLISHED ROUTINE OF THE EXISTING BUILDINGS AND THAT ALL WORK BE PERFORMED WITHIN THE REQUIRED CONTRACT TIME.
- M. THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IN WRITING WHEN INTERRUPTION OF THE PRESENTLY MAINTAINED SERVICES, MECHANICAL, ELECTRICAL OR OTHERWISE IS REQUIRED. WRITTEN PERMISSION SHALL BE OBTAINED FROM THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCING WITH THE SHUT-DOWN.
- N. PROVIDE ALL NECESSARY TRAILERS, EXTENSION CORDS AND LAMPS TO PROVIDE TEMPORARY LIGHT AND POWER FOR THE PROPER EXECUTION OF ALL WORK.
- O. PROVIDE ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES OF ANY EQUIPMENT AND APPARATUS FURNISHED. REMOVE SAME FROM PREMISES WHEN NO LONGER REQUIRED.
- P. ALL WORK SHOWN ON THE DRAWINGS THAT IS NOT SPECIFICALLY INDICATED AS BEING EXISTING SHALL BE ASSUMED TO BE NEW.
- Q. THE INSTALLATION OF ALL ELECTRICAL EQUIPMENT, LIGHTING, CONDUIT AND WIRING SHALL CONFORM TO THE LATEST EDITION IBC CODE EARTHQUAKE CONTROL SECTION 1622.
- R. NO PART OF THESE DRAWINGS OR SPECIFICATIONS IS INTENDED TO ALLOW A VIOLATION OF PHYSICAL WORKING SPACE REQUIREMENTS AROUND ELECTRICAL EQUIPMENT.
- S. VERIFY ALL UNDERGROUND UTILITIES WITH GROUND PENETRATING RADAR PRIOR TO ANY EXCAVATION.
- T. USE "CALL BEFORE YOU DIG" SERVICE PRIOR TO ANY EXCAVATION.
- U. CONTRACTOR TO PROVIDE TOILET FACILITIES DURING CONSTRUCTION.
- V. THE PV ARRAY IS LOCATED ON A GROUND MOUNT.
- A. ALL PENETRATIONS TO BE SEALED WITH FIREPROOF SEALANT WITH FIREHOUR RATING TO MATCH EXISTING WALL.
- 1.3 TESTS
- A. WIRE AND CABLE: PERFORM INSULATION RESISTANCE AND CONTINUITY TESTS FOR ALL CONDUCTORS. THESE SHALL BE COMPLETED PRIOR TO ENERGIZING. INVESTIGATE AND TAKE REMEDIAL ACTION WHEN CONTINUITY VALUES EXCEED 1.0 OHM AND/OR INSULATION RESISTANCE TESTS LESS THAN 500 MEGAOHMS.
- B. GROUND RESISTANCE TESTS: RESISTANCE OF THE ELECTRICAL SYSTEM GROUNDING SHALL BE TESTED TO GROUND AT THE MAIN GROUND ELECTRODE CONNECTION TO ENSURE THAT GROUND RESISTIVITY VALUES DO NOT EXCEED 5 OHMS. SUPPLEMENTAL GROUNDING ELECTRODES MAY NOT EXCEED 5 OHMS.
- 1.4 GROUNDING
- A. COMPLY WITH REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION, NEC, UL AND IEEE STANDARDS. SIZE GROUND CONDUCTORS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE EXCEPT WHERE LARGER SIZES ARE INDICATED. ALL GROUND CONDUCTORS SHALL BE NOT SMALLER THAN NO.12 AWG. PROVIDE A COMPLETE ASSEMBLY OF MATERIALS REQUIRED FOR GROUNDING AND BONDING. GROUNDING ELECTRODE CONDUCTORS SHALL BE COPPER.
- B. GROUNDING BUSHINGS SHALL BE HOT-DIPPED GALVANIZED BODY, MOLDED PHENOLIC INSULATION, RATED AT150 DEG C. WITH COPPER-TINNED LAY-IN LUG. PROVIDE FOR ALL INCOMING AND OUTGOING CONDUITS TO THE DISTRIBUTION EQUIPMENT. USE STAINLESS STEEL SCREWS.
- C. GROUND RODS SHALL BE STEEL CORE, COPPER JACKETED TYPE, HIGH STRENGTH STEEL ALLOY CORE WITH A MOLTEN-WELDED COVERING AND CONICAL POINT WITH CHAMFER EDGE AT TOP. DRIVING HEADS SHALL BE USED TO PROTECT TOPS OF RODS DURING DRIVING. MINIMUM SIZE ROD SHALL BE 3/4 INCH DIAMETER AND ATLEAST 8 FOOT LONG IN CONTACT WITH SOIL AS REQUIRED BY THE CODE.
- D. GROUND CONNECTORS FOR CONNECTING CABLE TO PIPE SHALL BE HIGH COPPER ALLOY OR BRONZE FITTINGS. PROVIDE AN OFFSET STEEL TONGUE FOR CONNECTIONS TO STEEL AND A DRILLED TONGUE FOR CONNECTION TO COPPER BUS BAR.
- E. EXPOSED NON-CURRENT CARRYING METAL PARTS OF MODULE FRAMES, EQUIPMENT AND ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH NEC 250.134 AND 250.136(A). PHOTOVOLTAIC MODULES TO BE GROUNDED USING FACTORY GROUND POINT ONLY OR ANY METHOD THAT DOES NOT VIOLATE THE MODULE'S UL LISTING AND MUST BE APPROVED BY THE DESIGN PROFESSIONAL.
- F. GROUND CONTINUITY SHALL BE MAINTAINED ACROSS CONDUIT/ENCLOSURE INTERFACE USING APPROVED JUMPER METHOD.
- G. PARTS OF THE ELECTRICAL INSTALLATION TO BE GROUNDED AND BONDED SHALL INCLUDE BUT NOT BE LIMITED TO ELECTRICAL EQUIPMENT, RACEWAYS, CABLE TRAYS, BOXES, CABINETS AND OTHER NON-CURRENT CARRYING METAL PARTS OF THE WIRING SYSTEM, METAL CONDUIT, SWITCHGEAR, HOUSING AND NEUTRALS OF TRANSFORMERS, LIGHTING FIXTURES, PANEL DEVICES, FENCES AROUND ELECTRICAL EQUIPMENT AS APPLICABLE TO EQUIPMENT INSTALLED ON THIS PROJECT.
- H. USE EXOTHERMIC WELDING FOR PERMANENTLY CONCEALED BURIED AND INACCESSIBLE CONNECTIONS TO FORM SOLID METAL JOINTS. MAKE ACCESSIBLE GROUND CONNECTIONS WITH MECHANICAL PRESSURE TYPE GROUND CONNECTIONS UNLESS OTHERWISE NOTED.
- I. APPLY CORROSION-RESISTANT FINISH TO FILED-CONNECTIONS, BURIED METALLIC GROUNDING AND BONDING PRODUCTS, AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED, WHICH ARE SUBJECTED TO CORROSIVE ACTION.
- 1.5 CONDUITS AND FITTINGS
- A. ABOVE GROUND: PVC SCH 80 WITH EXPANSION FITTINGS AS APPLICABLE. COMBINER BOX OUTPUT MUST BE EITHER INTERMEDIATE METALLIC CONDUIT(IMC) OR RIGID METALLIC CONDUIT(RMC): ANSI-C80.3, GALVANIZED THREADLESS, THIN WALL CONDUIT, MINIMUM 3/4 INCH STEEL COMPRESSION CONNECTORS AND COUPLINGS. MECHANICAL SET SCREWS AND DIE-CAST TYPE COUPLINGS AND CONNECTORS SHALL NOT BE USED. USE METAL CONDUIT BODIES TO MATCH CONDUIT WITH COMPRESSION FITTINGS.
- B. RACEWAYS IN CLOSE PROXIMITY OF OTHER TRADES, SHALL BE ARRANGED TO ALLOW FOR PROPER CLEARANCE FOR SERVICING, MAXIMUM HEADROOM, ETC. AND TO PRESENT A NEAT APPEARANCE. MAINTAIN ADEQUATE CLEARANCE BETWEEN CONDUIT AND PIPING WITH A MINIMUM OF 12 INCHES CLEARANCE BETWEEN CONDUIT AND SURFACES WITH TEMPERATURES EXCEEDING 104 DEGREES F.
- C. JOIN RACEWAYS WITH FITTINGS DESIGNED AND APPROVED FOR THE PURPOSE AND MAKE JOINTS TIGHT. WHERE JOINTS CANNOT BE MADE TIGHT, USE BONDING JUMPERS TO PROVIDE ELECTRICAL CONTINUITY OF THE RACEWAY SYSTEM. MAKE RACEWAY TERMINATIONS TIGHT. WHERE SUBJECT TO VIBRATION OR DAMPNESS, USE INSULATION BUSHINGS TO PROTECT CONDUCTORS. CUT CONDUIT SQUARE USING SAW OR PIPE CUTTER AND DE-BURR CUT ENDS.
- D. USE CONDUIT HUBS OR SEALING LOCKNUTS TO FASTEN CONDUIT TO BOXES IN DAMP AND WET LOCATIONS.
- E. SUPPORT CONDUIT USING STEEL OR MALLEABLE IRON SINGLE OR DOUBLE HOLE CONDUIT STRAPS, LAY-IN ADJUSTABLE HANGERS, CLEVIS HANGERS AND SPLIT HANGERS AS REQUIRED. FASTEN CONDUIT SUPPORTS TO STRUCTURE AND SURFACES. DO NOT ATTACH CONDUIT SUPPORTS TO CEILING SUPPORT WIRES, OR ANY OTHER CONDUIT, PIPE, DUCT, ETC. DO NOT SUPPORT CONDUIT WITH WIRE OR PIPE HANGER STRAPS. ALL SUPPORTS SHALL CONFORM TO NEC 344.30.
- F. BELOW GRADE: PVC SCHEDULE 80 OR PVC SCHEDULE 40. VERIFY WITH DESIGN ENGINEER PRIOR TO INSTALLATION. CONDUIT NEMA TC2 UL 651, WITH MATCHING FITTINGS BY SAME MANUFACTURER AS THE CONDUIT. COMPLYING WITH NEMA TC 3 AND UL 51413.
- G. CONDUIT EXPANSION FITTINGS SHALL BE PROVIDED AS REQUIRED PER NEC 300.7 & 352.44.
- H. ALL CONDUITS SHALL BE SEALED AT ALL ENDS.
- A. ALL WIRE BETWEEN COMBINER BOXES AND INVERTER TO BE ALUMINUM. ALL ALUMINIUM CONDUCTORS TO BE CODE REQUIRED AND INDUSTRY STANDARD AA-8000 ALUMINUM ALLOY CONDUCTORS.
- B. PULL CONDUCTORS SIMULTANEOUSLY WITH UL LISTED PULLING COMPOUND OR LUBRICANT FOR BUILDING WIRE #4 AWG AND LARGER. USE PULLING MEANS INCLUDING, FISH TAPE, CABLE, ROPE, AND BASKET WEAVE WIRE/CABLE GRIPS WHICH WILL NOT DAMAGE CABLES OR RACEWAYS. TENSION GAGE SHALL BE USED ON ALL MECHANICAL PULLING PROCEDURES. PULL TENSION AND SPEED SHALL BE RECORDED DURING ALL PULLS. MAXIMUM TENSION AND SPEED SHALL BE CALCULATED BEFORE HAND.
- C. ALL WIRING SHALL BE FACTORY COLOR CODED. FOR MODIFICATIONS TO EXISTING SYSTEMS, MATCH COLOR CODING SCHEME ALREADY IN PLACE. OTHERWISE FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:
- | 240/120 VOLTS | PHASE | 480 VOLTS | 270 VOLTS | DC POLARITY | 2000 VOLTS |
|---------------|---------|-----------|-----------|-------------|-------------------------|
| BLACK | A | BROWN | BROWN | POSITIVE | BLACK WITH COLOR STRIPE |
| RED | B | ORANGE | ORANGE | NEGATIVE | BLACK |
| BLUE | C | YELLOW | YELLOW | GROUND | GREEN/BARE |
| WHITE/GREY | NEUTRAL | WHITE | WHITE | | |
| GREEN | GROUND | GREEN | GREEN | | |
- D. ALL WIRING IN PANELS SHALL BE NEATLY TIE-WRAPPED AND TRAINED WITHIN GUTTER SPACES.
- E. POSITIVE AND NEGATIVE PV WIRES SHALL BE VISUALLY DESIGNATED DIFFERENTLY BETWEEN TERMINATION POINTS.ALL BLACK INSULATION FOR POSITIVE AND NEGATIVE WIRES WILL NOT BE ALLOWED. TIE WRAPS SHALL BE WEATHER AND OIL/GAS RESISTANT. TIE WRAPS MUST BE NYLON COATED STEEL OR BE UV STABILIZED GUARANTEED FOR 25 YEARS.
- F. COMPRESSION TYPE CONNECTORS ARE TO BE USED AT ALL TIMES UNLESS THE MANUFACTURER'S INSTRUCTION MANUAL REQUIRES A MECHANICAL TYPE CONNECTION.
- G. ALL ALUMINUM TERMINATIONS NEED ANTI-OXIDATION COMPOUND.
- 1.7 BOXES
- A. GALVANIZED STEEL PULL BOXES: NEMA OS 1 WITH WELDED SEAMS. WHERE NECESSARY TO PROVIDE A RIGID ASSEMBLY, CONSTRUCT WITH INTERNAL STRUCTURAL STEEL BRACING, HOT-DIP GALVANIZED AFTER FABRICATION. COVER SHALL BE GASKETED, SCREWED OR BOLTED ON OF MATERIAL SAME AS BOX AND SHALL BE OF SIZE AND SHAPE TO SUIT APPLICATION. SIZES SHALL BE ADEQUATE TO MEET NEC VOLUME REQUIREMENTS, BUT IN NO CASE SMALLER THAN SIZES INDICATED. REMOVE SHARP EDGES WHERE THEY MAY COME IN CONTACT WITH WIRING OR PERSONNEL.
- B. FOR INTERIOR DRY LOCATIONS USE GALVANIZED SHEET STEEL, NEMA TYPE 1. FOR LOCATIONS EXPOSED TO WEATHER OR DAMPNESS USE NEMA TYPE 3R BOXES, FULLY GASKETED. FOR WET LOCATIONS USE NEMA TYPE 4 BOXES WITH FULLY GASKETED WEATHERPROOF COVERS.
- C. ELECTRICALLY GROUND ALL METAL BOXES TO CONDUIT SYSTEM. WHERE WIRING TO ITEMS INCLUDES A GROUNDING CONDUCTOR, ALSO PROVIDE A GROUNDING TERMINAL IN THE INTERIOR OF THE CABINET, BOX OR ENCLOSURE.
- 1.8 SUPPORTING DEVICES
- A. PROVIDE MATERIALS, SIZES AND TYPES OF ANCHORS, FASTENERS AND SUPPORTS TO CARRY THE LOADS OF EQUIPMENT AND CONDUIT. CONSIDER THE WEIGHT OF WIRE IN CONDUIT WHEN SELECTING PRODUCTS. ATTACHMENTS SHALL BE RATED BY AN INDEPENDENT TESTING LABORATORY FOR THE RATED LOADING WITH A SAFETY FACTOR OF FIVE. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS. DO NOT USE SPRING STEEL CLIPS AND CLAMPS, POWDER-ACTUATED ANCHORS, TESTING FOR CONCRETE AND STEEL ATTACHMENTS SHALL BE IN ACCORDANCE WITH TEST CRITERIA ESTABLISHED BY UL SUPPORTS, SUPPORT HARDWARE, AND FASTENERS SHALL BE PROTECTED WITH ZINC COATING OR WITH TREATMENT OF EQUIVALENT CORROSION RESISTANCE. PRODUCTS FOR USE OUTDOORS SHALL BE HOT-DIP GALVANIZED. IN CORROSIVE AREAS, PRODUCTS SHALL BE TREATED WITH 15 MIL PVC COATING. ALL PRODUCTS SHALL BE TREATED AFTER CUTTING AND THREADING.
- B. PROVIDE ANY SPECIAL WORK, INCLUDING BUT NOT LIMITED TO INTERMEDIATE STEEL CHANNELS, THAT MAY BE REQUIRED TO OVERCOME UNUSUAL CONDITIONS. DO NOT FASTEN TO ANY TRADES OTHER THAN THE STRUCTURAL SYSTEM WHERE SPECIFICALLY NOTED BELOW.
- C. PROVIDE SUPPORTS FOR ALL RACEWAYS INCLUDING U-CHANNEL SYSTEMS, RISER CLAMPS, CONDUIT STRAPS, THREADED C-CLAMPS WITH RETAINERS AND WALL BRACKETS.
- D. CONCRETE STRUCTURAL ELEMENTS AND MASONRY WALLS: USE CARBON STEEL WEDGE OR SLEEVE TYPE EXPANSION ANCHORS. COORDINATE ALL ANCHOR LOCATIONS IN POST-TENSIONED SLABS. HOLES CUT DEPTH OF MORE THAN 1-1/2 INCHES IN REINFORCED CONCRETE BEAMS OR MORE THAN 3/4 INCH IN REINFORCED CONCRETE SHALL NOT CUT THE MAIN REINFORCING BARS. FILL HOLES THAT ARE NOT USED.
- E. HOLLOW MASONRY: USE STEEL SPRINGHEAD TYPE TOGGLE BOLTS AND HOLLOW WALL FASTENERS.
- F. STEEL STRUCTURAL ELEMENTS: USE BEAM CLAMPS, STEEL FASTENERS AND CLEVIS HANGERS.
- G. STEEL SURFACES: MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS.
- H. PARTITIONS OF LIGHT STEEL CONSTRUCTION: SHEET METAL SCREWS.
- I. WOOD ELEMENTS: USE WOOD SCREWS.
- J. U-CHANNEL SYSTEMS: 12 GAUGE CARBON STEEL CHANNELS, WITH 9/16 X 7/8 INCH HOLES IN TOP SURFACE, 2 INCHES ON CENTER. PROVIDE FITTINGS AND ACCESSORIES THAT MATE AND MATCH WITH U-CHANNEL AND ARE OF THE SAME MANUFACTURER. PROVIDE ANGLES AND OTHER STANDARD STRUCTURAL SHAPES. CONNECT WITH WELDS OR MACHINE BOLTS TO FORM RIGID SUPPORTS.
- K. A HANGER OR SUPPORT SHALL BE INSTALLED CLOSE TO THE POINT OF A CHANGE IN DIRECTION OF ALL CONDUIT RUNS, IN EITHER A HORIZONTAL OR VERTICAL PLANE.
- L. UNDER NO CONDITIONS SHALL ANY HANGERS, SUPPORTS, BOLTS, OR RIVETS PIERCE DUCTS. THE PUNCHING OF HOLES IN STRUCTURAL SHAPES WILL NOT BE ALLOWED. "C" CLAMPS WILL NOT BE ACCEPTED AS A MEANS OF FASTENING EQUIPMENT OR CONDUITS TO THE BUILDING STRUCTURE, UNLESS HE HANGER SPACING IS REDUCED BY 33-1/3%
- M. SPACING OF CONDUIT SUPPORTS AS PER NEC REQUIREMENTS.
- N. CABLE TIES FOR WIRE AND CABLE: PROVIDE CLIPS FROM WILEY ELECTRONICS OR APPROVED EQUAL
- O. TORQUE MARKS SHALL BE APPLIED TO ALL FASTENERS, SCREWS, ETC THAT REQUIRE AND HAVE BEEN PROPERLY TORQUE.

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
**ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W**

SEAL:

STEPHEN A. BRAY
PROFESSIONAL ENGINEER
CT LICENSE: 26657

DATE: **03/09/2020**

PROJECT #: **2000500**

DRAWN BY: **V. PISSAREVSKI**

CHECKED BY: **R. VUDI**

TITLE:
GENERAL NOTES SHEET 1

SHEET:
E-001

1.9 IDENTIFICATION

- A. WIRE DESIGNATION MARKERS: PROVIDE FUNGUS RESISTANT, VINYL OR VINYL-CLOTH CONDUCTOR MARKERS IN OUTLET, JUNCTION AND PULL BOXES INDICATING WIRE USAGE (I.E SWITCH LEG, POWER FEED, TRAVELERS, ETC). THIS IS IN ADDITION TO WIRE CIRCUIT IDENTIFICATION REQUIREMENTS AND IS INTENDED TO CLARIFY WIRING WITHIN BOXES.
- B. CIRCUIT IDENTIFICATION: PROVIDE WIRE MARKERS ON EACH CONDUCTOR IN PANELBOARD GUTTERS, PULL BOXES, OUTLET AND JUNCTION BOXES, AND AT LOAD CONNECTION. IDENTIFY BRANCH CIRCUIT OR FEEDER NUMBER FOR POWER AND LIGHTING CIRCUITS, AND WIRE DESIGNATION INDICATED ON EQUIPMENT MANUFACTURER'S SHOP DRAWING FOR CONTROL WIRING, MAINTAIN CONSISTENCY WITH SIMILAR PREVIOUSLY ESTABLISHED IDENTIFICATION SCHEMES FOR THE FACILITY'S ELECTRICAL INSTALLATIONS.

1.10 SITE CONDITIONS:

- A. A TOTAL OF 19,978.24 KW-DC, 15,000KW-AC OF PHOTOVOLTAIC SYSTEM WILL BE INSTALLED AT THE ELLA ROAD SOLAR SITE LOCATED IN NORTH STONINGTON, CT.
- B. PHOTOVOLTAIC ARRAYS WILL BE INSTALLED ON THE POST DRIVEN TRACKER GROUND MOUNT ARRAY AS IDENTIFIED IN THE DRAWINGS.
- C. THE ASHRAE EXTREME ANNUAL DRY BULB MINIMUM TEMPERATURE AT THE SITE IS -16.5 DEG CELSIUS.
- D. THE ASHRAE 2% DRY BULB HIGH AMBIENT TEMPERATURE AT THE SITE IS 29.9 DEG CELSIUS.

1.11 PHOTOVOLTAIC CIRCUIT DESIGN:

- A. THE NUMBER OF MODULES IN A STRING BASED ON MANUFACTURERS SPECIFICATIONS FOR THE TEMPERATURE CO-EFFICIENT FOR VOLTAGE FOR THE LONGI 435 (435W) MODULE IS -0.30%/DEG C AT AN AMBIENT TEMPERATURE OF 25 DEG C. BASED ON THE RECORD LOW AMBIENT TEMPERATURE OF -16.5 DEG C, THE TEMPERATURE DIFFERENTIAL IS 29.9 DEG C. CALCULATION: THE MAXIMUM VOLTAGE CALCULATED FROM THE DATA SIMULATED BY SAM USING SANDIA NATIONAL LABORATORIES' PHOTOVOLTAIC ARRAY PERFORMANCE MODEL WAS FOUND TO BE 1500 V.
- B. THE PHOTOVOLTAIC ARRAY STRINGS USE 27 MODULES IN SERIES EACH.
- C. ALL THE DC CIRCUIT CONNECTIONS HAVE BEEN DESIGNED TO HAVE A VOLTAGE DROP OF LESS THAN 2% FROM THE MODULE TO INVERTER TERMINALS AT STANDARD TEST CONDITIONS. REFER TO WIRING SCHEDULE FOR SAMPLE CALCULATION.
- D. PHOTOVOLTAIC ARRAY DC WIRE SIZING IS BASED ON ETAP SOFTWARE PROVIDED DERATE VALUES PER BACKFILL SOIL THERMAL RESISTIVITY AND DUCT BANK CONFIGURATION.
- E. ALL MATING STRING WIRING CONNECTORS SHALL BE OF THE SAME BRAND NAME. MC4 COMPATIBLE CONNECTORS SHALL NOT MATE WITH MC4 OR OTHER BRAND NAME MC4 COMPATIBLE CONNECTORS.
- F. PHOTOVOLTAIC SOURCE CIRCUITS ARE PROTECTED BY OVER CURRENT PROTECTION IN ACCORDANCE WITH NEC SEC 690.9.
- G. PHOTOVOLTAIC INVERTERS ARE PROVIDED WITH GROUND FAULT PROTECTION AND INTERRUPTION ABILITIES IN ACCORDANCE WITH NEC SEC. 690.5. 690.11 DOES NOT APPLY.
- H. PHOTOVOLTAIC ARRAYS HAVE BEEN PROVIDED WITH DISCONNECTING MEANS IN ACCORDANCE WITH NEC SEC 690.13.
- I. PHOTOVOLTAIC ARRAYS HAVE A COMMON DC AND AC GROUNDING ELECTRODE SYSTEM COMPLYING WITH THE REQUIREMENTS OF NEC SEC 690.47.
- J. ALL PHOTOVOLTAIC EQUIPMENT INCLUDING PV MODULES, COMBINER BOXES, DISCONNECTS, INVERTERS, AC CIRCUIT BREAKERS WILL BE IDENTIFIED AND INFORMATION ON MAXIMUM SYSTEM VOLTAGE, CURRENT, OPERATING VOLTAGE AND CURRENT WILL BE NOTED WITH A WARNING LABEL ON A CLEARLY VISIBLE LOCATION.
- K. ALL PHOTOVOLTAIC DC CONDUCTORS SHALL BE 2000V PV WIRE "SUNLIGHT RESISTANT" MARKED FOR EXPOSED WIRING. 2000V PV WIRE, DIRECT BURIAL FOR DIRECT BURIED WIRED, 2000V XLPE INSULATION /RHW-2 FOR ALL WIRING IN CONDUIT. RATING OF AC EQUIPMENTS SHALL MATCH EXISTING EQUIPMENTS.
- L. ALL EQUIPMENT SHALL BE RATED FOR A MAXIMUM SYSTEM VOLTAGE OF 2000V AND ALL TERMINALS WILL BE RATED FOR STRANDED WIRES AND HAVE A 90°C TEMPERATURE RATING.
- M. CONDUITS HAVE BEEN SIZED TO MEET THE CONDUIT FILL REQUIREMENTS OF NEC. CHAPTER 9 TABLE 1.

1.12 CB LABELS, DC DISC LABELS, INV LABELS, WARNING LABELS:

- A. ALL LABELS SHALL BE UV STABILIZED, WEATHERPROOF AND DURABLE.
- B. TEXT ON LABELS SHALL BE OF ARIAL FONT - IT SHALL BE LEGIBLE AND CLEAR.
- C. THE TONE OF THE BACKGROUND COLOR SHALL BE BRIGHT TO ATTRACT ATTENTION. YELLOW (106) FOR CAUTION LABELS AND ORANGE (152) FOR WARNING LABELS.
- D. LABELS SHALL BE SECURELY FASTENED TO SPECIFIED LOCATIONS BY USING A WEATHER PROOF AND DURABLE ADHESIVE SUITABLE FOR THE MATERIAL OF THE LABEL AND THE LOCATION.
- E. THE LABELS SHALL BE POSTED AT THE LOCATIONS SPECIFIED. IF FOR REASONS OF REDUCED ACCESS OR SPACE, THE LABELS SHALL BE POSTED AT THE CLOSEST LOCATION THAT BEST SERVES THE INTENT OF THE LABEL. NOTIFY THE ENGINEER/SUPERVISOR IN SUCH A CASE BEFORE ATTACHING.

1.13 ABBREVIATIONS

A	AMPERES (AMP)
AC	ALTERNATING CURRENT
AF	AMP FRAME
AT	AMP TRIP
BIL	BASIC IMPULSE LEVEL
CB	COMBINER BOX
COM	COMMUNICATIONS
CT	CURRENT TRANSFORMER
CPT	CONTROL POWER TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
EMT	ELECTRICAL METALIC TUBING
EPR	ETHYLENE PROPYLENE RUBBER
GEM	GROUND ENHANCEMENT MATERIAL
G/GND	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFD	GROUND FAULT PROTECTION
Inom	NOMINAL CURRENT (AMPS)
KCMIL	THOUSAND CIRCULAR MILS
KV	THOUSAND VOLT
KVA	THOUSAND VOLT-AMPS
KW	THOUSAND WATT
LFMC	LIQUID TIGHT FLEXIBLE METALLIC CONDUIT
MPPT	MAXIMUM POWER POINT
MV	MEDIUM VOLTAGE
NEC	NATIONAL ELECTRIC CODE
NESC	NATIONAL ELECTRIC SAFETY CODE
PCC	POINT OF COMMON COUPLING
PT	POTENTIAL (VOLTAGE) TRANSFORMER
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
RMC	RIGID METAL CONDUIT
SA	SURGE ARRESTER
SCH	SCHEDULE
SPD	SURGE PROTECTION DEVICE
UL	UNDERWRITER'S LAB
V	VOLTAGE (VOLT)
Z	IMPEDANCE

1.14 SYMBOLS:

	EXISTING GAS HEADER
	ROAD (NEW)
	PV MODULE
	AC LINE (15KV) ABOVE GRADE CONDUIT ROUTE
	DC LINE (2000V)
	GROUND
	OVERHEAD LINE
	UNDERGROUND CABLE ROUTE
	GROUND ROD/PLATE
	CB COMBINER BOX
	LOAD BREAK DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	POWER CIRCUIT BREAKER (15KV)
	CIRCUIT BREAKER (<= 1000V)
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	GROUND
	UTILITY METER
	DEAD BREAK ELBOW (15KV)
	CABLE "LUG" TERMINATION
	TRANSFORMER
	FUSE
	GROUND FAULT DEVICE
	SPD
	OH CABLE TERMINATION "POT HEAD"
	SURGE ARRESTER "SA"
	EQUIPMENT PAD
	GRAVEL ACCESS ROAD

REV	DESCRIPTION	DATE
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1999 Harrison St, Ste 830
Oakland, CA 94612, USA


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SEAL:



Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26657



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WALL, NJ 07719
(732) 981-5433
FOR ALL QUESTIONS, PLEASE CONTACT
STEVE FOX - PROJECT MANAGER

DATE: **03/09/2020**

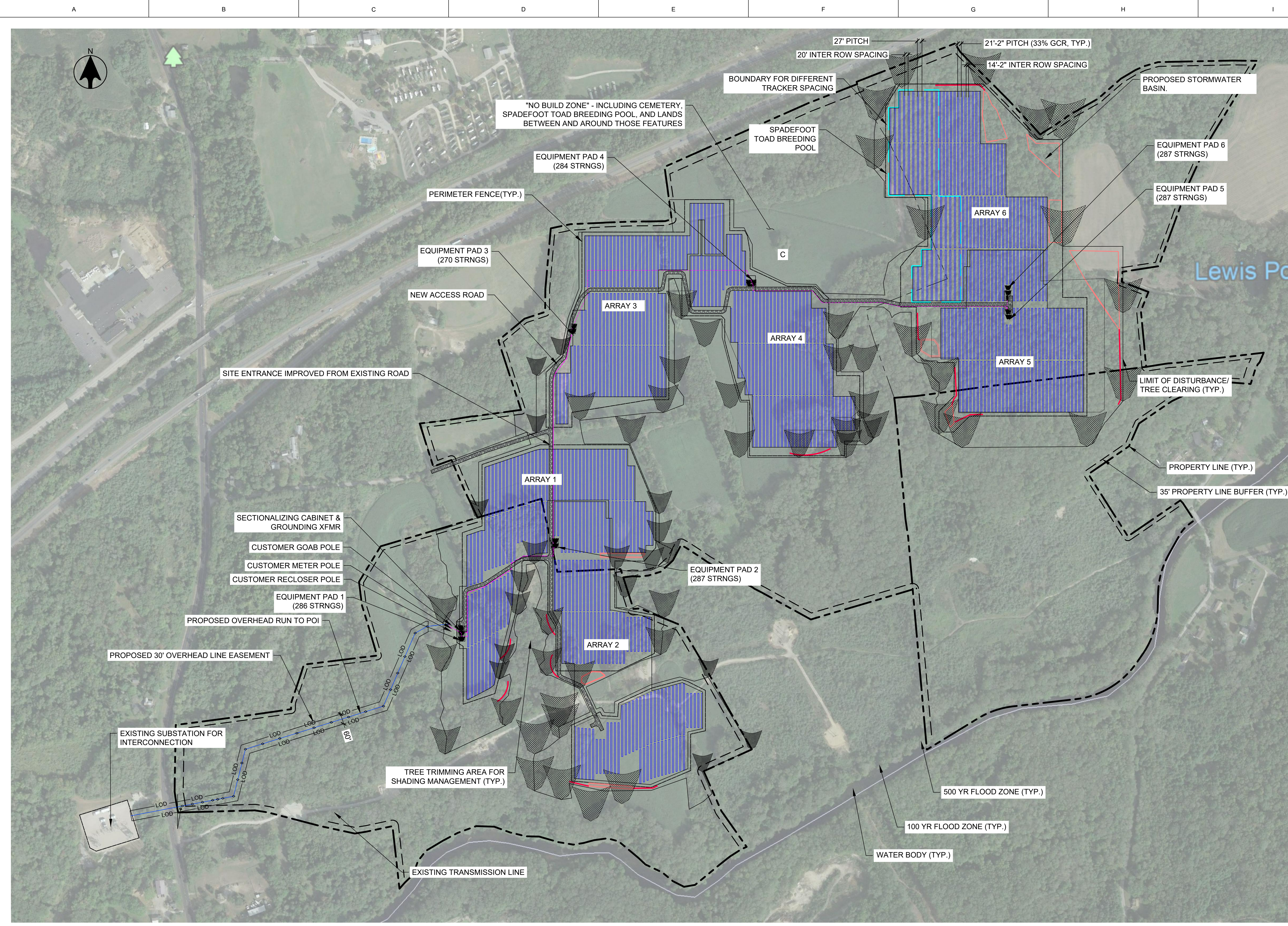
PROJECT #: **2000500**

DRAWN BY: **V. PISSAREVSKI**

CHECKED BY: **R. VUDI**

TITLE:
GENERAL NOTES SHEET 2

SHEET:
E-002



SYSTEM SUMMARY

STRING QTY.	1,701
MODULES / STR	27
MODULE QTY.	45,927
TOTAL DC SIZE	19.97 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
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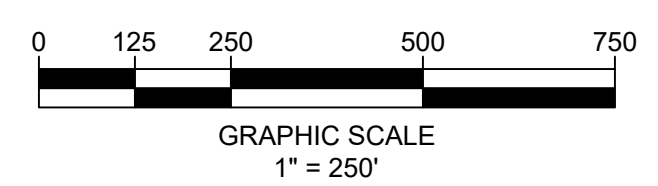
SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

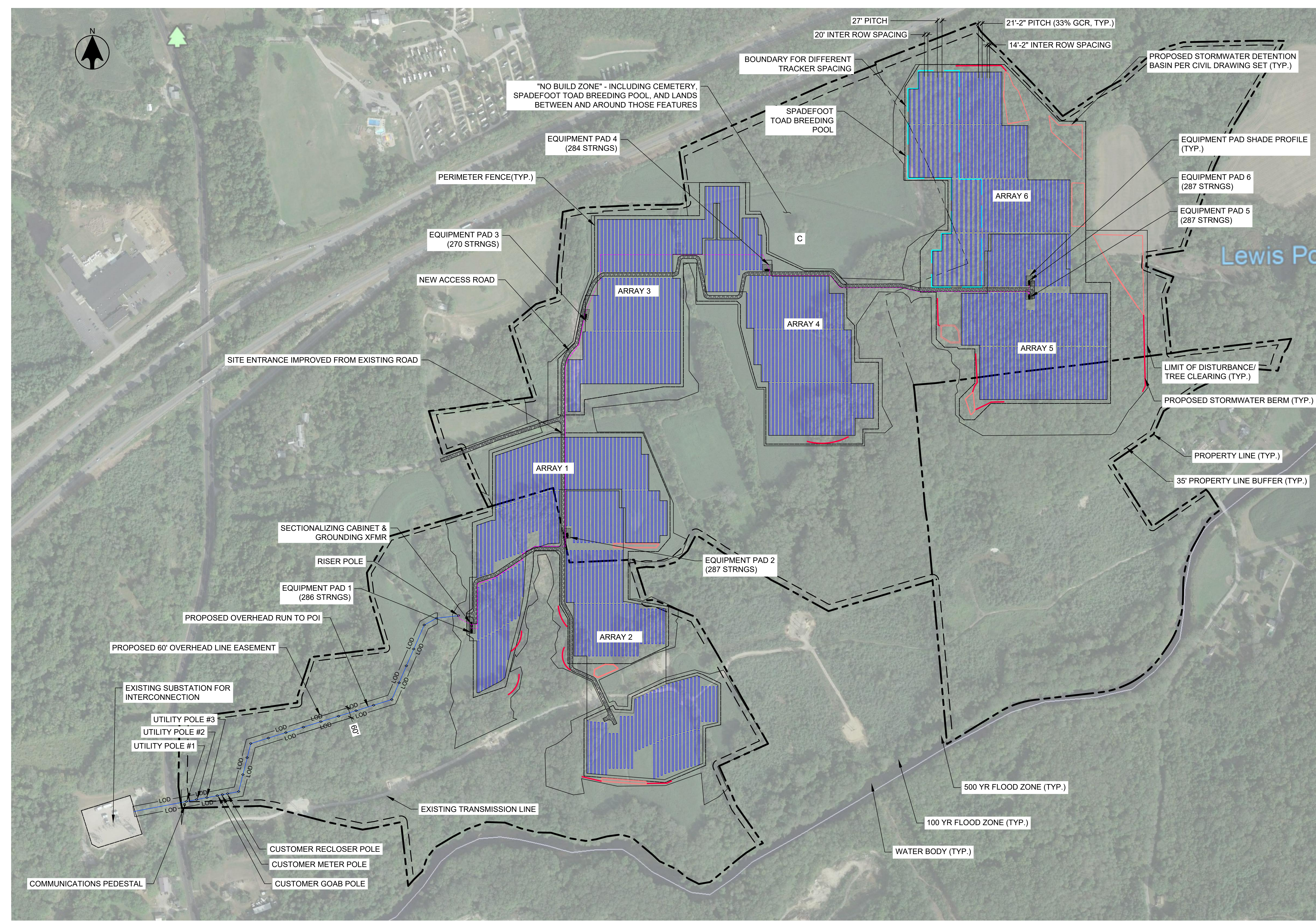
TITLE:
 OVERALL SITE PLAN

SHEET:
 E-100

1 OVERALL SITE PLAN



PLOT DATE: Thursday, June 04, 2020



SYSTEM SUMMARY

STRING QTY.	1,701
MODULES / STR	27
MODULE QTY.	45,927
TOTAL DC SIZE	19.97 MW
AZIMUTH	180°
GCR	33% & 26%
RACKING	NEXTRACKER

- NOTES:**
- DISTANCE BETWEEN UTILITY POLES ASSUMED TO BE 60 FEET.
 - DISTANCE BETWEEN EQUIPMENT TOP CUSTOMER POLES ASSUMED TO BE 30 FEET. ALL OTHER POLES ARE PLACED 105 FEET APART.
 - EQUIPMENT PAD SHADE PROFILE BASED ON 10 FEET HIGH STRUCTURE.

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
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 1999 Harrison St, Ste 830
 Oakland, CA 94612, USA

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 NORTH STONINGTON

PROJECT ADDRESS:
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 NORTH STONINGTON, CT 06359
 41°25'9.71"N, 71°50'4.83"W

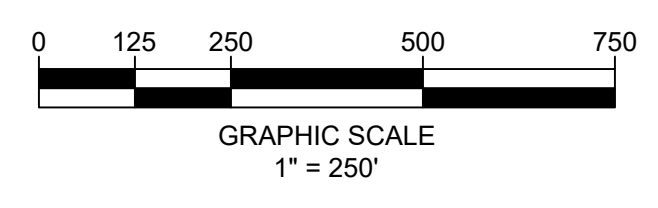
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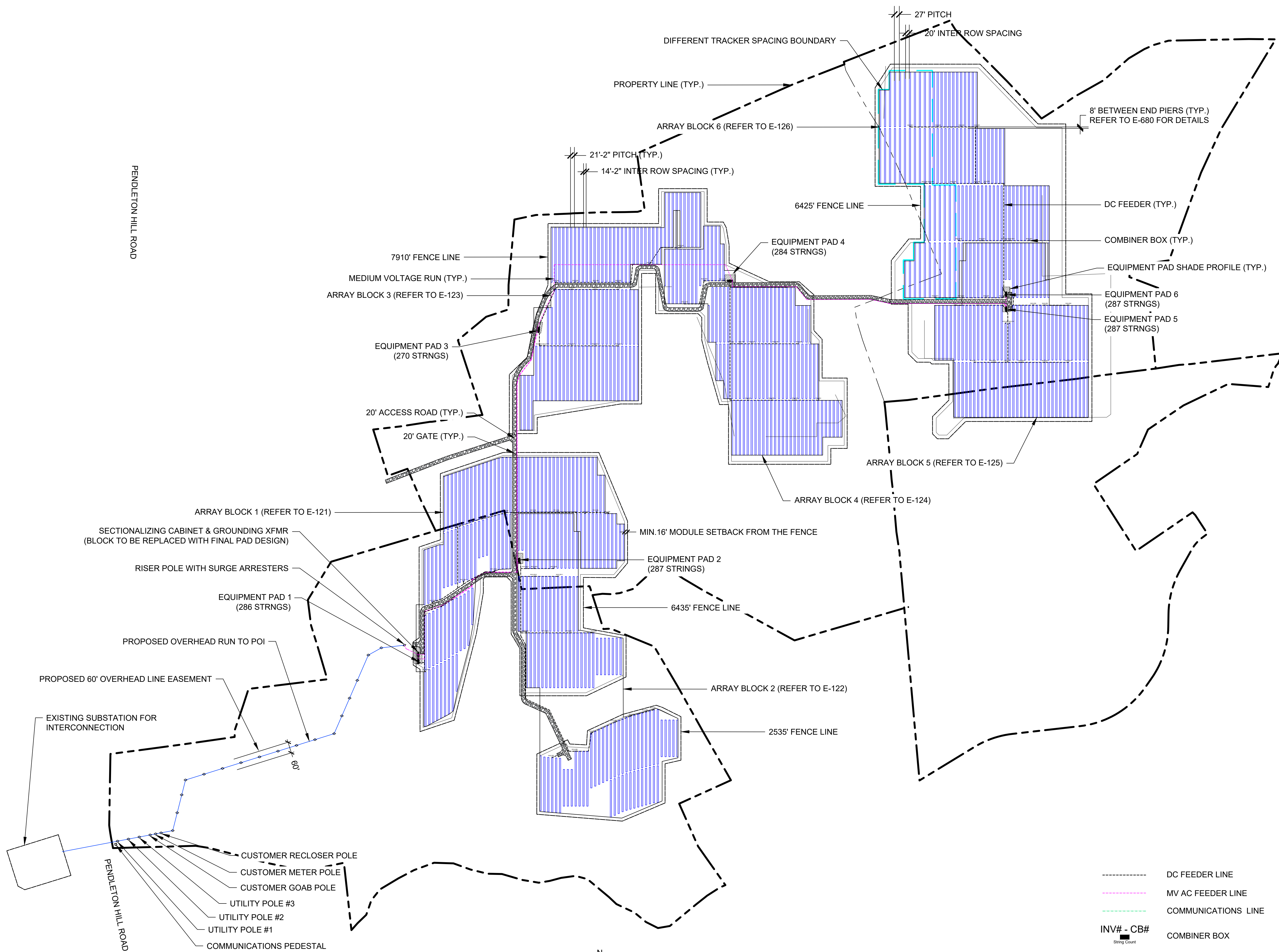
DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE:
 OVERALL SITE PLAN

SHEET:
 E-101

1 OVERALL SITE PLAN





SYSTEM SUMMARY

STRING QTY.	1,701
MODULES / STR	27
MODULE QTY.	45,927
TOTAL DC SIZE	19.97 MW
AZIMUTH	180°
GCR	33% & 26%
RACKING	NEXTRACKER
CB QTY.	95

- NOTES:**
- DISTANCE BETWEEN UTILITY POLES ASSUMED TO BE 60 FEET.
 - DISTANCE BETWEEN EQUIPMENT TOP CUSTOMER POLES ASSUMED TO BE 30 FEET. ALL OTHER POLES ARE PLACES 105 FT APART.
 - EQUIPMENT PAD SHADE PROFILE BASED ON 10 FEET HIGH STRUCTURE.

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SEAL:

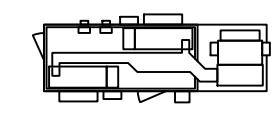


STEPHEN A. BRAY
 PROFESSIONAL ENGINEER
 CT LICENSE: 26657

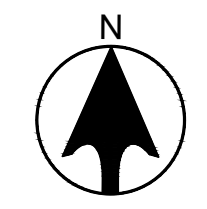
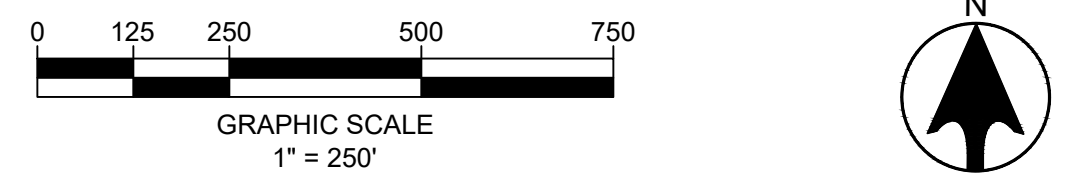


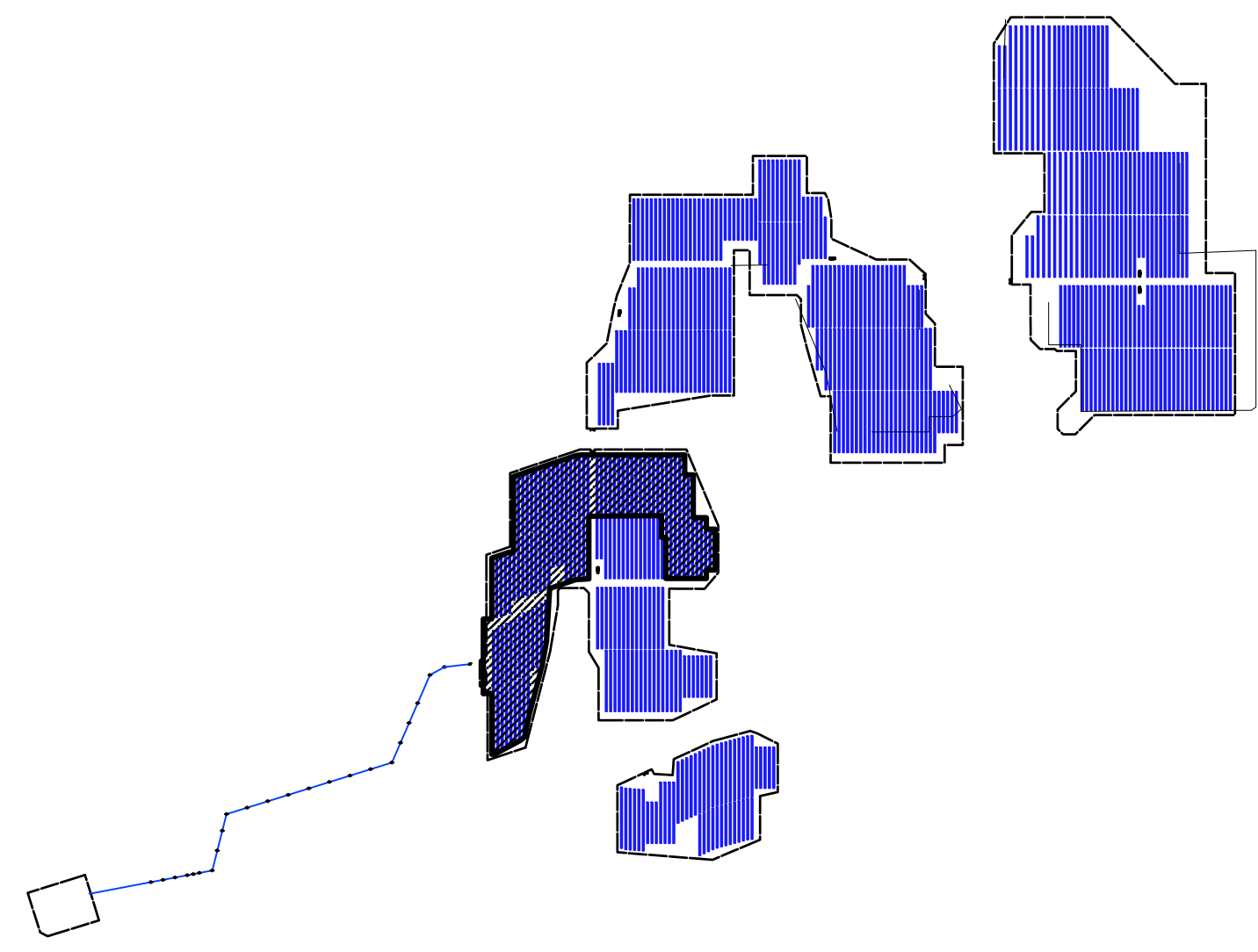
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 kmbdg.com
 1800 ROUTE 14, SUITE 200
 WALL, NJ 07719
 (732) 261-5421
 FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB# COMBINER BOX
-  EQUIPMENT PAD WITH INVERTER

1 OVERALL ARRAY SITE PLAN





2 KEY MAP

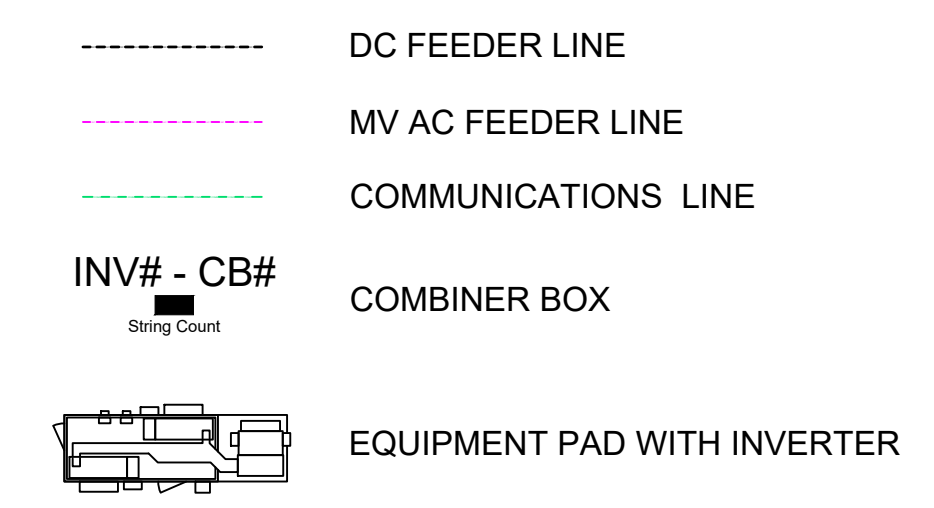
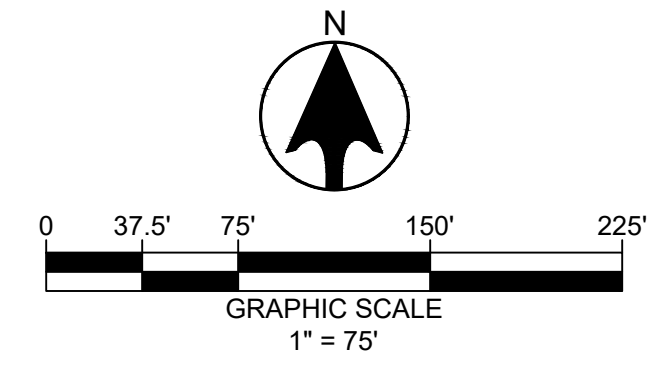
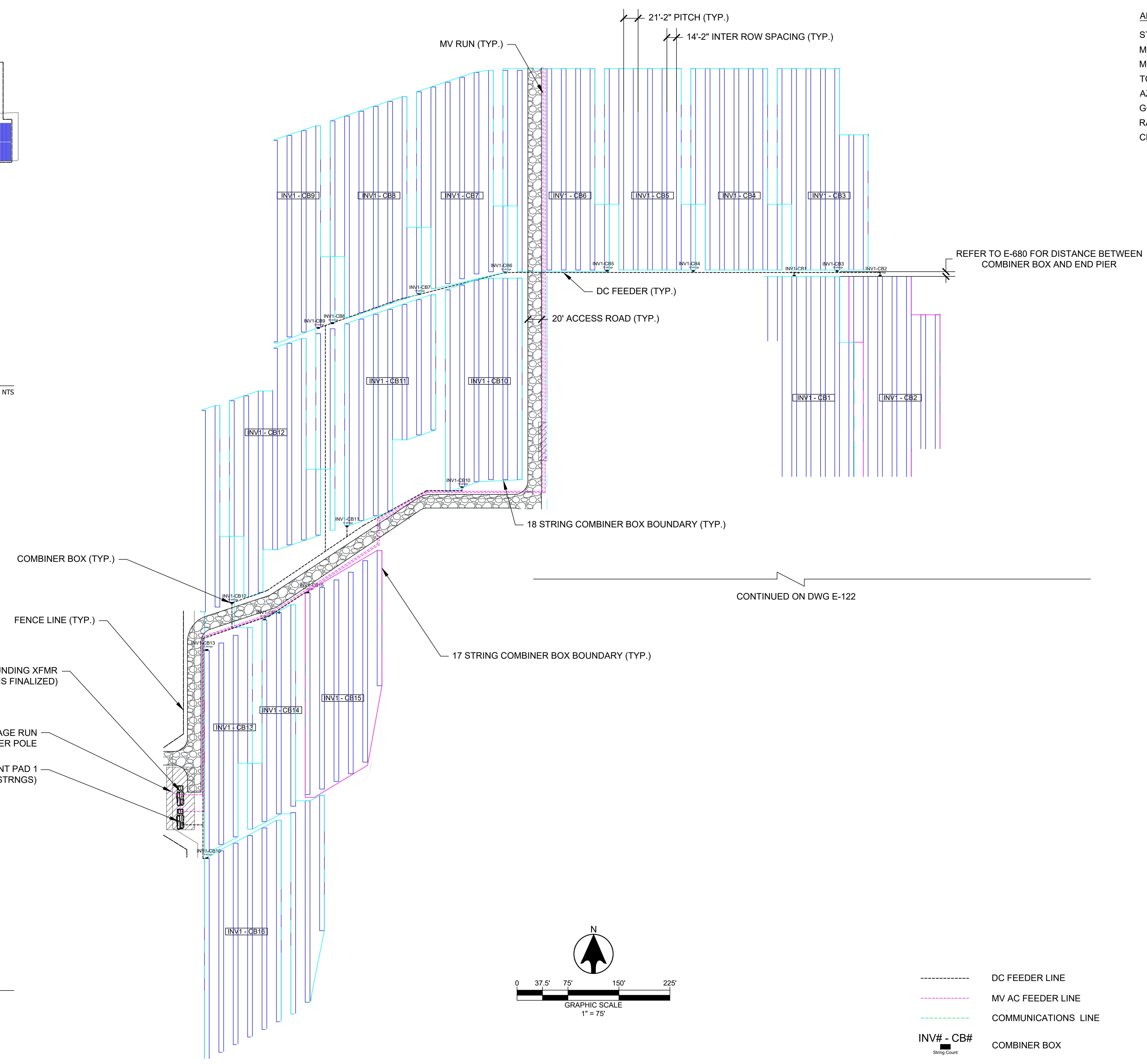
NTS

SECTIONALIZING CABINET & GROUNDING XFMR
(BLOCK WILL BE UPDATED ONCE PAD DESIGN IS FINALIZED)

MEDIUM VOLTAGE RUN
TO RISER POLE

EQUIPMENT PAD 1
(286 STRNGS)

1 ARRAY PLAN - BLOCK 1



ARRAY 1 SYSTEM SUMMARY

STRING QTY.	286
MODULES / STR	27
MODULE QTY.	7,722
TOTAL DC SIZE	3.359 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	16

REFER TO E-680 FOR DISTANCE BETWEEN
COMBINER BOX AND END PIER

CONTINUED ON DWG E-122

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
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41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020

PROJECT #: 2000500

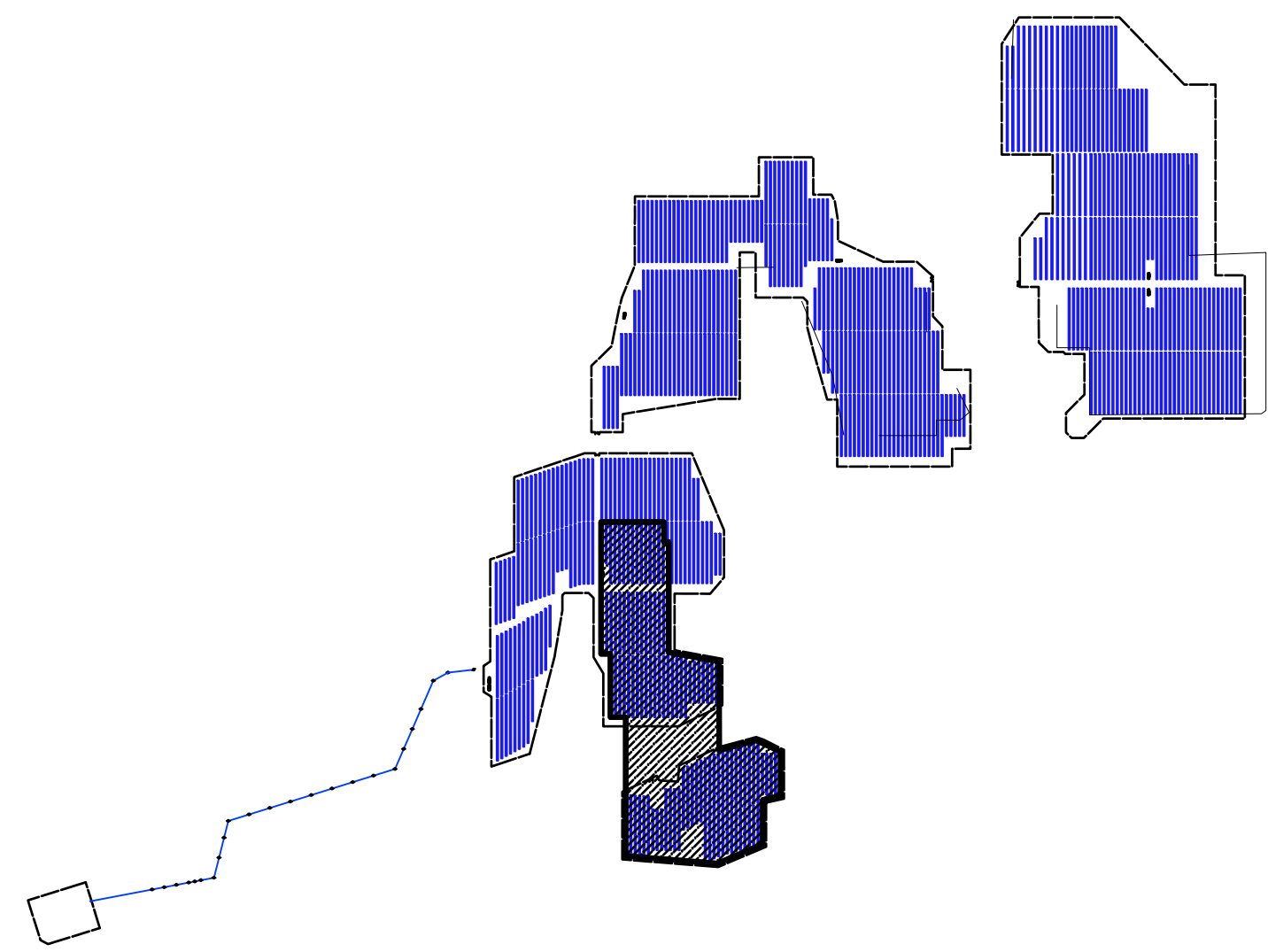
Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26657

DRAWN BY:
V. PISSAREVSKI

CHECKED BY:
R. VUDI

TITLE:
ARRAY PLAN - BLOCK 1

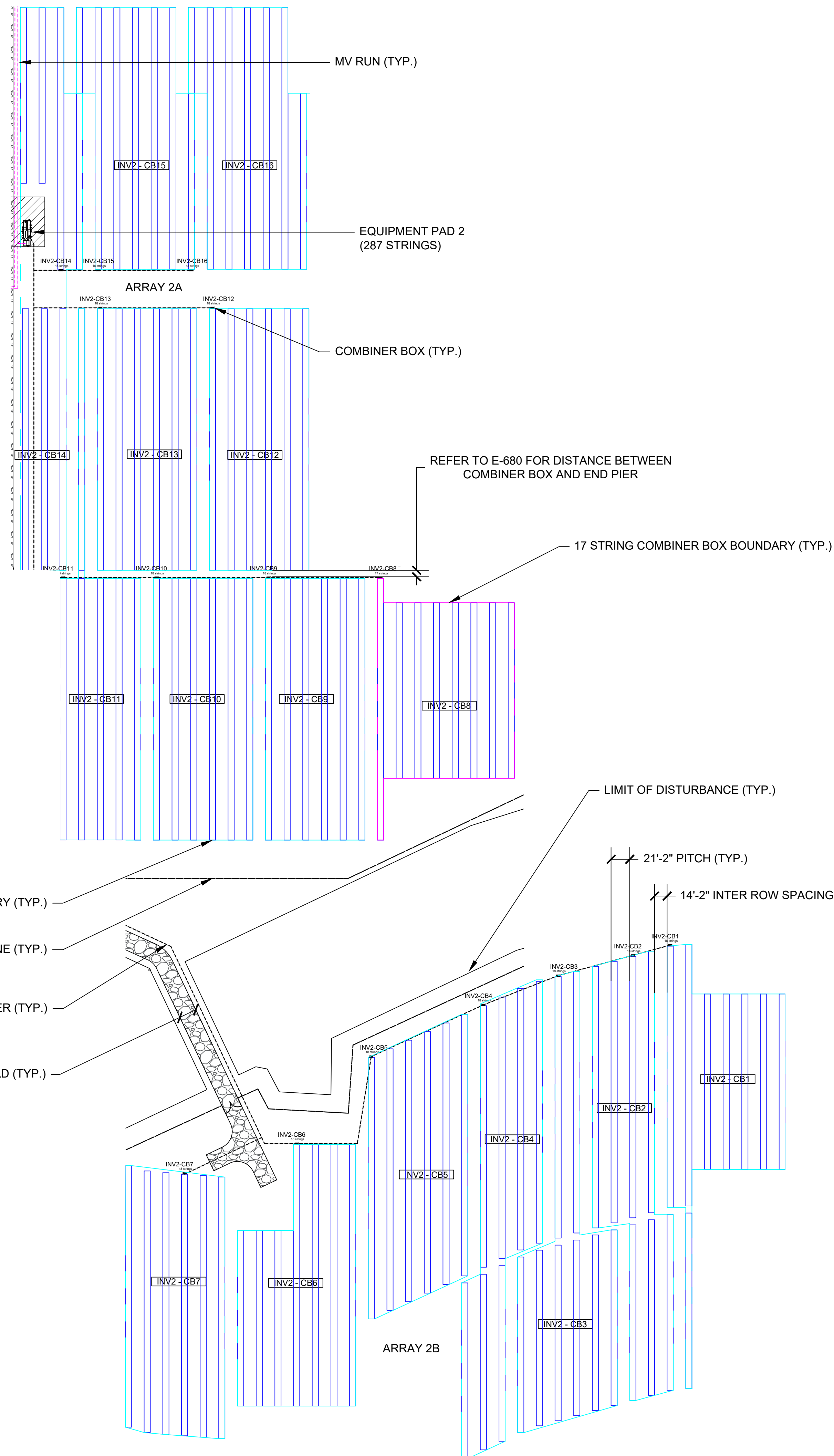
SHEET:
E-121



2 KEY MAP

NTS

CONTINUED ON DWG E-121



1 ARRAY PLAN - BLOCK 2

ARRAY 2 SYSTEM SUMMARY

STRING QTY.	287
MODULES / STR	27
MODULE QTY.	7,749
TOTAL DC SIZE	3.37 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	16

REV	DESCRIPTION	DATE
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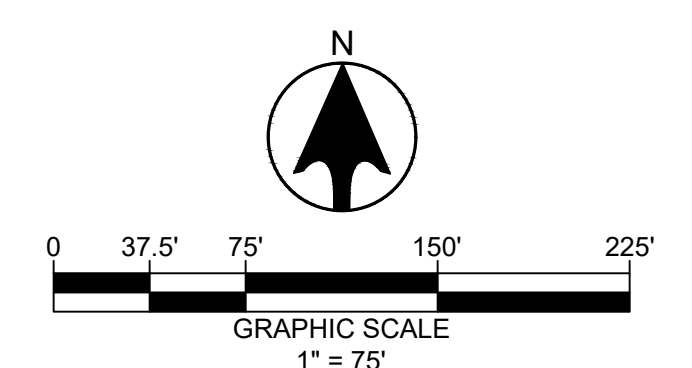
PROJECT ADDRESS:
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41°25'9.71"N, 71°50'4.83"W

SEAL:

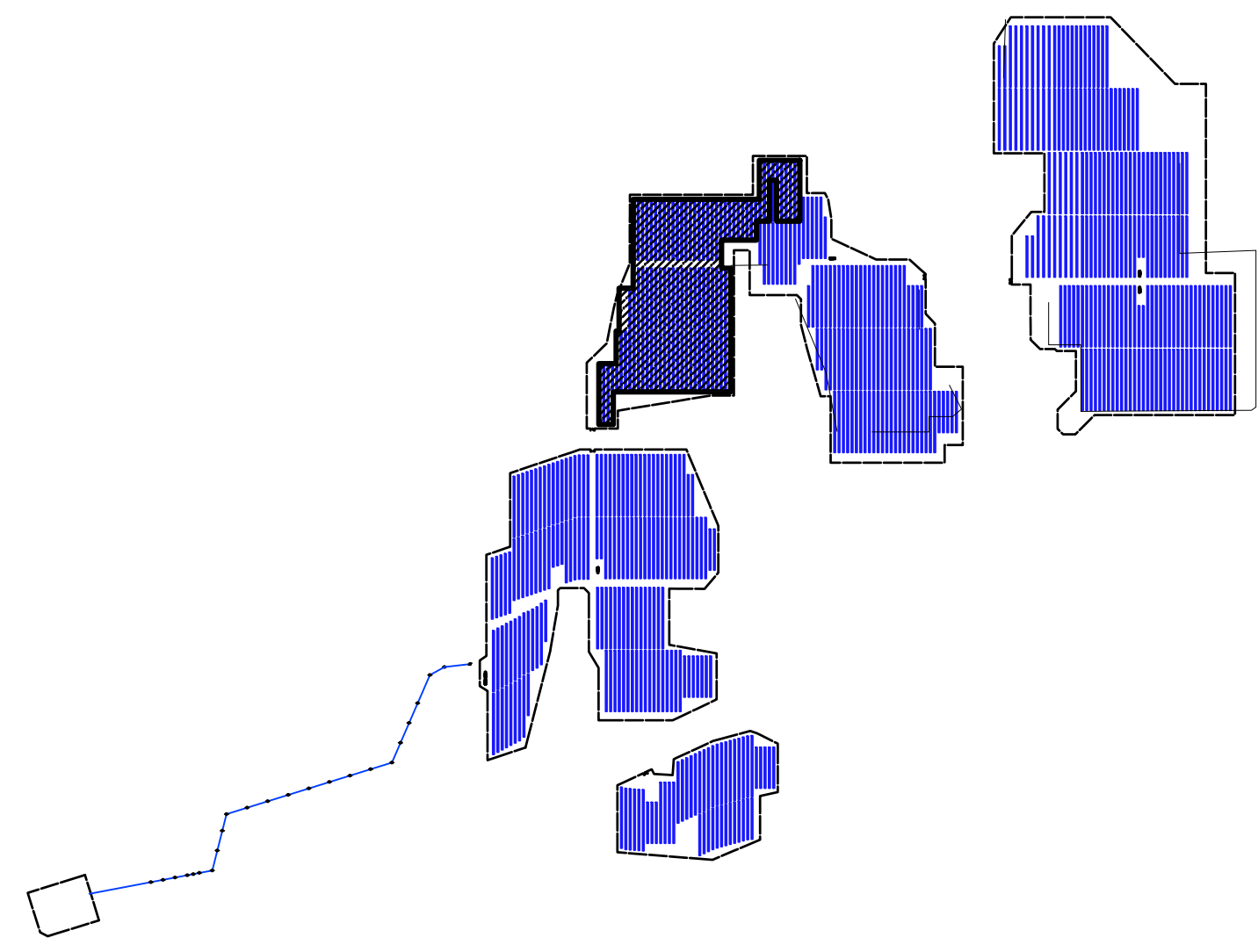
DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE:
ARRAY PLAN - BLOCK 2

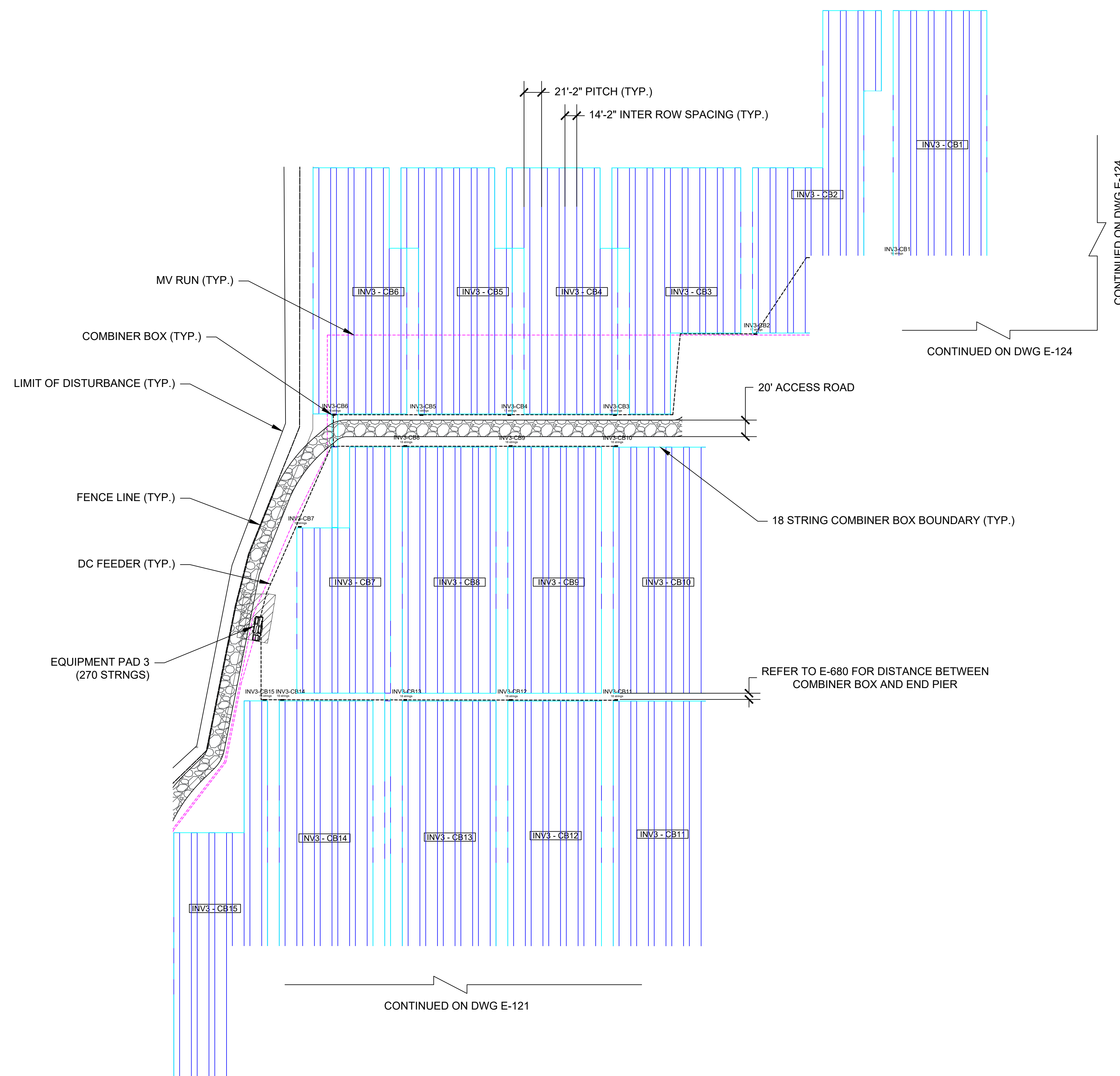
SHEET:
E-122



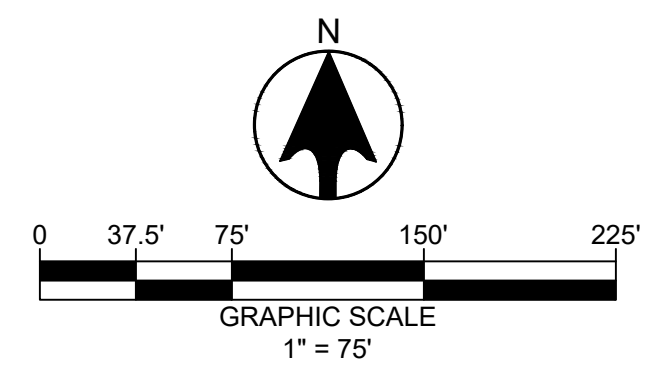
- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
String Count
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER



2 KEY MAP



1 ARRAY PLAN - BLOCK 3



- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
String Count
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER

ARRAY 3 SYSTEM SUMMARY

STRING QTY.	270
MODULES / STR	27
MODULE QTY.	7,290
TOTAL DC SIZE	3.17 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	15

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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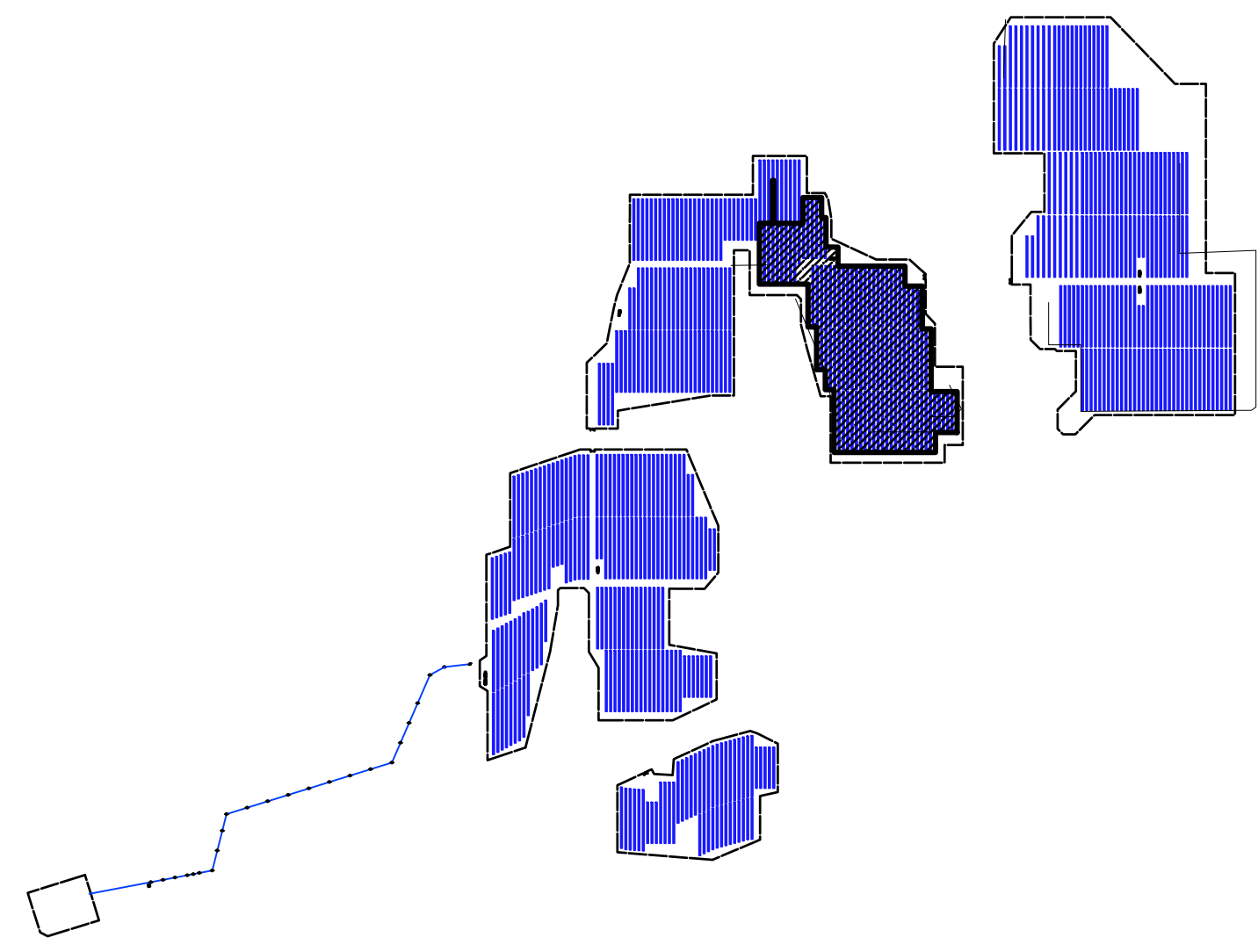
PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

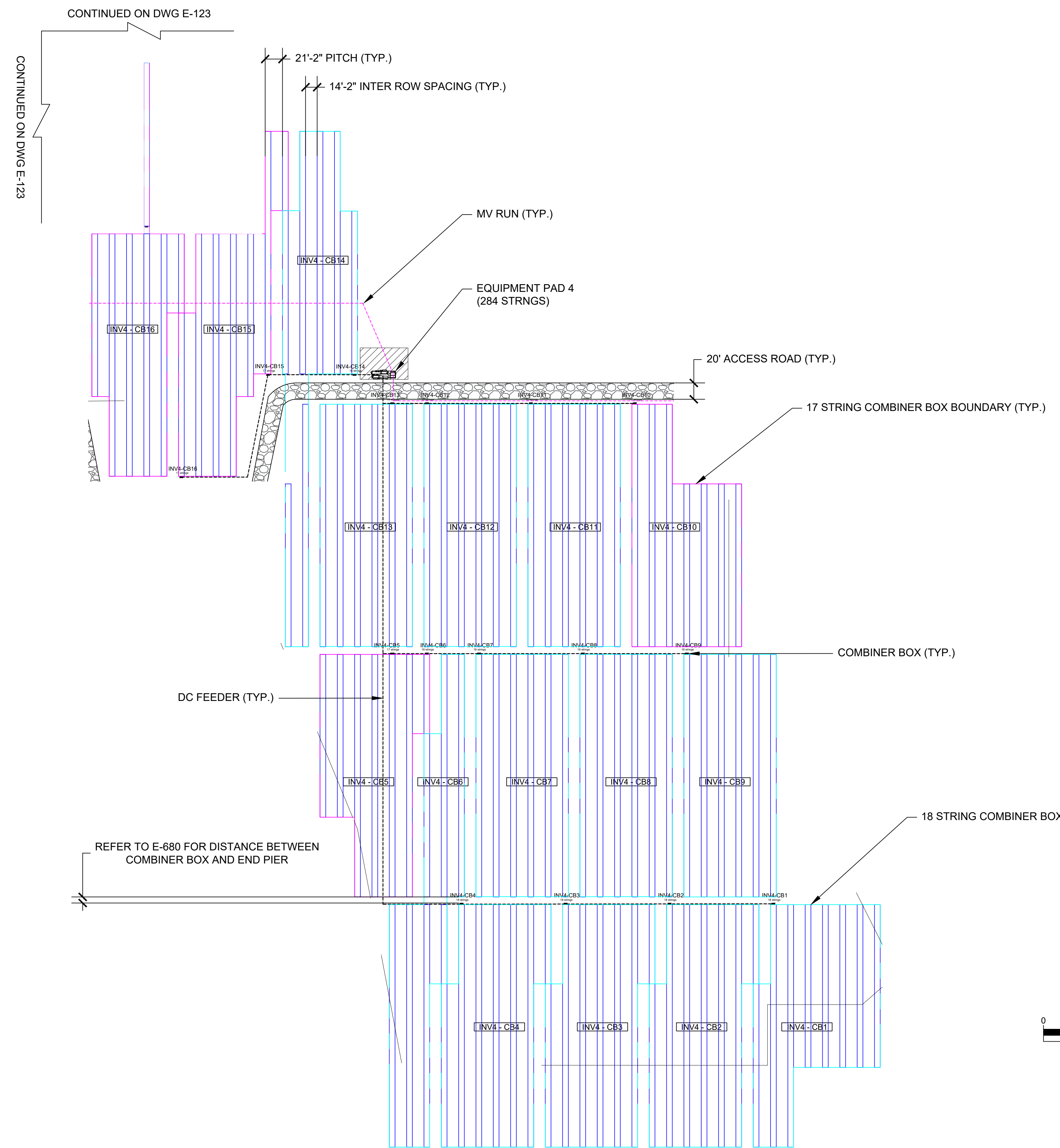
	<p>DATE: 03/09/2020</p> <p>PROJECT #: 2000500</p> <p>DRAWN BY: V. PISSAREVSKI</p> <p>CHECKED BY: R. VUDI</p>

TITLE:
ARRAY PLAN - BLOCK 3

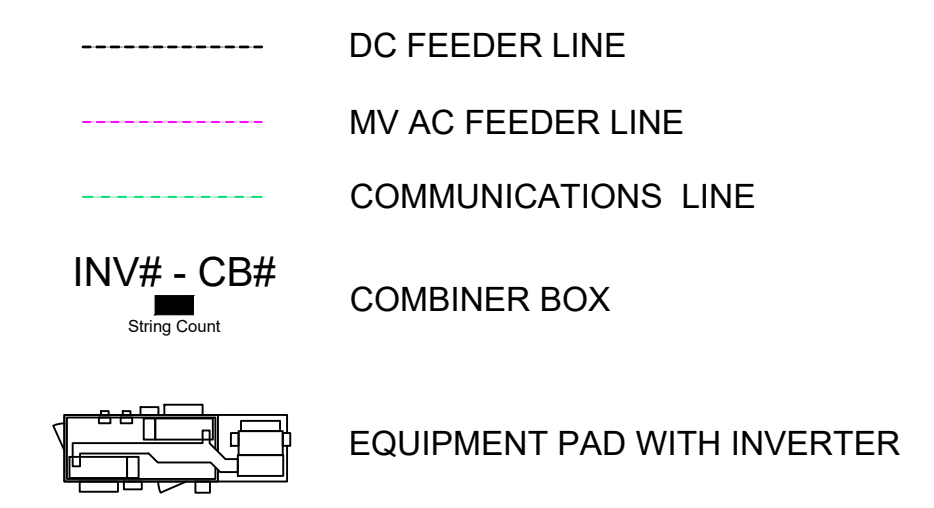
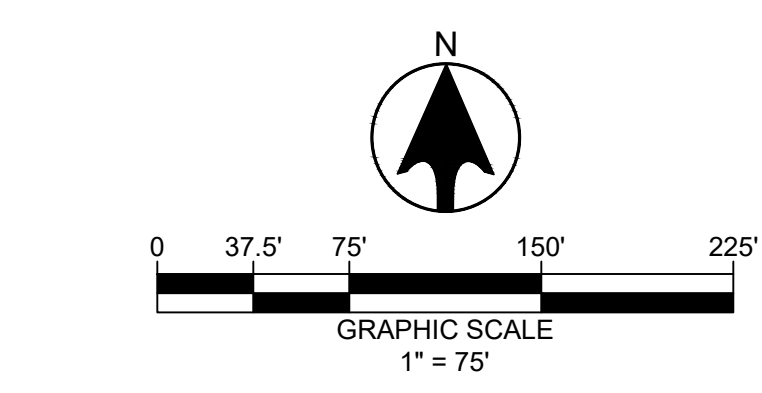
SHEET:
E-123



2 KEY MAP
NTS



1 ARRAY PLAN - BLOCK 4



ARRAY 4 SYSTEM SUMMARY

STRING QTY.	284
MODULES / STR	27
MODULE QTY.	7,668
TOTAL DC SIZE	3.33 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	16

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
I	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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ENERPARC INC.
1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

C.T. CERTIFICATE OF REGISTRATION: PEC.0001173

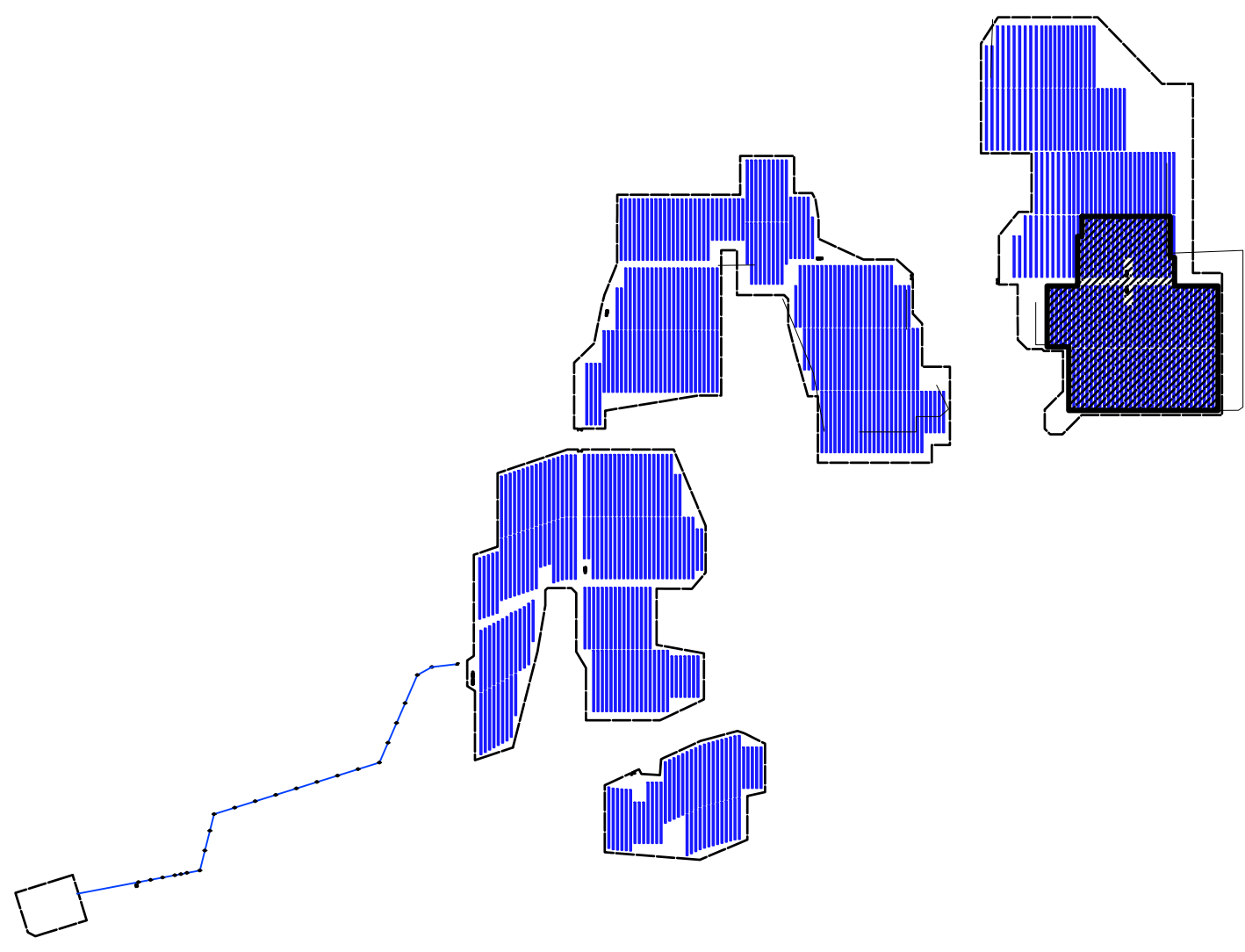
Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26657 6/4/20

KMB DESIGN GROUP
1800 ROUTE 14, SUITE 200
WALL, NJ 07719
(732) 385-5633
FOR ALL QUESTIONS, PLEASE CONTACT
STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE:
ARRAY PLAN - BLOCK 4

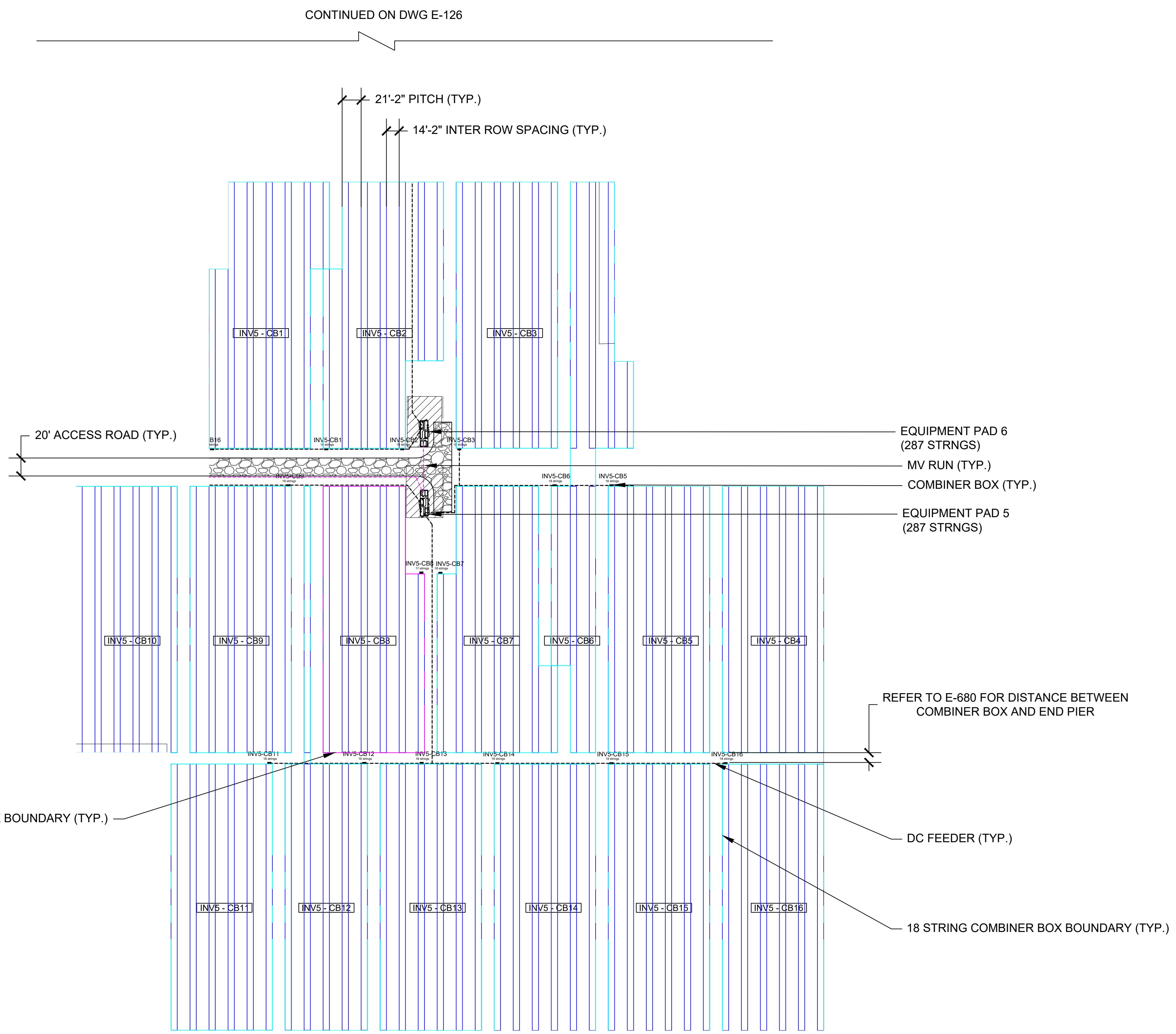
SHEET:
E-124



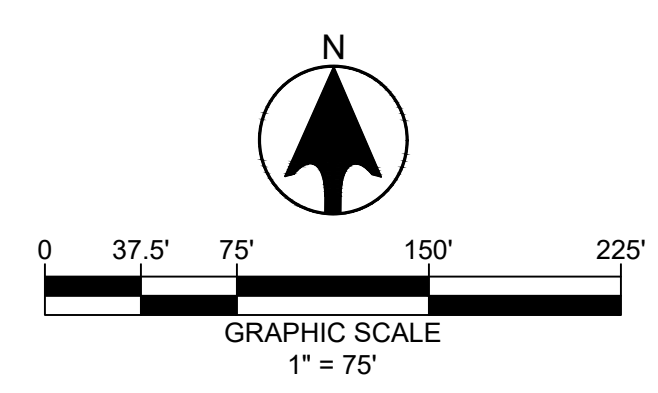
2 KEY MAP

NTS

CONTINUED ON DWG E-124



1 ARRAY PLAN - BLOCK 5



- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
String Count
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER

CONTINUED ON DWG E-126

ARRAY 5 SYSTEM SUMMARY

STRING QTY.	287
MODULES / STR	27
MODULE QTY.	7,749
TOTAL DC SIZE	3.37 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	16

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

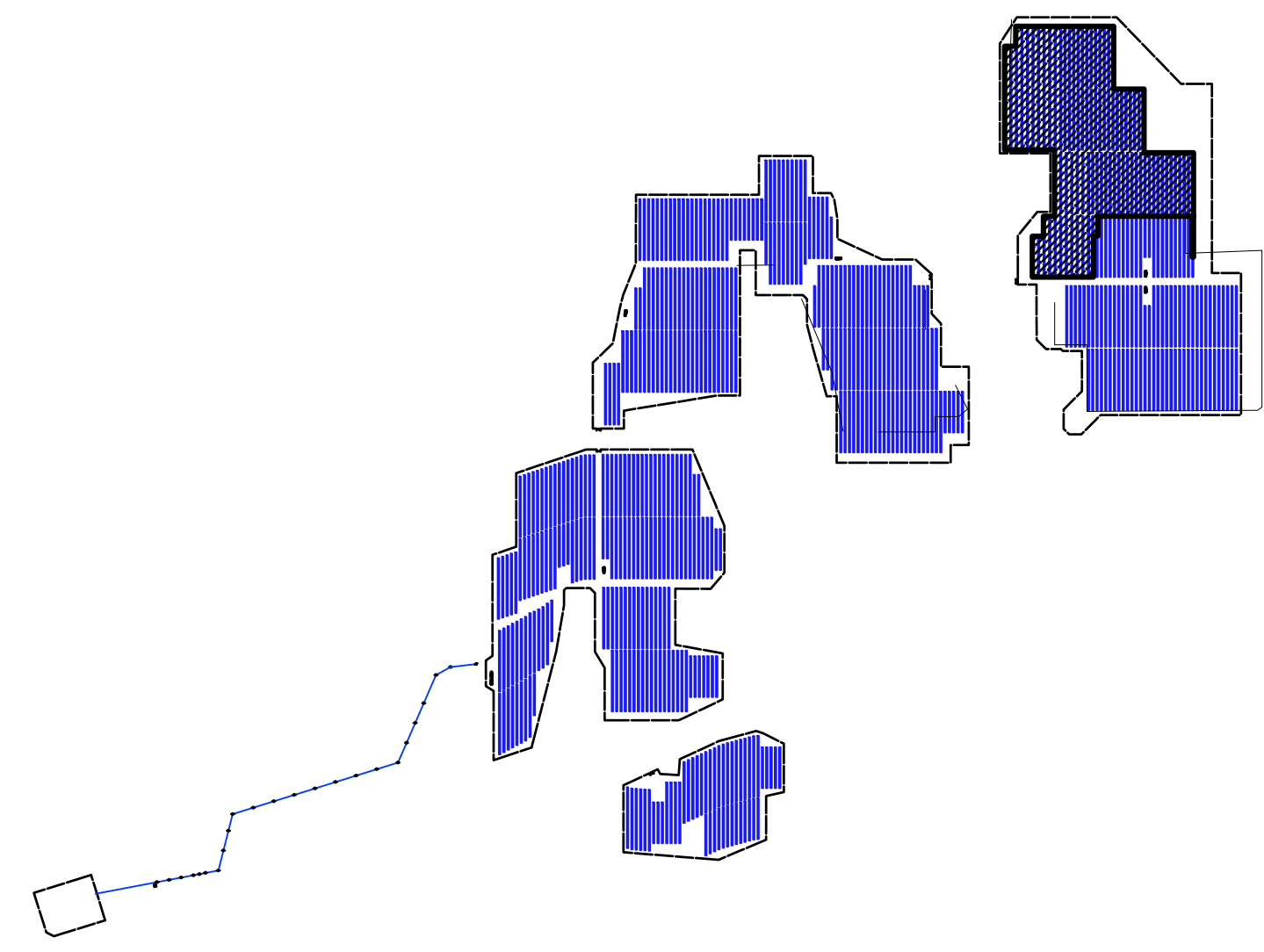
SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

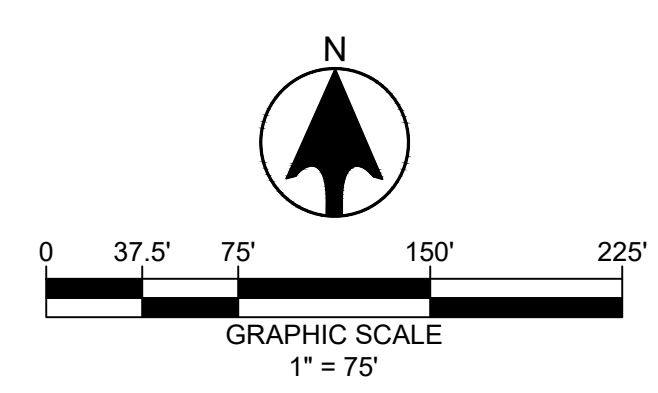
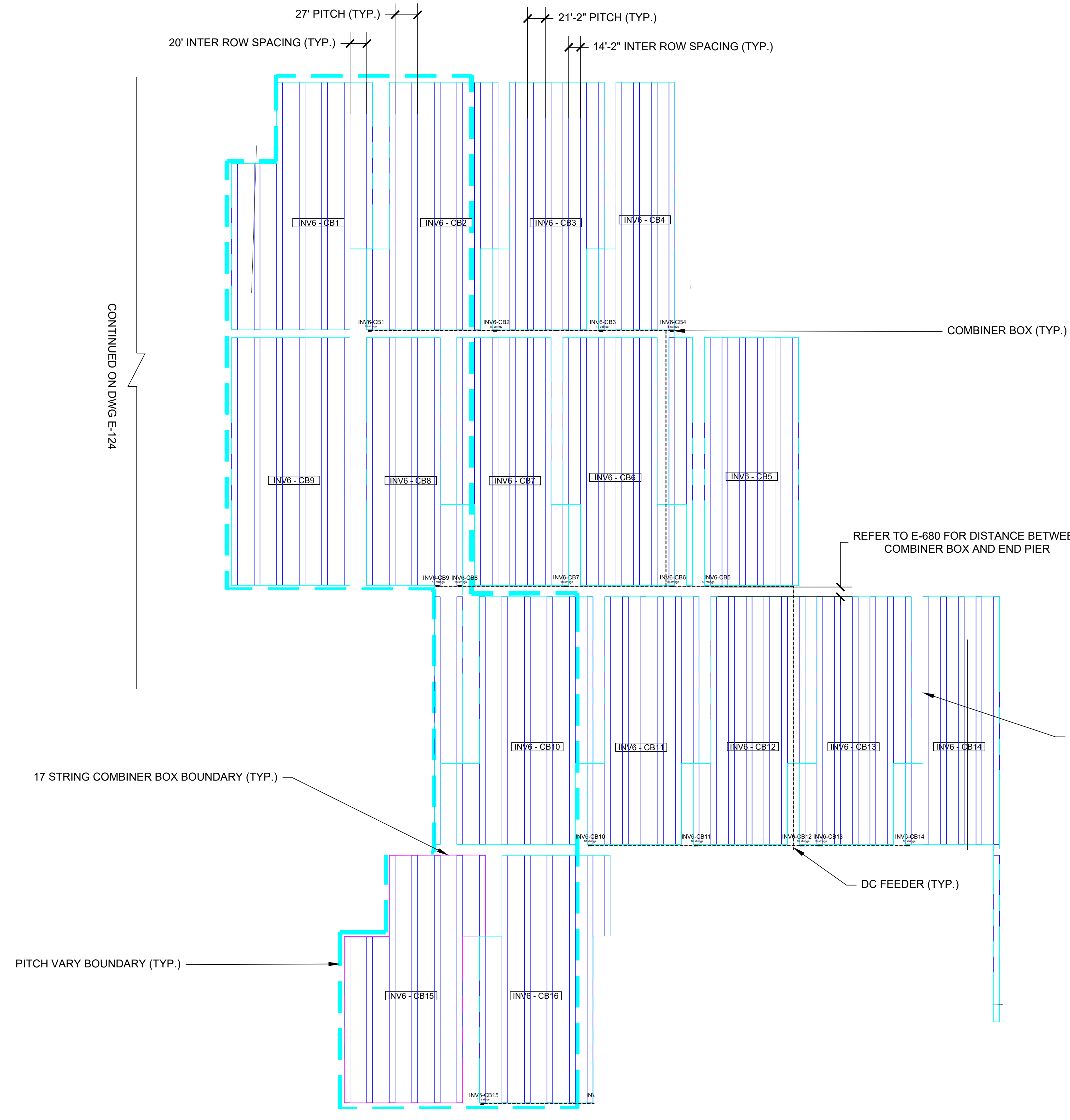
TITLE:
ARRAY PLAN - BLOCK 5

SHEET:
E-125

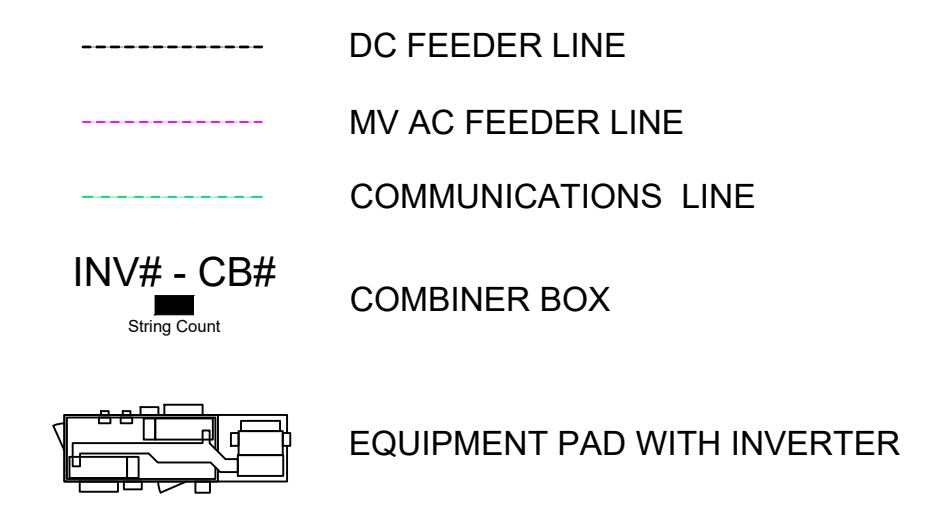
PLOT DATE: Thursday, June 04, 2020



2 KEY MAP
NTS



1 ARRAY PLAN - BLOCK 6



ARRAY 6 SYSTEM SUMMARY

STRING QTY.	287
MODULES / STR	27
MODULE QTY.	7,749
TOTAL DC SIZE	3.37 MW
AZIMUTH	180°
GCR	26 % & 33%
RACKING	NEXTRACKER
CB QTY.	16

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

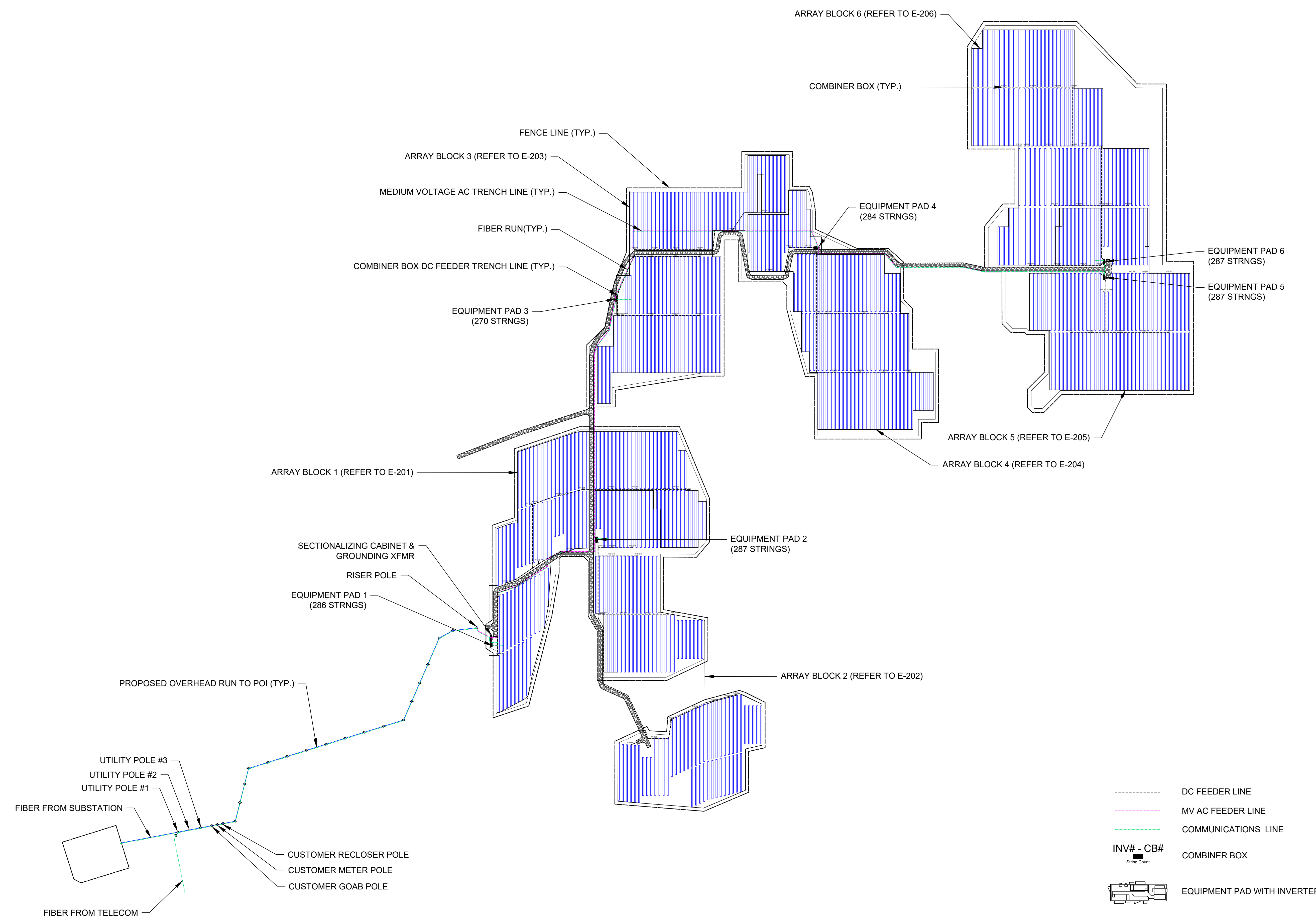
PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE:
ARRAY PLAN - BLOCK 6

SHEET:
E-126



REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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 ENERPARC INC.
 1999 Harrison St, Ste 830
 Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
 ELLA WHEELER RD,
 NORTH STONINGTON, CT 06359
 41°25'9.71"N, 71°50'4.83"W

SEAL:

STEPHEN A. BRAY
 PROFESSIONAL ENGINEER
 CT LICENSE: 26657

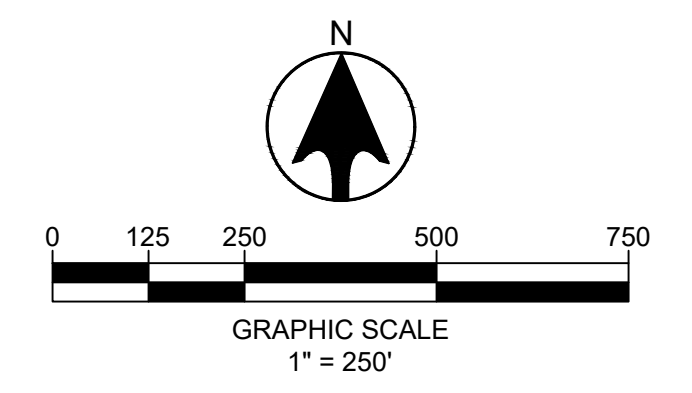
KMB
 DESIGN GROUP
 kmbdgg.com
 1800 ROUTE 14, SUITE 200
 WALL, NJ 07719
 (732) 261-5623
 FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

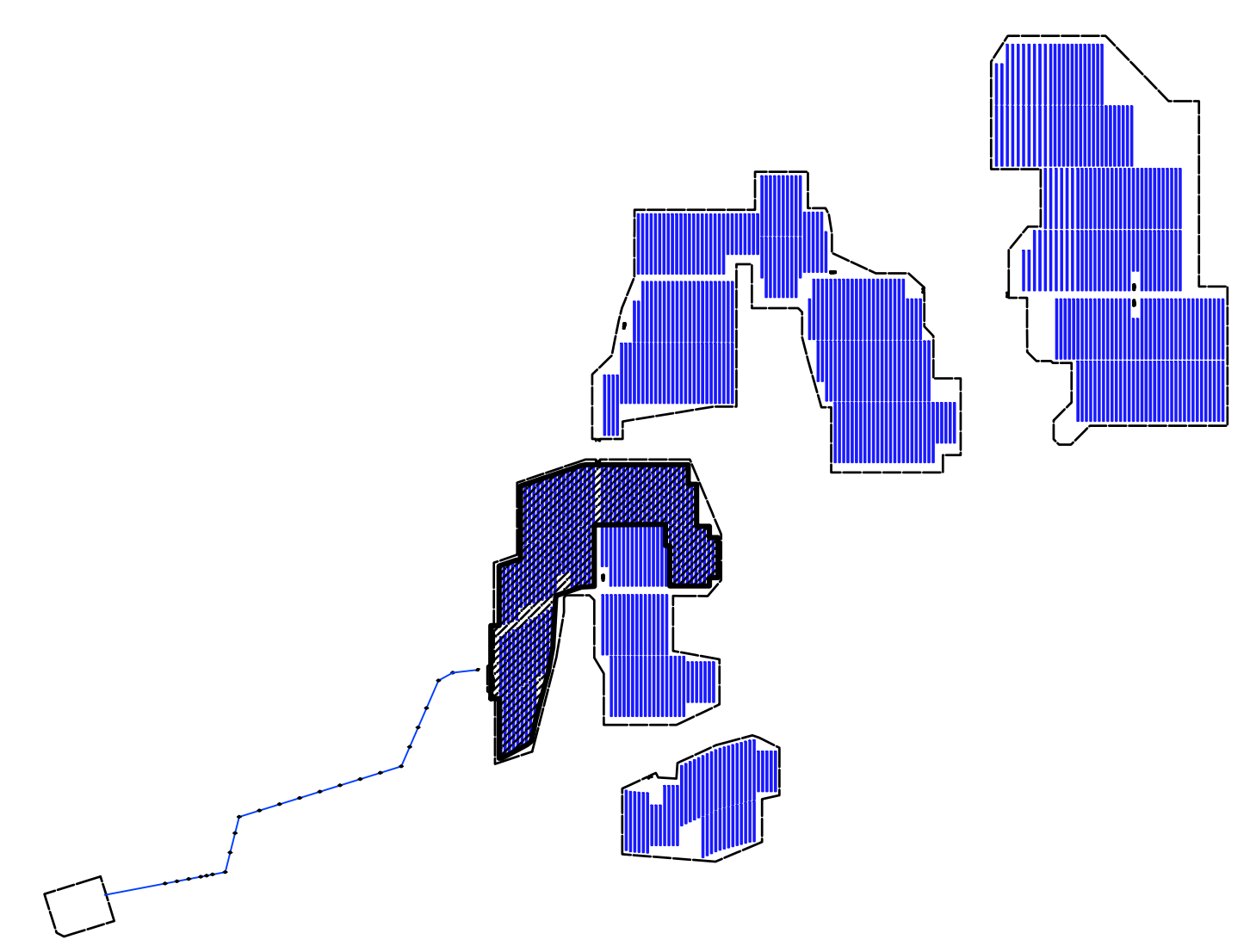
DATE: 03/09/2020
 PROJECT #: 2000500
 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI

TITLE:
TRENCH PLAN

SHEET:
E-200

1 OVERALL TRENCH PLAN

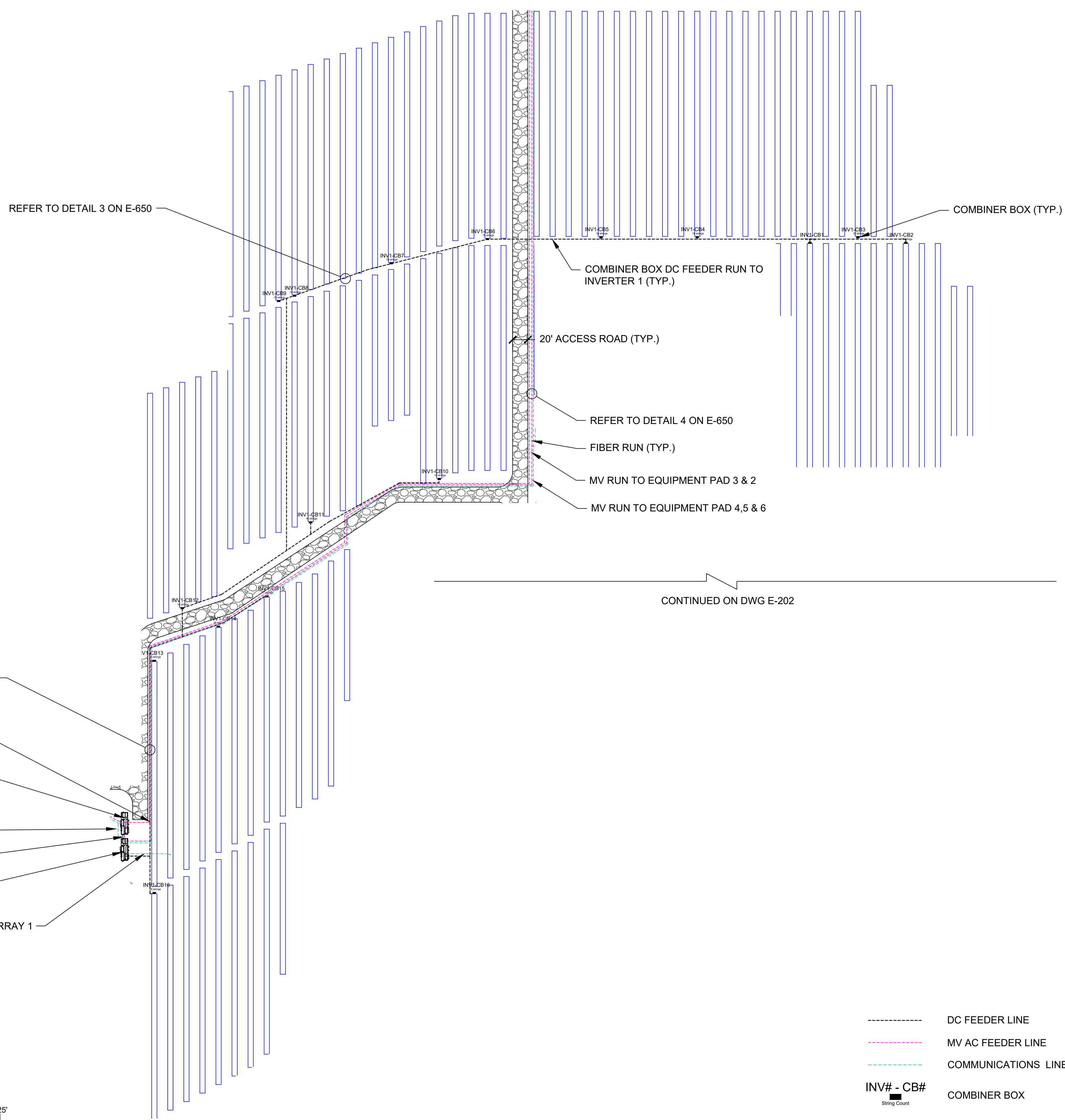
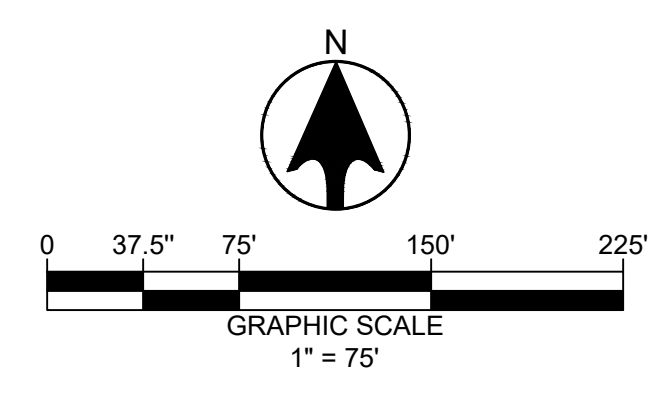




2 KEY MAP
NTS

1 TRENCH PLAN - BLOCK 1

- REFER TO DETAIL 5 ON E-650
- MV RUN TO EQUIPMENT PADS 4, 5 & 6
- SECTIONALIZING CABINET & GROUNDING XFMR
- MV RUN TO RISER POLE/METER POLE
- MV RUN TO EQUIPMENT PADS 1, 2 & 3
- EQUIPMENT PAD 1 (286 STRNGS)
- TRENCH FOR WEATHER SENSORS IN ARRAY 1



- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
String Count
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER

ARRAY 1 SYSTEM SUMMARY

STRING QTY.	286
MODULES / STR	27
MODULE QTY.	7,722
TOTAL DC SIZE	3,359 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	16

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20

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1999 Harrison St, Ste 830
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PROJECT NAME:
NORTH STONINGTON

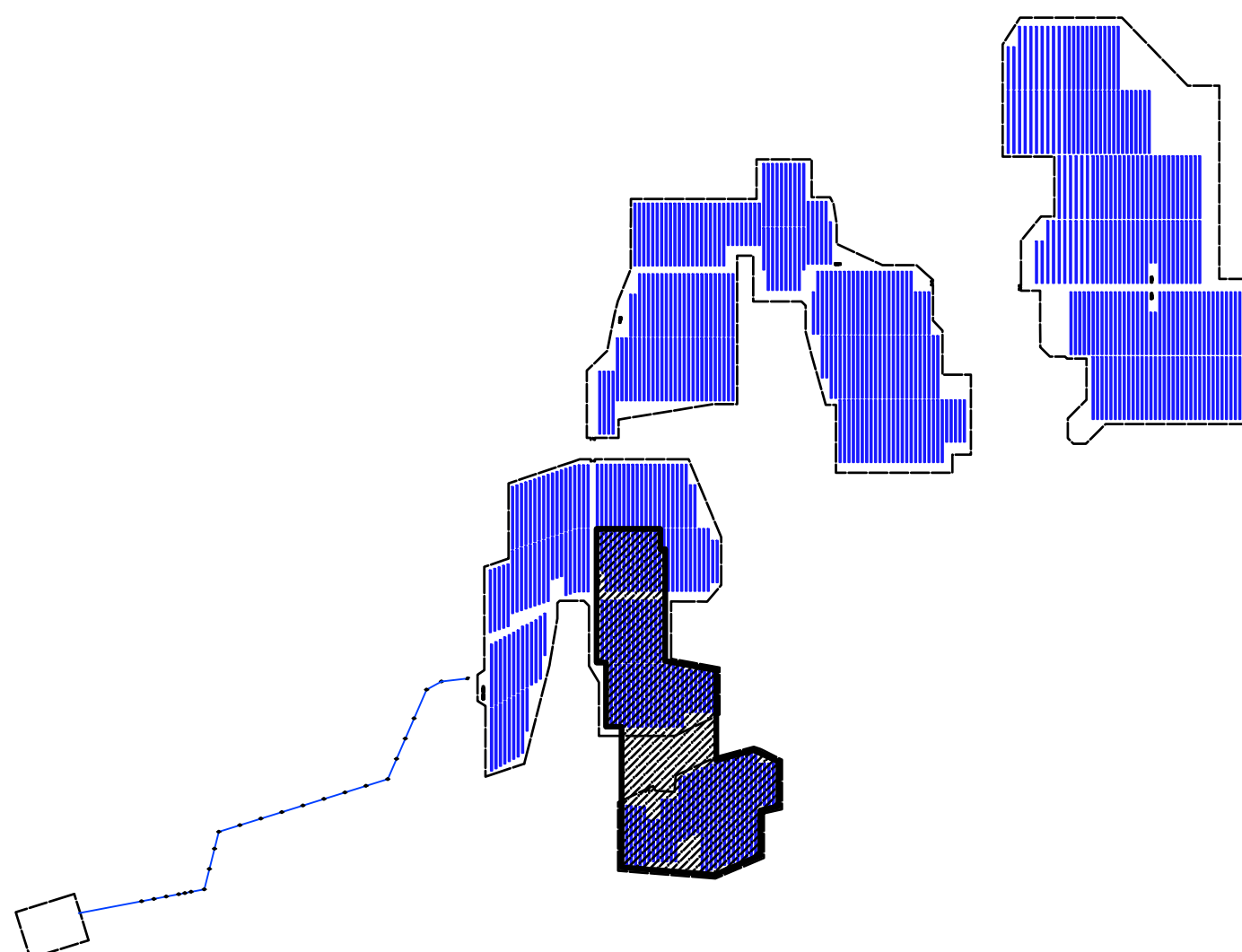
PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

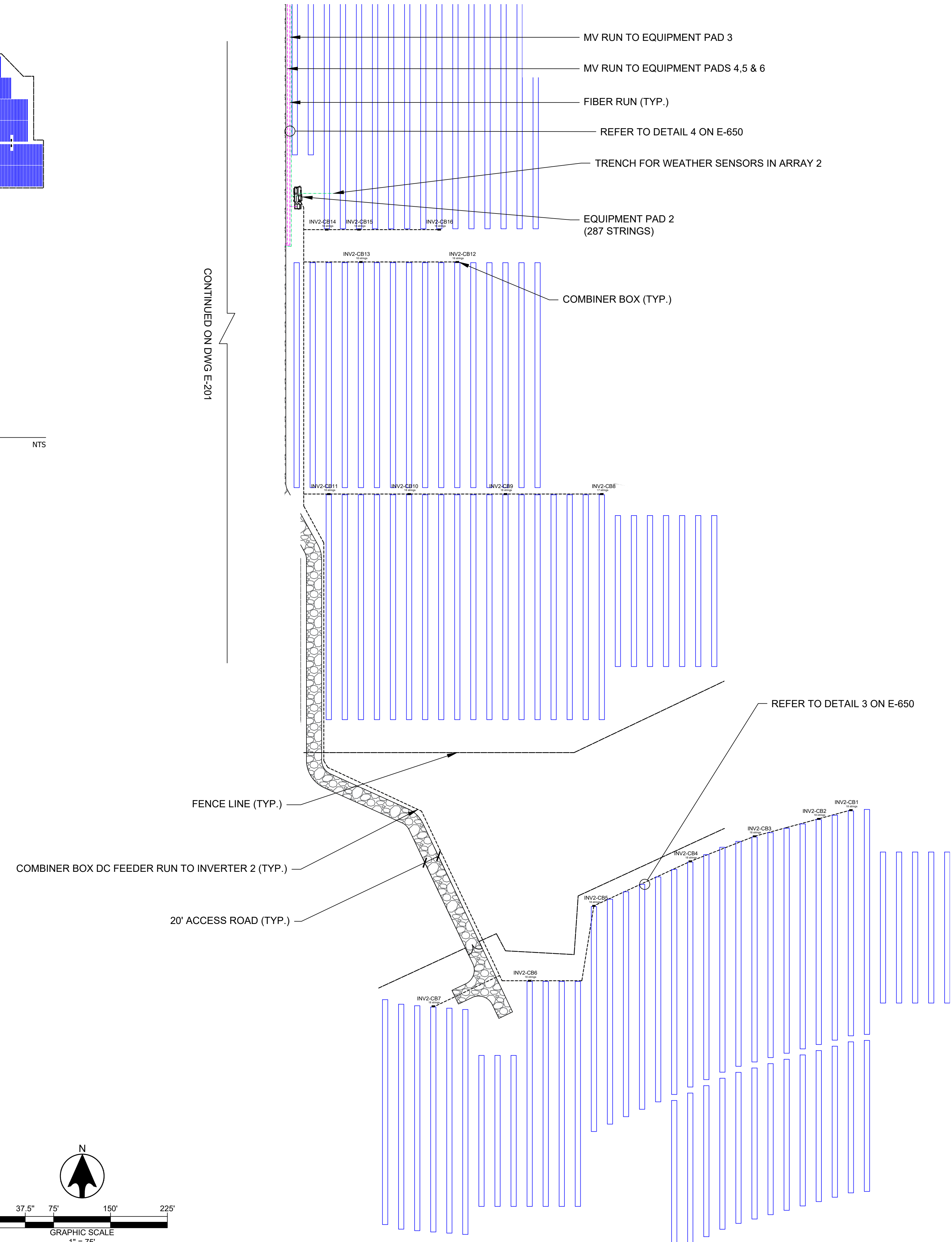
DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE:
TRENCH PLAN - BLOCK 1

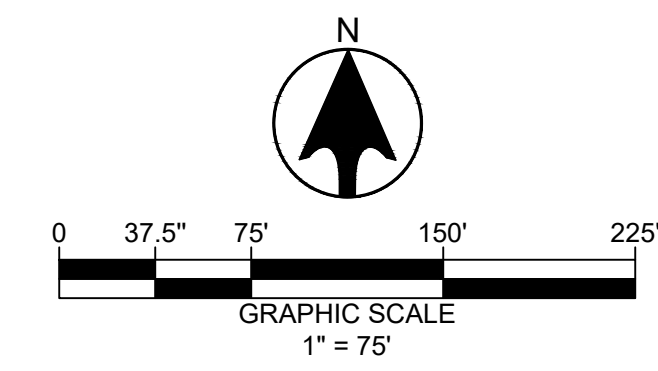
SHEET:
E-201



2 KEY MAP
NTS



CONTINUED ON DWG E-201



1 TRENCH PLAN - BLOCK 2

- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
String Count
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER

ARRAY 2 SYSTEM SUMMARY

STRING QTY.	287
MODULES / STR	27
MODULE QTY.	7,749
TOTAL DC SIZE	3.37 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	16

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
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ENERPARC INC.
1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26657

KMB
DESIGN GROUP
kmb@kg.com

1800 ROUTE 14, SUITE 200
WALL, NJ 07719
(732) 395-5633

FOR ALL QUESTIONS, PLEASE CONTACT
STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020

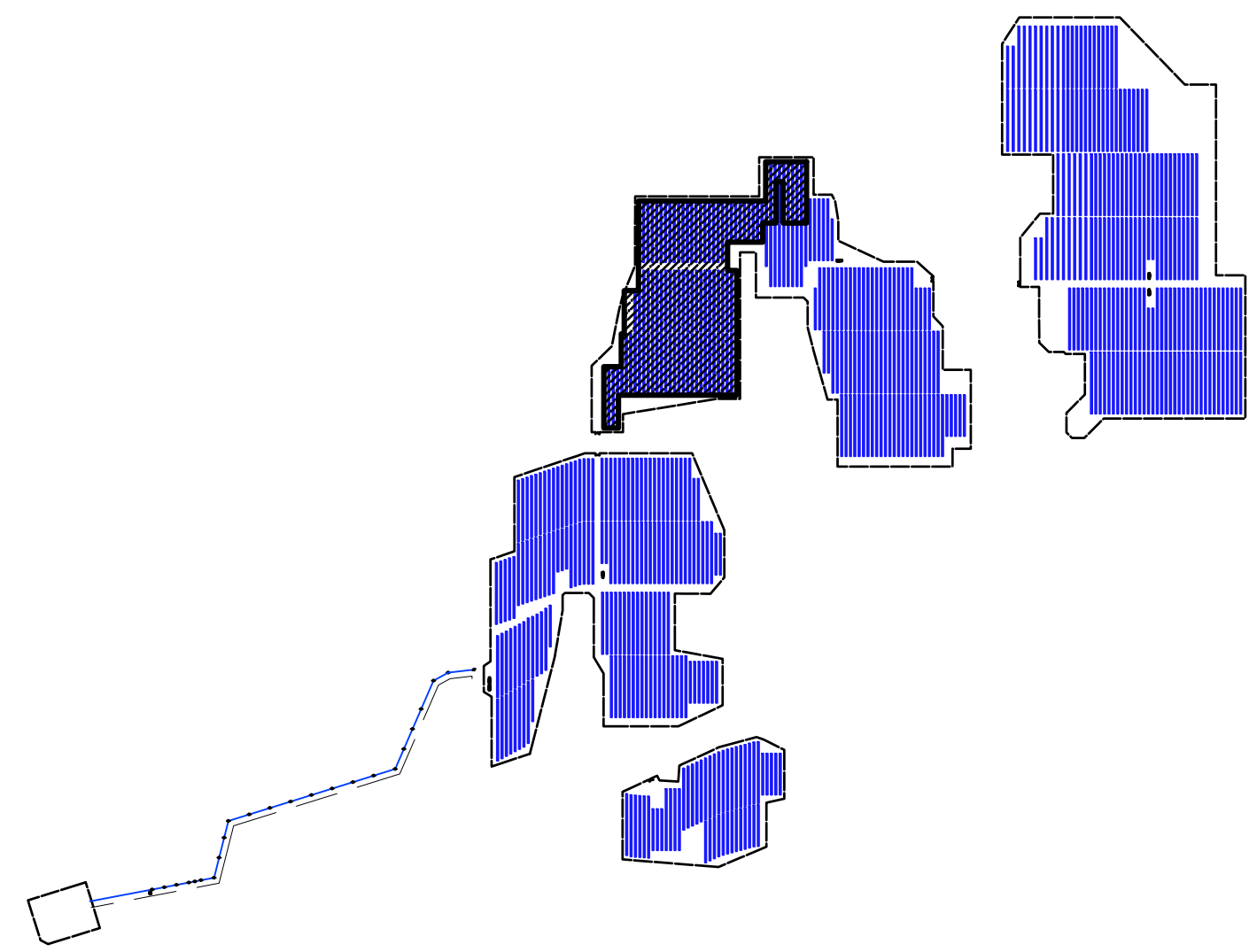
PROJECT #: 2000500

DRAWN BY: V. PISSAREVSKI

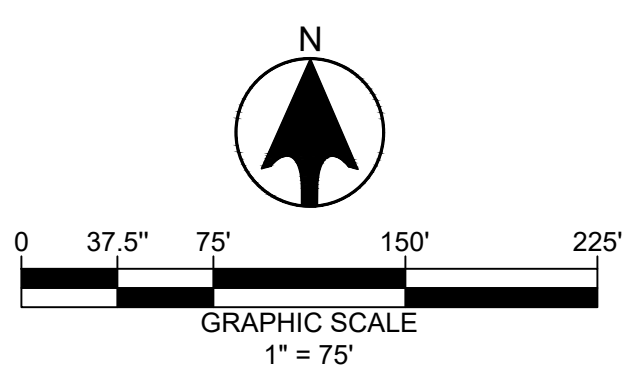
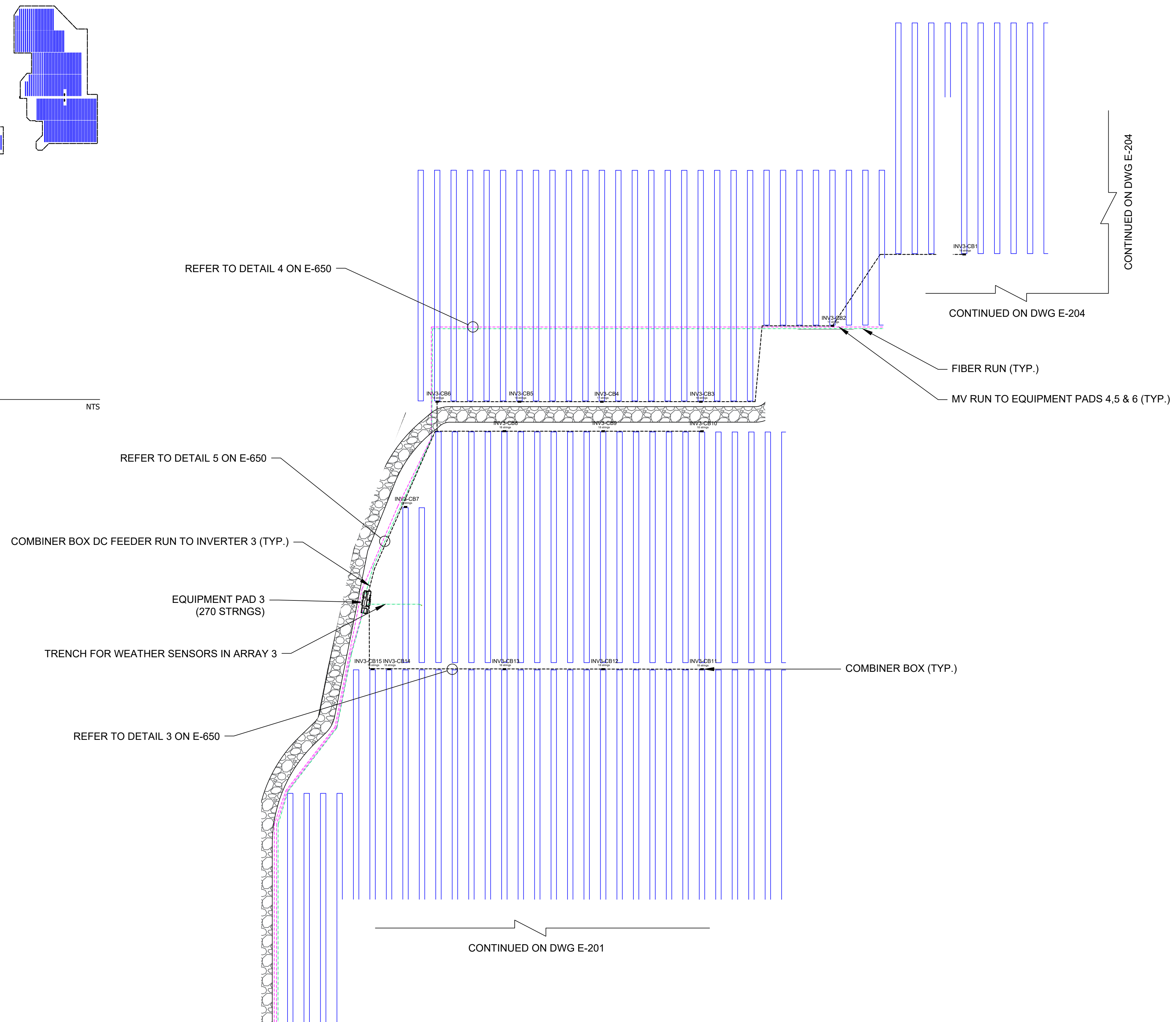
CHECKED BY: R. VUDI

TITLE:
TRENCH PLAN - BLOCK 2

SHEET:
E-202



2 KEY MAP



1 TRENCH PLAN - BLOCK 3

- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
String Count
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER

ARRAY 3 SYSTEM SUMMARY

STRING QTY.	270
MODULES / STR	27
MODULE QTY.	7,290
TOTAL DC SIZE	3.17 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	15

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
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Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

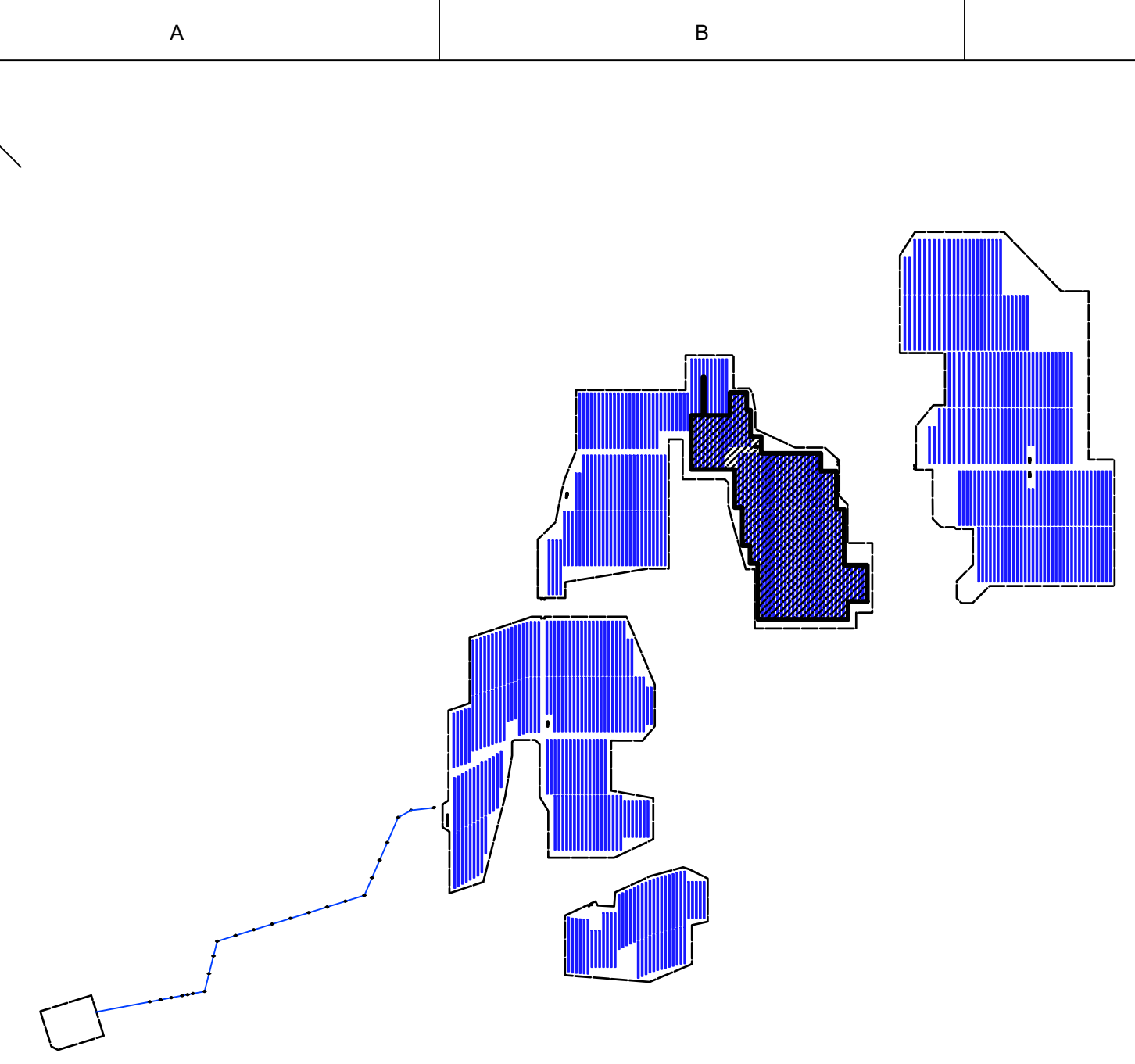
PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

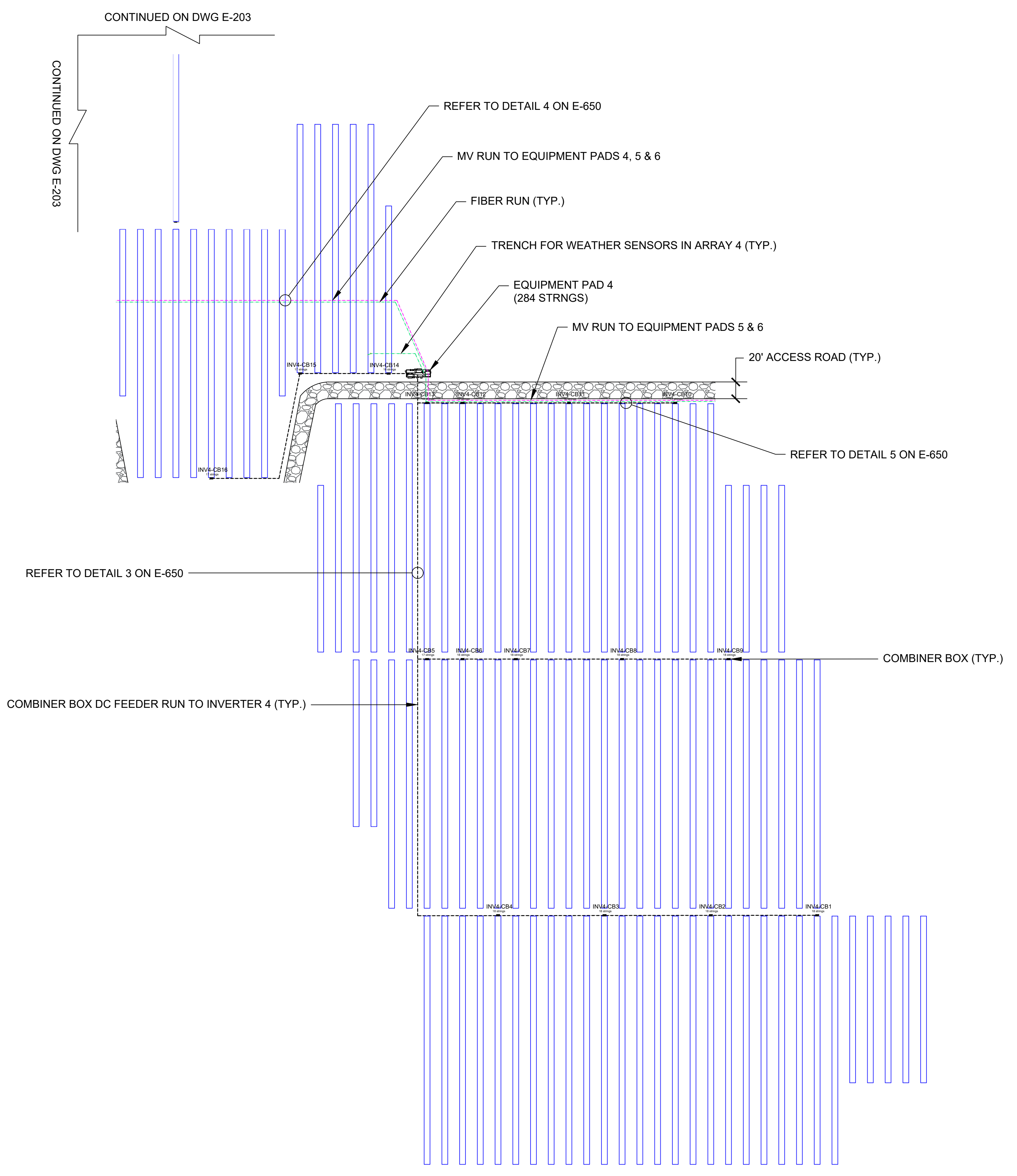
TITLE:
TRENCH PLAN - BLOCK 3

SHEET:
E-203



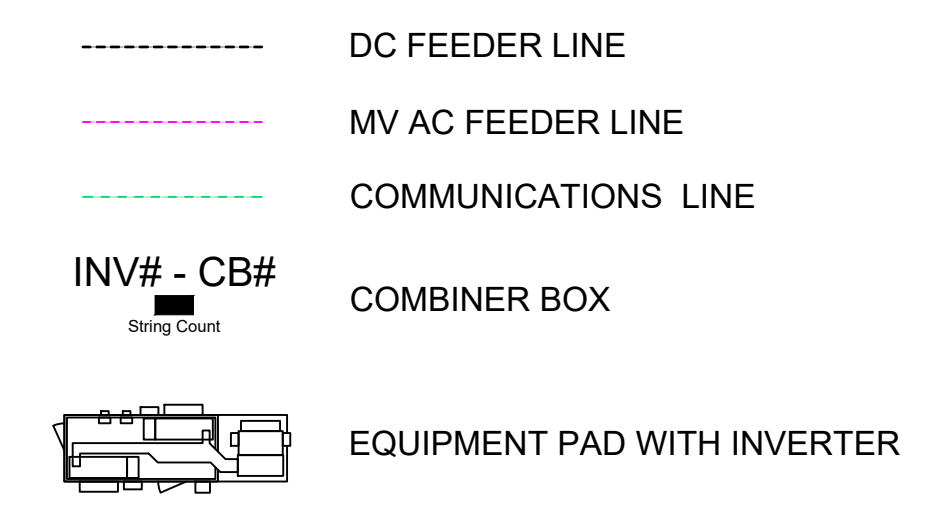
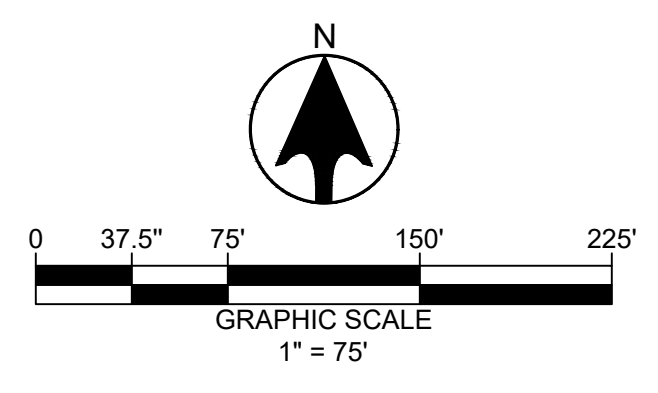
2 KEY MAP

NTS



CONTINUED ON DWG E-205 & E-206

1 TRENCH PLAN - BLOCK 4



ARRAY 4 SYSTEM SUMMARY

STRING QTY.	284
MODULES / STR	27
MODULE QTY.	7,668
TOTAL DC SIZE	3.33 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	16

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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ENERPARC

ENERPARC INC.
1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020

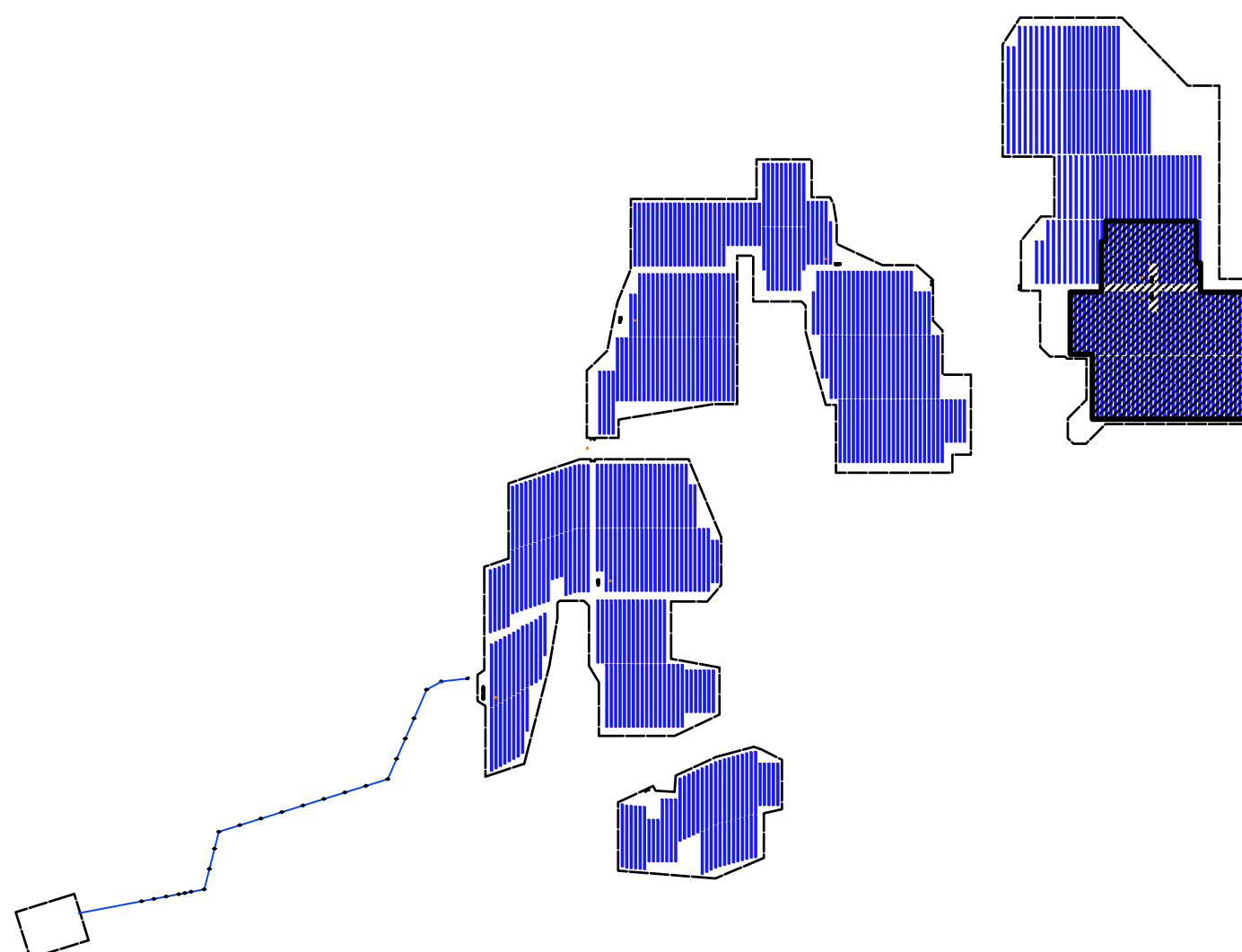
PROJECT #: 2000500

DRAWN BY: V. PISSAREVSKI

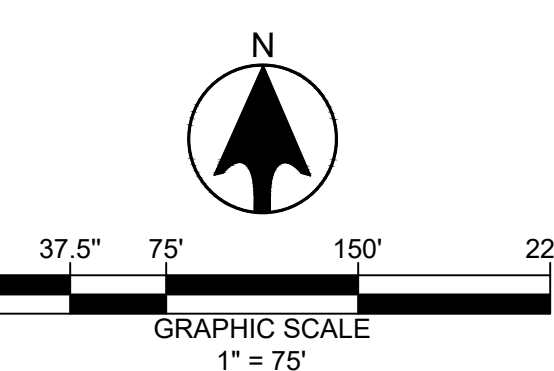
CHECKED BY: R. VUDI

TITLE:
TRENCH PLAN - BLOCK 4

SHEET:
E-204

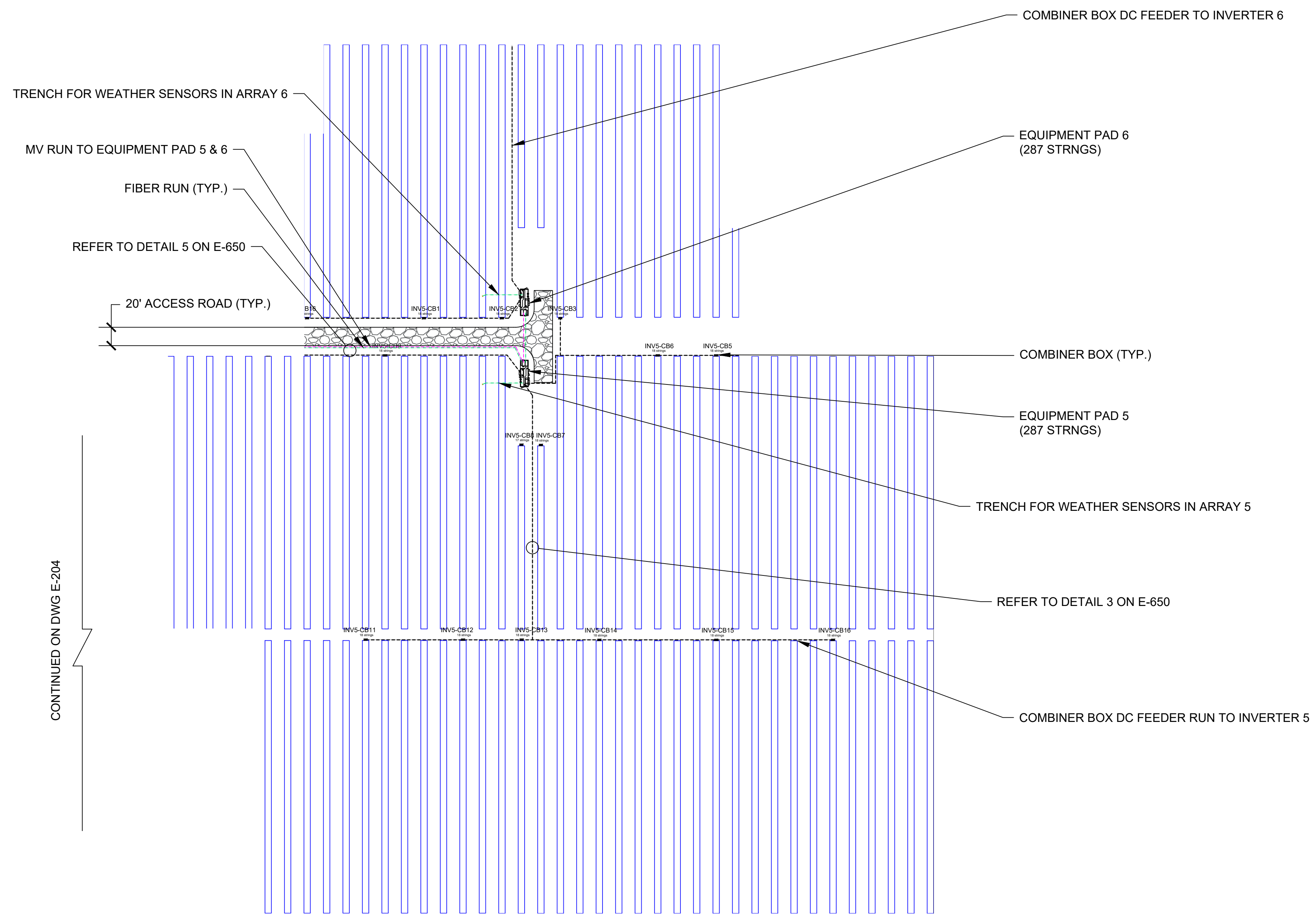


2 KEY MAP



1 TRENCH PLAN - BLOCK 5

CONTINUED ON DWG E-206



CONTINUED ON DWG E-204

- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
String Count
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER

ARRAY 5 SYSTEM SUMMARY

STRING QTY.	287
MODULES / STR	27
MODULE QTY.	7,749
TOTAL DC SIZE	3.37 MW
AZIMUTH	180°
GCR	33%
RACKING	NEXTRACKER
CB QTY.	16

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
I	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

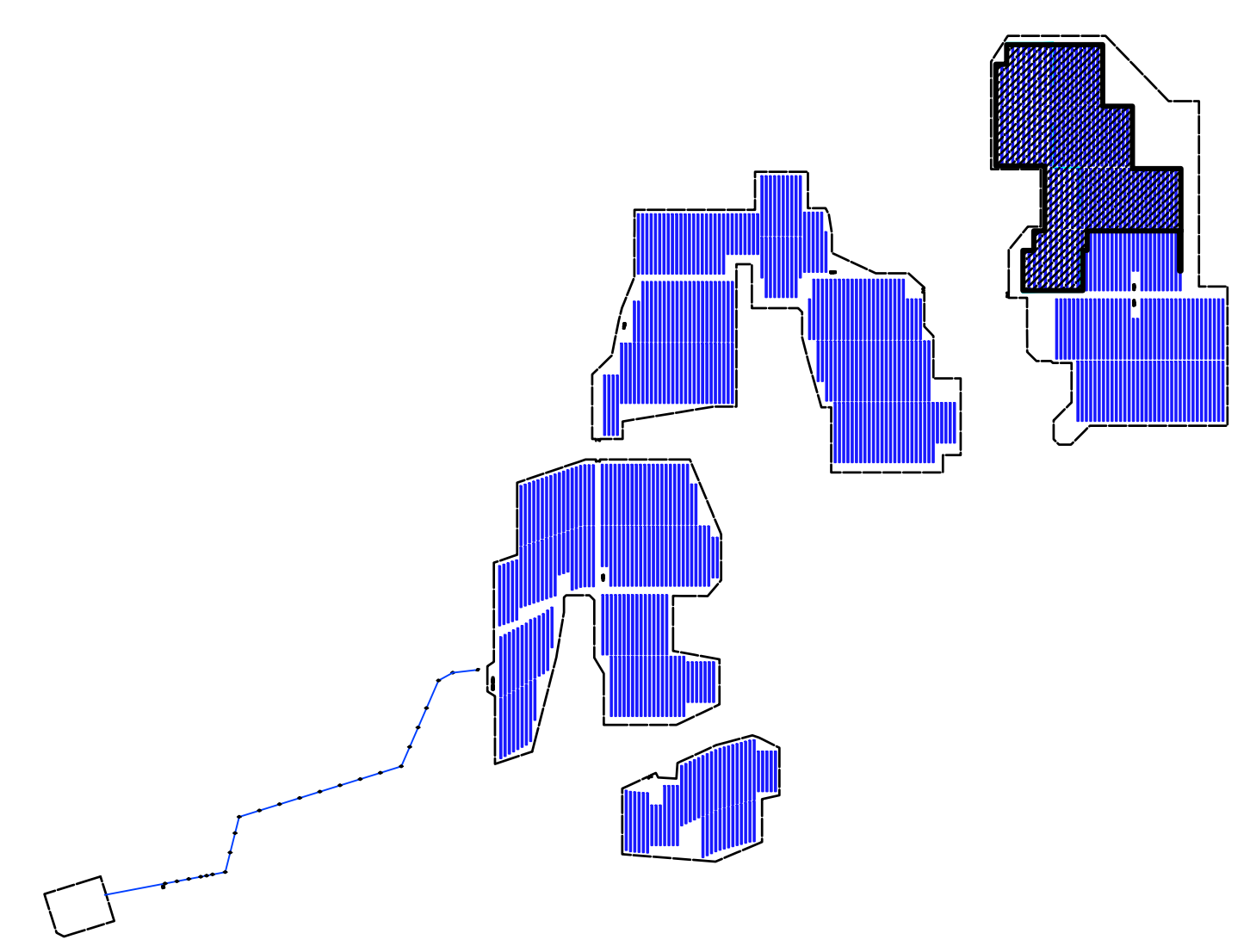
PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE:
TRENCH PLAN - BLOCK 5

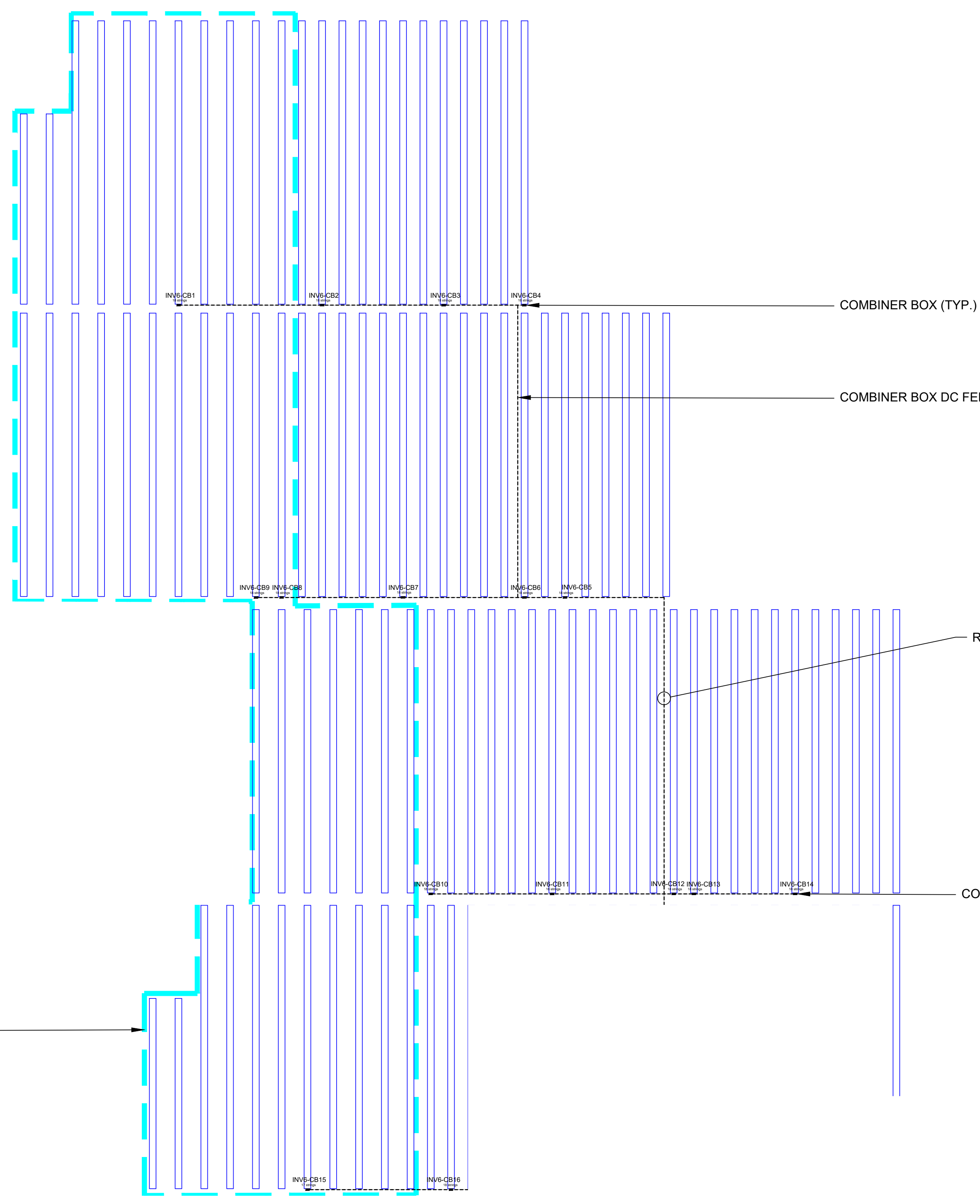
SHEET:
E-205



2 KEY MAP

NTS

CONTINUED ON DWG E-204



PITCH VARY BOUNDARY (TYP.)

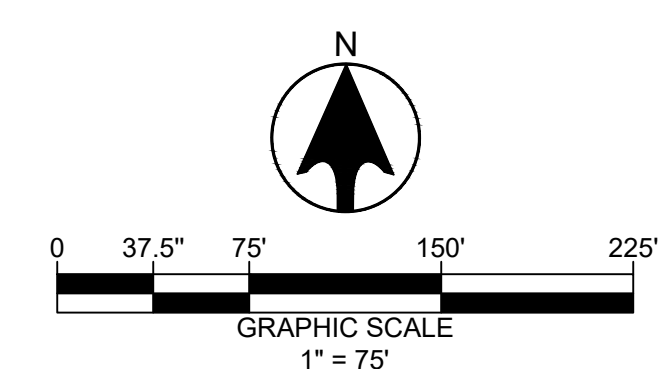
COMBINER BOX (TYP.)

COMBINER BOX DC FEEDER RUN TO INVERTER 6 (TYP.)

REFER TO DETAIL 3 ON E-650

COMBINER BOX (TYP.)

CONTINUED ON DWG E-206



1 TRENCH PLAN - BLOCK 6

- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
String Count
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER

ARRAY 6 SYSTEM SUMMARY

STRING QTY.	287
MODULES / STR	27
MODULE QTY.	7,749
TOTAL DC SIZE	3.37 MW
AZIMUTH	180°
GCR	26 % & 33%
RACKING	NEXTRACKER
CB QTY.	16

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0	ISSUE FOR PERMIT SET	5/28/20

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SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

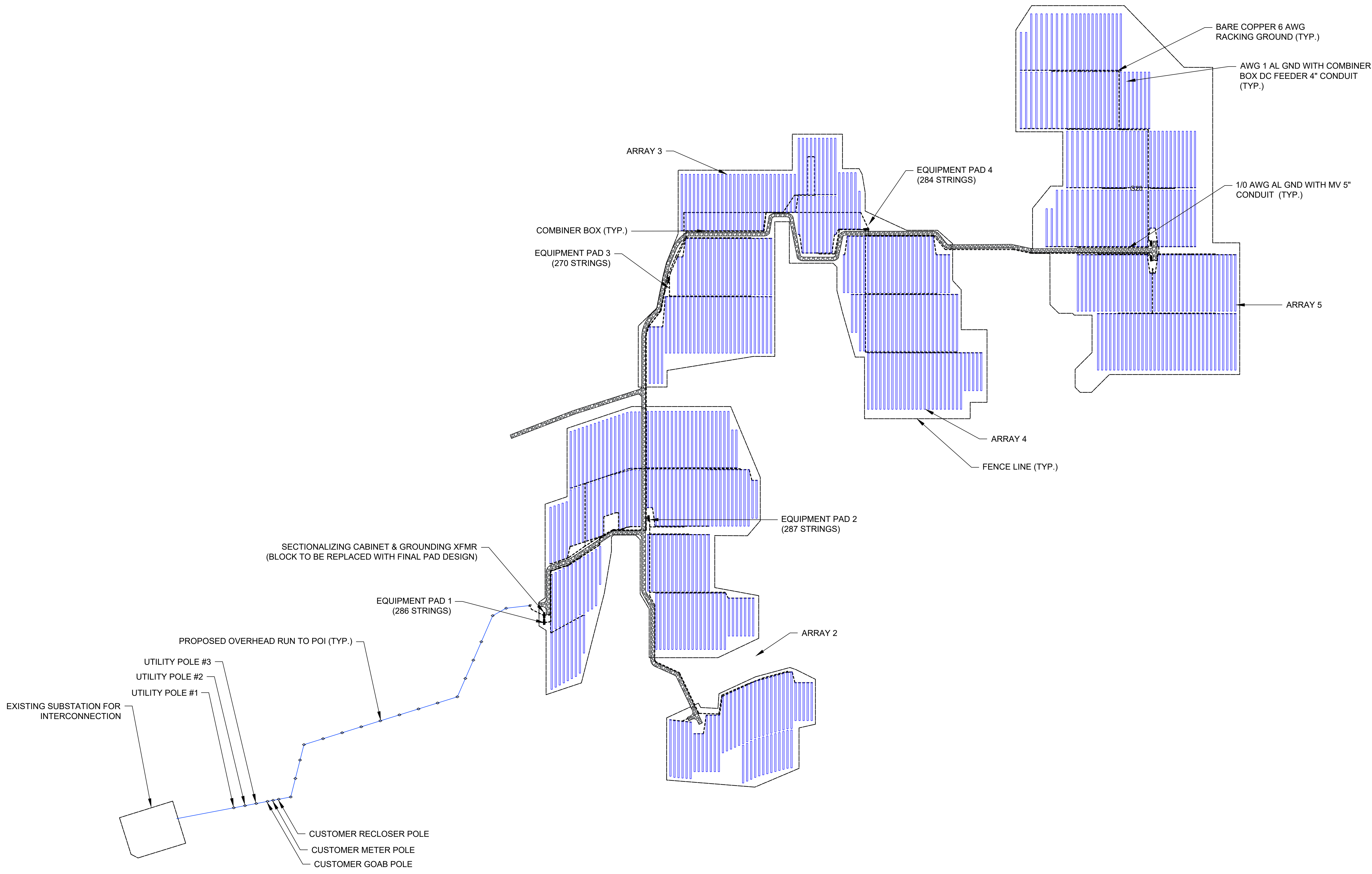
TITLE:
TRENCH PLAN - BLOCK 6

SHEET:
E-202

NOTES:
 1. CODE REQUIRED AND INDUSTRY STANDARD AA-8000 ALUMINUM ALLOY CONDUCTORS REQUIRE NO MORE THAN COPPER PER NFPA 70B, "RECOMMENDED PRACTICE FOR ELECTRICAL EQUIPMENT MAINTENANCE". THIS STANDARD DOES NOT DIFFERENTIATE BETWEEN AA-8000 AND COPPER WIRE.
 2. MODERN ALUMINUM CONDUCTORS DO NOT REACT ANY DIFFERENTLY THAN COPPER IN MECHANICAL CONNECTION. THEY HAVE THE SAME SUGGESTED MAINTENANCE CYCLE.

H

PLOT DATE: Thursday, June 04, 2020



REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
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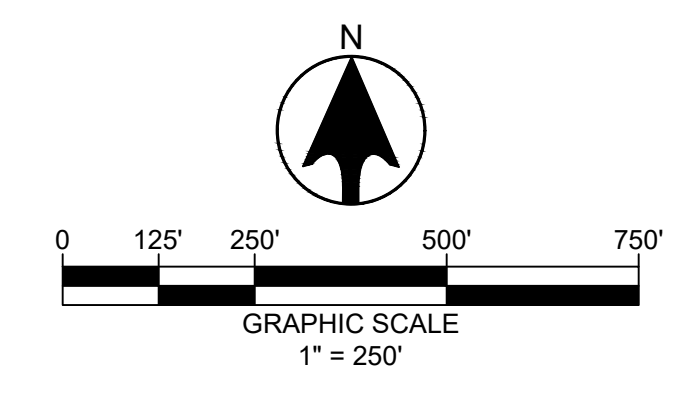
ENERPARC
 ENERPARC INC.
 1999 Harrison St, Ste 830
 Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
 ELLA WHEELER RD,
 NORTH STONINGTON, CT 06359
 41°25'9.71"N, 71°50'4.83"W

SEAL:

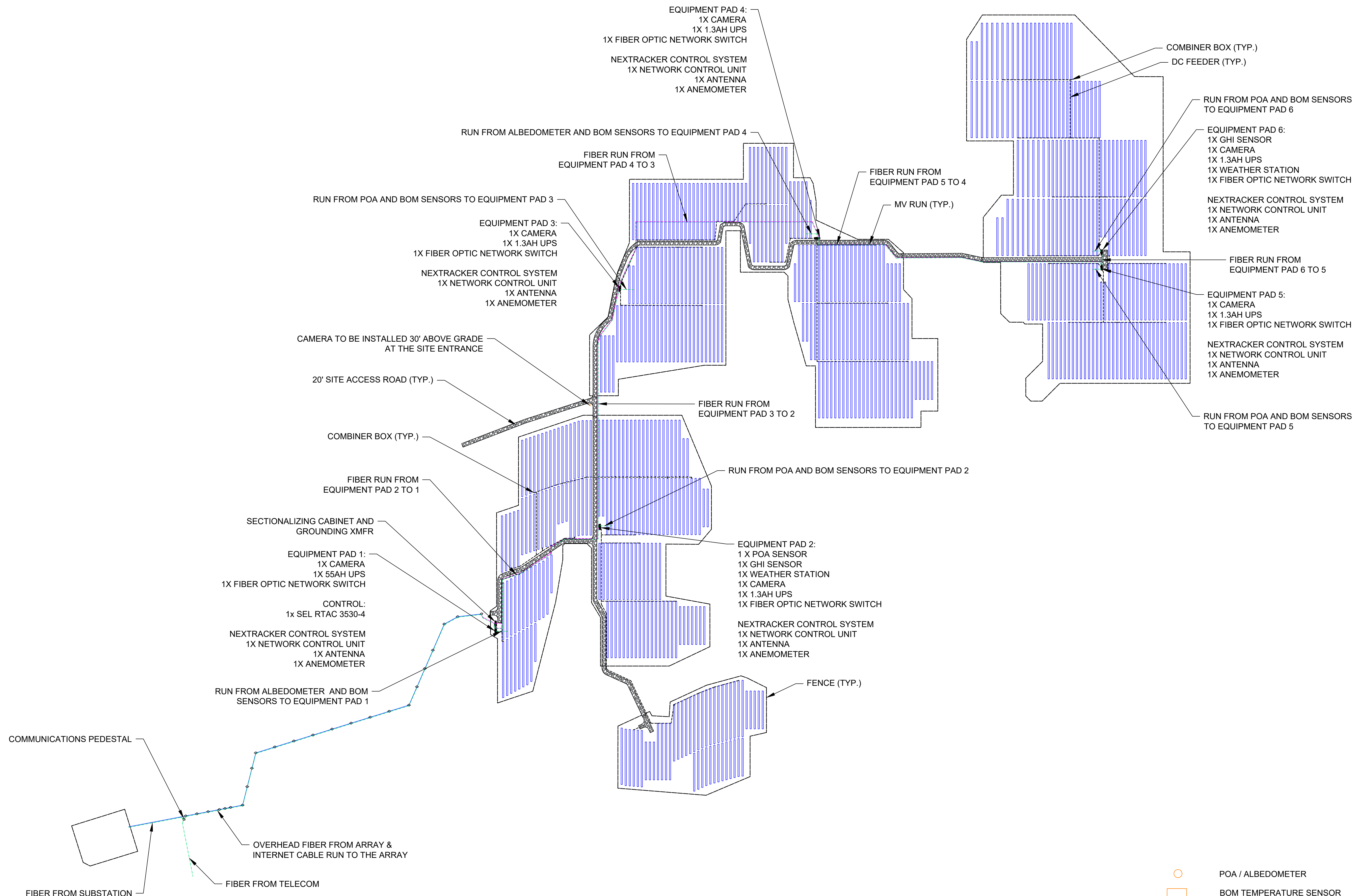
DATE: 03/09/2020
 PROJECT #: 2000500
 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI



1 GROUNDING PLAN

TITLE:
GROUNDING PLAN

SHEET:
E-250



REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
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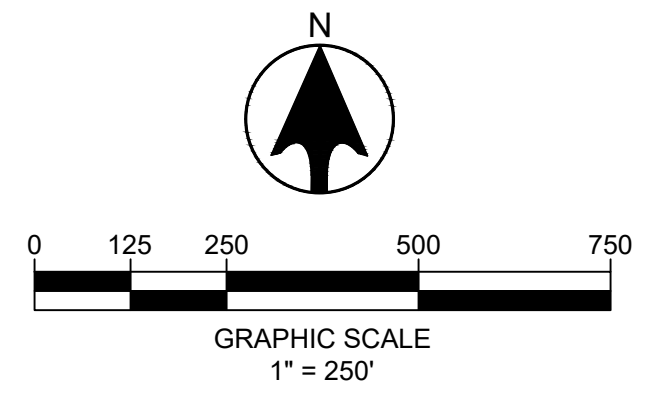
SEAL:

STEPHEN A. BRAY
 PROFESSIONAL ENGINEER
 CT LICENSE: 26657

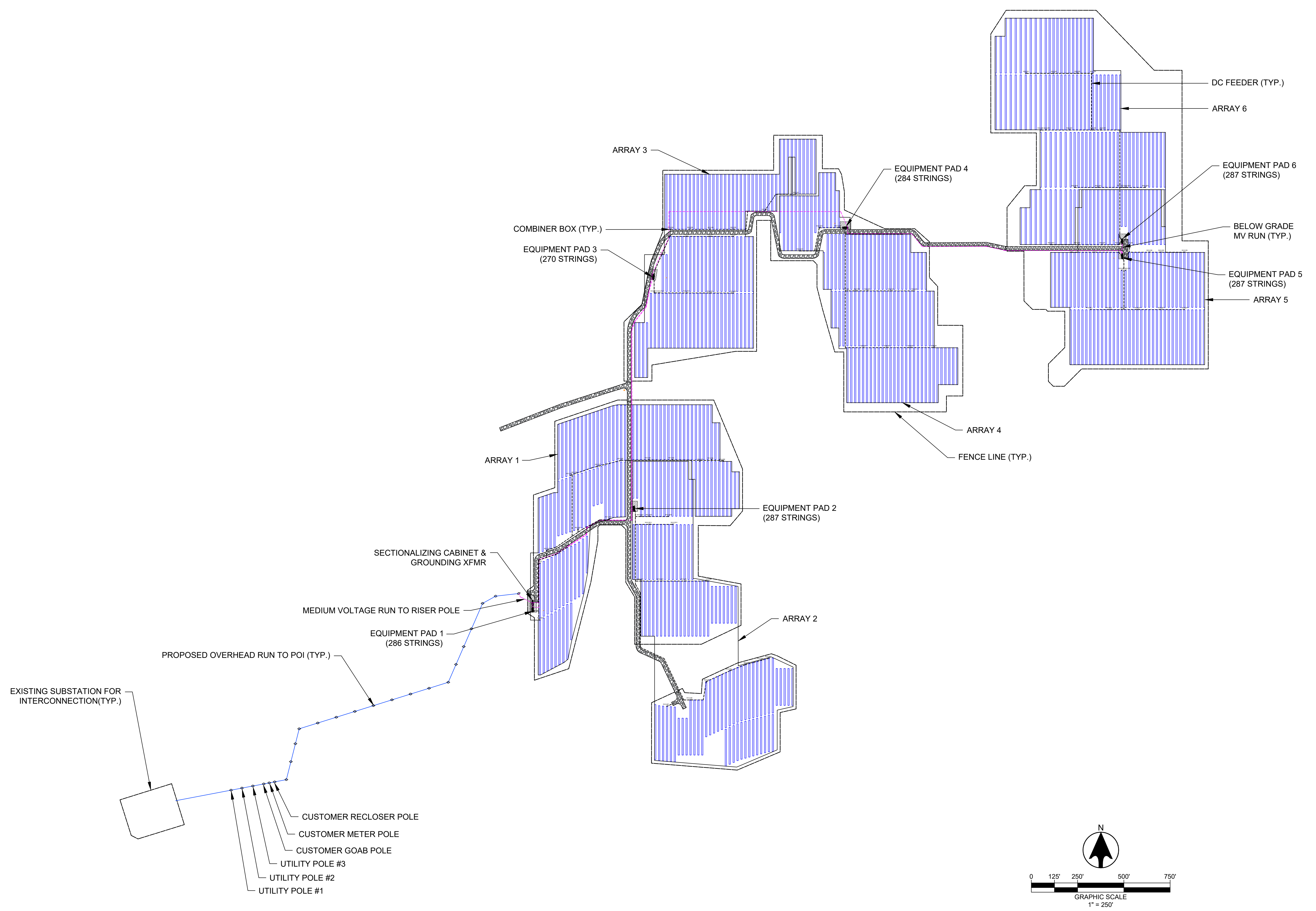
KMB
 DESIGN GROUP
 kmbdg.com
 1800 ROUTE 14, SUITE 200
 WALL, NJ 07719
 (732) 265-5423
 FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020
 PROJECT #: 2000500
 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI

1 COMMUNICATION PLAN



- POA / ALBEDOMETER
- BOM TEMPERATURE SENSOR
- DC FEEDER LINE
- MV AC FEEDER LINE
- COMMUNICATIONS LINE
- INV# - CB#
- COMBINER BOX
- EQUIPMENT PAD WITH INVERTER



REV	DESCRIPTION	DATE
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1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
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NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

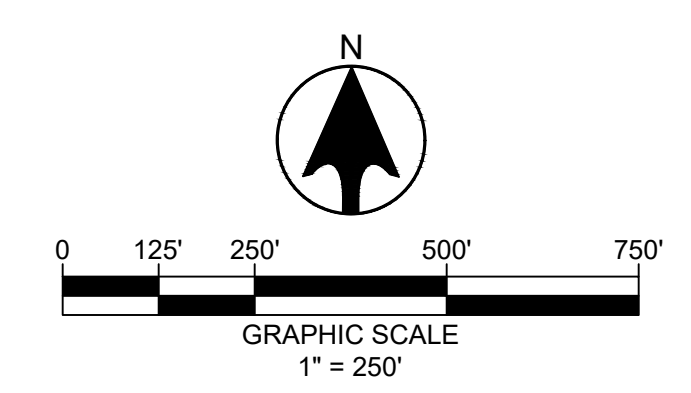
SEAL:

DATE: **03/09/2020**

PROJECT #: **2000500**

DRAWN BY: **V. PISSAREVSKI**

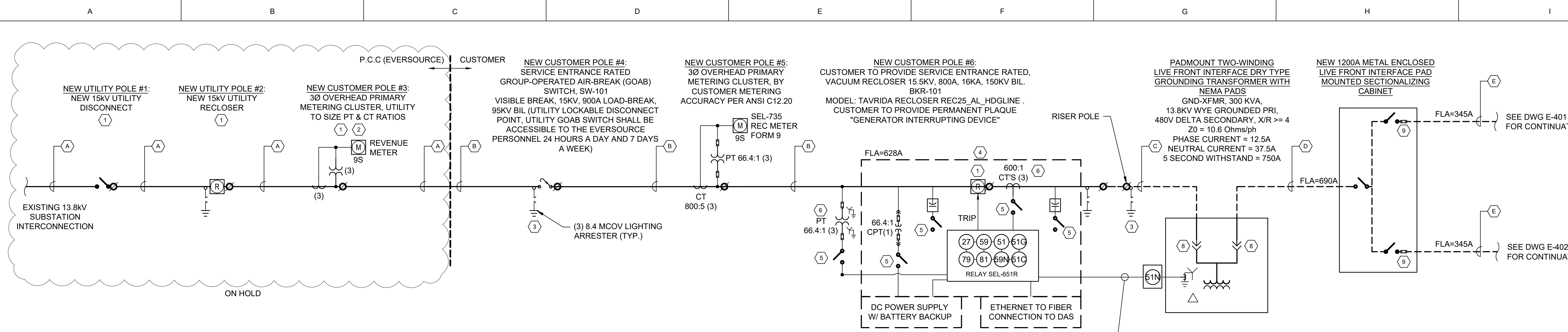
CHECKED BY: **R. VUDI**



1 MV SITE PLAN

TITLE:
MV SITE PLAN

SHEET:
E-350



REFER TO NOTES
 REFER TO WIRE TABLE

- NOTES:
- FULL LOAD AMPERAGE OF THE SITE IS CALCULATED PER THE MAXIMUM TRANSFORMER RATING.
 - EQUIPMENT GROUND CONDUCTORS ARE SIZED PER TABLE 250.122 FOR THE CIRCUIT OCPD.

REV	DESCRIPTION	DATE
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PROJECT ADDRESS:
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 NORTH STONINGTON, CT 06359
 41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: **03/09/2020**

PROJECT #: **2000500**

DRAWN BY: **V. PISSAREVSKI**

CHECKED BY: **R. VUDI**

TITLE: **SINGLE LINE DIAGRAM SHEET 1**

SHEET: **E-400**

SYMBOL LEGEND

	LOAD-BREAK DISCONNECT
	TRANSFORMER, DELTA PRI: WYE SEC (TYPICAL)
	FUSE
	CIRCUIT BREAKER
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	GROUND
	LIGHTNING ARRESTER
	GROUP AIR (GOAB) SWITCH
	METER UNIT
	RECLOSER UNIT
	600A LOAD BREAK ELBOWS
	POLE
	OVERHEAD / PRIMARY
	UNDERGROUND / PRIMARY
	ON GRADE / PRIMARY
	EQUIPMENT BORDER

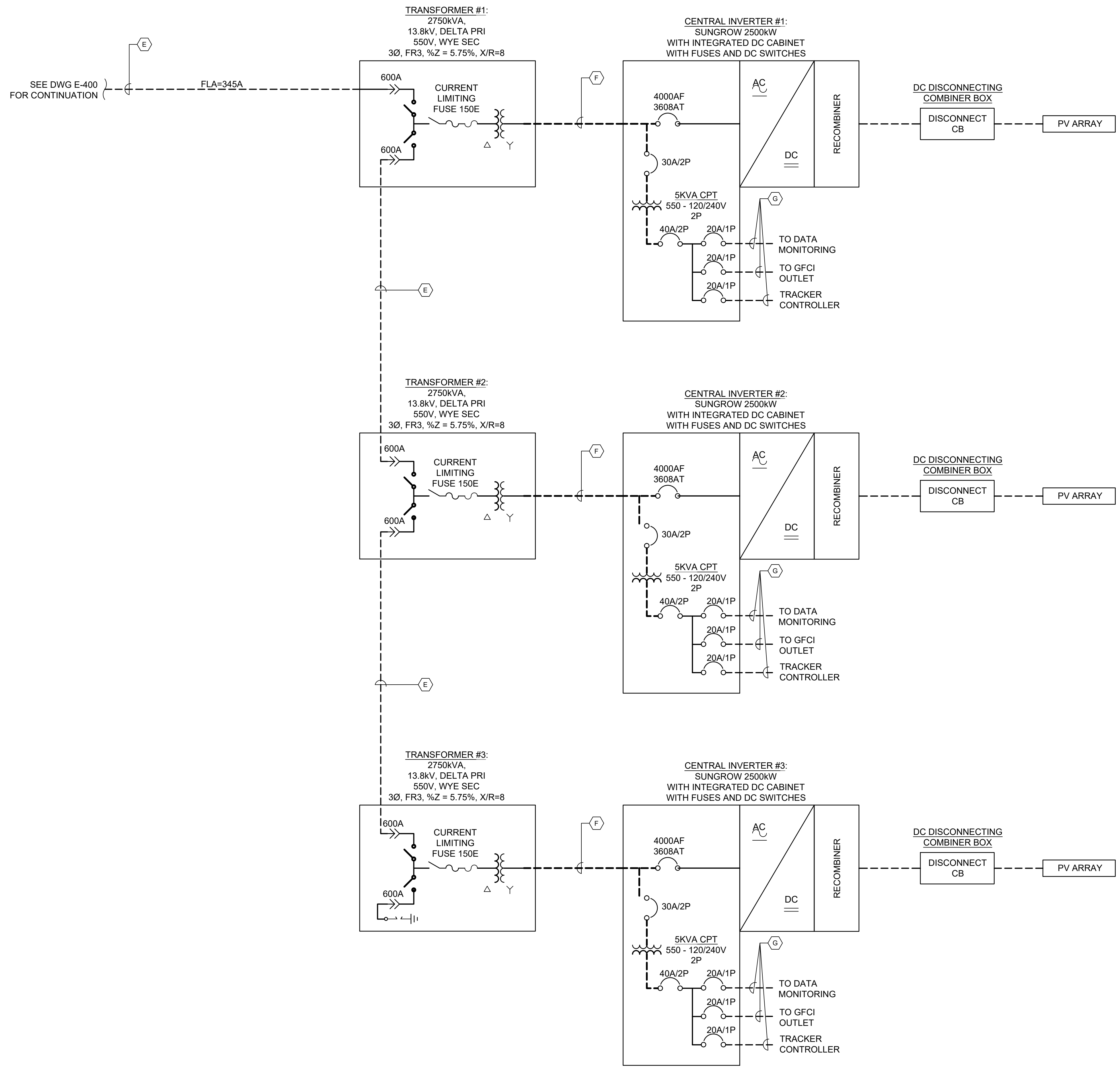
SEL-651R RELAY SETTINGS										
#	PICKUP				DEFAULT TIME DELAY (SEC)	DEFAULT TIME DELAY (CYCLES)	DELAY PER TCC	TIME DELAY AND TCC	VPHASE, A, HZ	
	PERCENTAGE	ACTUAL								
		59-1	110% ≤ V	15180					V L-L (PRI)	1.73
59-2	V ≥ 120%	16560	V L-L (PRI)	1.88	V (SEC)	0.11	6.60	-		
27-1	V ≤ 50%	6900	V L-L (PRI)	0.78	V (SEC)	1.05	63.00	-		
27-2	V ≤ 88%	12144	V L-L (PRI)	1.38	V (SEC)	1.95	117.00	-		
81U-1	56.5HZ				0.16	9.60	-			
81U-2	58.5HZ				300	18000	-			
81O-1	61.2HZ				300	18000	-			
81O-2	62 HZ				0.16	9.60	-			
51C	196A PRIMARY (0.22A SECONDARY)				-	-	3.0 TD U3 CURVE			
51P	785A PRIMARY (0.87A SECONDARY)				-	-	3.0 TD U4 CURVE			
51GC	50A PRIMARY (0.05A SECONDARY)				-	-	2.0 TD U3 CURVE			
59N-1	86.52% OF VNOM	11939.76	V (PRI)	1.36	V (SEC)	0.05	3.00	-		
59N-2	27.01% OF VNOM	3727.38	V (PRI)	0.42	V (SEC)	0.95	57.00	-		
79	95% ≤ VNOM ≤ 105.8%	13110	≤VNOM(PRIMARY) ≤	14600.4	V (SEC)	300	180000	-		
		1.49	≤VNOM (SEC) ≤	1.66	V (SEC)					
59.3HZ < FREQUENCY < 60.5										

a. SETTINGS TAKE INTO ACCOUNT AN ESTIMATED 3 CYCLE OPENING TIME ON THE RECLOSER.
 b. FAIL-SAFE RELAY TO TRIP AT A MAXIMUM OF 2 SECONDS FOLLOWING LOSS OF DC POWER AND OR HARDWARE FAILURE.
 c. AUTO-RESTORATION (79) FUNCTION WILL NOT CLOSE-IN UNTIL HEALTHY VOLTAGE AND FREQUENCY HAVE BEEN MAINTAINED FOR A MINIMUM OF 5 MINUTES.

PV SYSTEM SUMMARY	
MODULE MODEL	LONGI LR4-72HBD-435M
MODULE STC DC RATING	435
STRINGS COUNT	1,701
MODULES PER STRING	27
MODULES COUNT	45,927
TOTAL STC DC SIZE	19,978
TOTAL STC AC SIZE	15,000 kW
INVERTER MODEL	(QTY 6) SUNGROW SG-2500-U
TRANSFORMER	(QTY 6) 2750KVA PAD MOUNTED
POWER FACTOR	1
RACKING SYSTEM	GROUND-MOUNT
SITE COORDINATES	41°25'9.71"N 71°50'4.83"W

NOTES	
#	DESCRIPTION
1	EQUIPMENT IS PROVIDED AND INSTALLED BY EVERSOURCE.
2	CUSTOMER TO PROVIDE PHONE LINE TO UTILITY METER POLE FOR UTILITY ACCESS IF NEEDED.
3	(3) 8.4 kV MAXIMUM CONTINUOUS OPERATING VOLTAGE (MCOV) LIGHTNING ARRESTERS. ONE PER PHASE. ARRESTERS ARE SIZED PER IEEE C62.11 WITH THE ASSUMPTION THAT MAXIMUM VOLTAGE IS 5% OF NOMINAL (14.5kV)
4	RECLOSER TO BE PROVIDED WITH SEL 651R RELAY. RELAY TO HAVE DC BATTERY OR UPS BACK-UP WITH A MINIMUM OF 40AH BATTERY BACKUP. RELAY EQUIPPED WITH FAIL-SAFE PROTECTION AND TO BE TRIPPED WITHIN 2.0 SECONDS OF DC FAILURE. AC POWER TO DC SUPPLY LOCATED ON THE UTILITY SIDE OF THE RECLOSER
5	TEST SWITCHES SHALL BE INCLUDED AS SHOWN FOR O&M PURPOSES.
6	EXTERNAL 66.4:1 PT'S IN GWYE - GWYE CONFIGURATION WITH EXTERNAL TEST SWITCH
7	INTERNAL 600:1 CT(3) C10 AT +/-1% ACCURACY AND 0.13VA BURDEN AT 1A
8	MEDIUM VOLTAGE PORCELAIN BUSHINGS AND SPADES
9	500A 3Ø FUSED SWITCH

WIRE TABLE	
WIRE	DESCRIPTION
A	NEW (3) 15KV CLASS OVERHEAD 3Ø WIRE & (1) GROUND CONDUCTOR BY EVERSOURCE
B	(3) 636 KCM 26/7 ASCR (GROSBEAK), 3Ø, 3W CONDUCTORS & (1) 3/0 AWG 6/1 ASCR (PIGEON) GROUND CONDUCTOR
C	3 SETS OF (3) 500 kCMIL AL (MV-105), 100%, 15KV CLASS, EPR, WITH 1/3 CONCENTRIC NEUTRAL, 3Ø CONDUCTORS WITH AND (1) 3/0 AWG AL, 600V, EQUIPMENT GROUNDING CONDUCTOR IN 5" CONDUIT.
D	3 SETS OF (3) 500 kCMIL AL (MV-105), 133%, 15KV CLASS, EPR, PV JACKETED, 3Ø CONDUCTORS WITH AND (1) 3/0 AWG AL, 600V, EQUIPMENT GROUNDING CONDUCTOR IN 5" CONDUIT.
E	1 SET OF (3) 750kCMIL AL (MV-105), 133%, 15KV CLASS, EPR, PV JACKETED, 3Ø CONDUCTORS WITH AND (1) 1/0 AWG AL, 600V, EQUIPMENT GROUNDING CONDUCTOR IN 5" CONDUIT.



WIRE TABLE	
WIRE	DESCRIPTION
E	1 SET OF (3) 750 kCMIL AL (MV-105), 15KV CLASS, EPR, 133%, PVC JACKETED 3Ø CONDUCTORS AND (1) #1/0AWG AL, 600V, EQUIPMENT GROUND CONDUCTOR IN 5" CONDUIT
F	COPPER BUS BAR CONNECTION PROVIDED BY SUNGROW
G	(2) #10 CU TWHN-2 W (1) #10 CU GND, IN 1" EMT CONDUIT

INVERTER SETTINGS			
DEVICE	PICKUP	V (L - N)	TIME DELAY
27-1	$V \geq 88\%$	279.40	2.00
27-2	$V \geq 50\%$	158.80	1.10
59-1	$110\% \leq V < 120\%$	349.30	2.00
59-2	$V \geq 120\%$	381.10	0.16
81U-1	58.5 HZ		300.00
81U-2	56.5 HZ		0.16
81O-1	61.2 HZ		300.00
81O-2	62.0 HZ		0.16

INVERTER SHALL RESUME OPERATING UPON 5 MINUTES OF STABLE GRID. 5 MINUTE PERIOD SHALL RESET FOR ANY ELEMENT TRIP

- NOTES:
- FULL LOAD AMPERAGE OF THE SITE IS CALCULATED PER THE MAXIMUM TRANSFORMER RATING.
 - EQUIPMENT GROUND CONDUCTORS ARE SIZED PER TABLE 250.122 FOR THE CIRCUIT OCPD.
 - REFER E-403 FOR STRING AND COMBINER BOX WIRING DETAIL.

REV	DESCRIPTION	DATE
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PROJECT ADDRESS:
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NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

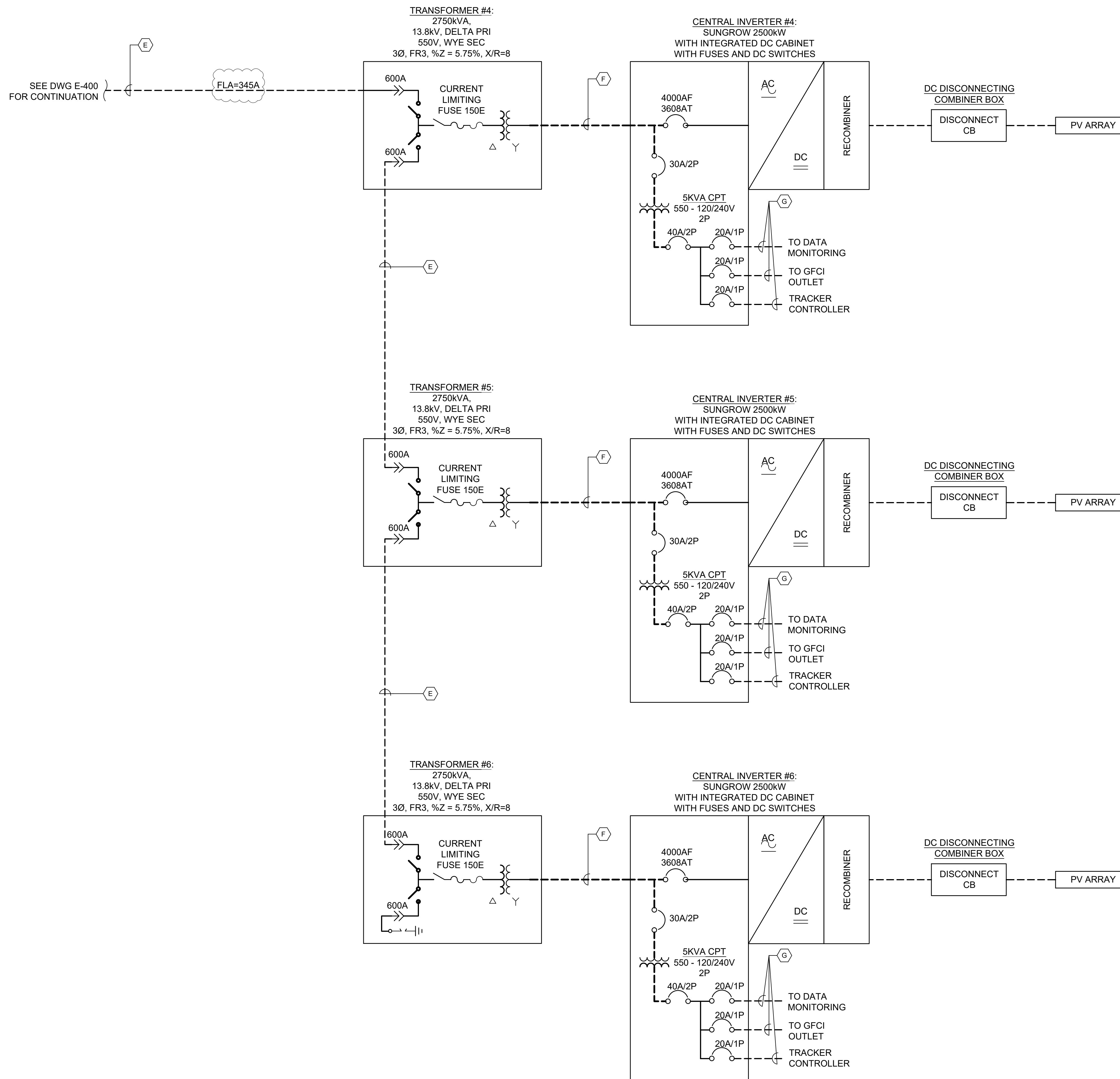
SEAL:

Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26657

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE: **SINGLE LINE DIAGRAM SHEET 2**

SHEET: **E-401**



WIRE TABLE	
WIRE	DESCRIPTION
E	1 SET OF (3) 750 kCMIL AL (MV-105), 15KV CLASS, EPR, 133%, PVC JACKETED 3Ø CONDUCTORS AND (1) #1/0 AWG AL, 600V, EQUIPMENT GROUND CONDUCTOR IN 5" CONDUIT
F	COPPER BUS BAR CONNECTION PROVIDED BY SUNGROW
G	(2) #10 CU TWHN-2 W (1) #10 CU GND, IN 1" EMT CONDUIT

INVERTER SETTINGS			
DEVICE	PICKUP	V (L - N)	TIME DELAY
27-1	$V \geq 88\%$	279.40	2.00
27-2	$V \geq 50\%$	158.80	1.10
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81U-1	58.5 Hz		300.00
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INVERTER SHALL RESUME OPERATING UPON 5 MINUTES OF STABLE GRID. 5 MINUTE PERIOD SHALL RESET FOR ANY ELEMENT TRIP

- NOTES:
- FULL LOAD AMPERAGE OF THE SITE IS CALCULATED PER THE MAXIMUM TRANSFORMER RATING.
 - EQUIPMENT GROUND CONDUCTORS ARE SIZED PER TABLE 250.122 FOR THE CIRCUIT OCPD.
 - REFER E-403 FOR STRING AND COMBINER BOX WIRING DETAIL.

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SEAL:

STEPHEN A. BRAY
 PROFESSIONAL ENGINEER
 CT LICENSE: 26657

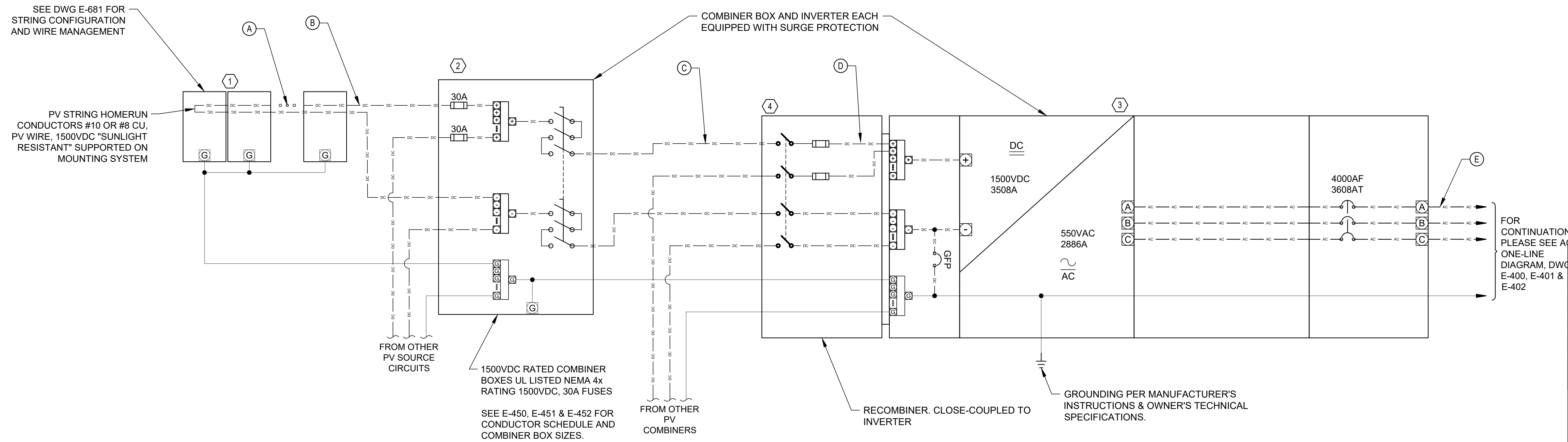
1800 ROUTE 14, SUITE 200
 WALL, NJ 07719
 (732) 261-5433
 FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020
 PROJECT #: 2000500
 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI

TITLE: **SINGLE LINE DIAGRAM SHEET 3**

SHEET: **E-402**

ELECTRICAL DC ONE-LINE DIAGRAM TYPICAL



EQUIPMENT SCHEDULE			
ITEM	DESCRIPTION	DETAIL	REMARKS
①	PV SOURCE CONDUCTORS	(27)x LONGI LR4-72HBD 435W IN EACH STRING	
②	PV COMBINER BOX	1500VDC, UL LISTED, 90°C, NEMA 4X, 30A FUSES. MANUFACTURER TBD	REFER TO WIRING SCHEDULE E-450, E-451 & E-452
③	INVERTER	(6) SUNGROW SG2500U 2500 KW PV SKID	WITH DC AND AC DISCONNECTS
④	RECOMBINER	1500VDC, UL LISTED FUSES WITH CONTACTORS	REFER TO INVERTER INSTALLATION MANUAL

CONDUCTOR AND CONDUIT SCHEDULE				
ITEM	DESCRIPTION	CONDUCTOR	CONDUIT	PATH
Ⓐ	PV SOURCE CONDUCTORS	2 X #12, CU, 1500VDC PV WIRE	N/A - BACK OF MODULE WIRING	N/A
Ⓑ	PV STRING HOMERUN CONDUCTORS	2 X #10 OR #8, CU, 1500VDC PV WIRE	N/A - HOME RUN WIRING	BACK OF RACKING
Ⓒ	DC COMBINER BOX OUTPUT CONDUCTORS	REFER TO CONDUCTOR SCHEDULE		PVC SCH 40 CONDUIT IN TRENCH
Ⓓ	RECOMBINER OUTPUT	REFER TO MANUFACTURER'S INSTRUCTIONS		RECOMBINER IS CLOSE-COUPLED TO INVERTER
Ⓔ	INVERTER OUTPUT CONDUCTORS	REFER TO AC ONE-LINE DIAGRAM, E-400, E-401 & E-402		BUS BAR TO TRANSFORMER

PV ARRAY SCHEDULE								
INVERTER REF	MODULE			NUM STRINGS	MODS / STRING	TOTAL # OF MODULES	TOTAL POWER (KW)	INVERTER TYPE
	MFG	MODEL	POWER (W)					
INV1	LONGI	LR4-72HBD	435	286	27	7722	3,359	SUNGROW SG2500U
INV2	LONGI	LR4-72HBD	435	287	27	7749	3,371	
INV3	LONGI	LR4-72HBD	435	270	27	7290	3,171	
INV4	LONGI	LR4-72HBD	435	284	27	7668	3,336	
INV5	LONGI	LR4-72HBD	435	287	27	7749	3,371	
INV6	LONGI	LR4-72HBD	435	287	27	7749	3,371	
TOTAL				1,701		45,927	19,978	

NOTE:

- REFER TO E-450, E-451 & E-452 FOR CONDUCTOR SCHEDULE OF DC RECOMBINER AND COMBINER BOXES.
- CONTRACTOR SHALL VERIFY THAT THE COMBINER BOXES USED MATCH THE STRING COUNT PRIOR TO INSTALLATION.

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20

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ENERPARC INC.
1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

STATE OF CONNECTICUT

STEPHEN A. BRAY

REGISTERED PROFESSIONAL ENGINEER

CT LICENSE: 26657

DATE: **03/09/2020**

PROJECT #: **2000500**

DRAWN BY: **V. PISSAREVSKI**

CHECKED BY: **R. VUDI**

TITLE: **SINGLE LINE DIAGRAM SHEET 4**

SHEET: **E-403**

LONGI 435W COEFFICIENTS	
P _{MAX}	-0.37%/°C
VOC	-0.30%/°C
ISC	0.06%/°C

LONGI 435W BIFACIAL PANEL PARAMETERS ITEM A	
VOC	49.8VDC
VMP	41.4VDC
ISC	11.16ADC
INOM	10.51ADC
BIFACIALITY FACTOR	125%
WIRE	#12 PV WIRE

STRING OF 27X435W ITEM B	
WITH NEC 690.7 & 690.8	
V _{MAX}	1500VDC
V _{NOM}	1117.8VDC
ISC	13.95ADC
INOM	13.14ADC
WITH NEC 690.8	
STRING FUSE	21.8ADC -> 30ADC
WIRE	#10 PV WIRE OR #8 PV WIRE

COMBINER WITH 18X30A FUSES USING 435W ITEM (C), (1)	
WITH NEC 690.7 & 690.8	
V _{MAX}	1500VDC
V _{NOM}	1117.8VDC
ISC	252ADC
INOM	237ADC
WITH NEC 690.8	
INV OCPD	391.7ADC -> 400ADC
WIRE	2 SETS OF 600KCMIL PV WIRE AL OR 750KCMIL PV WIRE

COMBINER WITH 17X20A FUSES USING 435W ITEM (C), (2)	
WITH NEC 690.7 & 690.8	
V _{MAX}	1500VDC
V _{NOM}	1117.8VDC
ISC	237.15ADC
INOM	223.4ADC
WITH NEC 690.8	
INV OCPD	370ADC -> 400ADC
WIRE	2 SETS OF 600KCMIL PV WIRE AL OR 750KCMIL PV WIRE

DESIGN TEMPERATURE COEFFICIENTS	
ASHRAE HIGH TEMP	29.9°C
ASHRAE LOW TEMP	-16.5°C

SYSTEM DESIGN CALCULATIONS:

STRING FUSE DISCONNECT SIZING (PER NEC 2014 690.9(B)): FORMULA - ISC *1.25*1.25
 1 STRING (18 MODULES) = 10.11A*1.25*1.25 = 15.79A ~ 20A

COMBINER BOX MAX ISC CURRENT FORMULA [NEC 2017 690.8(A)(1)] - ISC *BIFACIALITY FACTOR* 1.25 *NUMBER OF STRINGS
 18 STRING COMBINER BOX = 11.16A *1.25*1.25* 18 = 314A
 17 STRING COMBINER BOX = 11.16A *1.25*1.25* 17 = 297A

INVERTER FUSE DISCONNECT SIZING (PER NEC 2017 690.9(B)): FORMULA - ISC *BIFACIALITY FACTOR*1.56 *NUMBER OF STRINGS
 18 STRING COMBINER BOX = 11.16A *1.25*1.56* 18 = 391.7A ~ 400A
 17 STRING COMBINER BOX = 11.16A *1.25*1.56* 17 = 369.9A ~ 400A

DC HOME RUN CONDUCTOR SIZING PER NEC 2017 690.8(A) & (B):
 1 STRING (27 MODULES) = 11.16A*BIFACIALITY FACTOR*1.56 = 21.76A
 PER NEC 2017 TABLE 310.15(B)(16) FOR COPPER CONDUCTORS WITH 90 DEGREE CELSIUS TEMPERATURE RATING, #10 CONDUCTOR CAN HANDLE UP TO 40A.

COMBINER BOX OUTPUT CONDUCTOR SIZING PER NEC 2017 690.8(A) & (B):
 18 STRING COMBINER BOX = 11.16*BIFACIALITY FACTOR*1.56*18 = 391.72A
 PER NEC 2017 TABLE 310.15(B)(16) FOR ALUMINIUM CONDUCTORS WITH 90 DEGREE CELSIUS TEMPERATURE RATING, 2 SETS OF 600KCMIL CONDUCTOR CAN HANDLE UP TO 770A AND 2 SETS OF 750KCMIL CONDUCTOR CAN HANDLE UP TO 870A.

SAMPLE VOLTAGE DROP FORMULA FOR INV1- CB1:
 VOLTAGE DROP FROM COMBINER BOX TO INVERTER = [(INOM * BIFACIALITY FACTOR* (RESISTANCE OF WIRE/1000) * 2 * DISTANCE * # OF STRINGS)/(VMP * # OF MODULES PER STRING* # OF SETS)
 VOLTAGE DROP FROM COMBINER BOX TO INVERTER = [10.51A * 1.25 * (0.0353/1000) * 2 * 1565FT * 18]/ (41.4V*27*2) = 0.0117 = 1.17%

VOLTAGE DROP FROM STRING TO COMBINER BOX = [(INOM * BIFACIALITY FACTOR* (RESISTANCE OF WIRE/1000) * 2 * DISTANCE) / (VMP * # OF MODULES PER STRING)
 VOLTAGE DROP FROM MODULE TO COMBINER BOX = [10.51A * 1.25 * (0.778/1000) * 2 * 390FT]/ (41.4V*27) = 0.0071 = 0.71%

INVERTER 1 : SUNGROW SG-2500-U 2500kW													
COMBINER BOX	STRINGS	MODULE TYPE	MODULE WATTAGE	HOMERUN CONDUCTOR	COMBINER OUTPUT CONDUCTOR	SETS	CONDUIT	MAX DC HOMERUN LENGTH TO COMBINER BOX FT	MAX DC HOMERUN VOLTAGE DROP	DC FEEDER LENGTH TO INVERTER FT	DC FEEDER VOLTAGE DROP	TOTAL DC VOLTAGE DROP	
INV1-CB1	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	390	0.71%	1565	1.17%	1.88%	
INV1-CB2	17	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	350	0.64%	1690	1.19%	1.83%	
INV1-CB3	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	390	0.71%	1625	1.21%	1.92%	
INV1-CB4	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	1415	1.06%	1.81%	
INV1-CB5	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	1285	0.96%	1.71%	
INV1-CB6	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	440	0.80%	1135	0.85%	1.65%	
INV1-CB7	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	420	0.77%	1005	0.75%	1.52%	
INV1-CB8	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	420	0.77%	870	0.65%	1.42%	
INV1-CB9	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	375	0.69%	870	0.65%	1.34%	
INV1-CB10	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	395	0.72%	760	0.57%	1.29%	
INV1-CB11	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	435	0.80%	580	0.43%	1.23%	
INV1-CB12	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	470	0.86%	375	0.28%	1.14%	
INV1-CB13	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	380	0.70%	285	0.21%	0.91%	
INV1-CB14	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	665	1.22%	380	0.28%	1.50%	
INV1-CB15	17	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	405	0.74%	455	0.32%	1.06%	
INV1-CB16	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	430	0.79%	100	0.07%	0.86%	

INVERTER 2 : SUNGROW SG-2500-U 2500kW													
COMBINER BOX	STRINGS	MODULE TYPE	MODULE WATTAGE	HOMERUN CONDUCTOR	COMBINER OUTPUT CONDUCTOR	SETS	CONDUIT	MAX DC HOMERUN LENGTH TO COMBINER BOX FT	MAX DC HOMERUN VOLTAGE DROP	DC FEEDER LENGTH TO INVERTER FT	DC FEEDER VOLTAGE DROP	TOTAL DC VOLTAGE DROP	
INV2-CB1	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 750 KCMIL AL + #1 AL GND	2	4"	535	0.98%	1720	1.02%	2.00%	
INV2-CB2	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 750 KCMIL AL + #1 AL GND	2	4"	550	1.00%	1670	1.00%	2.00%	
INV2-CB3	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 750 KCMIL AL + #1 AL GND	2	4"	560	1.02%	1585	0.95%	1.97%	
INV2-CB4	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 750 KCMIL AL + #1 AL GND	2	4"	540	0.99%	1495	0.89%	1.88%	
INV2-CB5	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 750 KCMIL AL + #1 AL GND	2	4"	425	0.78%	1355	0.81%	1.59%	
INV2-CB6	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	370	0.68%	1190	0.89%	1.57%	
INV2-CB7	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	370	0.68%	1240	0.93%	1.61%	
INV2-CB8	17	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	375	0.69%	790	0.56%	1.25%	
INV2-CB9	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	665	0.50%	1.25%	
INV2-CB10	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	540	0.40%	1.15%	
INV2-CB11	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	390	0.71%	430	0.32%	1.03%	
INV2-CB12	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	295	0.22%	0.97%	
INV2-CB13	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	170	0.13%	0.88%	
INV2-CB14	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	80	0.06%	0.81%	
INV2-CB15	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	390	0.71%	125	0.09%	0.80%	
INV2-CB16	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	230	0.17%	0.92%	

NOTES:

- CODE REQUIRED AND INDUSTRY STANDARD AA-8000 ALUMINUM ALLOY CONDUCTORS REQUIRE NO MORE MAINTENANCE THAN COPPER PER NFPA 70B, "RECOMMENDED PRACTICE FOR ELECTRICAL EQUIPMENT MAINTENANCE". THIS STANDARD DOES NOT DIFFERENTIATE BETWEEN AA-8000 AND COPPER WIRE.
- MODERN ALUMINUM CONDUCTORS DO NOT REACT ANY DIFFERENTLY THAN COPPER IN MECHANICAL CONNECTION, THEY HAVE THE SAME SUGGESTED MAINTENANCE CYCLE.
- ALL DC CONDUCTORS SHALL BE 2000V RATED PV WIRE.

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
I	ISSUE FOR PERMIT SET	5/28/20

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PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
**ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W**

SEAL: DATE: **03/09/2020**

PROJECT #: **2000500**

DRAWN BY: **V. PISSAREVSKI**

CHECKED BY: **R. VUDI**

TITLE:
CONDUCTOR SCHEDULE

SHEET:
E-450

- NOTES:
1. CODE REQUIRED AND INDUSTRY STANDARD AA-8000 ALUMINUM ALLOY CONDUCTORS REQUIRE NO MORE MAINTENANCE THAN COPPER PER NFPA 70B, "RECOMMENDED PRACTICE FOR ELECTRICAL EQUIPMENT MAINTENANCE". THIS STANDARD DOES NOT DIFFERENTIATE BETWEEN AA-8000 AND COPPER WIRE.
 2. MODERN ALUMINUM CONDUCTORS DO NOT REACT ANY DIFFERENTLY THAN COPPER IN MECHANICAL CONNECTION, THEY HAVE THE SAME SUGGESTED MAINTENANCE CYCLE.
 3. ALL DC CONDUCTORS SHALL BE 2000V RATED PV WIRE.

INVERTER 3 : SUNGROW SG-2500-U 2500kW

COMBINER BOX	STRINGS	MODULE TYPE	MODULE WATTAGE	HOMERUN CONDUCTOR	COMBINER OUTPUT CONDUCTOR	SETS	CONDUIT	MAX DC HOMERUN LENGTH TO COMBINER BOX FT	MAX DC HOMERUN VOLTAGE DROP	DC FEEDER LENGTH TO INVERTER FT	DC FEEDER VOLTAGE DROP	TOTAL DC VOLTAGE DROP
INV3-CB1	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	1130	0.84%	1.59%
INV3-CB2	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	535	0.98%	910	0.68%	1.66%
INV3-CB3	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	440	1.28%	650	0.49%	1.77%
INV3-CB4	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	525	0.39%	1.59%
INV3-CB5	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	390	1.14%	420	0.31%	1.45%
INV3-CB6	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	370	1.08%	310	0.23%	1.31%
INV3-CB7	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	630	1.84%	165	0.12%	1.96%
INV3-CB8	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	360	0.27%	1.47%
INV3-CB9	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	485	0.36%	1.56%
INV3-CB10	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	615	0.46%	1.66%
INV3-CB11	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	475	0.35%	1.55%
INV3-CB12	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	350	0.26%	1.01%
INV3-CB13	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	0.75%	220	0.16%	0.91%
INV3-CB14	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	75	0.06%	1.26%
INV3-CB15	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	560	1.63%	50	0.04%	1.67%

INVERTER 4 : SUNGROW SG-2500-U 2500kW

COMBINER BOX	STRINGS	MODULE TYPE	MODULE WATTAGE	HOMERUN CONDUCTOR	COMBINER OUTPUT CONDUCTOR	SETS	CONDUIT	MAX DC HOMERUN LENGTH TO COMBINER BOX FT	MAX DC HOMERUN VOLTAGE DROP	DC FEEDER LENGTH TO INVERTER FT	DC FEEDER VOLTAGE DROP	TOTAL DC VOLTAGE DROP
INV4-CB1	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	335	0.98%	1160	0.87%	1.85%
INV4-CB2	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	1035	0.77%	1.97%
INV4-CB3	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	910	0.68%	1.88%
INV4-CB4	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	780	0.58%	1.78%
INV4-CB5	17	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	350	1.02%	390	0.28%	1.30%
INV4-CB6	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	680	1.24%	430	0.32%	1.56%
INV4-CB7	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	495	0.37%	1.57%
INV4-CB8	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	620	0.46%	1.66%
INV4-CB9	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	750	0.56%	1.76%
INV4-CB10	17	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	420	1.22%	380	0.27%	1.49%
INV4-CB11	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	350	0.19%	1.39%
INV4-CB12	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	125	0.09%	1.29%
INV4-CB13	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	85	0.06%	1.26%
INV4-CB14	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	60	0.04%	1.24%
INV4-CB15	17	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	490	1.43%	165	0.12%	1.55%
INV4-CB16	17	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	580	1.69%	375	0.26%	1.95%

REV	DESCRIPTION	DATE
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D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
 ELLA WHEELER RD,
 NORTH STONINGTON, CT 06359
 41°25'9.71"N, 71°50'4.83"W

SEAL:

Stephen A. Bray
 PROFESSIONAL ENGINEER
 CT LICENSE: 26657

1800 ROUTE 14, SUITE 200
 WALL, NJ 07719
 (732) 261-5421
 FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020

PROJECT #: 2000500

DRAWN BY: V. PISSAREVSKI

CHECKED BY: R. VUDI

TITLE:
CONDUCTOR SCHEDULE

SHEET:
E-451

7
6
5
4
3
2
1

INVERTER 5 : SUNGROW SG-2500-U 2500kW

COMBINER BOX	STRINGS	MODULE TYPE	MODULE WATTAGE	HOMERUN CONDUCTOR	COMBINER OUTPUT CONDUCTOR	SETS	CONDUIT	MAX DC HOMERUN LENGTH TO COMBINER BOX FT	MAX DC HOMERUN VOLTAGE DROP	DC FEEDER LENGTH TO INVERTER FT	DC FEEDER VOLTAGE DROP	TOTAL DC VOLTAGE DROP
INV5-CB1	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	430	1.25%	200	0.15%	1.40%
INV5-CB2	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	370	1.08%	115	0.09%	1.17%
INV5-CB3	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	125	0.09%	1.29%
INV5-CB4	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	380	0.28%	1.48%
INV5-CB5	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	255	0.19%	1.39%
INV5-CB6	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	190	0.14%	1.34%
INV5-CB7	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	525	1.53%	45	0.03%	1.56%
INV5-CB8	17	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	500	1.46%	45	0.03%	1.49%
INV5-CB9	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	205	0.15%	1.35%
INV5-CB10	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	330	0.25%	1.45%
INV5-CB11	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	425	0.32%	1.52%
INV5-CB12	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	390	1.14%	320	0.24%	1.38%
INV5-CB13	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	370	1.08%	255	0.19%	1.27%
INV5-CB14	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	320	0.24%	1.44%
INV5-CB15	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	445	0.33%	1.53%
INV5-CB16	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	570	0.43%	1.63%

INVERTER 6 : SUNGROW SG-2500-U 2500kW

COMBINER BOX	STRINGS	MODULE TYPE	MODULE WATTAGE	HOMERUN CONDUCTOR	COMBINER OUTPUT CONDUCTOR	SETS	CONDUIT	MAX DC HOMERUN LENGTH TO COMBINER BOX FT	MAX DC HOMERUN VOLTAGE DROP	DC FEEDER LENGTH TO INVERTER FT	DC FEEDER VOLTAGE DROP	TOTAL DC VOLTAGE DROP
INV6-CB1	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	415	0.76%	1390	1.04%	1.80%
INV6-CB2	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	430	0.79%	1240	0.93%	1.72%
INV6-CB3	18	LONGI LR4-72HBD-435M	435	2 X #8 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	430	0.79%	1110	0.83%	1.62%
INV6-CB4	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	370	1.08%	1025	0.77%	1.85%
INV6-CB5	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	700	0.52%	1.72%
INV6-CB6	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	435	1.27%	720	0.54%	1.81%
INV6-CB7	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	435	1.27%	850	0.63%	1.90%
INV6-CB8	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	415	1.21%	975	0.73%	1.94%
INV6-CB9	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	550	1.01%	1000	0.75%	1.76%
INV6-CB10	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	430	1.25%	510	0.38%	1.63%
INV6-CB11	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	430	1.25%	380	0.28%	1.53%
INV6-CB12	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	430	1.25%	255	0.19%	1.44%
INV6-CB13	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	250	0.19%	1.39%
INV6-CB14	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	410	1.20%	360	0.27%	1.47%
INV6-CB15	17	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	415	1.21%	440	0.31%	1.52%
INV6-CB16	18	LONGI LR4-72HBD-435M	435	2 X #10 CU + #6 CU GND	2 X 600 KCMIL AL + #1 AL GND	2	4"	430	1.25%	290	0.22%	1.47%

- NOTES:
1. CODE REQUIRED AND INDUSTRY STANDARD AA-8000 ALUMINUM ALLOY CONDUCTORS REQUIRE NO MORE MAINTENANCE THAN COPPER PER NFPA 70B, "RECOMMENDED PRACTICE FOR ELECTRICAL EQUIPMENT MAINTENANCE". THIS STANDARD DOES NOT DIFFERENTIATE BETWEEN AA-8000 AND COPPER WIRE.
 2. MODERN ALUMINUM CONDUCTORS DO NOT REACT ANY DIFFERENTLY THAN COPPER IN MECHANICAL CONNECTION, THEY HAVE THE SAME SUGGESTED MAINTENANCE CYCLE.
 3. ALL DC CONDUCTORS SHALL BE 2000V RATED PV WIRE.

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E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
I	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
 ELLA WHEELER RD,
 NORTH STONINGTON, CT 06359
 41°25'9.71"N, 71°50'4.83"W

SEAL:

Stephen A. Bray
 PROFESSIONAL ENGINEER
 CT LICENSE: 26657

1800 ROUTE 14, SUITE 200
 WALL, NJ 07719
 (732) 985-5033
 FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020

PROJECT #: 2000500

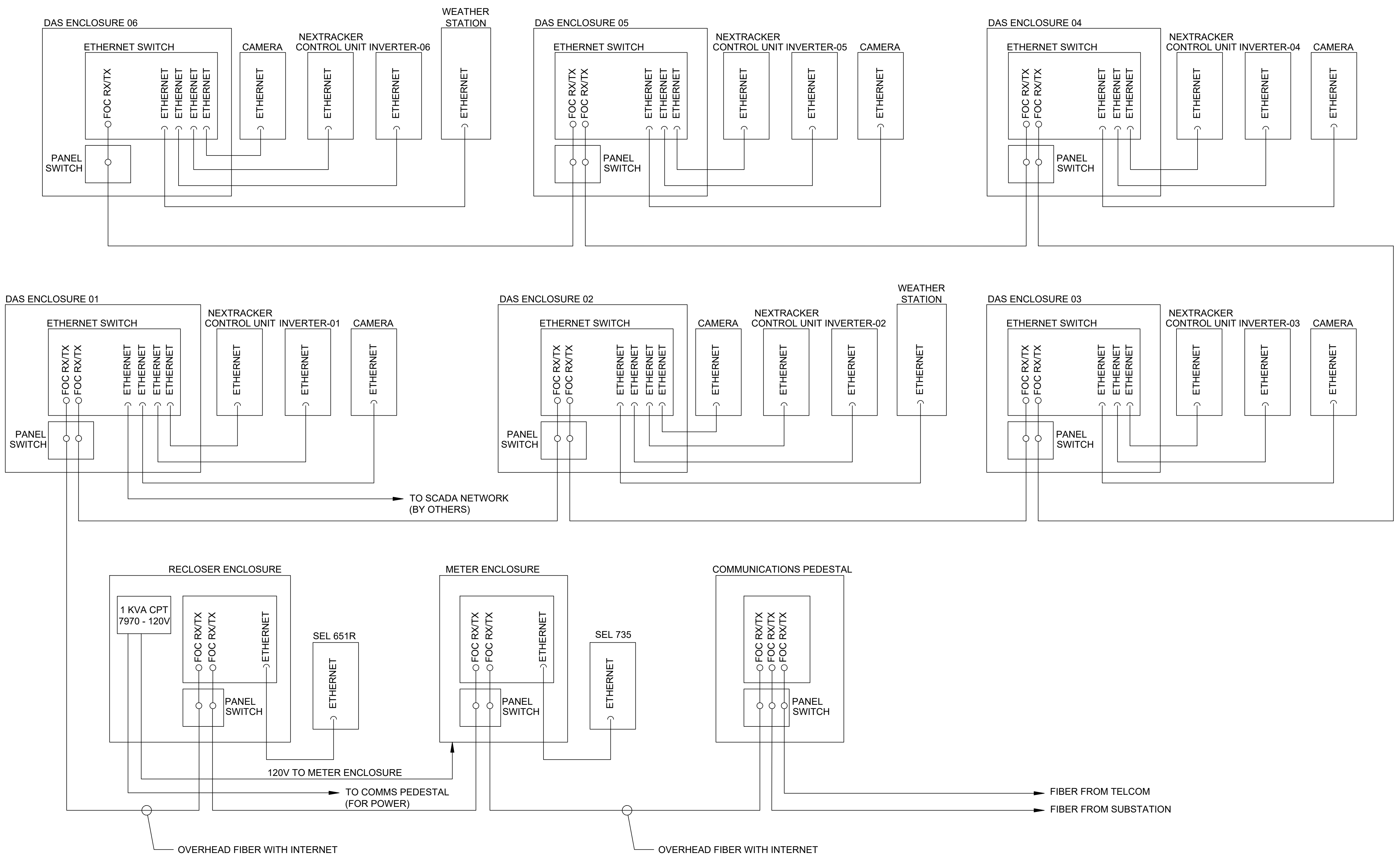
DRAWN BY: V. PISSAREVSKI

CHECKED BY: R. VUDI

TITLE:
CONDUCTOR SCHEDULE

SHEET:
E-452

- NOTES:
1. REFER TO SCADA VENDOR DRAWINGS FOR DETAILS.
 2. CONTRACTOR TO CHECK POSSIBILITY OF LAND INTERNET INSTEAD OF CELLULAR INTERNET.



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A	INITIAL 10% SET SUBMISSION	01/10/20
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ENERPARC
 ENERPARC INC.
 1999 Harrison St, Ste 830
 Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

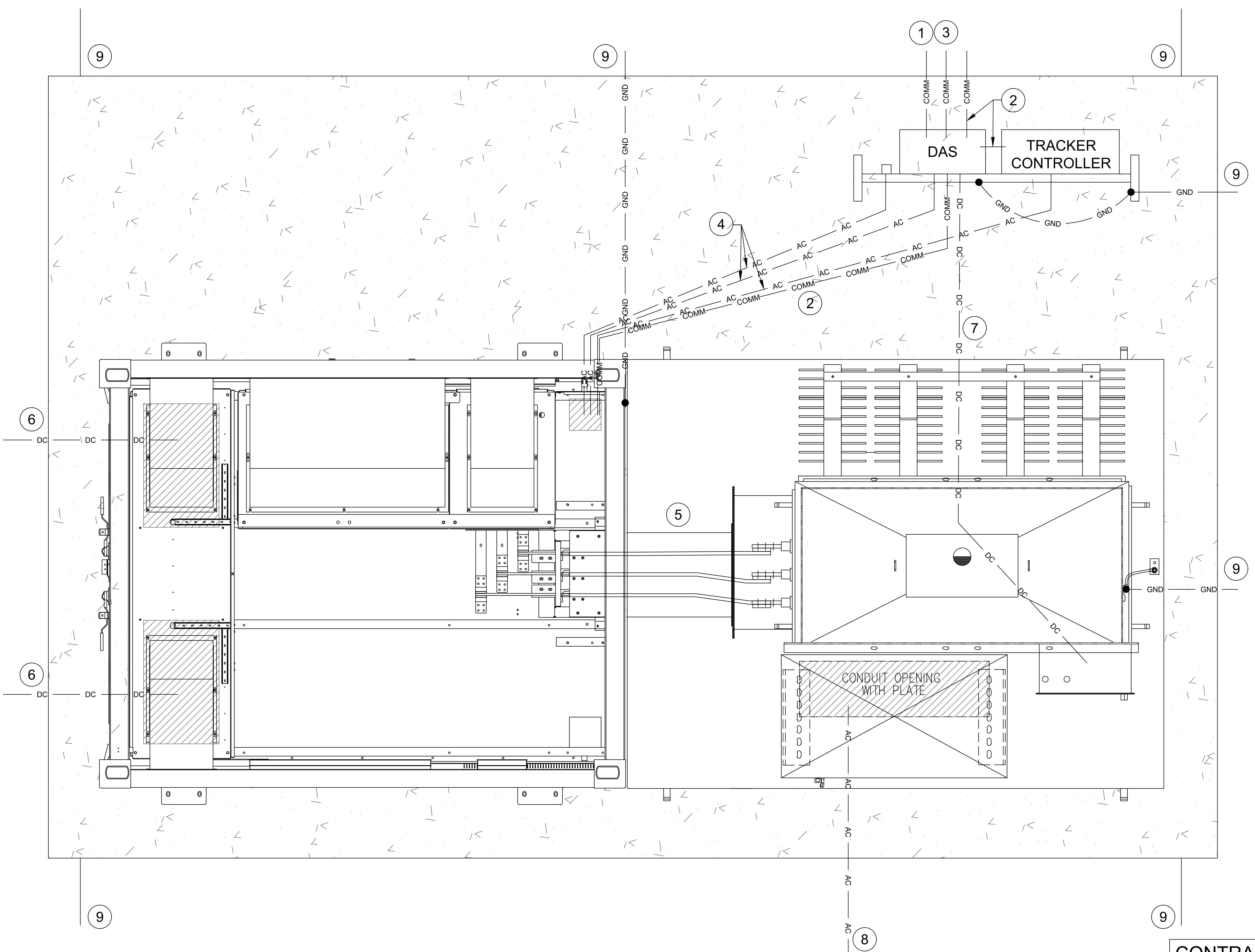
PROJECT ADDRESS:
 ELLA WHEELER RD,
 NORTH STONINGTON, CT 06359
 41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020
 PROJECT #: 2000500
 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI

TITLE:
COMMUNICATION NETWORK DIAGRAM

SHEET:
E-500



NOTES:

THE FOLLOWING CONDUITS ARE DETAILED IN THE PAD. IF ANY NEED TO BE ADDED, PLEASE CONTACT THE ENGINEER. ALL UNDERGROUND CONDUIT IS PVC SCH 40 UNLESS NOTED OTHERWISE. ALL ABOVE GRADE AC CONDUIT SHALL BE PVC SCH 80 UNLESS NOTED OTHERWISE.

COMMUNICATION CONDUITS

1. QTY 2 - 1" PVC SCH 40 CONDUIT FOR WEATHER SENSORS LOCATED IN THE ARRAY TO THE WEATHER STATION. 1- FOR PYRANOMETER/ALBEDOMETER. 1- FOR BACK OF MODULE TEMPERATURE SENSOR.
2. QTY 3 - 1" PVC SCH 40 CONDUIT FROM DAS ENCLOSURE. 1- TO INVERTER. 1- TO CAMERA. 1-TRACKER CONTROL UNIT.
3. QTY 2 - 2" PVC SCH 40 CONDUIT FROM DAS ENCLOSURE 1- INCOMING. 1- OUTGOING

LV AC CONDUITS (REFER TO E-400 & 401 FOR SIZING.)

4. QTY 3 - 1" PVC SCH 40 CONDUIT FROM INVERTER. 1- TO GFCI RECEPTACLE. 1- DAS ENCLOSURE. 1- TRACKER CONTROL UNIT.
5. 3 FLEXIBLE BUS BARS FOR INVERTER THROAT CONNECTION TO THE TRANSFORMER. REFER TO PROLEC GE THROAT INSTALLATION INSTRUCTION FOR METHOD OF CONNECTING INVERTER BUSBARS TO TRANSFORMER LV BUSHING.

DC CONDUITS

6. QTY 32 OR 30 - 4" PVC SCH 40 CONDUIT FROM COMBINER BOXES IN ARRAY TO INVERTER. REFER TO CONDUCTOR SCHEDULE ON E-450, E-451 & E-452 FOR CONDUIT AT EACH INVERTER. REFER TO INVERTER INSTALLATION MANUAL TO BALANCE THE MPPT INPUT TERMINALS.
7. QTY 1 - 1" PVC SCH 40 CONDUIT 24VDC FROM TRANSFORMER ALARM CONTACTS TO DAS ENCLOSURE.

MV AC CONDUITS

8. QTY 2 - 5" PVC SCH 40 CONDUIT AT TRANSFORMER. 1-INCOMING. 1-OUTGOING

GEC

9. ALL GEC CONDUCTORS SHALL BE #4/0 TINNED COPPER CONDUCTOR IN 2" PVC SCH 40. THIS SHALL SPLICE INTO THE GROUND RING. SPLICE SHALL BE EXOTHERMICALLY WELDED TO THE GROUND RING ALONG WITH EGC CONDUCTORS.

EQUIPMENT LIST ON EACH PAD:

- 1x 2750KVA 13.8KV-480V STEP UP TRANSFORMER
- 1x SG2500U 2500kW SUNGROW INVERTER
- 1x DAS MONITORING ENCLOSURE
- 1x UPS ENCLOSURE
- 1x GFCI RECEPTACLE
- 1x CAMERA
- 1x NEXTRACKER NETWORK CONTROL UNIT

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SEAL:

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 CT LICENSE: 29557

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FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020

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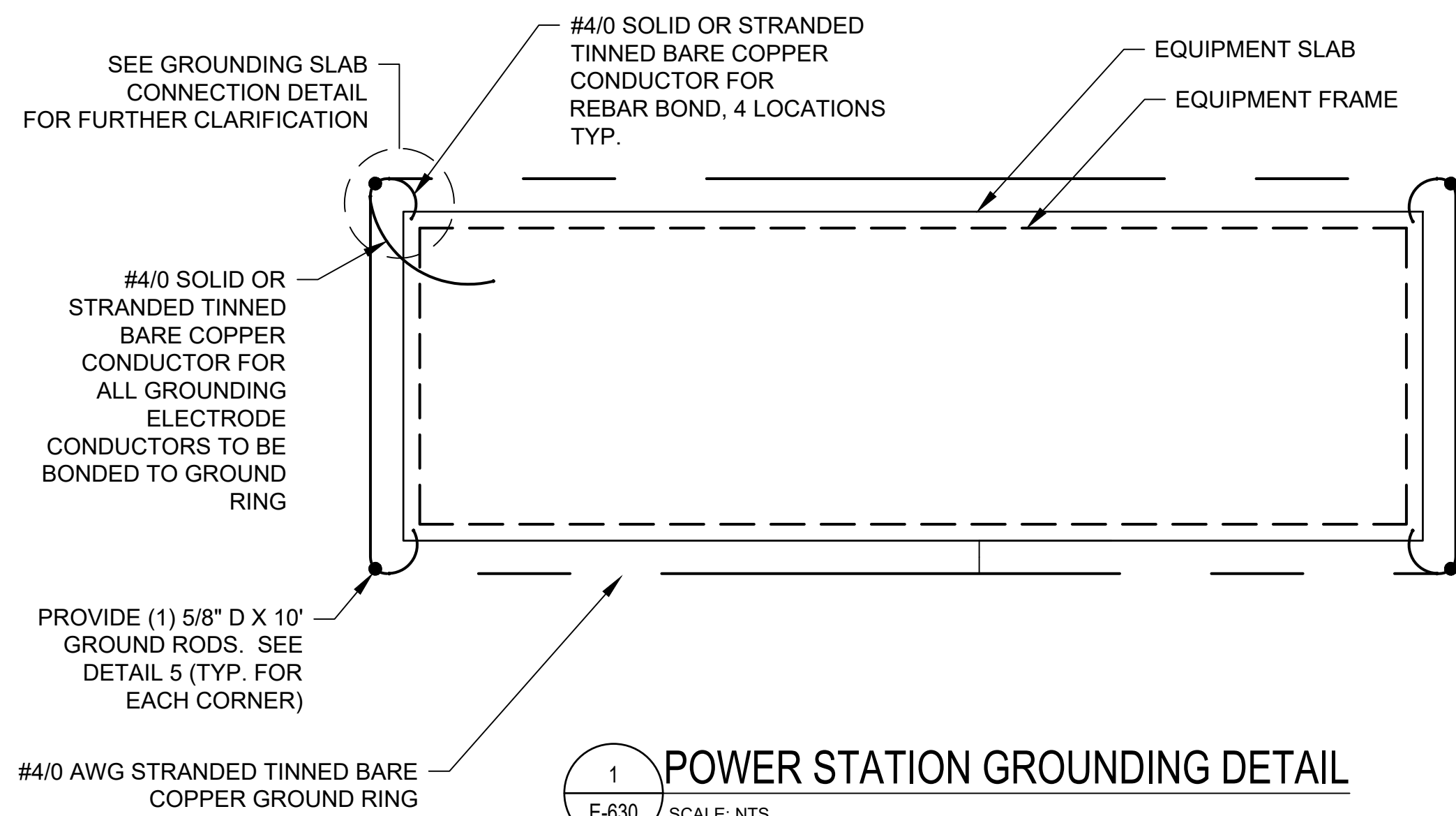
DRAWN BY: V. PISSAREVSKI

CHECKED BY: R. VUDI

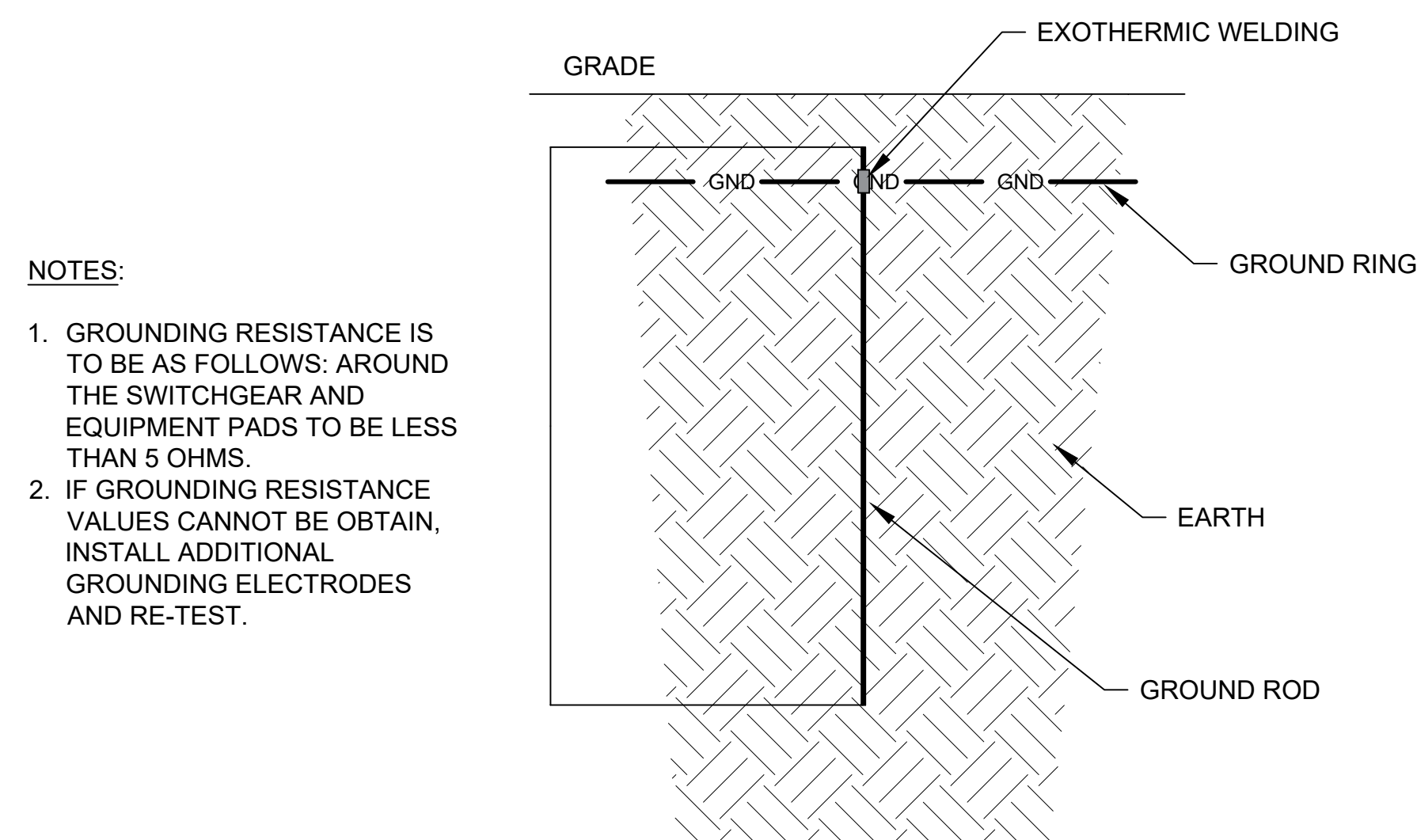
TITLE: DETAILS-EQUIPMENT PAD

SHEET: E-600

CONTRACTOR TO VERIFY EQUIPMENT DIMENSIONS, 6' WORKING CLEARANCE & REQUIRED SPACE TO OPEN ALL INVERTER DOORS PRIOR TO POURING THE PAD. SEE EQUIPMENT SHOP DRAWINGS FOR MORE INFORMATION.



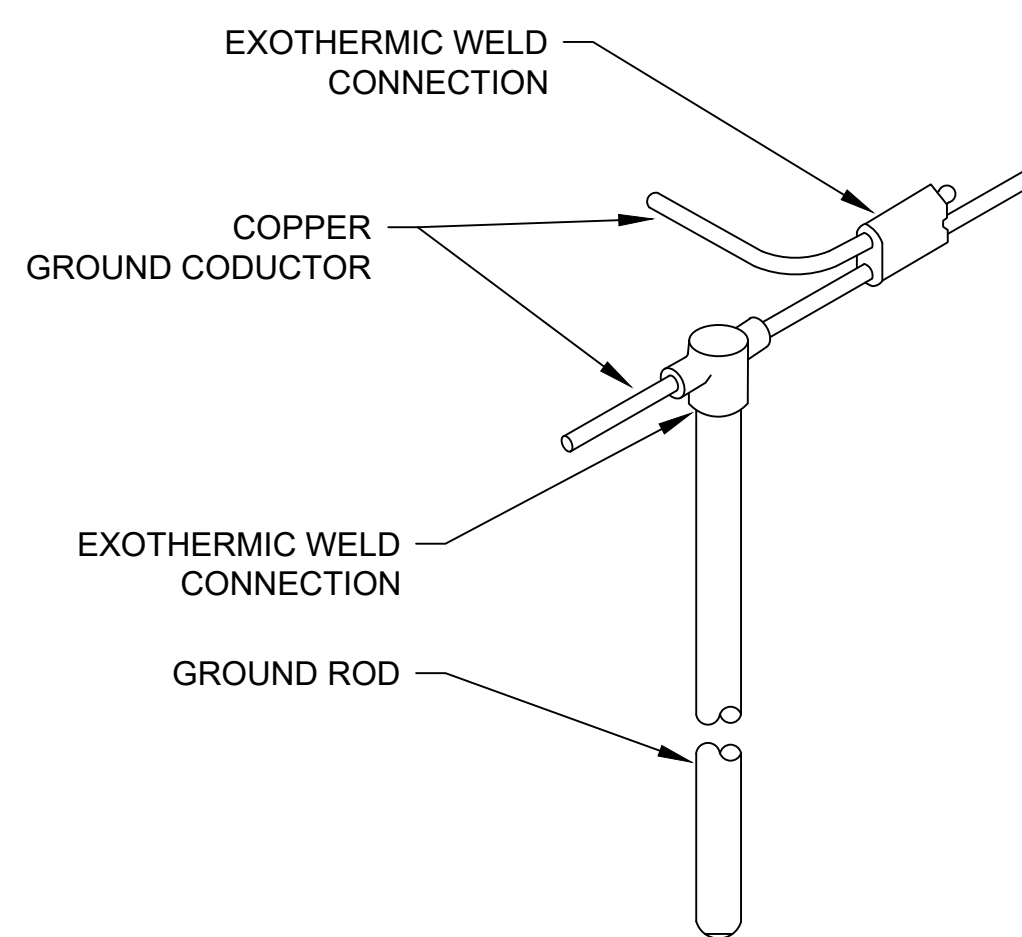
1 POWER STATION GROUNDING DETAIL
E-630 SCALE: NTS



2 EQUIPMENT PAD GROUNDING SLAB CONNECTION DETAIL
E-630 SCALE: NTS

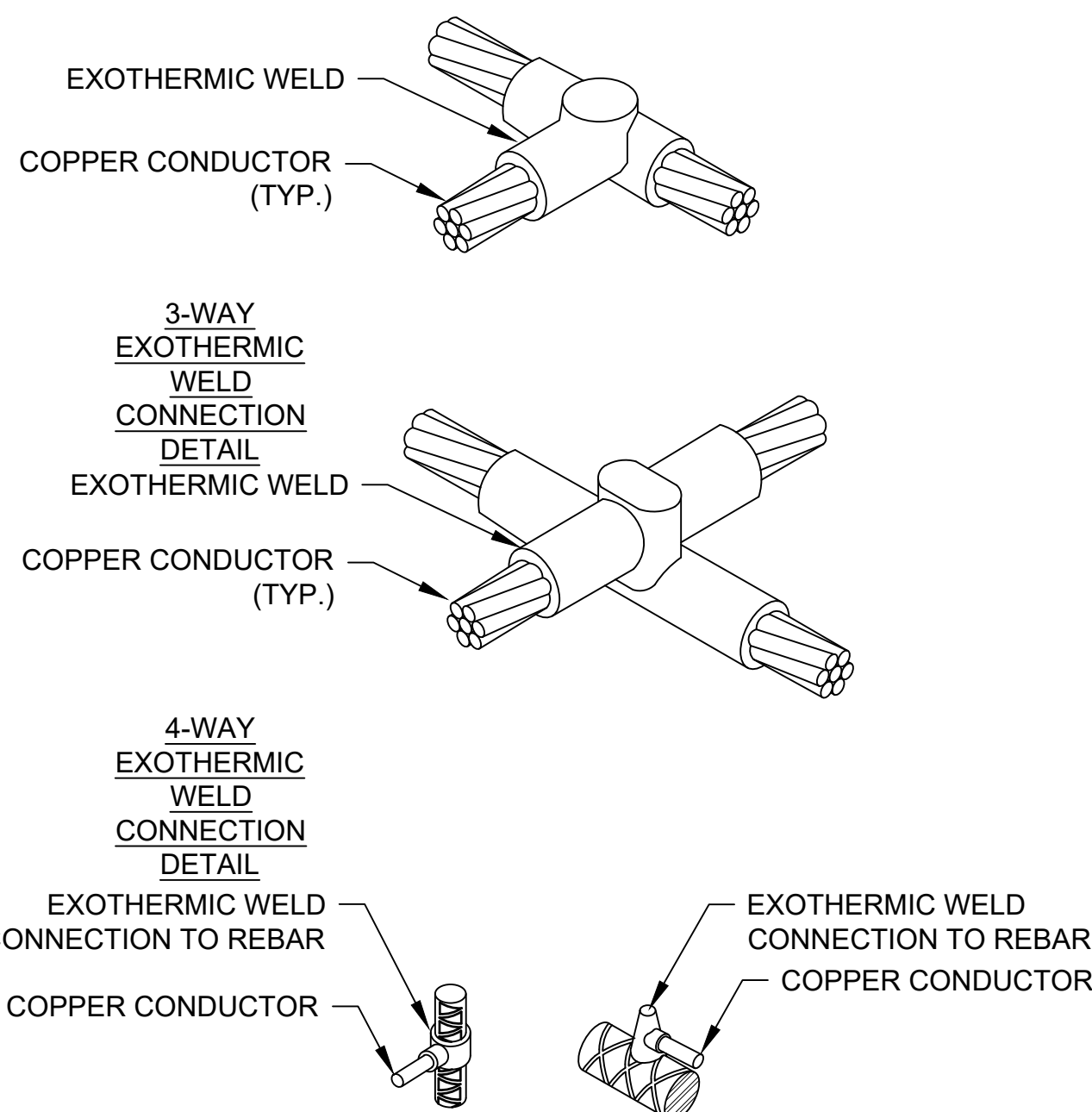
- NOTES:
1. GROUNDING RESISTANCE IS TO BE AS FOLLOWS: AROUND THE SWITCHGEAR AND EQUIPMENT PADS TO BE LESS THAN 5 OHMS.
 2. IF GROUNDING RESISTANCE VALUES CANNOT BE OBTAIN, INSTALL ADDITIONAL GROUNDING ELECTRODES AND RE-TEST.

3 GROUND ROD INSTALLATION
E-630 SCALE: NTS



5 GROUND ROD DETAIL
E-630 SCALE: NTS

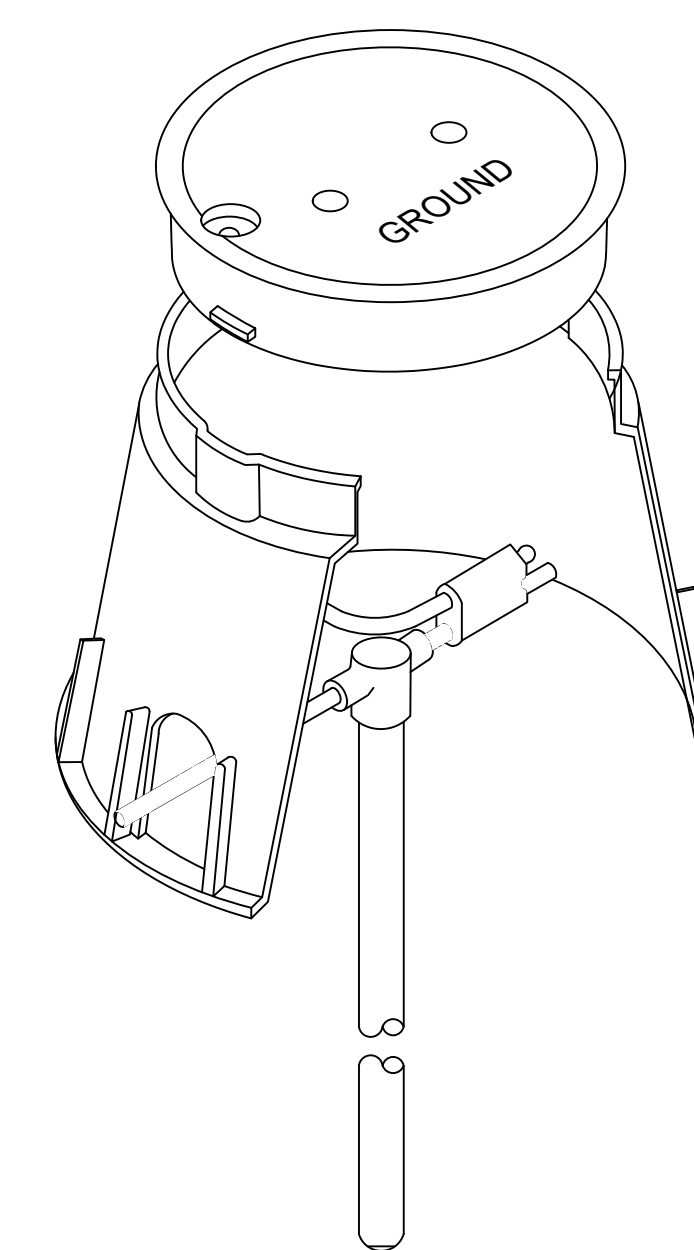
- NOTES:
1. GROUNDING RESISTANCE IS TO BE 5 OHMS OR LESS.
 2. IF GROUNDING RESISTANCE VALUES CANNOT BE OBTAINED, INSTALL ADDITIONAL GROUNDING ELECTRODES AND RE-TEST.
 3. GEM MAY BE USED.
 4. ONE TESTING WELL TO BE INSTALLED.



4 MODULE AND RACK GROUNDING
E-630 SCALE: NTS

- NOTE:
1. REBAR SHALL BE INSTALLED IN A MINIMUM OF ONE CONTINUOUS 20FT LENGTH PER NEC 250.52(A)(3).
- GROUND WIRE TO REBAR EXOTHERMIC WELD CONNECTION DETAIL

6 EXOTHERMIC WELD CONNECTIONS
E-630 SCALE: NTS



7 GROUND TEST WELL
E-630 SCALE: NTS

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ENERPARC INC.
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NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W**

SEAL:

DATE: **03/09/2020**

PROJECT #: **2000500**

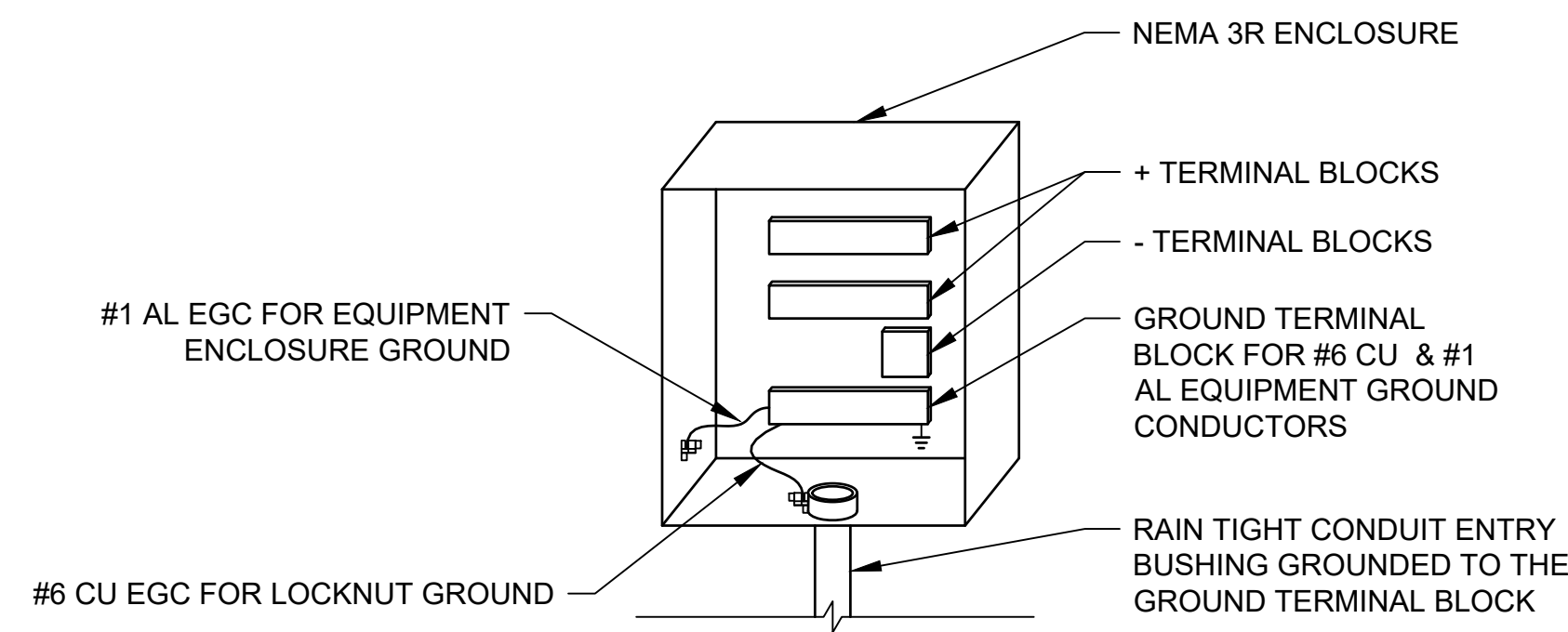
Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26657

DRAWN BY:
V. PISSAREVSKI

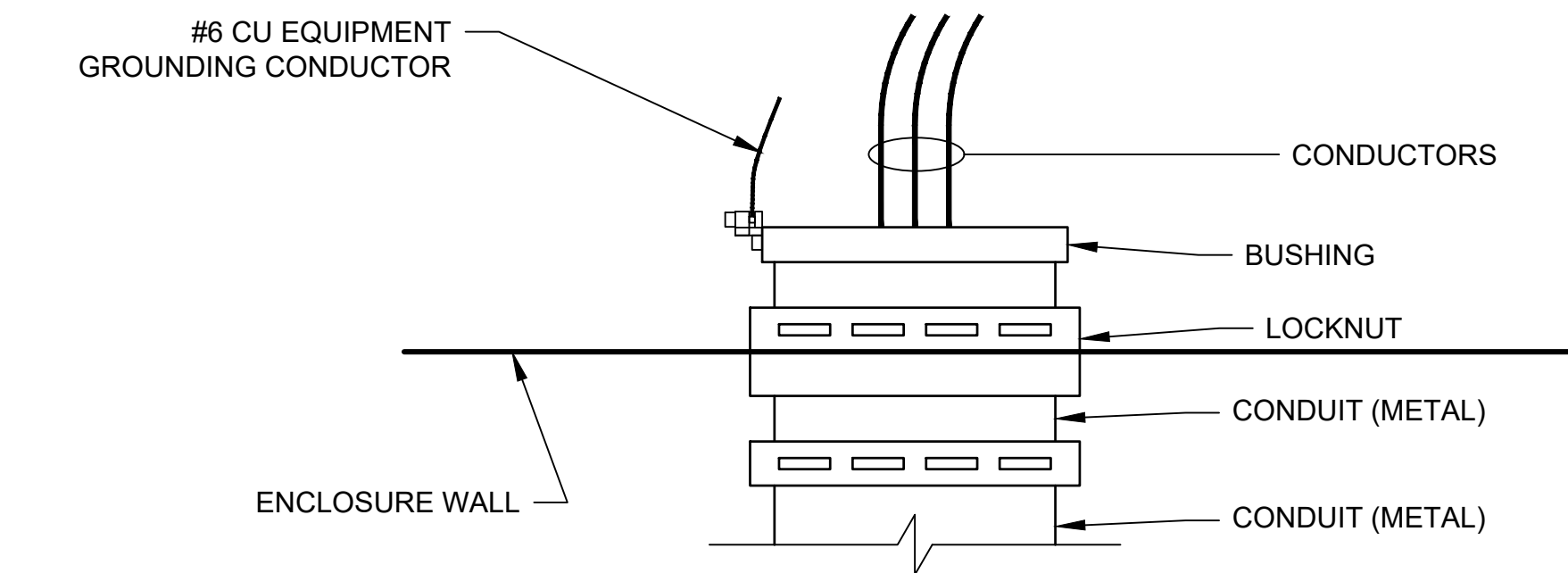
CHECKED BY:
R. VUDI

TITLE: **DETAILS-GROUNDING SHEET 1**

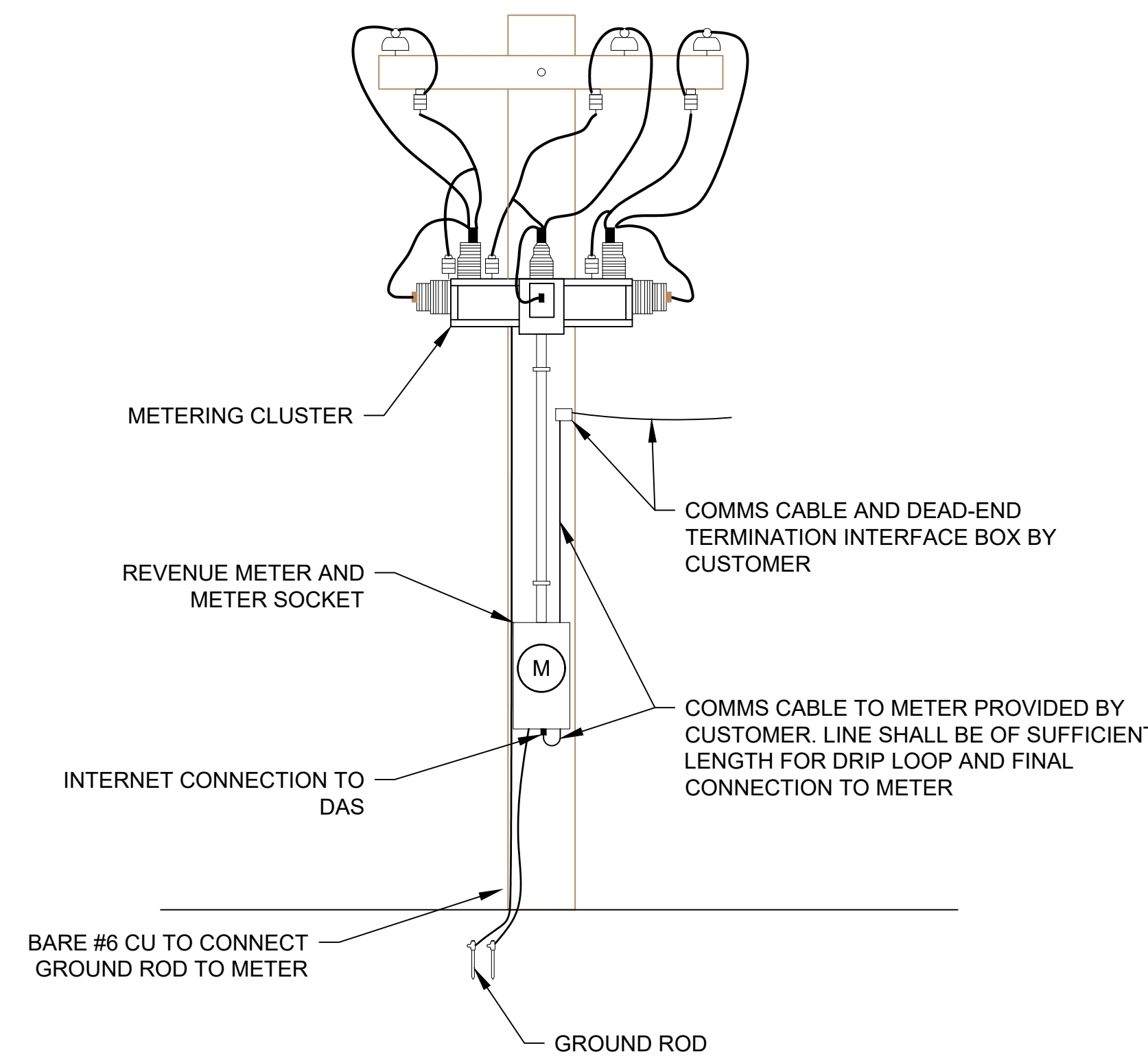
SHEET: **E-630**



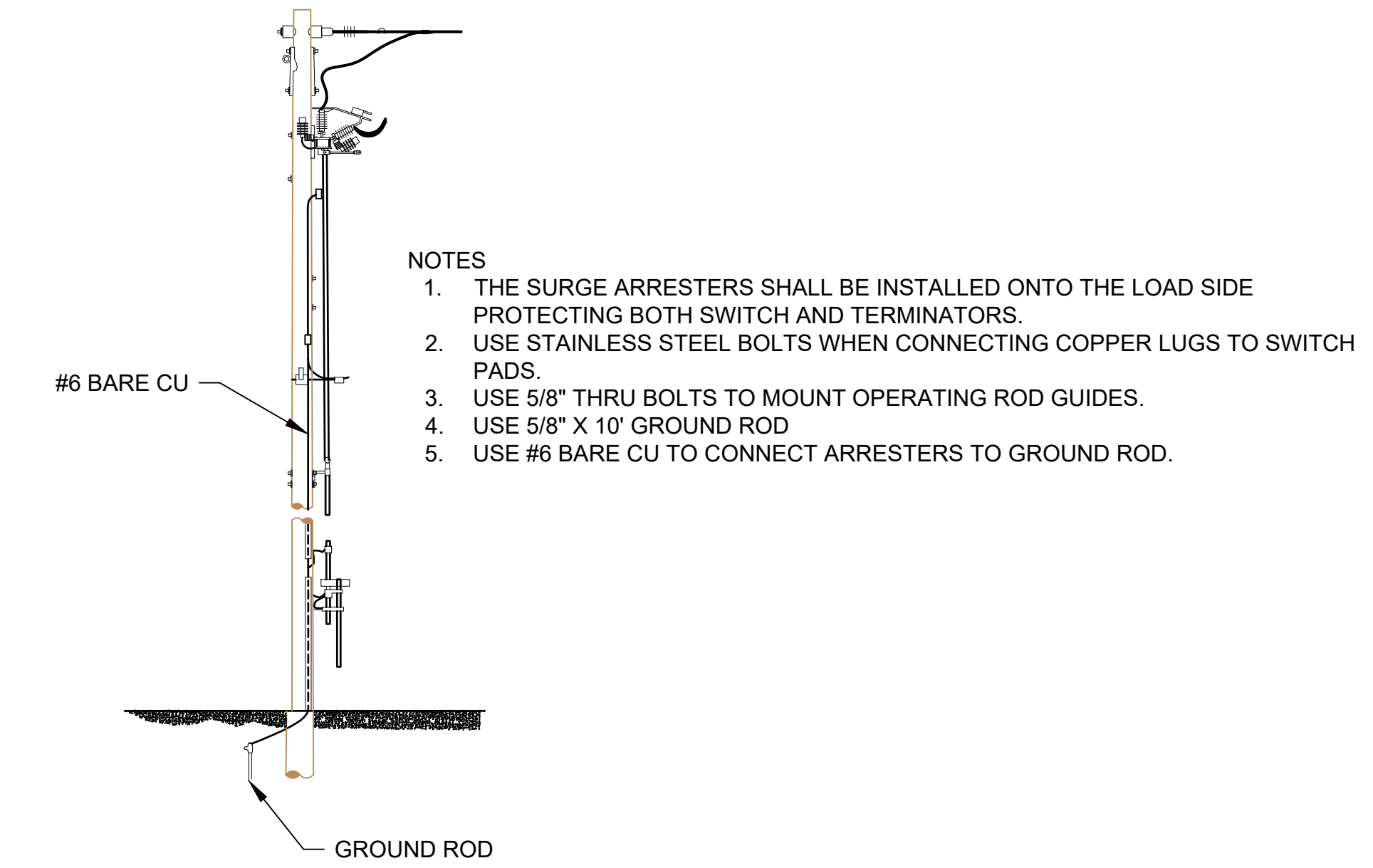
4 TYPICAL EQUIPMENT GROUNDING DETAIL
E-631 SCALE: NTS



5 TYPICAL CONDUIT GROUNDING DETAIL
E-631 SCALE: NTS

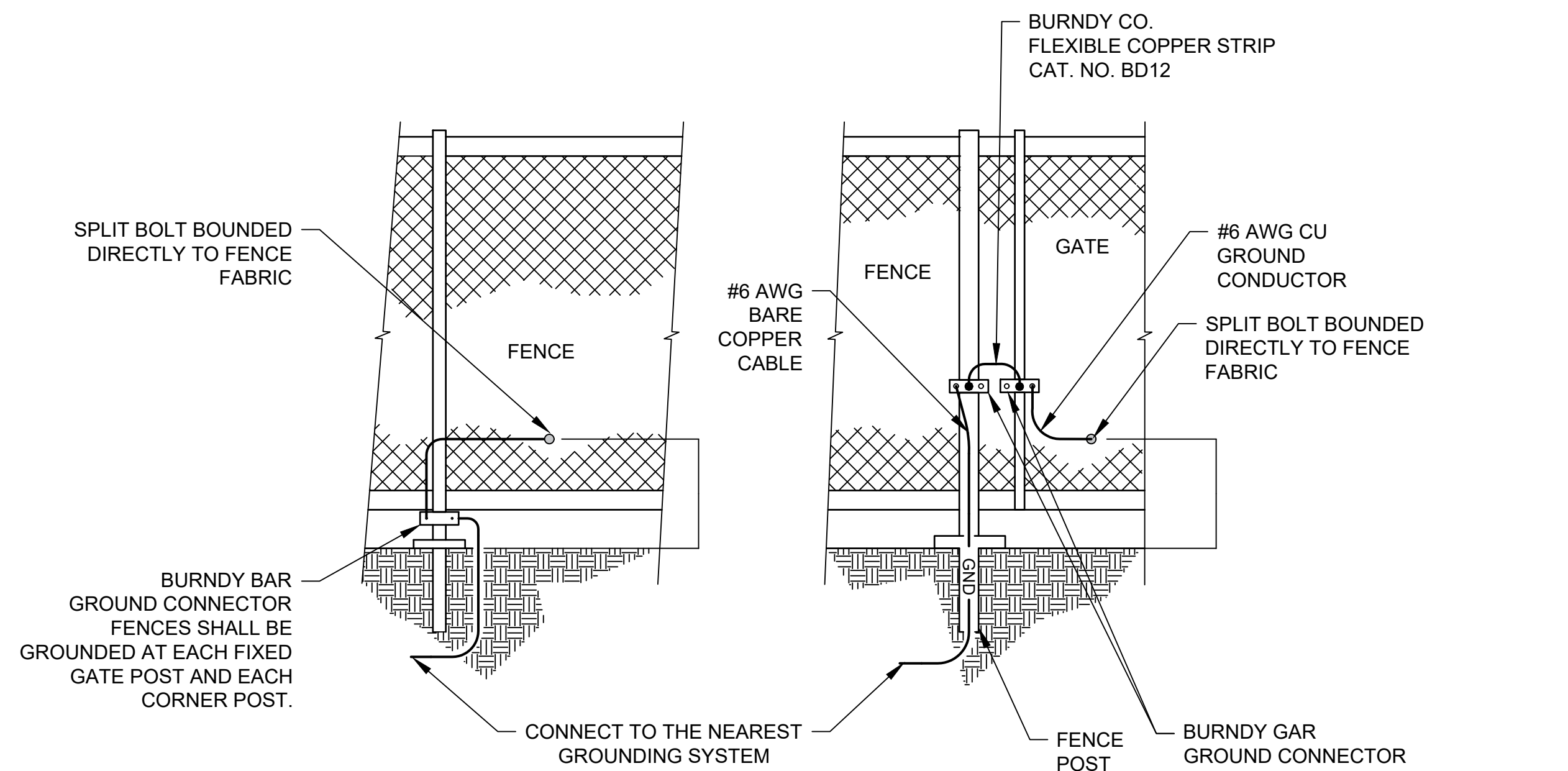


2 METER GROUNDING
E-631 SCALE: NTS



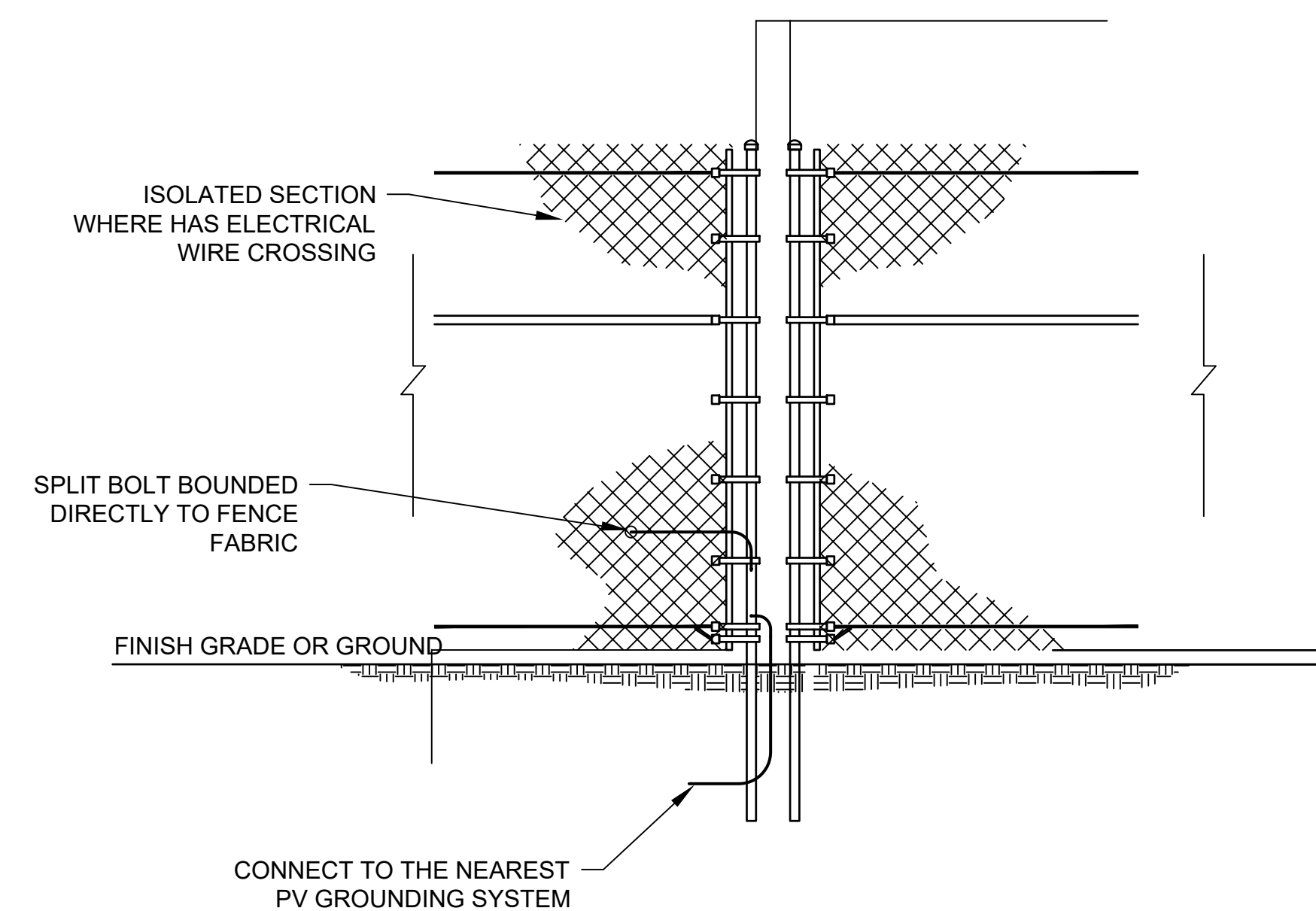
3 GOAB POLE GROUNDING
E-631 SCALE: NTS

- NOTES
1. THE SURGE ARRESTERS SHALL BE INSTALLED ONTO THE LOAD SIDE PROTECTING BOTH SWITCH AND TERMINATORS.
 2. USE STAINLESS STEEL BOLTS WHEN CONNECTING COPPER LUGS TO SWITCH PADS.
 3. USE 5/8" THRU BOLTS TO MOUNT OPERATING ROD GUIDES.
 4. USE 5/8" X 10' GROUND ROD
 5. USE #6 BARE CU TO CONNECT ARRESTERS TO GROUND ROD.



- NOTES:
1. FENCE GROUNDING BE GROUNDED WHEREVER THE FENCE CRSSSES UNDERGROUND OR OVERHEAD POWER LINES. FENCE SHALL BE GROUNDED AT A MIN. 20' ON EITHER SIDE OF THE POWER LINE.

6 FENCE GROUNDING DETAIL
E-631 SCALE: NTS



7 ISOLATED FENCE GROUNDING DETAIL
E-631 SCALE: NTS

ON HOLD. WAITING ON CONFIRMATION FROM AHJ

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
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D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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ENERPARC INC.
1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

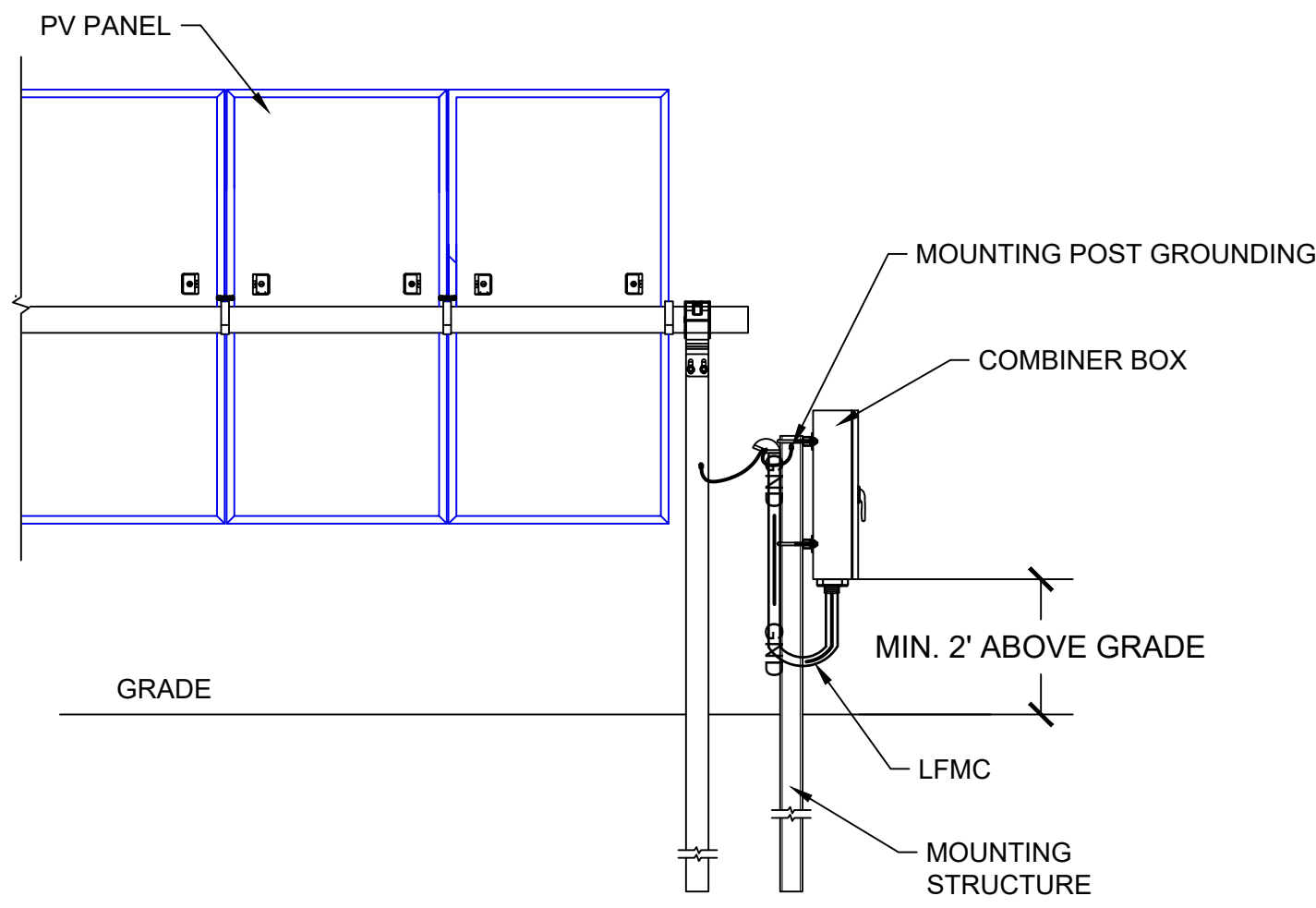
SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE: **DETAILS-GROUNDING SHEET 2**

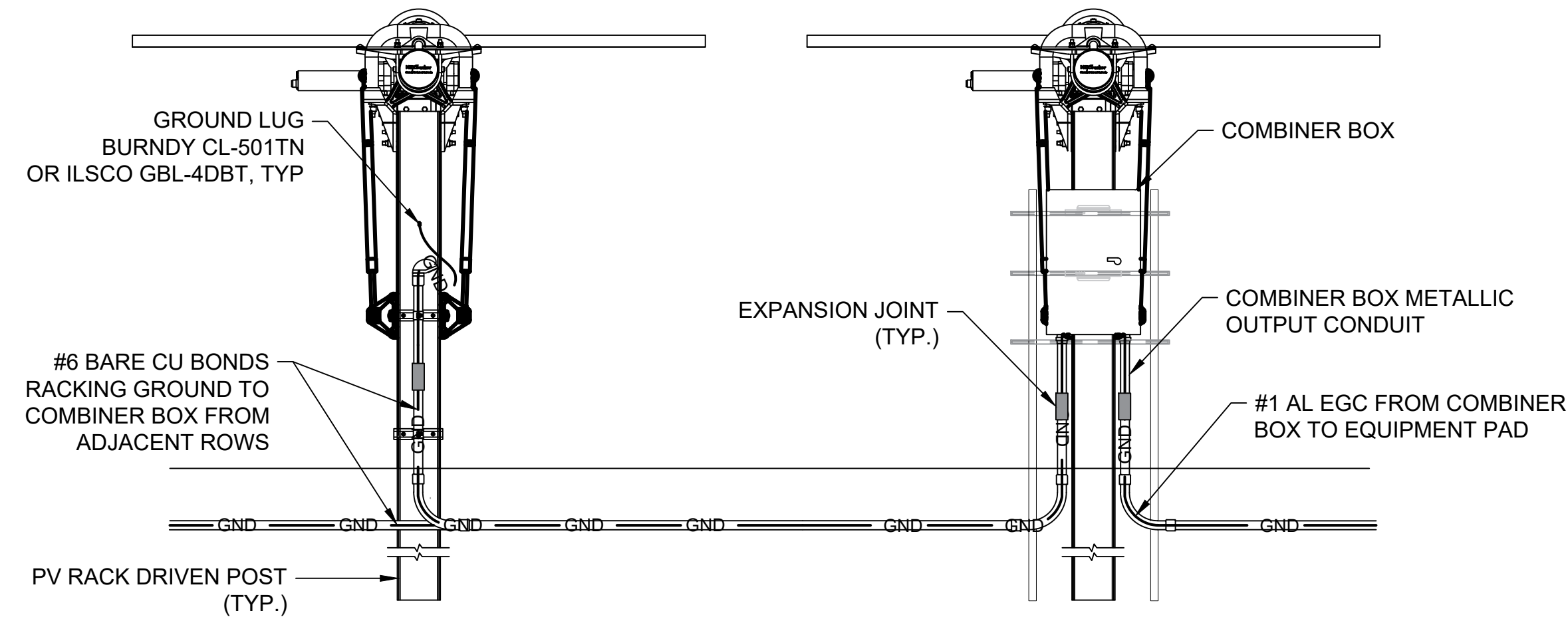
SHEET: **E-631**

TYP 1



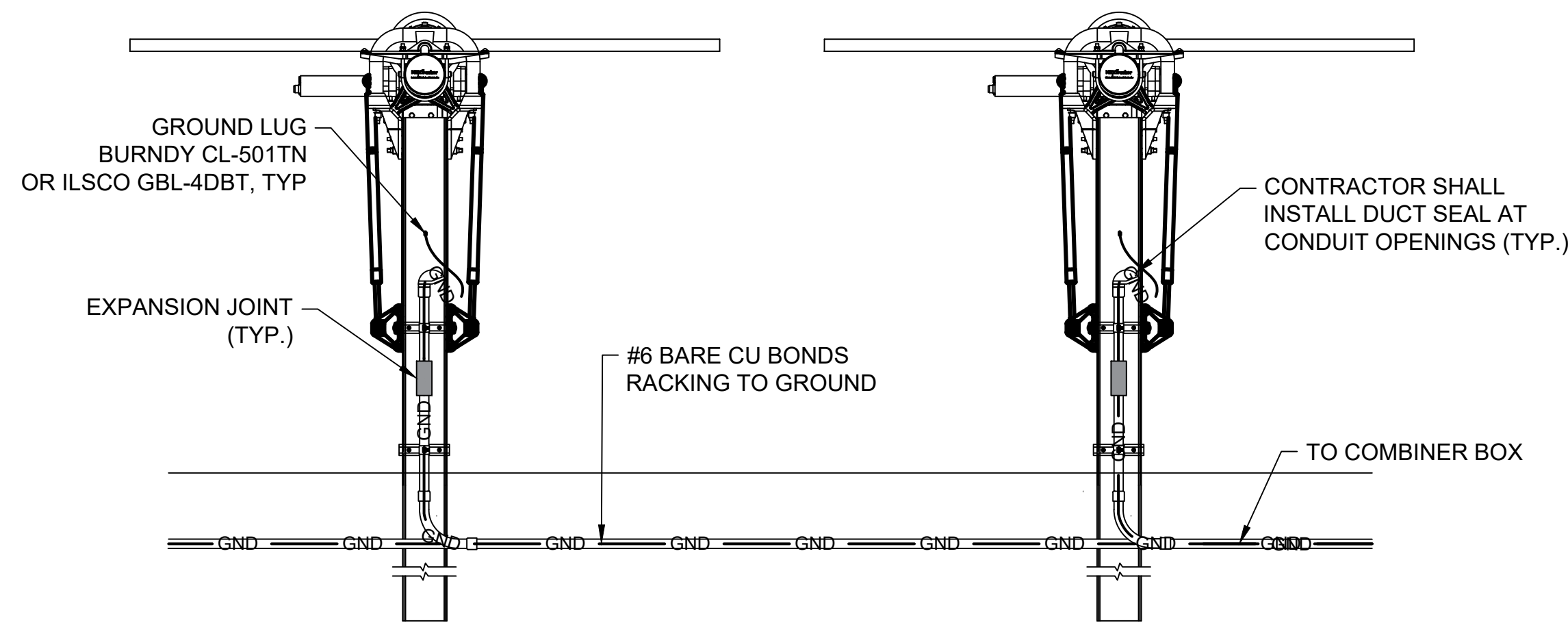
1 RACKING TO COMBINER BOX GROUNDING
E-632 SCALE = 1:25

TYP 1



2 COMBINER BOX OUTPUT GROUNDING
E-632 SCALE = 1:25

TYP 1

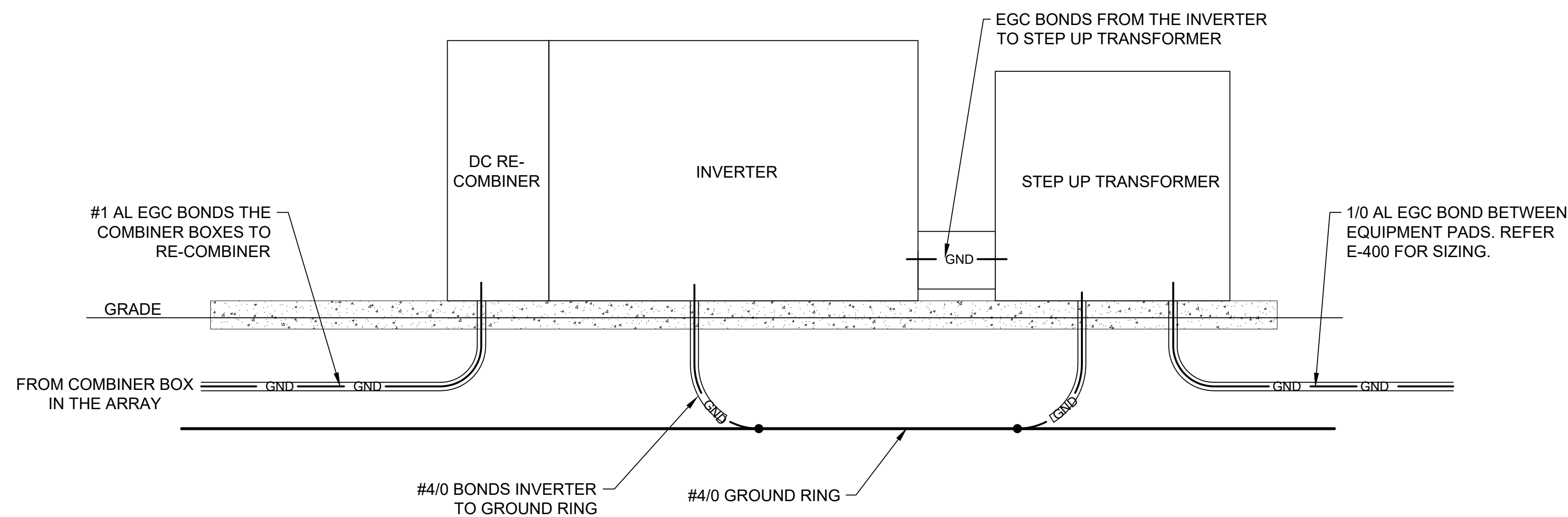


NOTES:

- #6 BARE CU BONDING JUMPERS TO BOND TABLE TO TABLE ARE RUN WITH STRING JUMPER CONDUITS.
- DRAWING IS REPRESENTATIVE OF GROUNDING; CONTRACTOR MAY INSTALL GROUND LUGS ON ANY OF THE RAILS.
- SUPPORT THE #6 GROUND CONDUCTOR TO THE RACKING STRUCTURE. IF UNSUPPORTED, NEED TO USE #4 CU.
- REFER TO STRUCTURAL DRAWINGS FOR DIMENSIONS AND ADDITIONAL DETAIL.
- STRING JUMPER CONDUITS SHALL BE MIN. OF 18" BELOW GRADE.

3 RACK TO RACK GROUNDING
E-632 SCALE = 1:25

CENTRAL INV



4 EQUIPMENT PAD GROUNDING
E-632 SCALE = 1:25

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A	INITIAL 10% SET SUBMISSION	01/10/20
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NORTH STONINGTON

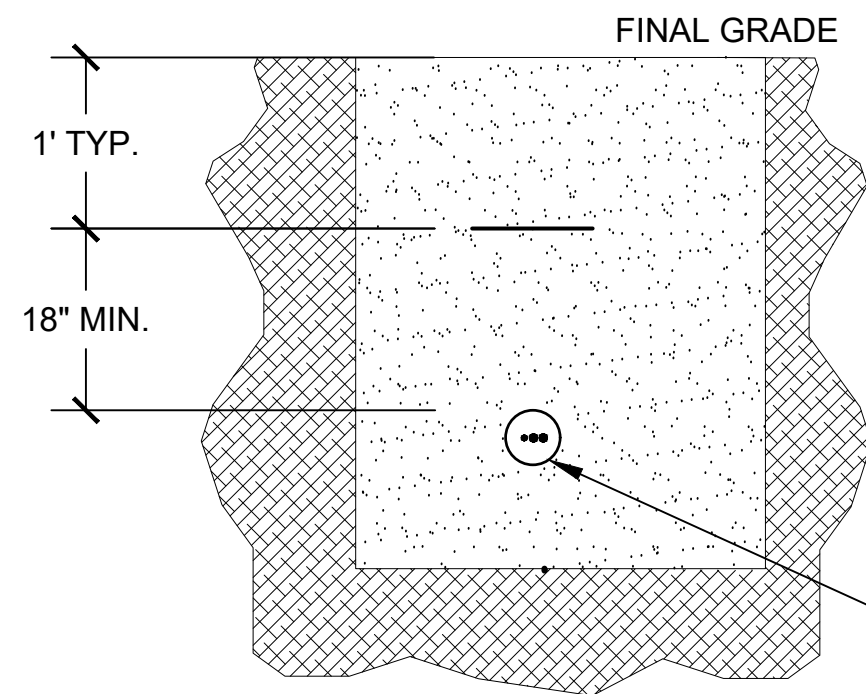
PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

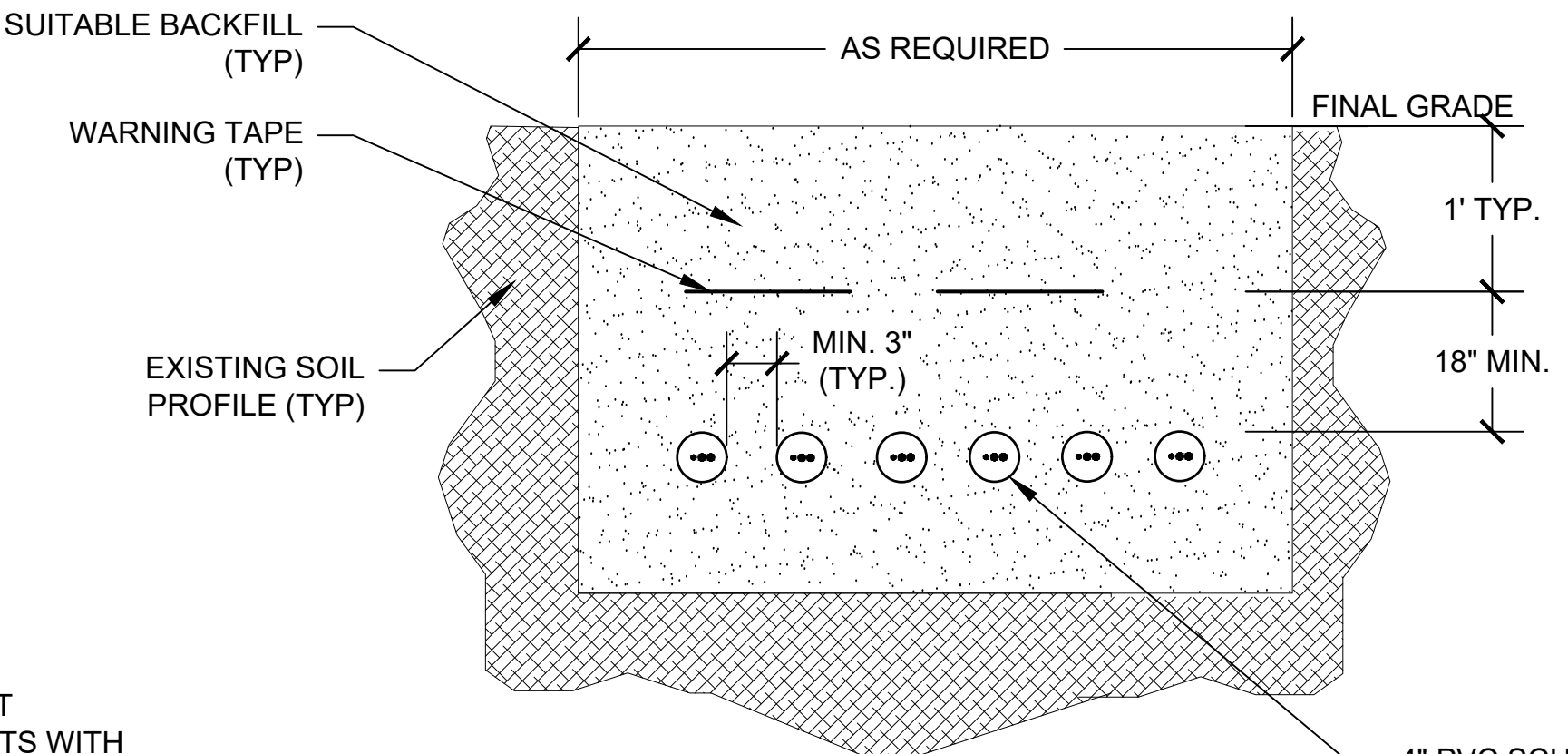
TITLE: **DETAILS-GROUNDING SHEET 3**

SHEET: **E-632**



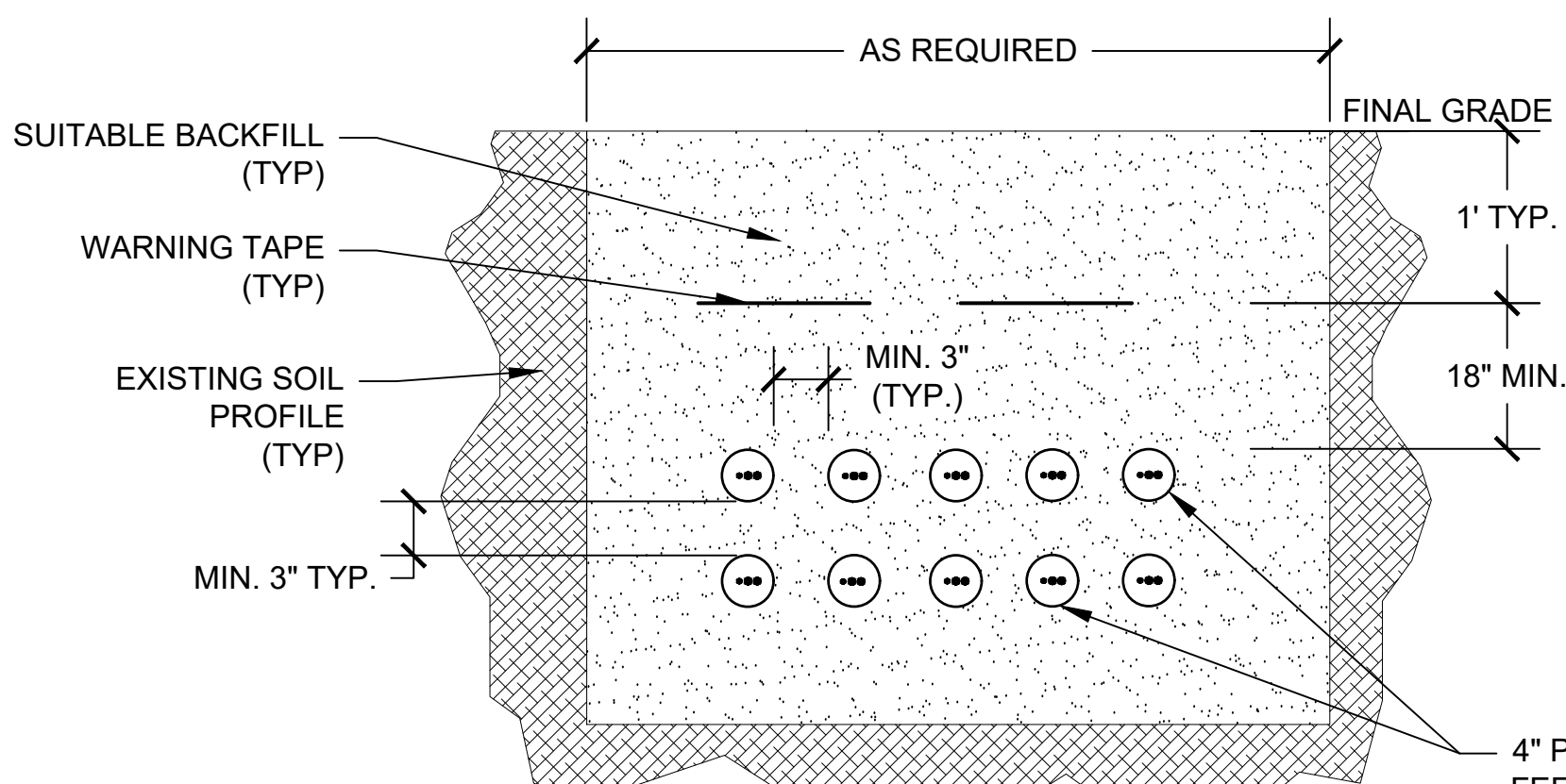
MIN. 2" PVC SCH40 CONDUIT WITH DC HOMERUN CIRCUITS WITH #6 CU FROM RACKING GROUND

1 DC HOMERUNS ROW TO ROW JUMPER TRENCH DETAILS
E-650 SCALE: NTS



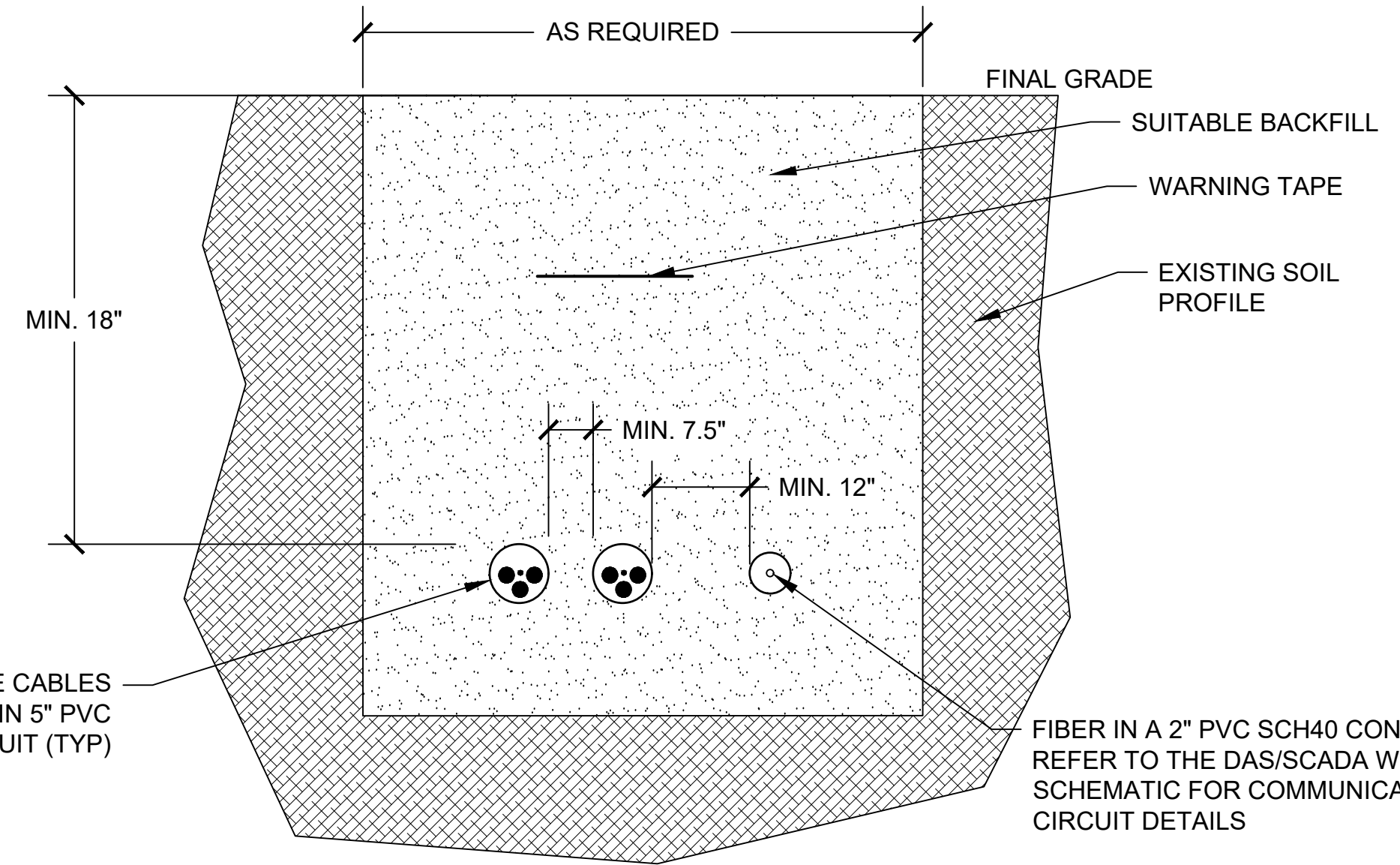
4" PVC SCH 40 FOR DC FEEDERS AND GROUND FROM COMBINER BOXES TO EQUIPMENT IN TRENCH (TYP)

2 DC FEEDER CIRCUITS TRENCH DETAILS(SINGLE LAYER)
E-650 SCALE: NTS



4" PVC SCH 40 FOR DC FEEDERS AND GROUND FROM COMBINER BOXES TO EQUIPMENT IN TRENCH (TYP)

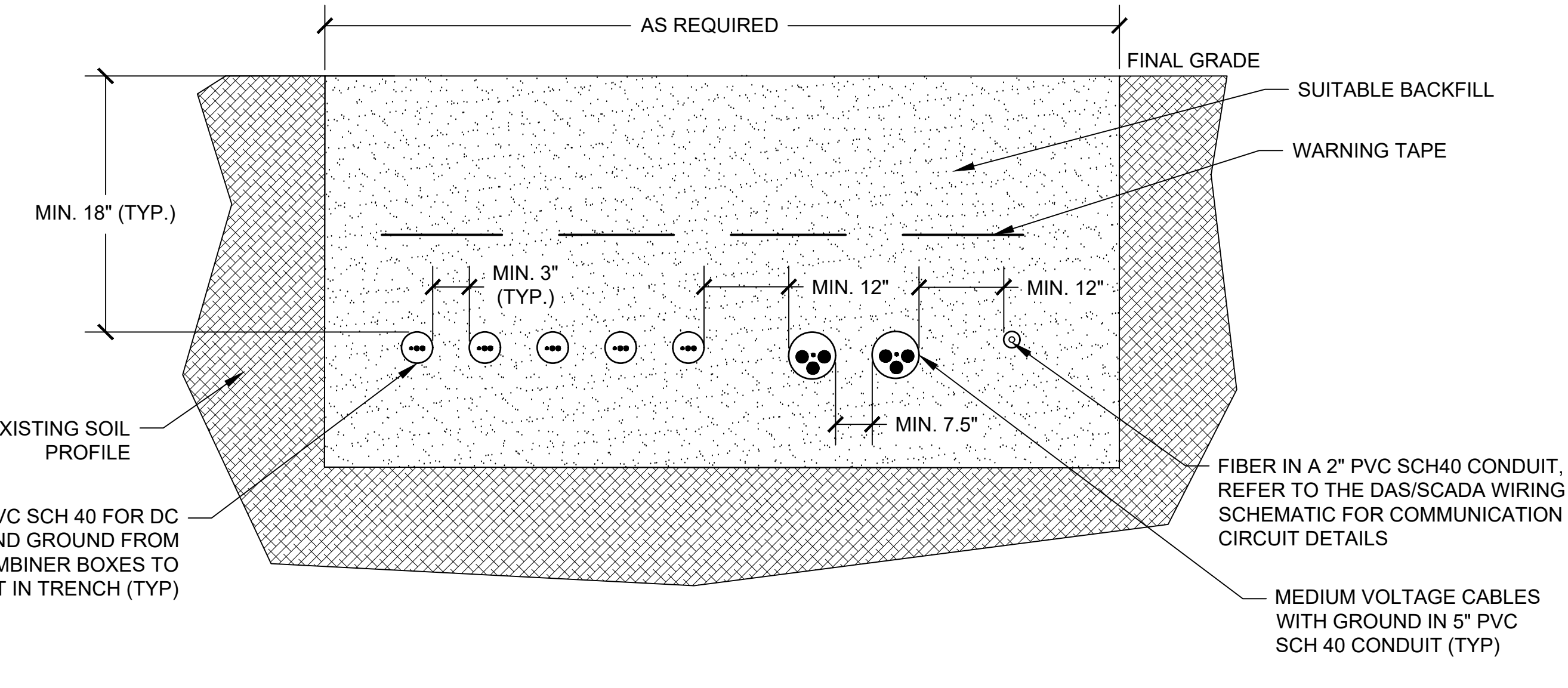
3 DC FEEDER CIRCUITS TRENCH DETAILS (TWO LAYERS)
E-650 SCALE: NTS



FIBER IN A 2" PVC SCH40 CONDUIT, REFER TO THE DAS/SCADA WIRING SCHEMATIC FOR COMMUNICATION CIRCUIT DETAILS

MEDIUM VOLTAGE CABLES WITH GROUND IN 5" PVC SCH 40 CONDUIT (TYP)

4 MEDIUM VOLTAGE CONDUCTORS WITH COMMUNICATION CABLES TRENCH DETAILS
E-650 SCALE: NTS



FIBER IN A 2" PVC SCH40 CONDUIT, REFER TO THE DAS/SCADA WIRING SCHEMATIC FOR COMMUNICATION CIRCUIT DETAILS

MEDIUM VOLTAGE CABLES WITH GROUND IN 5" PVC SCH 40 CONDUIT (TYP)

5 DC & MEDIUM VOLTAGE CONDUCTORS WITH COMMUNICATION CABLES TRENCH DETAILS
E-650 SCALE: NTS

NOTES:

1. ALL CONDUITS TO BE BURIED AT A MINIMUM OF 18".
2. DC, AC AND COMMUNICATION CABLES TO BE A MINIMUM OF 12" FROM EACH OTHER.
3. IF MAXIMUM BURIAL DEPTH TO TOP OF THE ELECTRICAL DUCT IS MORE THEN 30" AMPACITY DERATION SHALL BE APPLIED PER 310.60(C)(2)(b)
4. WARNING TAPE TO BE METALLIC WITH THE PHRASE "CAUTION: BURIED ELECTRICAL LINES"
5. BACKFILL TO BE FREE FROM ANY ROCKS OR OTHER DELETERIOUS OBJECTS THAT ARE 3/4" IN DIAMETER OR GREATER.
6. ELECTRICIANS TO PROVIDE MATCHING FITTINGS AND EXPANSION COUPLINGS BY THE SAME MANUFACTURER AS THE CONDUIT.
7. CONDUIT SPACING MAY BE REVISED BASED ON SOIL RESISTIVITY RESULTS FOR THIS SITE. ALL SPACING IS BASED ON RHO VALUE OF 90.
8. DC HOMEUN ROW JUMPER CONDUITS TO BE SIZED BASED ON NUMBER OF STRINGS AND SIZE OF PV WIRE AND VERIFIED BY THE ENGINEER.

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0	ISSUE FOR PERMIT SET	5/28/20

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PROJECT NAME:
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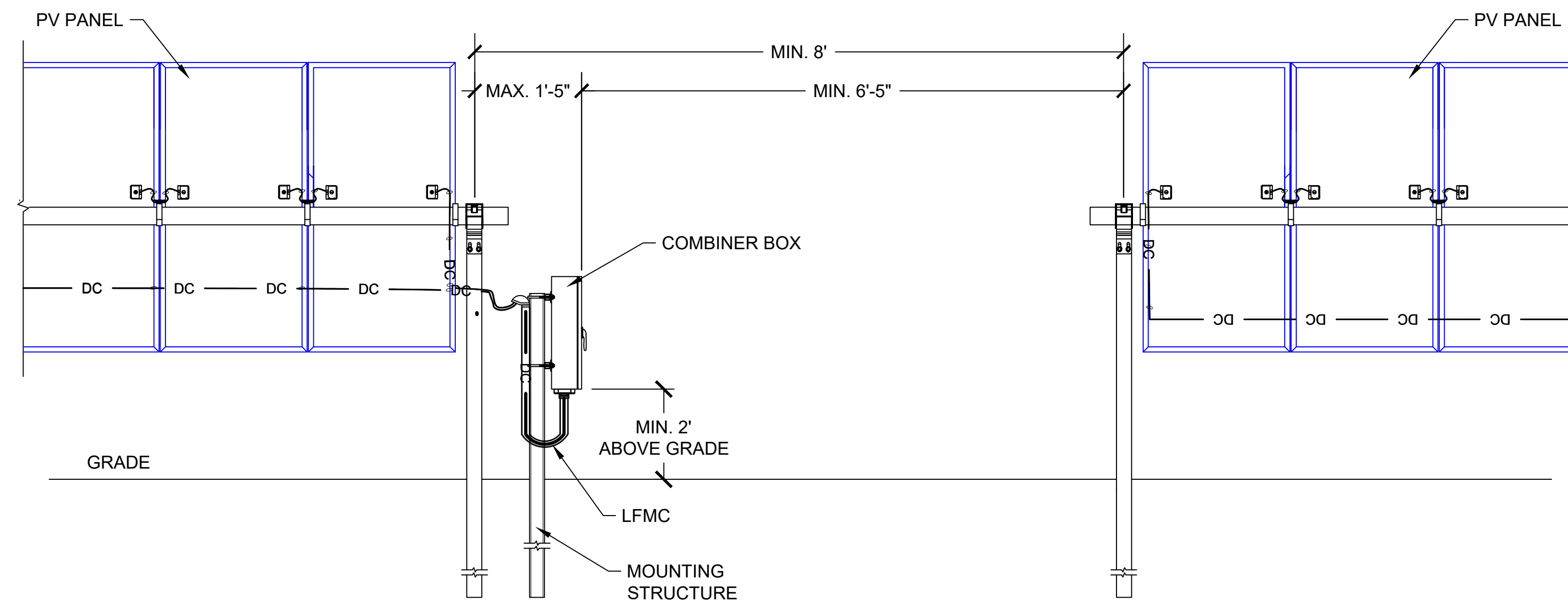
PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE:
DETAILS-TRENCH & CONDUIT

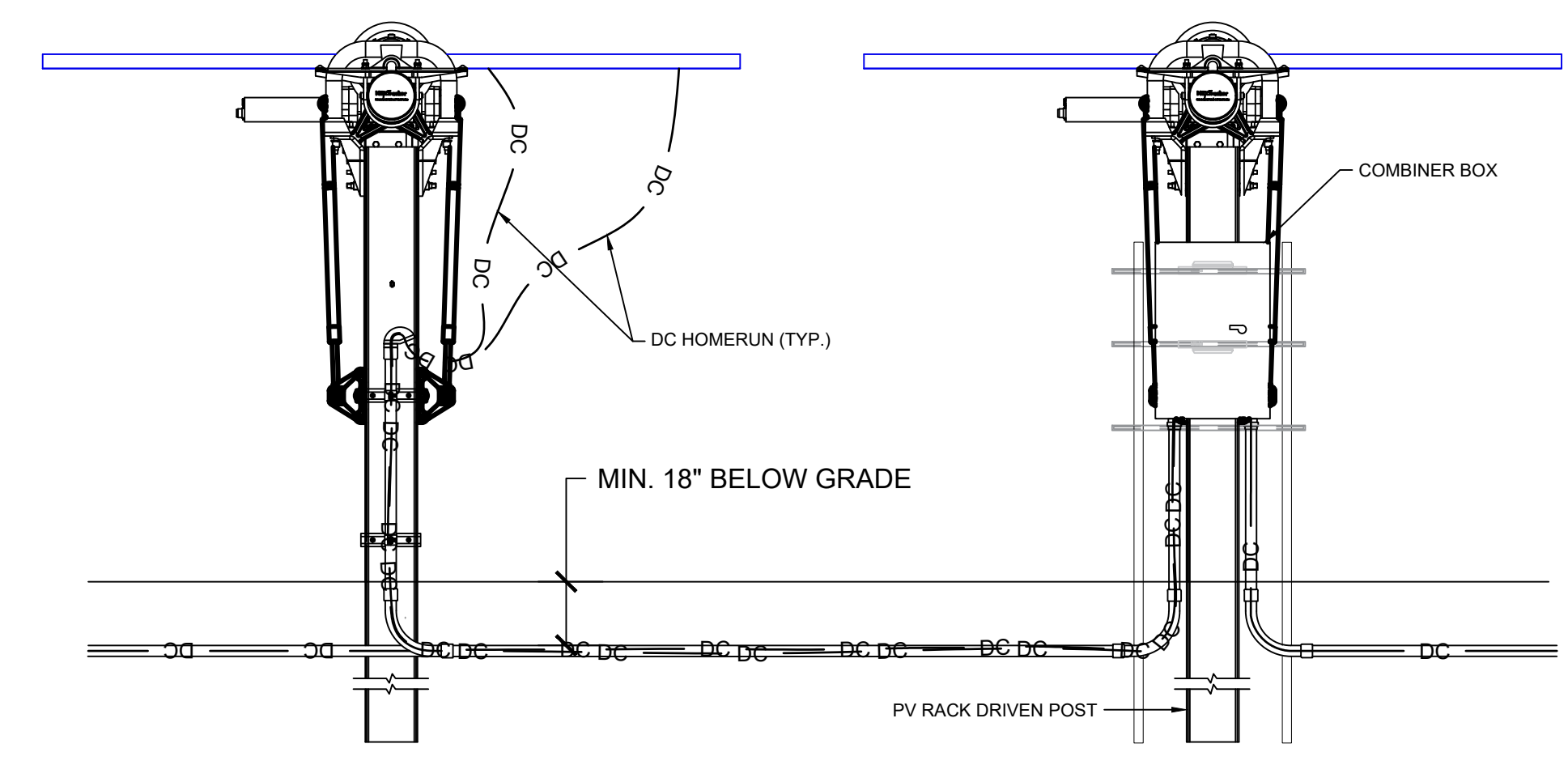
SHEET:
E-650



NOTE:

- DISTANCE BETWEEN COMBINER BOX AND END POST WILL BE UPDATED BASED ON NEXTRACKER DRAWINGS.
- DC HOMERUNS TO BE SUPPORTED EVERY 12\".

1 DC CONDUCTORS WIRE MANAGEMENT DETAIL
E-680 SCALE: NTS



NOTE:

- DC HOMERUNS TO BE SUPPORTED EVERY 12\".

2 ROW TO ROW JUMPING DETAIL
E-680 SCALE: NTS

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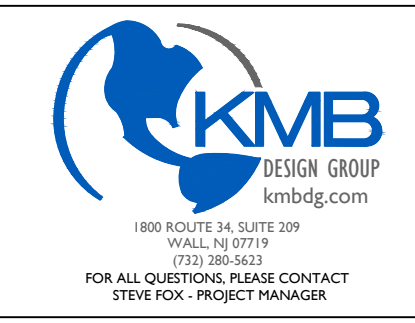
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PROJECT ADDRESS:
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NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:





DATE: 03/09/2020

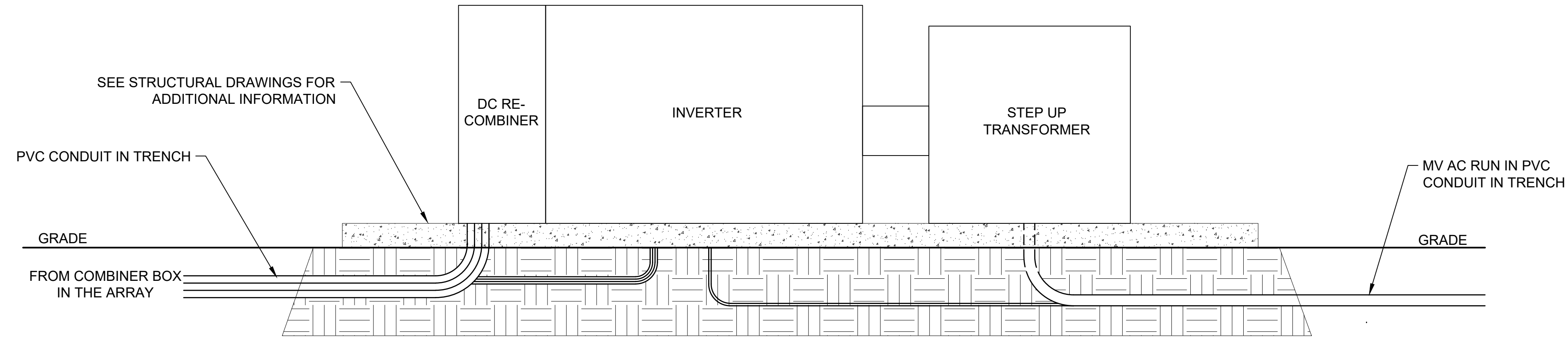
PROJECT #: 2000500

DRAWN BY: V. PISSAREVSKI

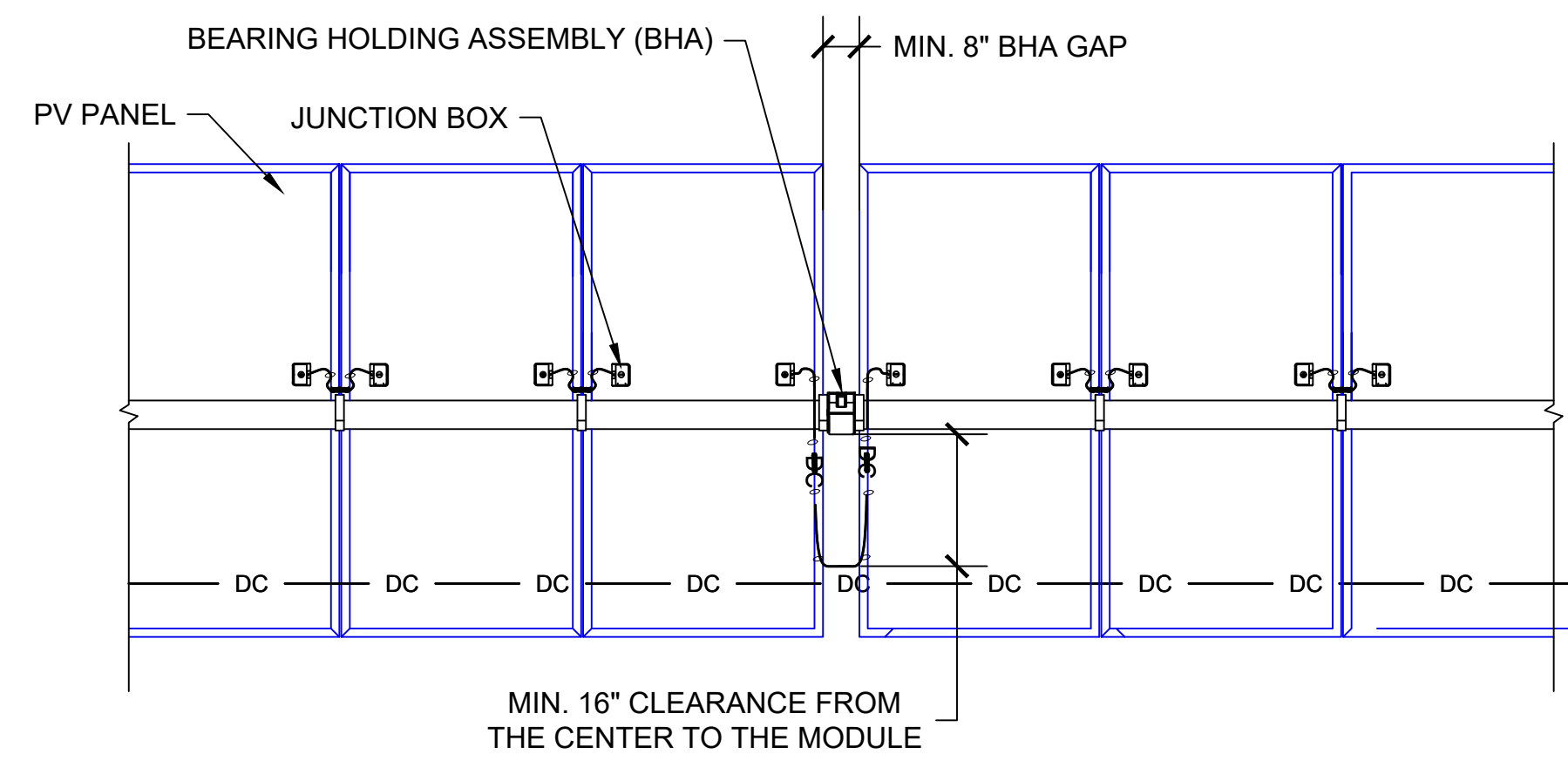
CHECKED BY: R. VUDI

TITLE: MISC. DETAILS SHEET 1

SHEET: E-680



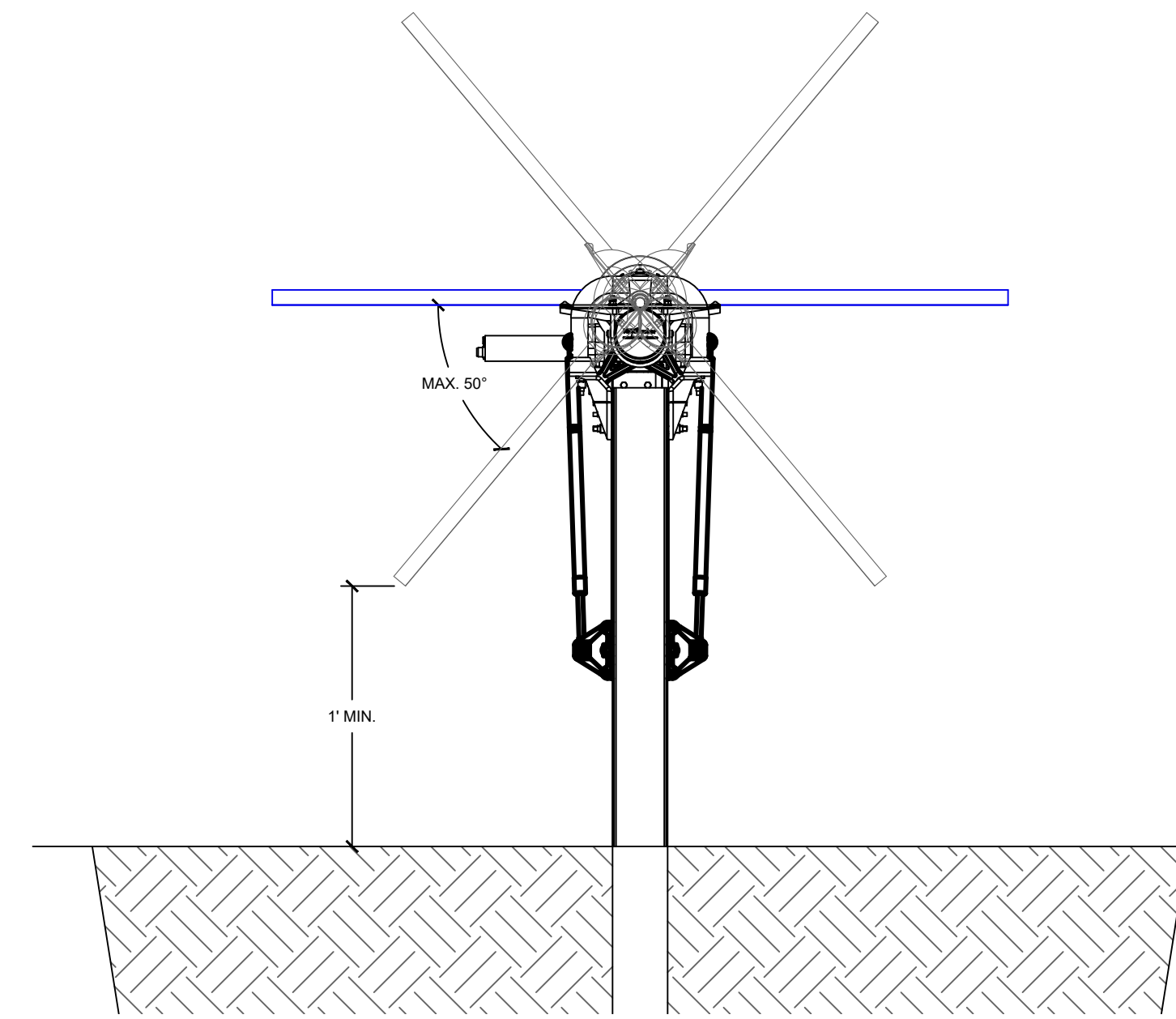
1 EQUIPMENT PAD WIRING MANAGEMENT
E-681 SCALE: NTS



NOTE:

1. PANEL HOME RUNS WIRES SHOULD BE ROUTED ALONG RACKING AND INSIDE CONDUIT AT THE EARLIEST AVAILABILITY
2. FOLLOW THE NEXTRACKER INSTALLATION MANUAL
3. MODULE WIRING IS BASED ON NEXTRACKER RECOMMENDED WIRE SCHEMATIC FOR BIFACIAL MODULE TO MINIMIZE REAR-SIDE OBSTRUCTION.
4. CABLES SHOULD BE SECURED TO BACK OF PANEL FRAME HOLES WITH ACME WILEY CABLE CLIPS OR APPROVED EQUIVALENT AT INTERVALS THAT DO NOT EXCEED 4.5' AND WITHIN 12" OF EACH BOX, CABINET, CONDUIT BODY OR OTHER TERMINATION.
5. ALLOW BENDING RADIUS OF AT LEAST 8X THE DIAMETER OF THE CABLE (2.4" TYP. FOR #12 PV WIRE)

2 MODULE WIRING MANAGEMENT
E-681 SCALE: NTS



3 TYPICAL MODULE RACKING SIDE VIEW
E-681 SCALE: NTS

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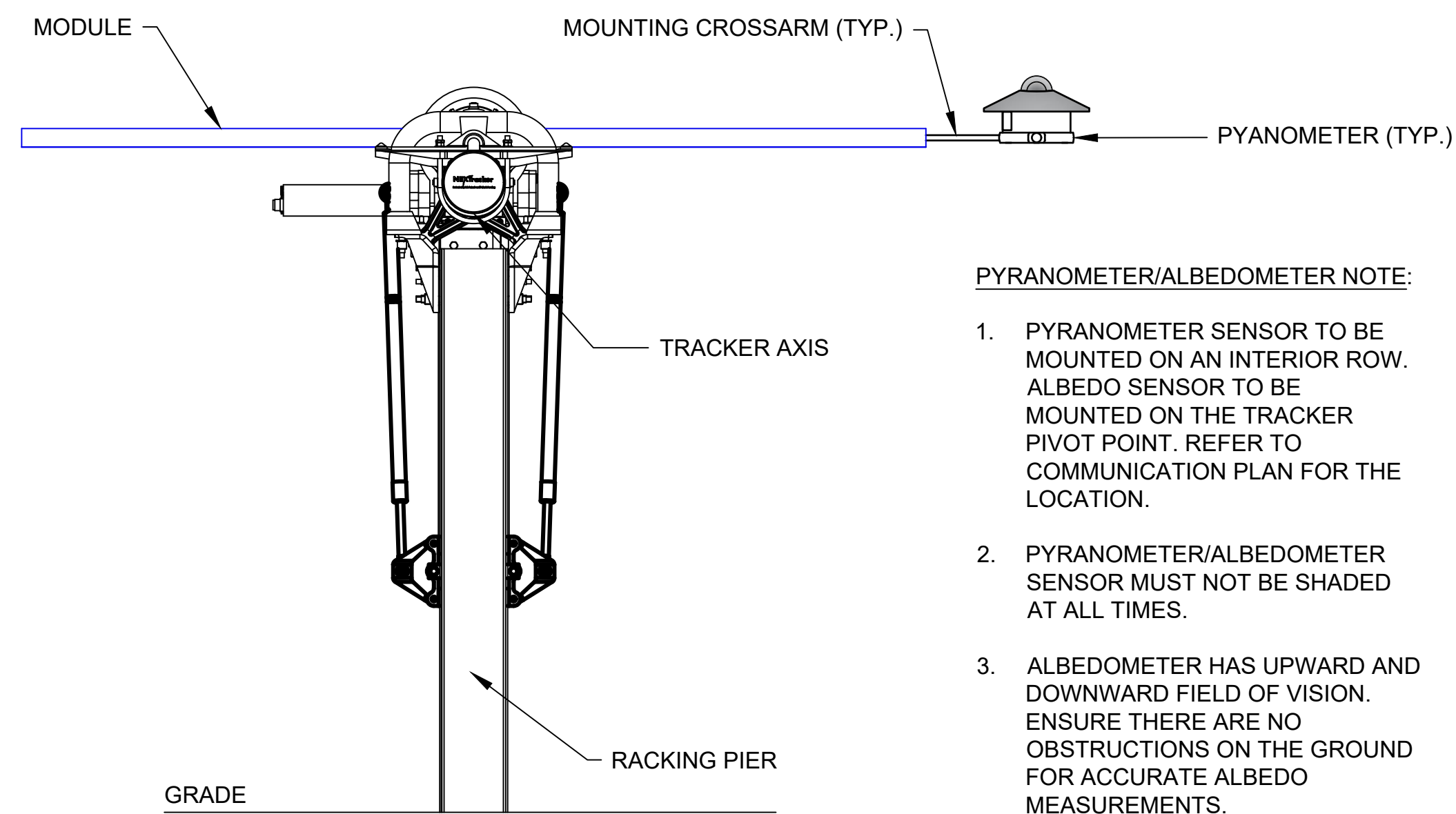
PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE: MISC. DETAILS SHEET 2

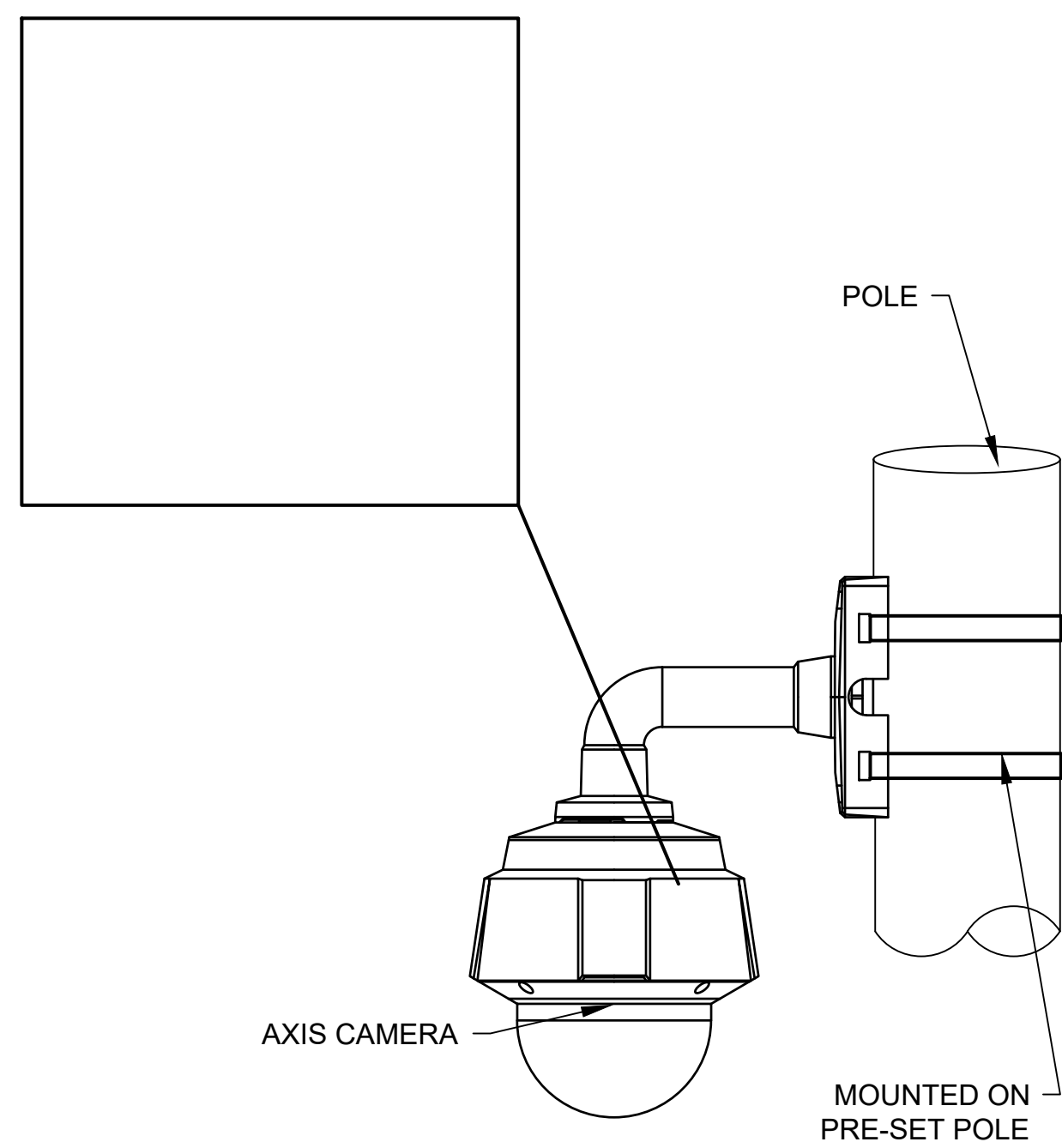
SHEET: E-681



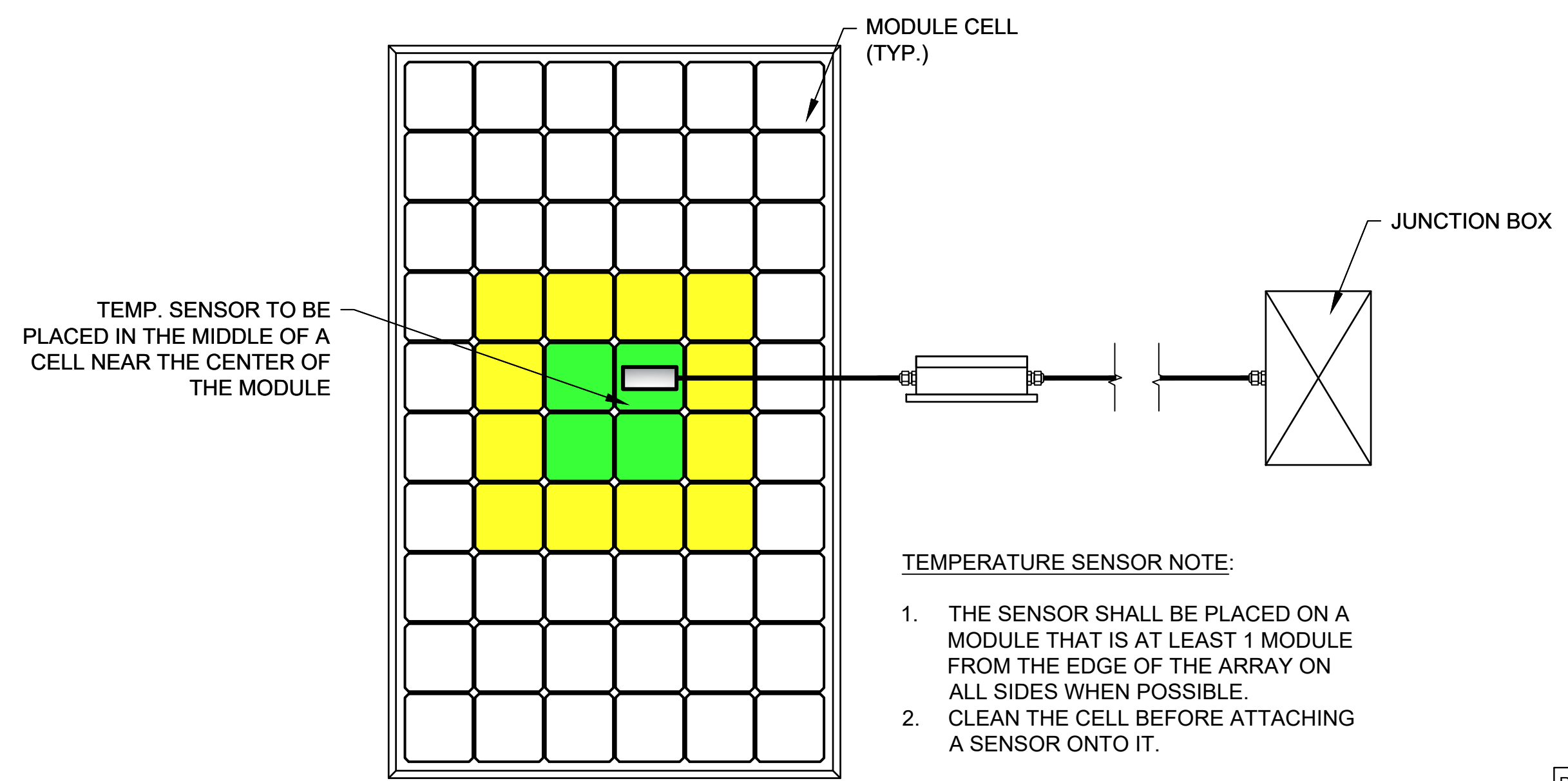
PYRANOMETER/ALBEDOMETER NOTE:

1. PYRANOMETER SENSOR TO BE MOUNTED ON AN INTERIOR ROW. ALBEDO SENSOR TO BE MOUNTED ON THE TRACKER PIVOT POINT. REFER TO COMMUNICATION PLAN FOR THE LOCATION.
2. PYRANOMETER/ALBEDOMETER SENSOR MUST NOT BE SHADED AT ALL TIMES.
3. ALBEDOMETER HAS UPWARD AND DOWNWARD FIELD OF VISION. ENSURE THERE ARE NO OBSTRUCTIONS ON THE GROUND FOR ACCURATE ALBEDO MEASUREMENTS.

1 PYRANOMETER/ALBEDOMETER INSTALLATION
E-682



3 AXIS CAMERA INSTALLATION
E-682



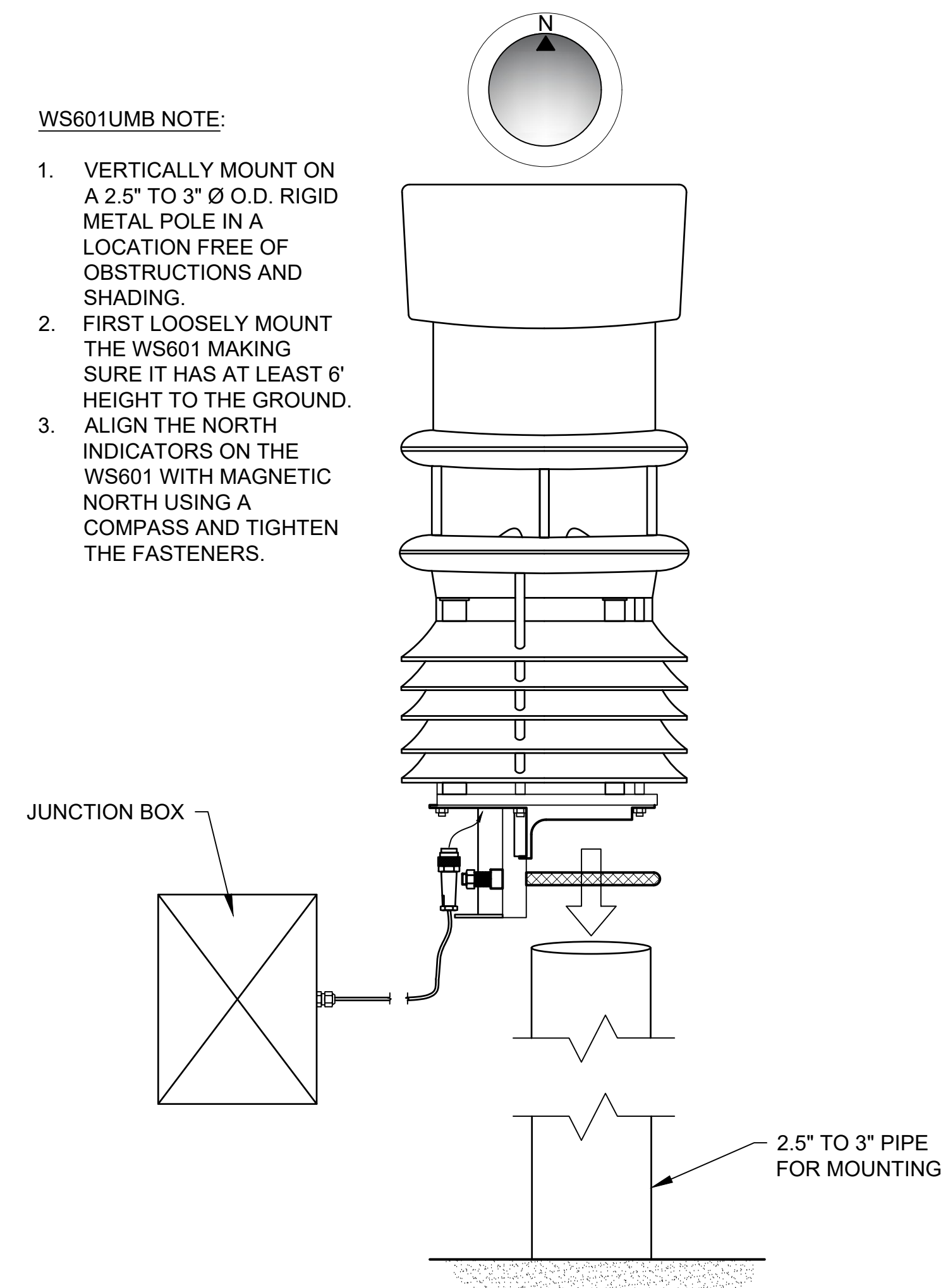
TEMPERATURE SENSOR NOTE:

1. THE SENSOR SHALL BE PLACED ON A MODULE THAT IS AT LEAST 1 MODULE FROM THE EDGE OF THE ARRAY ON ALL SIDES WHEN POSSIBLE.
2. CLEAN THE CELL BEFORE ATTACHING A SENSOR ONTO IT.

2 MODULE TEMPERATURE SENSOR INSTALLATION
E-682

WS601UMB NOTE:

1. VERTICALLY MOUNT ON A 2.5" TO 3" Ø O.D. RIGID METAL POLE IN A LOCATION FREE OF OBSTRUCTIONS AND SHADING.
2. FIRST LOOSELY MOUNT THE WS601 MAKING SURE IT HAS AT LEAST 6' HEIGHT TO THE GROUND.
3. ALIGN THE NORTH INDICATORS ON THE WS601 WITH MAGNETIC NORTH USING A COMPASS AND TIGHTEN THE FASTENERS.



5 LUFFT WS601USM INSTALLATION
#####

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NORTH STONINGTON, CT 06359
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SEAL:

DATE: 03/09/2020

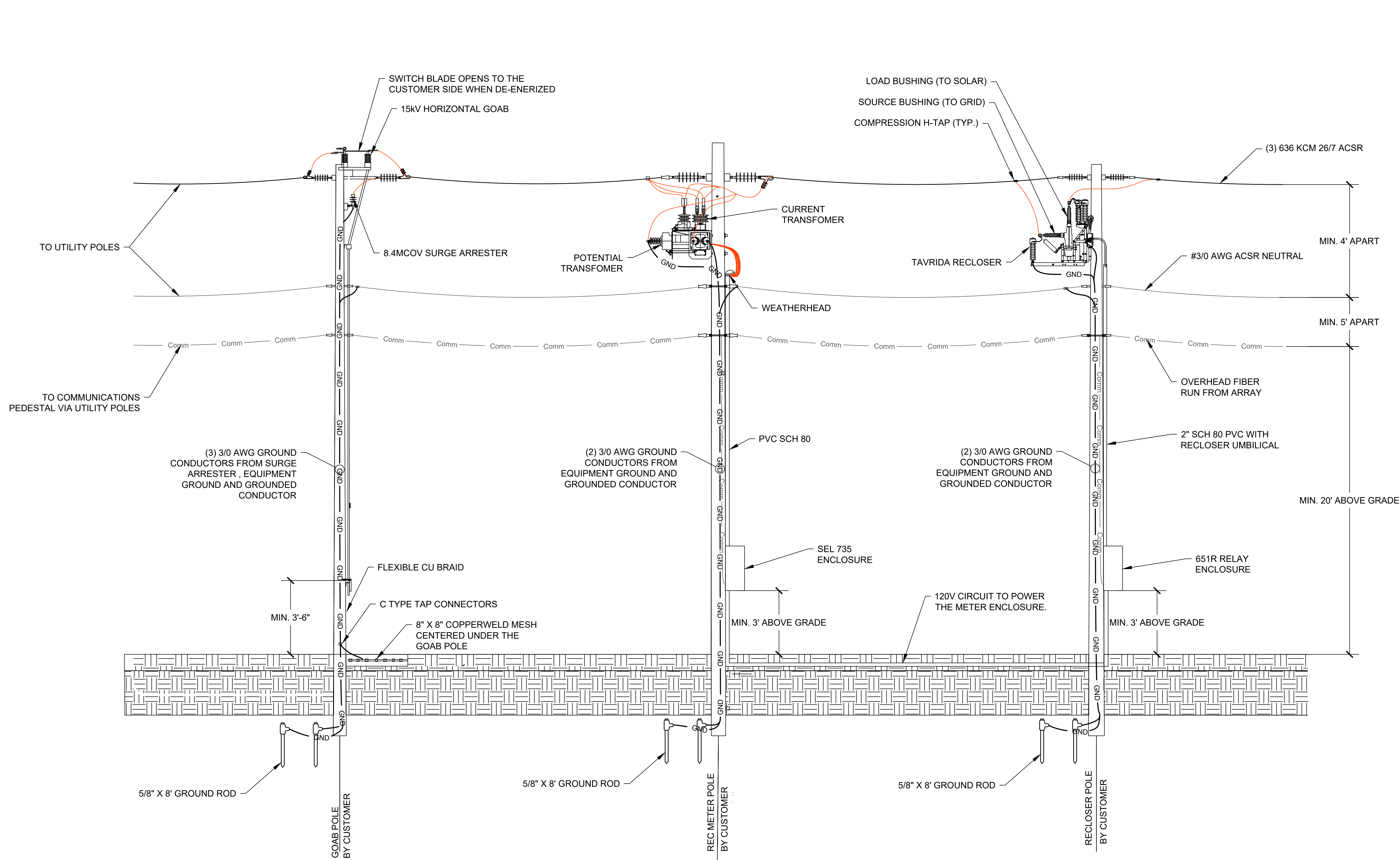
PROJECT #: 2000500

Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26657

DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE: **MISC. DETAILS SHEET 3**

SHEET: **E-682**



REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
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NORTH STONINGTON

PROJECT ADDRESS:
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 41°25'9.71"N, 71°50'4.83"W

SEAL:

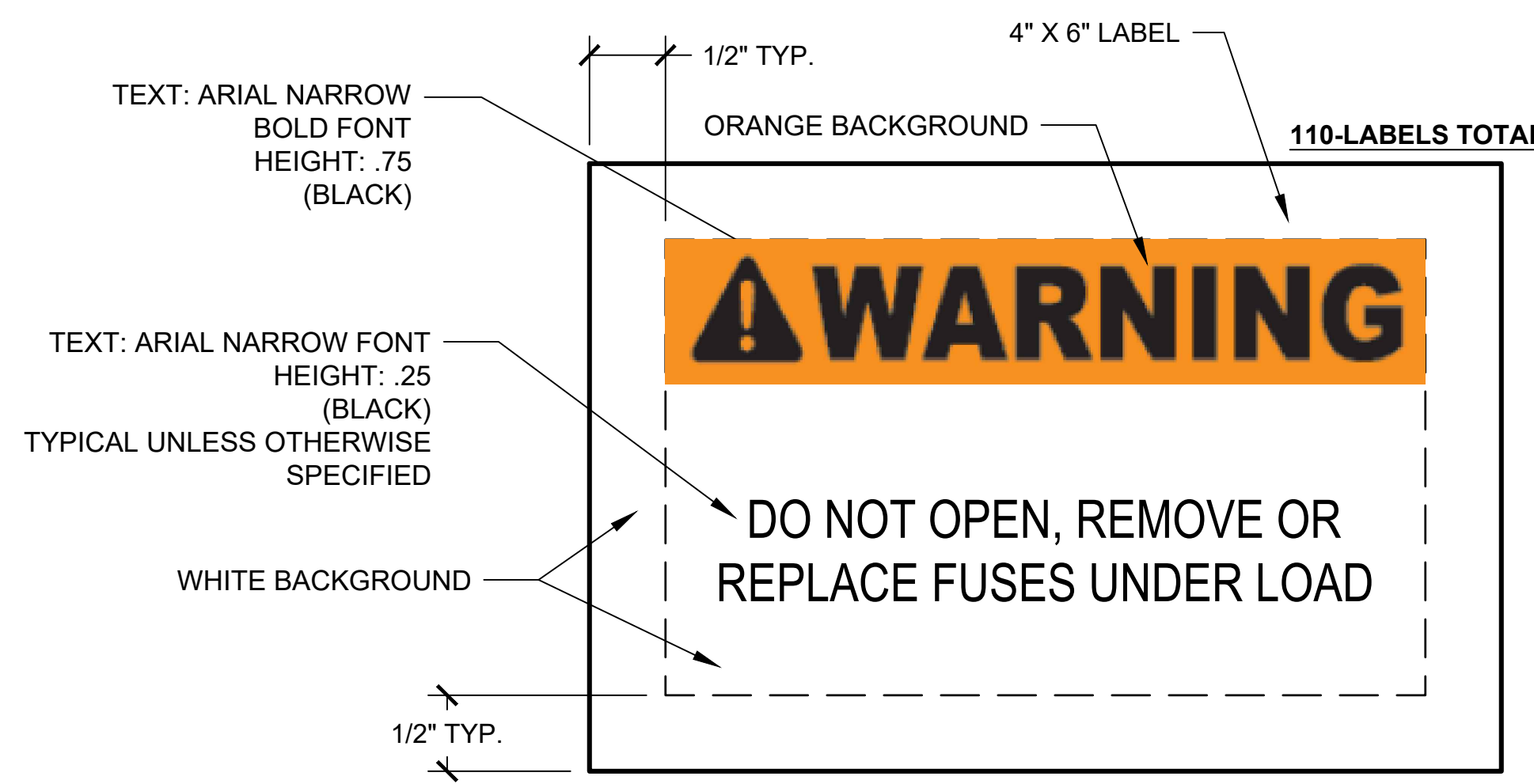
1800 ROUTE 14, SUITE 200
 WALL, NJ 07719
 (732) 983-5433
 FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020
 PROJECT #: 2000500
 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI

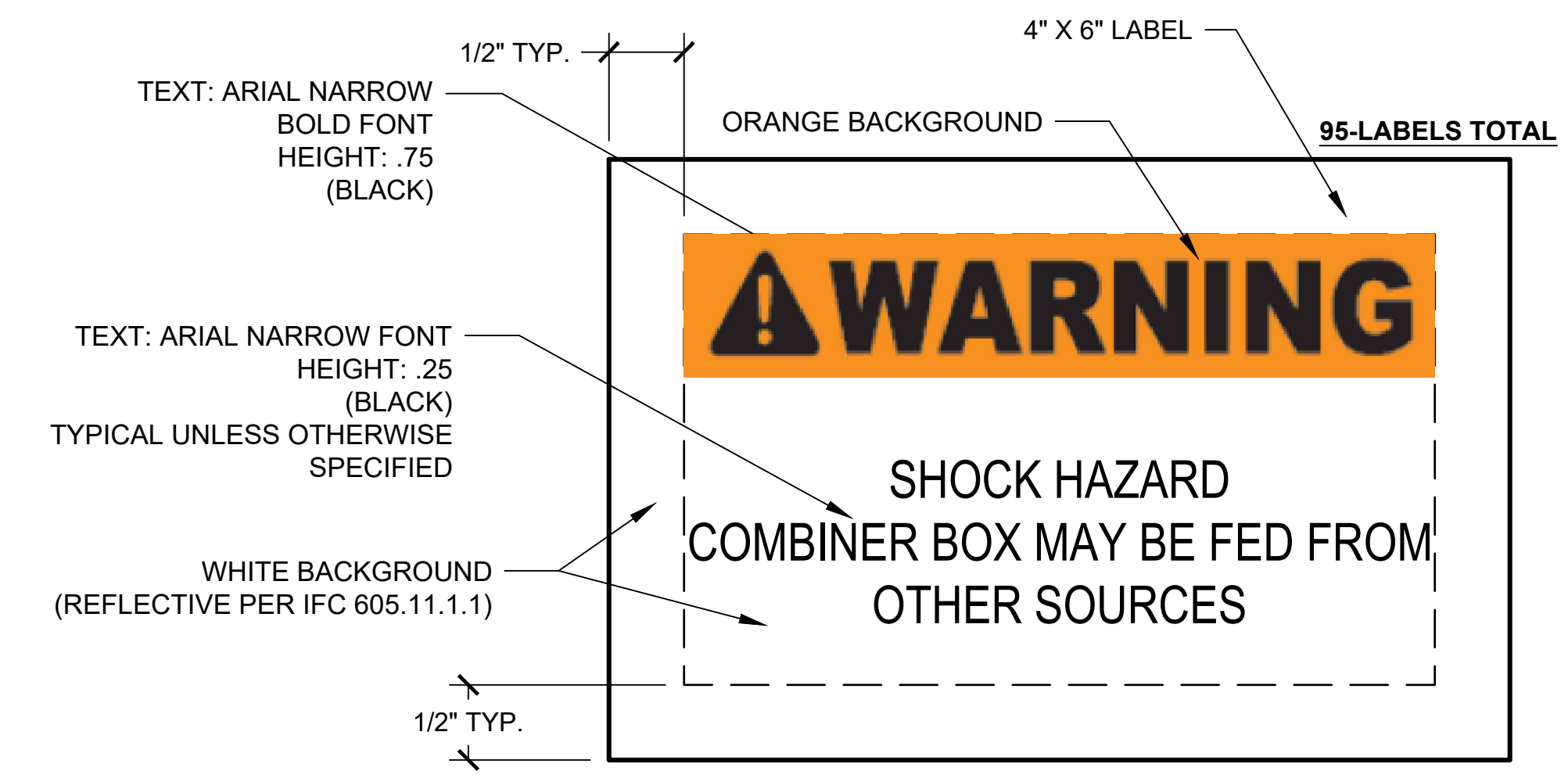
1 OVERHEAD POLE SPAN - SIDE ELEVATION DETAIL
 E-683

TITLE: **MISC. DETAILS SHEET 4**

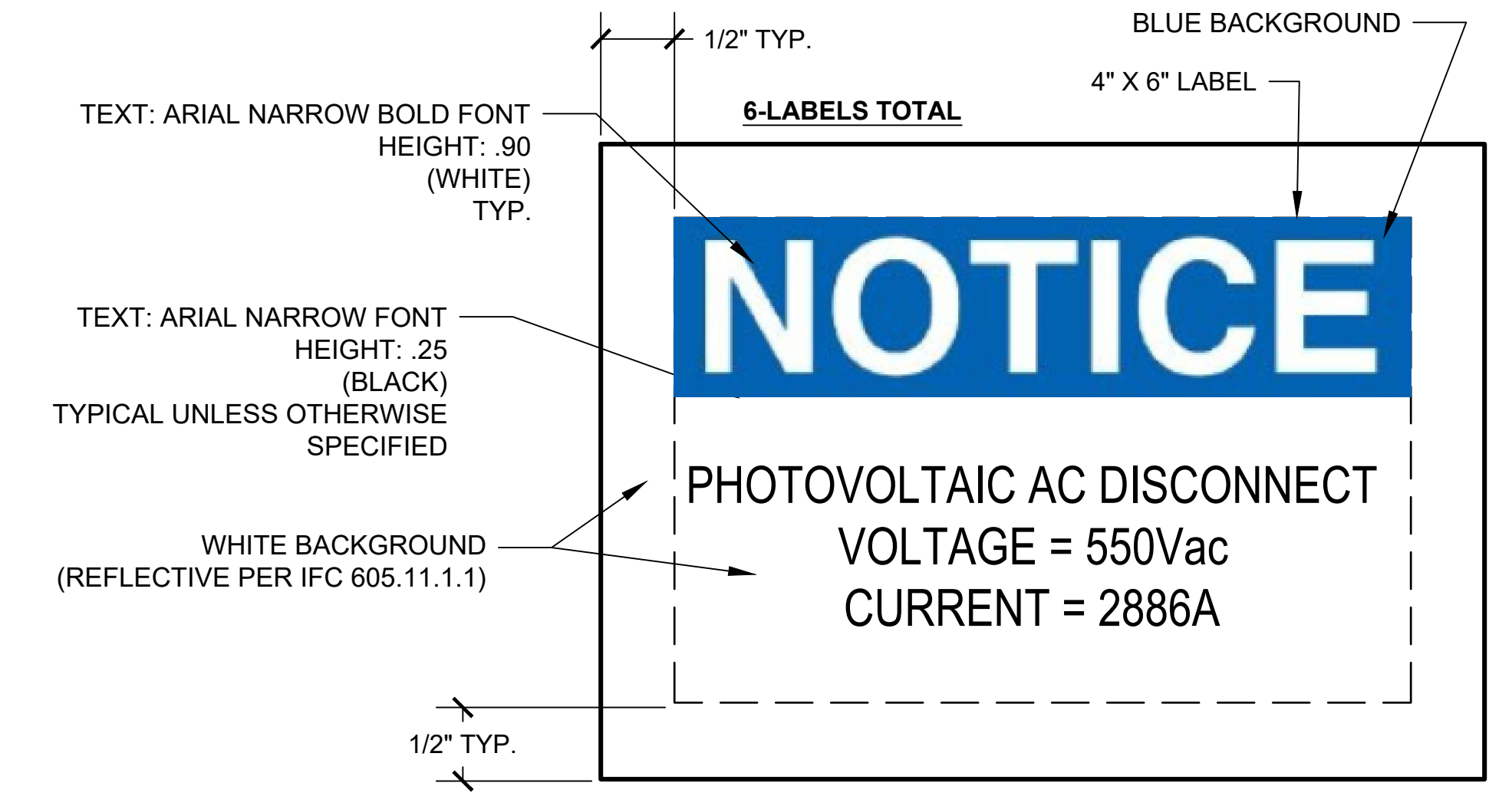
SHEET: **E-683**



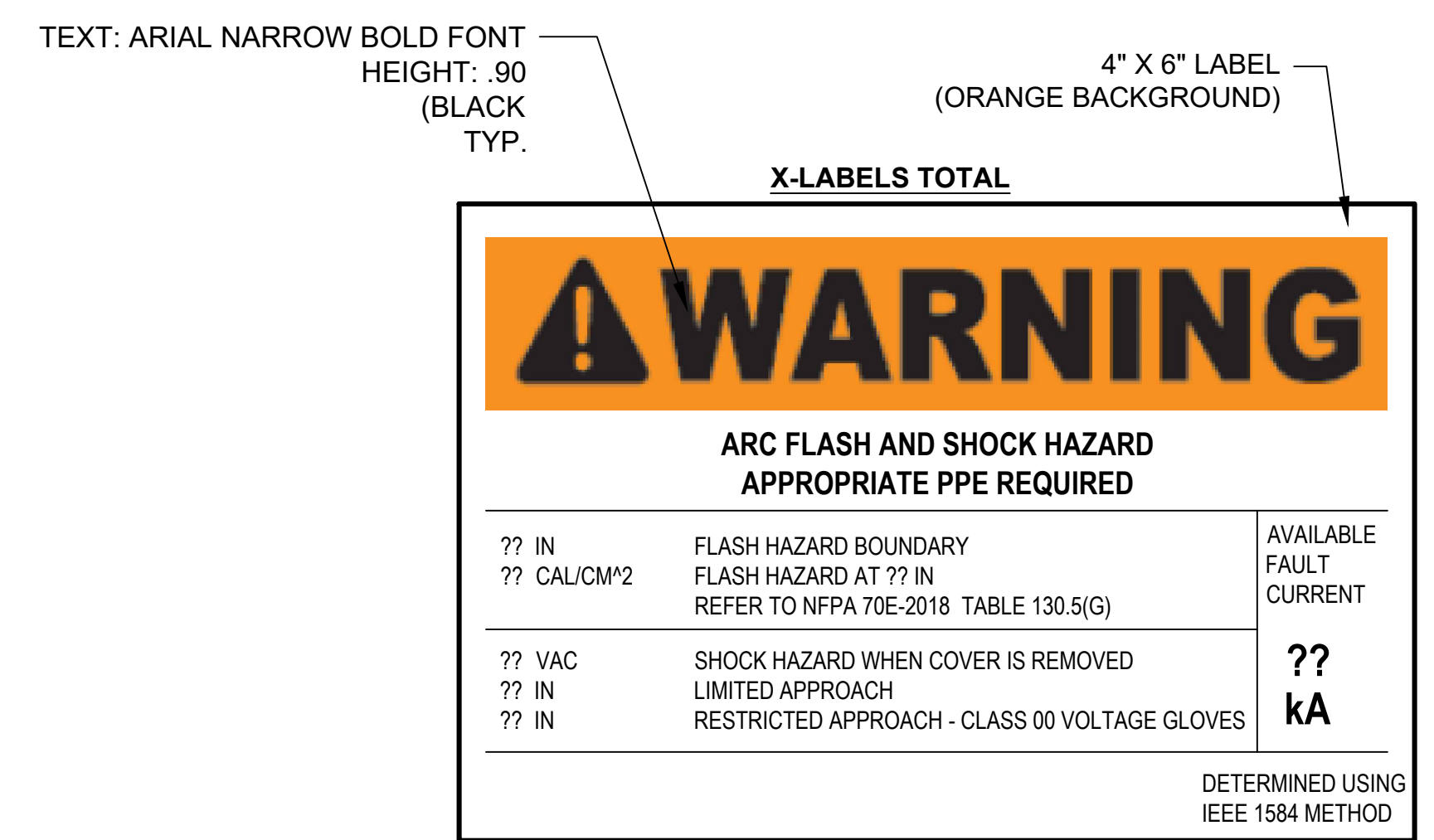
TO BE POSTED AT ALL COMBINER BOXES AND ALL OTHER FUSED LOCATIONS



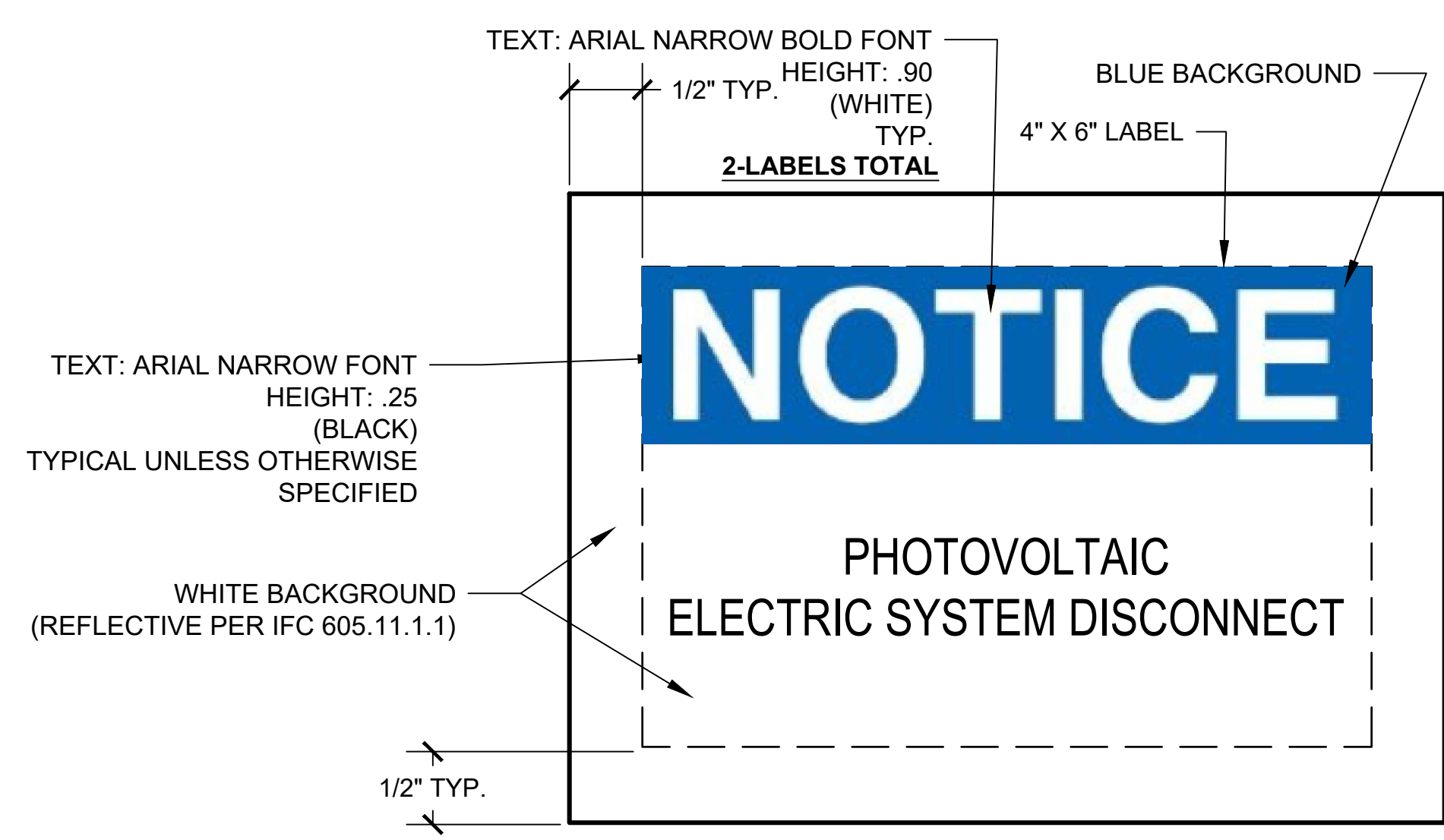
TO BE POSTED AT ALL COMBINER BOXES



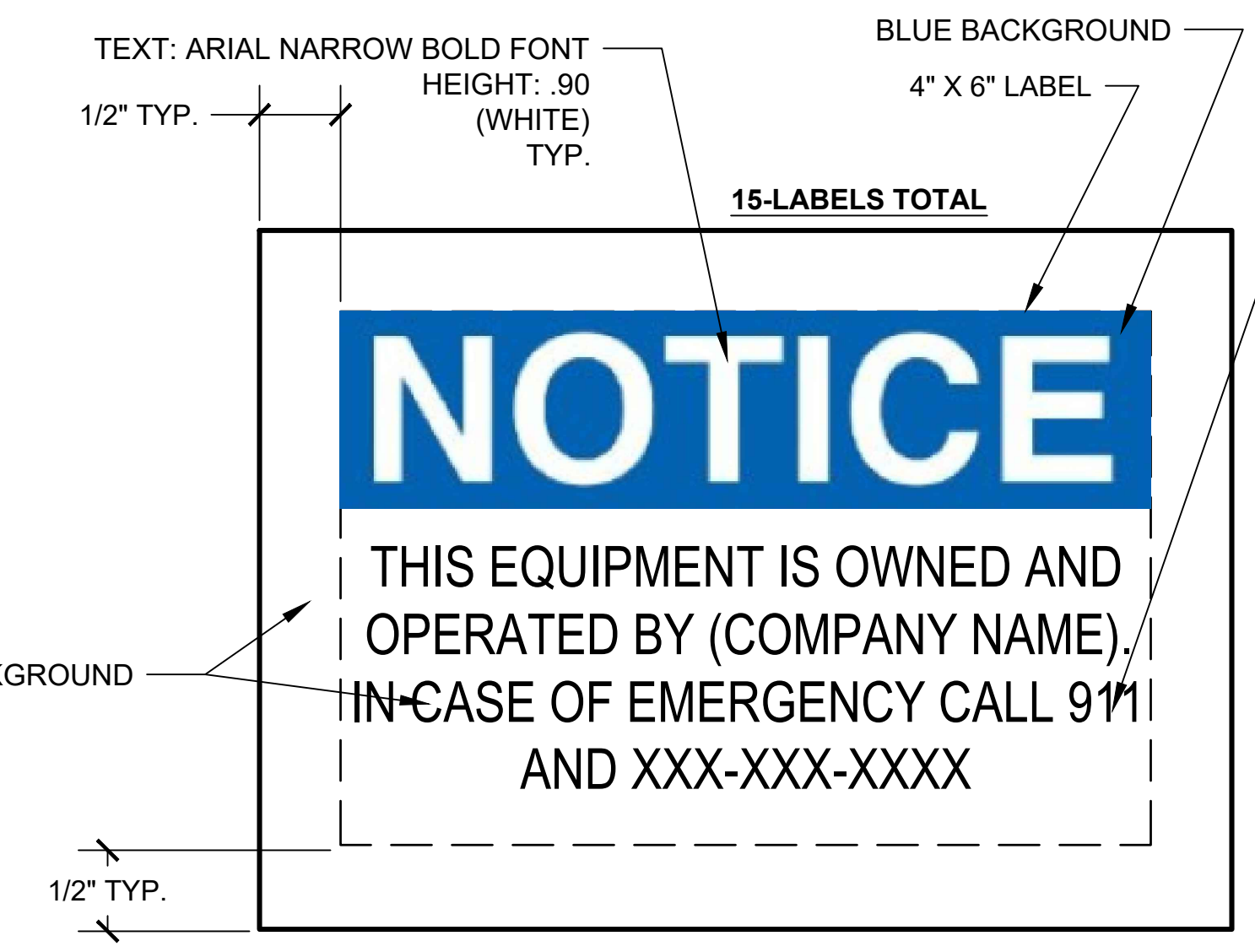
TO BE POSTED AT THE INVERTERS AC DISCONNECT



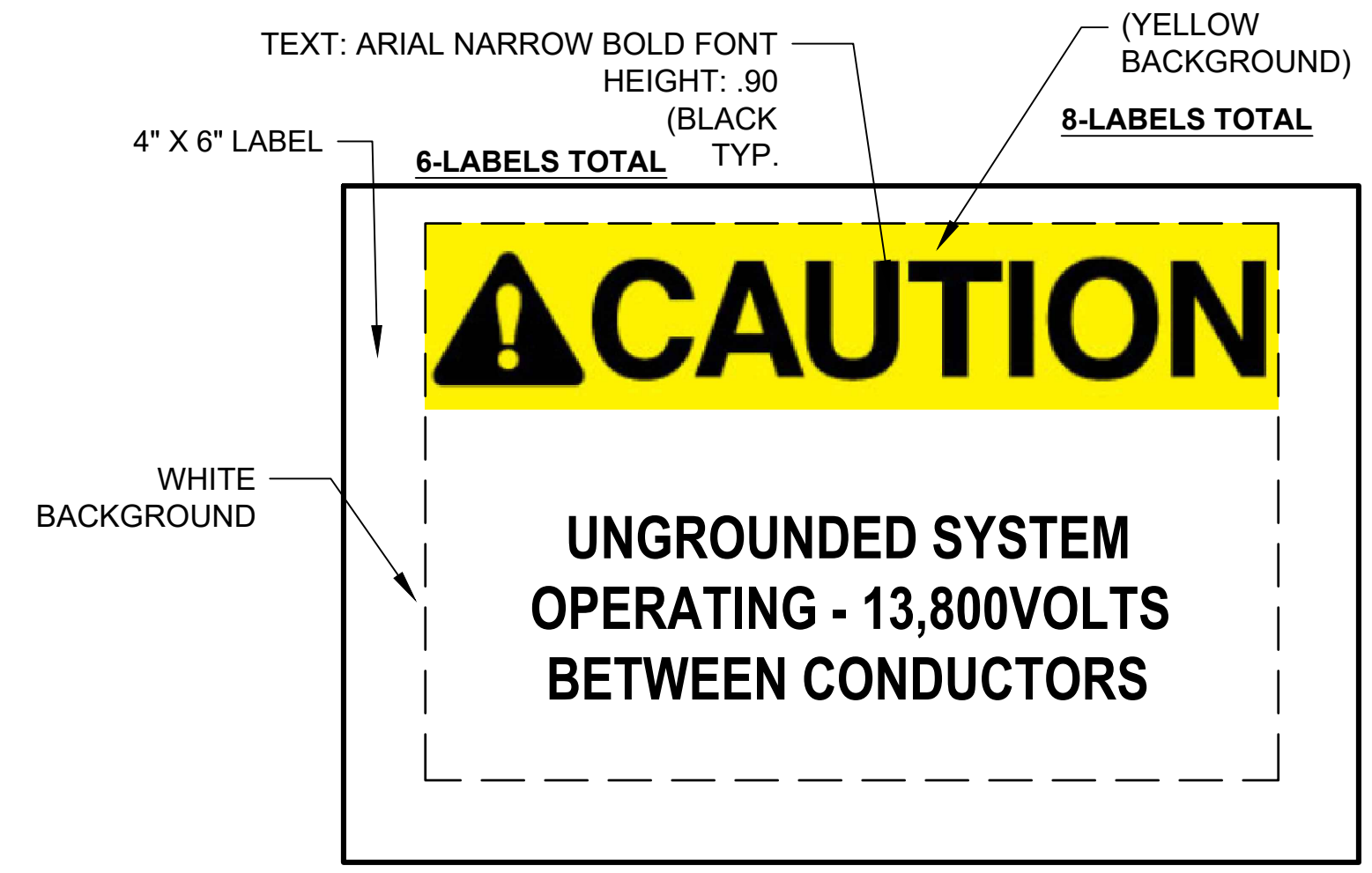
TO BE POSTED AT AC & DC SIDES OF INVERTERS, TRANSFORMERS, PANELS, DISCONNECTS, & SWITCHGEAR. WAITING FOR ARC FLASH & SHOCK HAZARD ANALYSIS



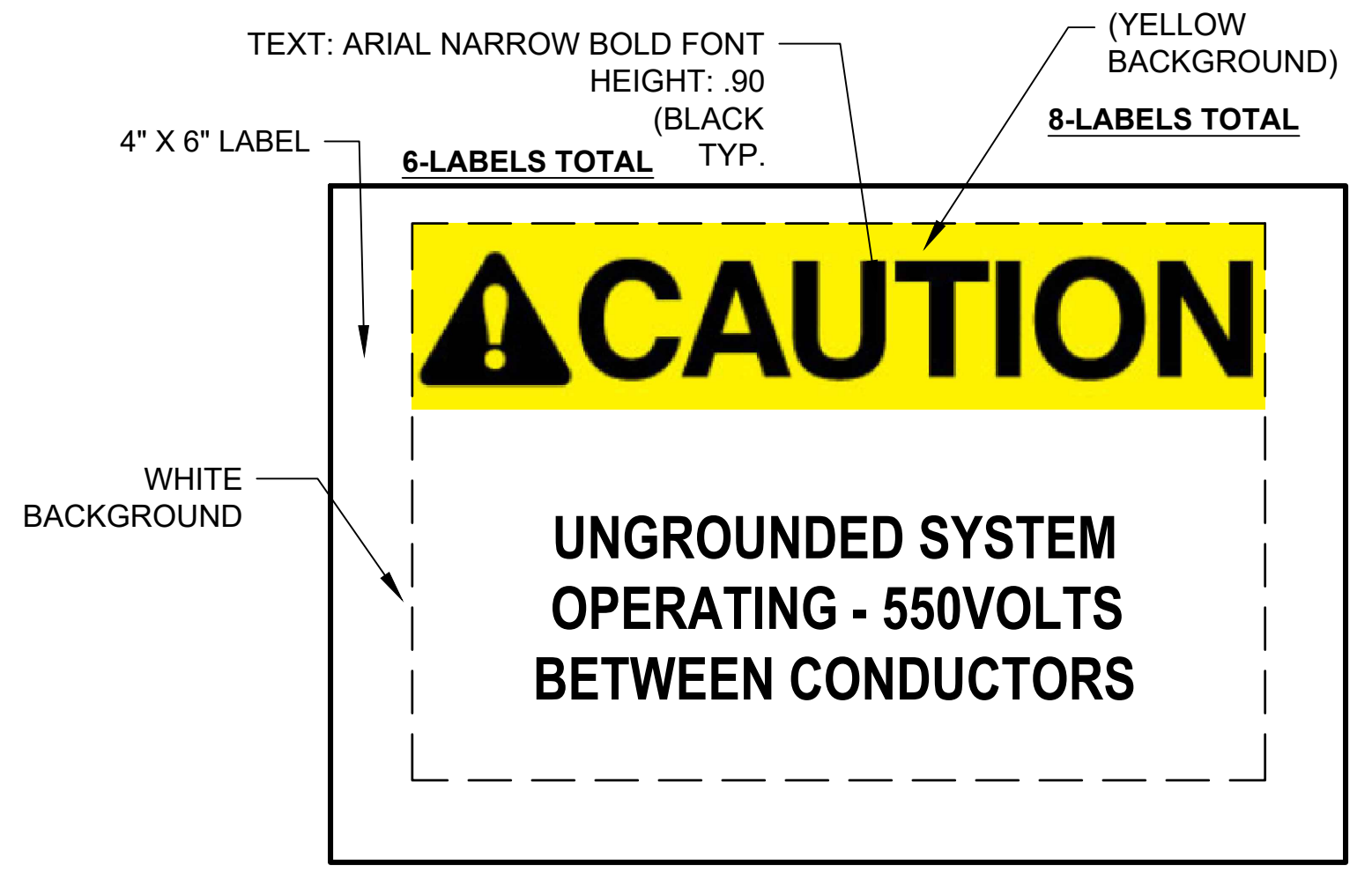
TO BE POSTED AT MAIN SERVICE DISCONNECT PER NEC 690.13(B)



TO BE POSTED AT MV SWITCHGEAR, TRANSFORMERS AND MAIN COMMUNICATION ENCLOSURES AND GATES



TO BE POSTED AT EACH MEDIUM VOLTAGE TRANSFORMER PER NEC 250.21(C)



TO BE POSTED AT AC SIDE OF EACH INVERTER PER NEC 250.21(C)

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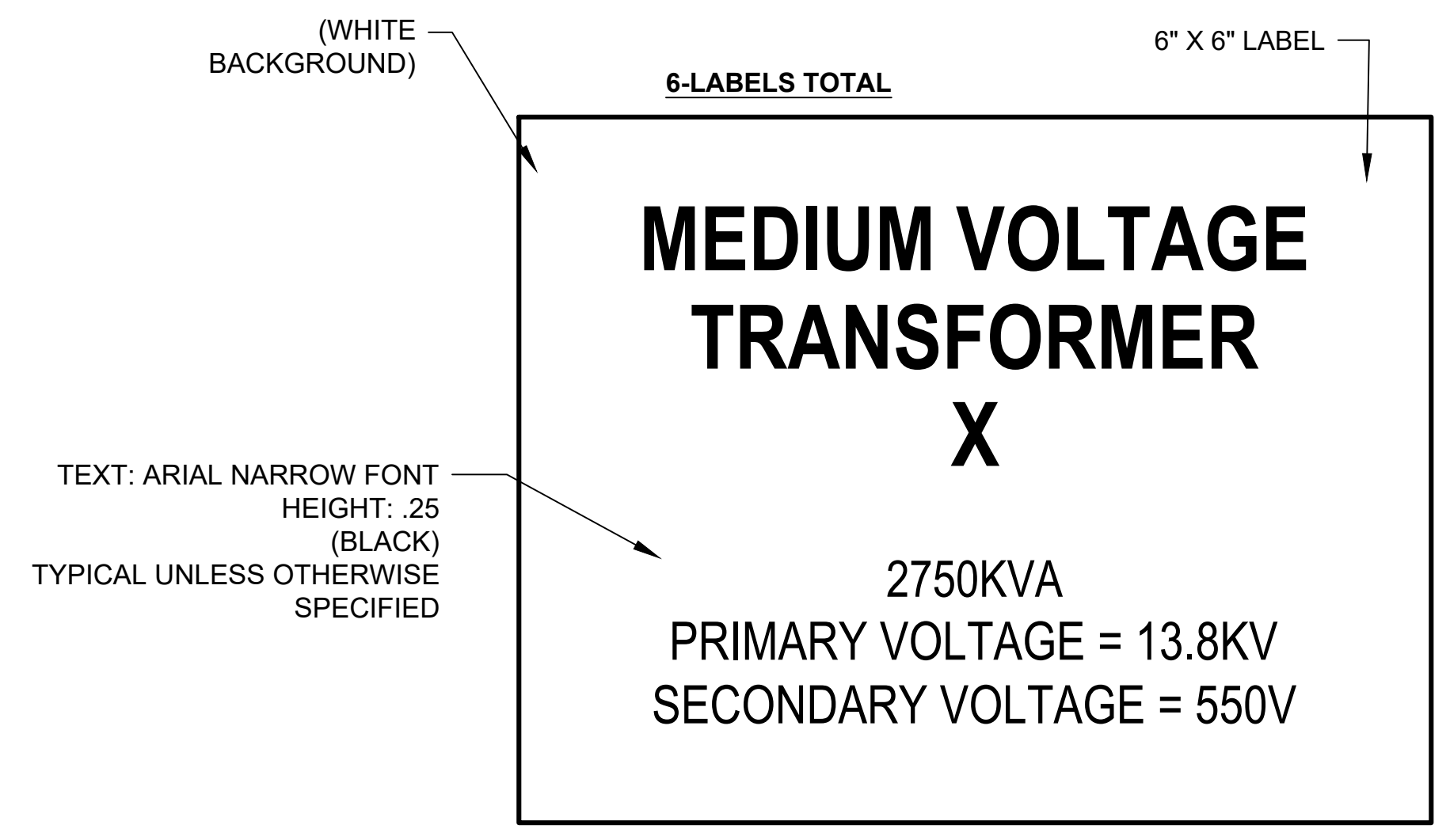
PROJECT ADDRESS:
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NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:

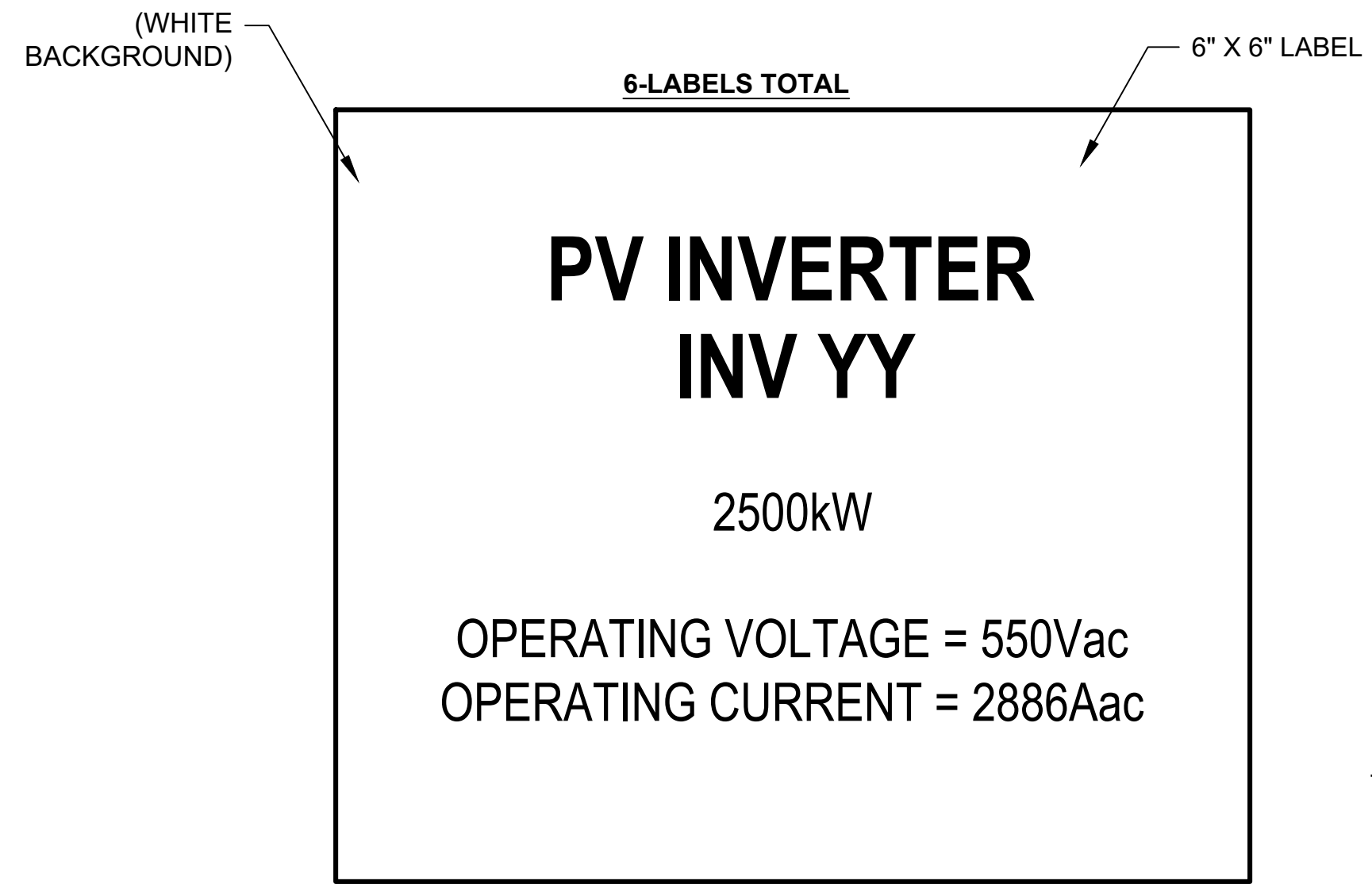
DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE: **WARNING LABELS SHEET 1**

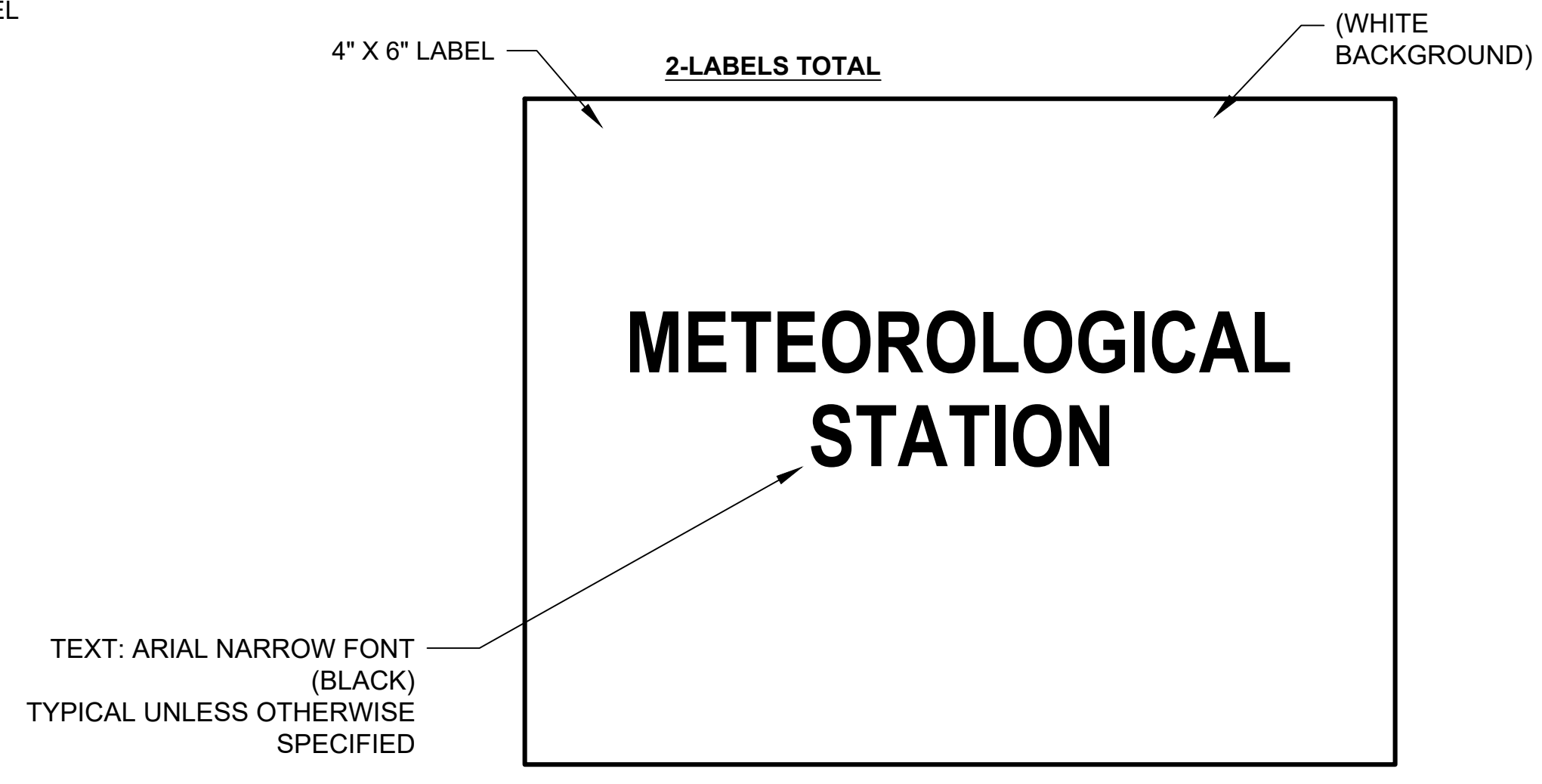
SHEET: **E-700**



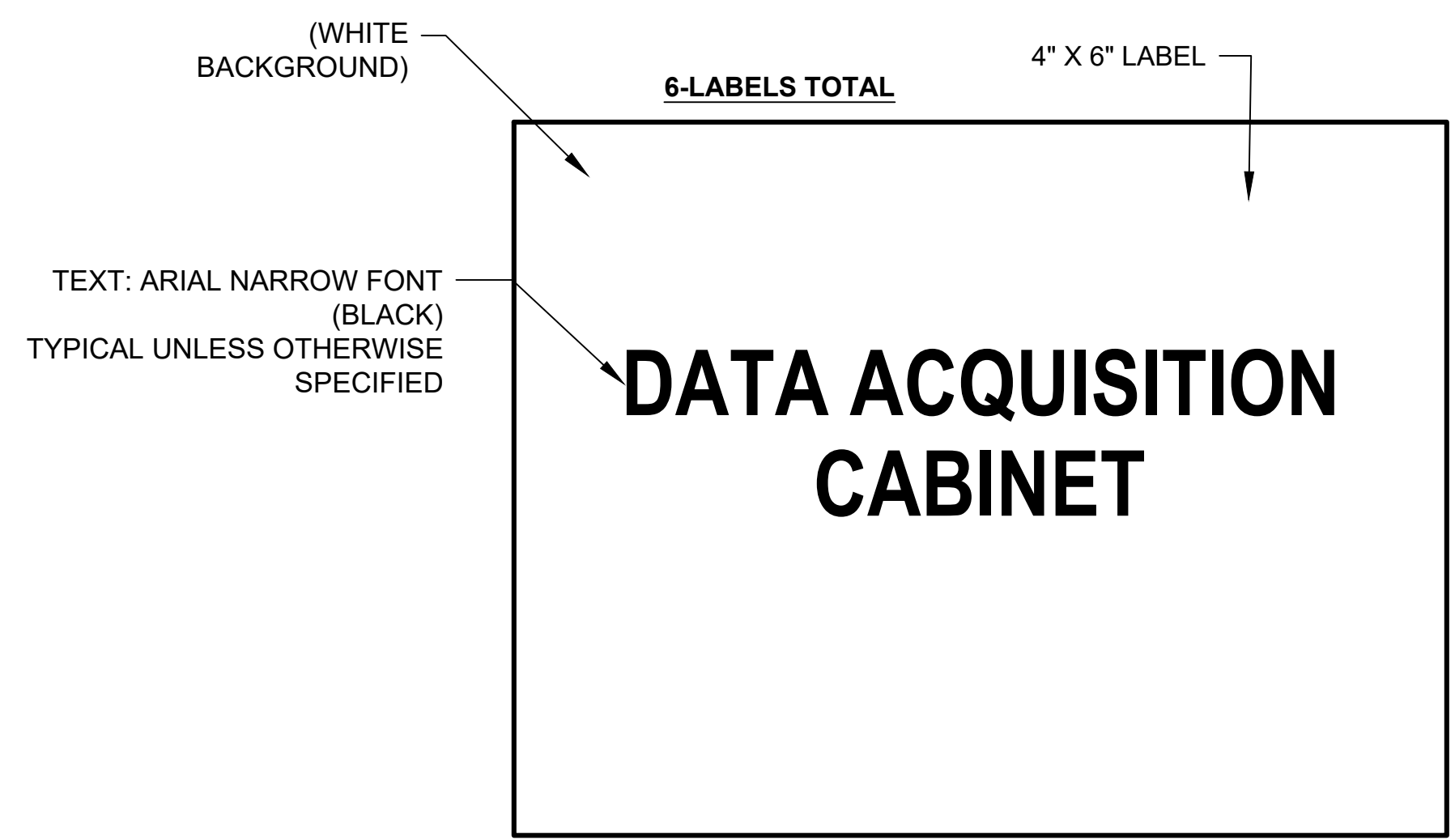
TO BE POSTED AT THE TRANSFORMERS. X TO BE REPLACED WITH TRANSFORMER NUMBER.



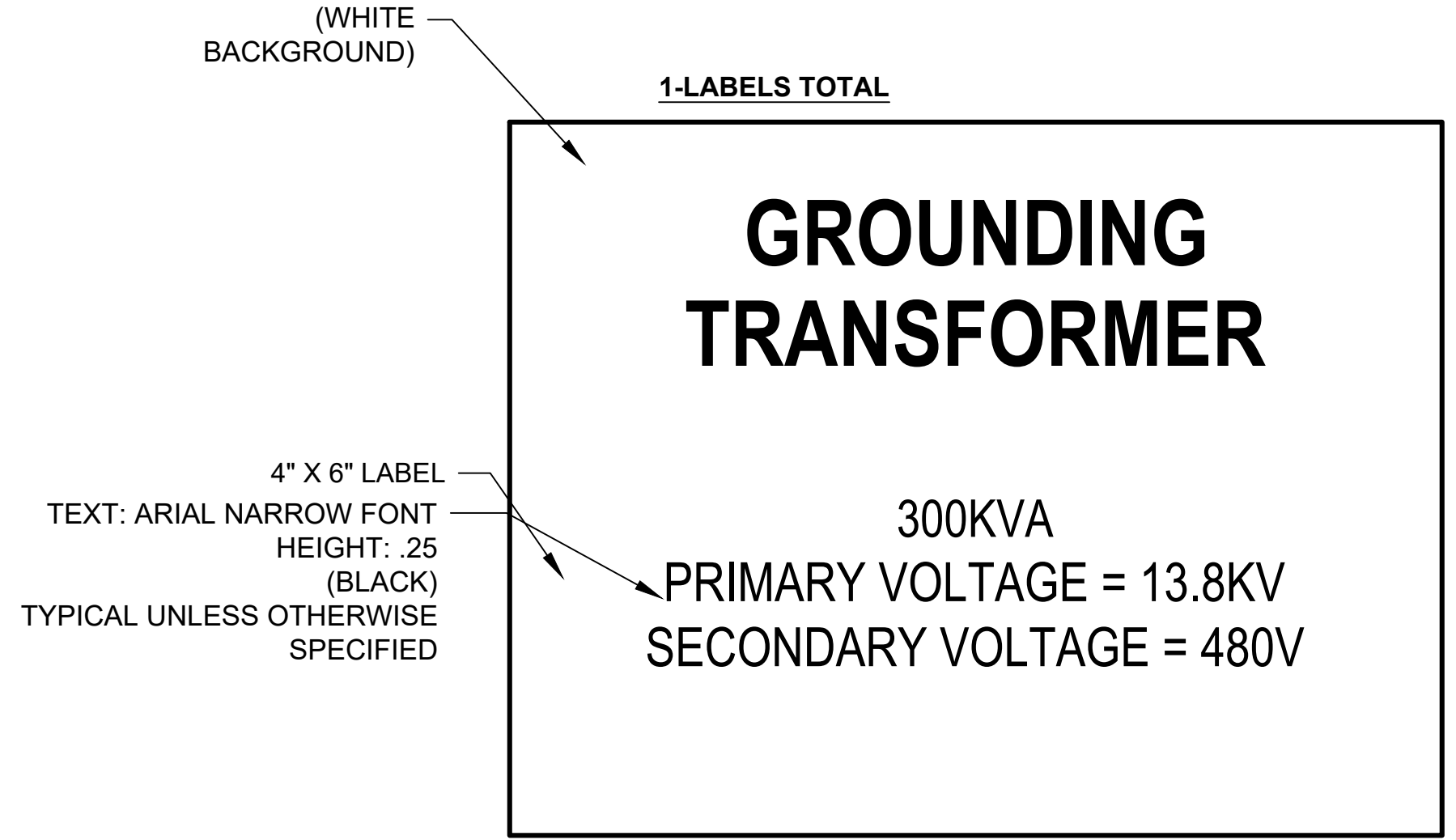
TO BE POSTED AT INVERTERS YY TO BE REPLACED WITH INVERTER NUMBER



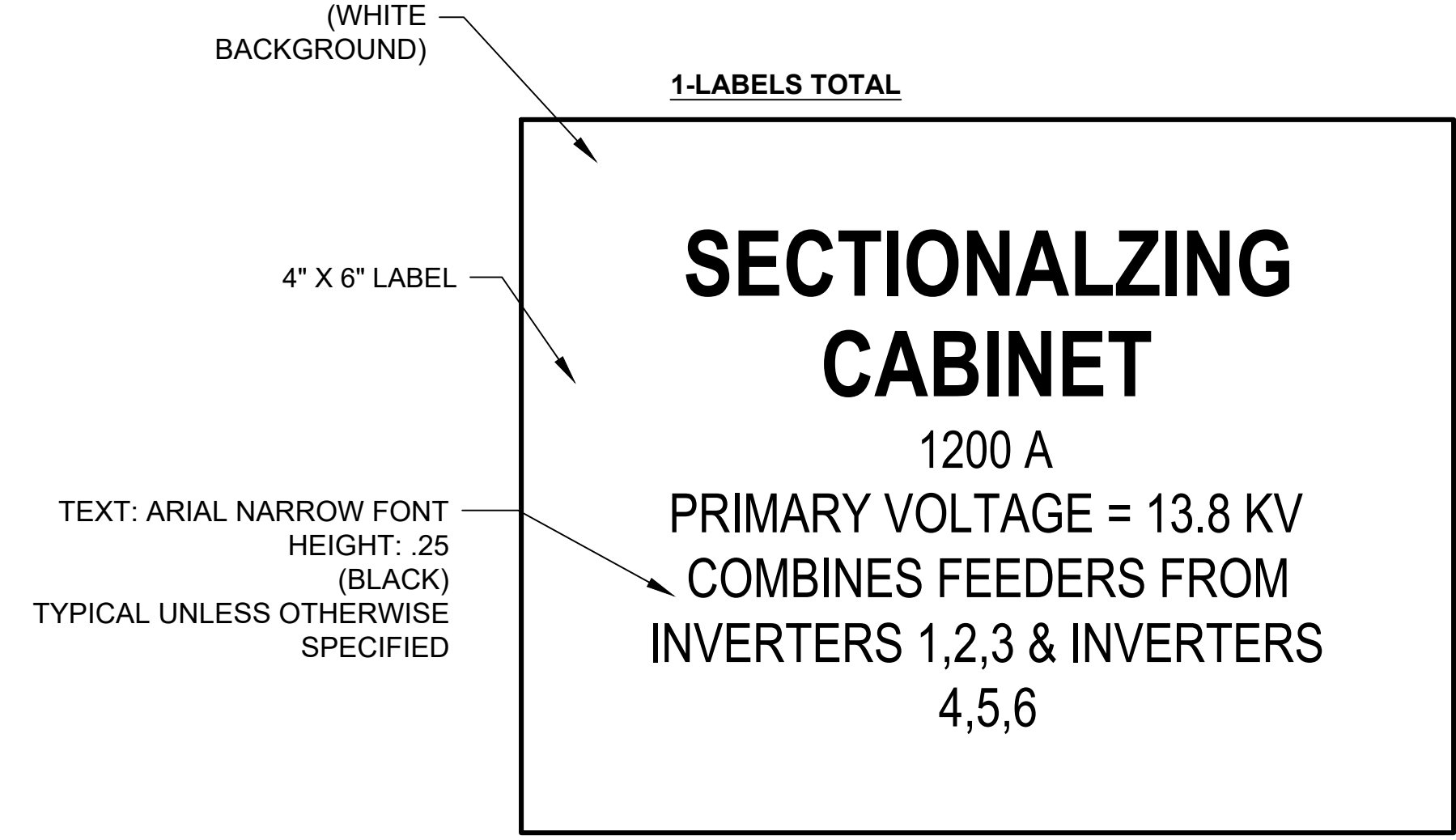
TO BE POSTED AT THE WEATHER STATION CABINETS



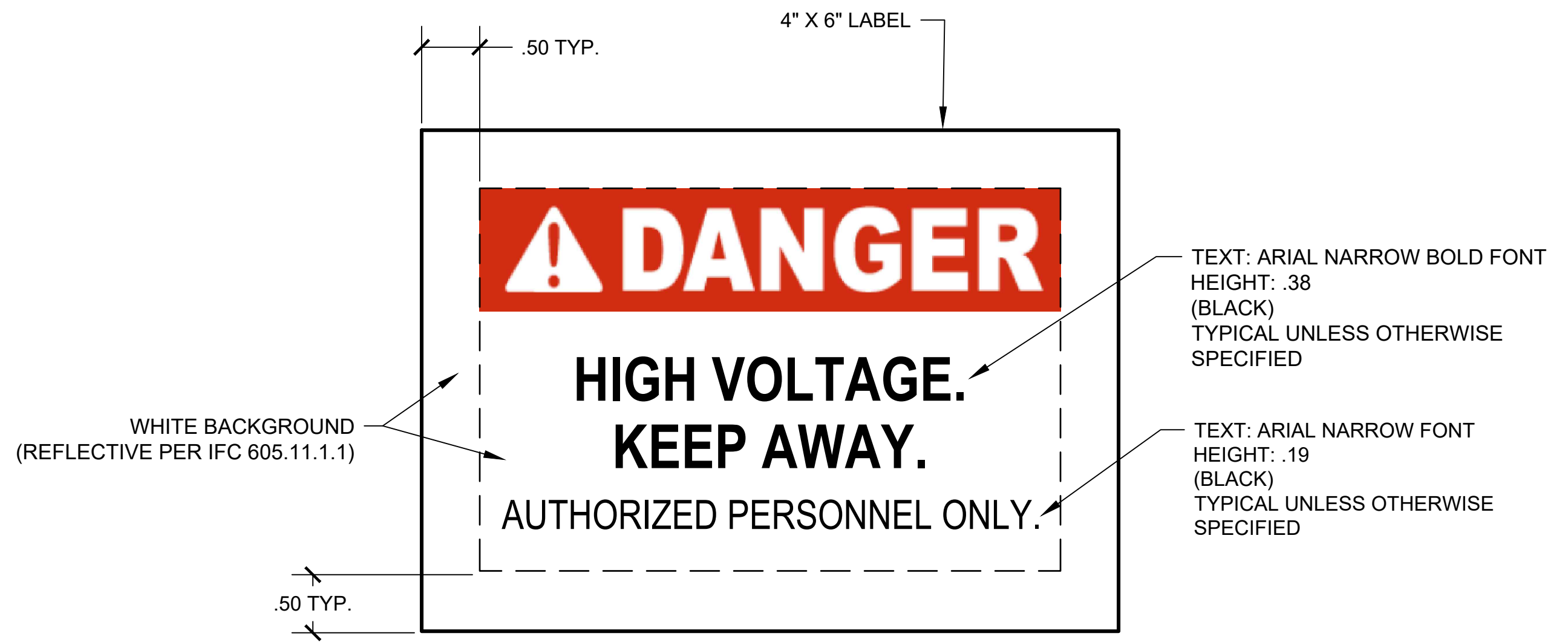
TO BE POSTED AT THE DAS CABINETS



TO BE POSTED ON GROUNDING TRANSFORMER



TO BE POSTED ON GROUNDING TRANSFORMER



TO BE POSTED AT GATES.

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20

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PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

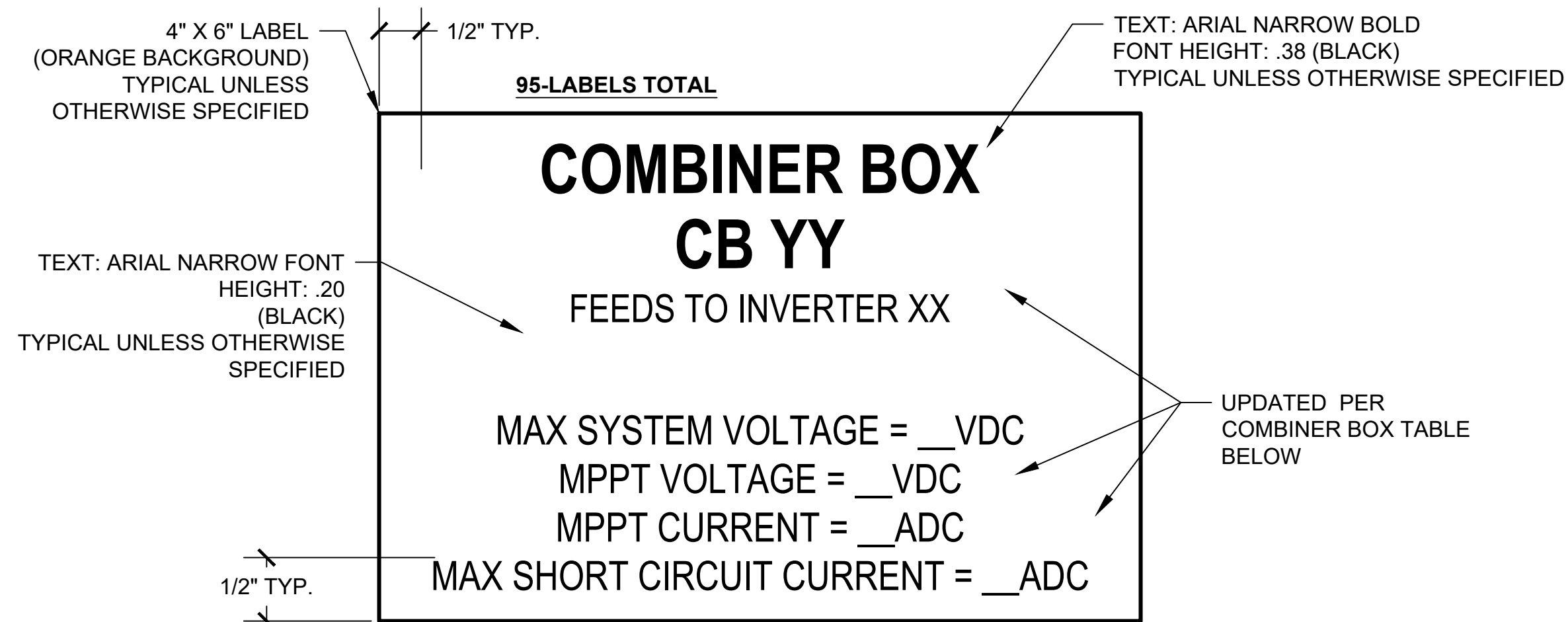
SEAL:

Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26657

DATE: 03/09/2020
PROJECT #: 2000500
DRAWN BY: V. PISSAREVSKI
CHECKED BY: R. VUDI

TITLE: **WARNING LABELS SHEET 2**

SHEET: **E-701**



TO BE POSTED AT THE COMBINER BOXES PER NEC 690.53
 XX TO BE REPLACED BY CENTRAL INVERTER NUMBER
 YY TO BE REPLACED BY COMBINER BOX NUMBER

INVERTER (XX)	CB# (YY)	MAX SYSTEM VOLTAGE	MAX POWER POINT VOLTAGE	MAX POWER POINT CURRENT	MAX SHORT CIRCUIT CURRENT
1	1	1500	1117	237	252
	2	1500	1117	224	238
	3	1500	1117	237	252
	4	1500	1117	237	252
	5	1500	1117	237	252
	6	1500	1117	237	252
	7	1500	1117	237	252
	8	1500	1117	237	252
	9	1500	1117	237	252
	10	1500	1117	237	252
	11	1500	1117	237	252
	12	1500	1117	237	252
	13	1500	1117	237	252
	14	1500	1117	237	252
	15	1500	1117	224	238
	16	1500	1117	237	252

INVERTER (XX)	CB# (YY)	MAX SYSTEM VOLTAGE	MAX POWER POINT VOLTAGE	MAX POWER POINT CURRENT	MAX SHORT CIRCUIT CURRENT
2	1	1500	1117	237	252
	2	1500	1117	237	252
	3	1500	1117	237	252
	4	1500	1117	237	252
	5	1500	1117	237	252
	6	1500	1117	237	252
	7	1500	1117	237	252
	8	1500	1117	224	238
	9	1500	1117	237	252
	10	1500	1117	237	252
	11	1500	1117	237	252
	12	1500	1117	237	252
	13	1500	1117	237	252
	14	1500	1117	237	252
	15	1500	1117	224	238
	16	1500	1117	237	252

INVERTER (XX)	CB# (YY)	MAX SYSTEM VOLTAGE	MAX POWER POINT VOLTAGE	MAX POWER POINT CURRENT	MAX SHORT CIRCUIT CURRENT
3	1	1500	1117	237	252
	2	1500	1117	237	252
	3	1500	1117	237	252
	4	1500	1117	237	252
	5	1500	1117	237	252
	6	1500	1117	237	252
	7	1500	1117	237	252
	8	1500	1117	237	252
	9	1500	1117	237	252
	10	1500	1117	237	252
	11	1500	1117	237	252
	12	1500	1117	237	252
	13	1500	1117	237	252
	14	1500	1117	237	252
	15	1500	1117	237	252

INVERTER (XX)	CB# (YY)	MAX SYSTEM VOLTAGE	MAX POWER POINT VOLTAGE	MAX POWER POINT CURRENT	MAX SHORT CIRCUIT CURRENT
4	1	1500	1117	237	252
	2	1500	1117	237	252
	3	1500	1117	237	252
	4	1500	1117	237	252
	5	1500	1117	224	238
	6	1500	1117	237	252
	7	1500	1117	237	252
	8	1500	1117	237	252
	9	1500	1117	237	252
	10	1500	1117	224	238
	11	1500	1117	237	252
	12	1500	1117	237	252
	13	1500	1117	237	252
	14	1500	1117	237	252
	15	1500	1117	224	238
	16	1500	1117	224	238

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ENERPARC INC.
 1999 Harrison St, Ste 830
 Oakland, CA 94612, USA

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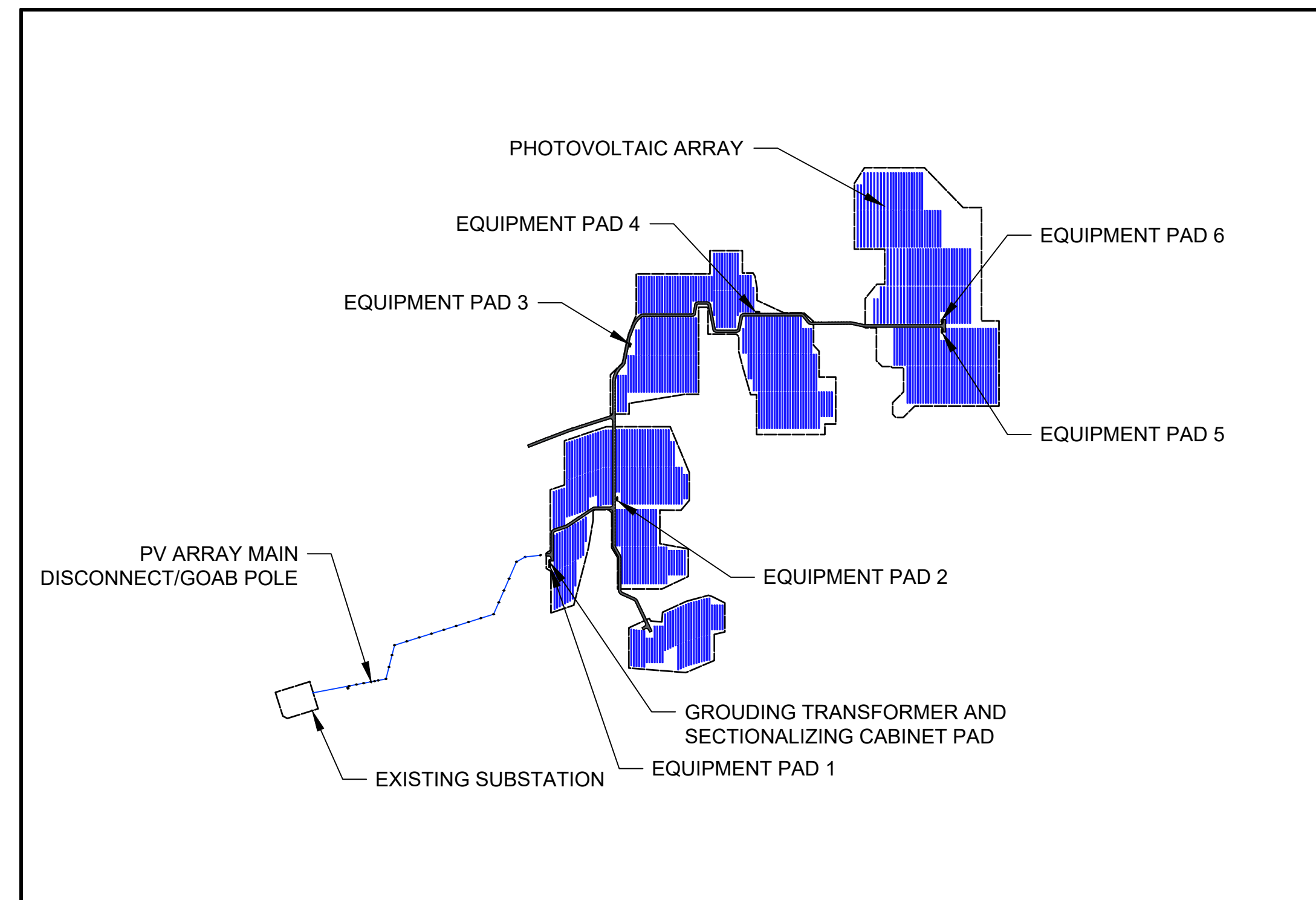
DATE: 03/09/2020
 PROJECT #: 2000500
 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI

TITLE:
WARNING LABELS SHEET 3

SHEET:
E-702

INVERTER (XX)	CB# (YY)	MAX SYSTEM VOLTAGE	MAX POWER POINT VOLTAGE	MAX POWER POINT CURRENT	MAX SHORT CIRCUIT CURRENT
5	1	1500	1117	237	252
	2	1500	1117	237	252
	3	1500	1117	237	252
	4	1500	1117	237	252
	5	1500	1117	237	252
	6	1500	1117	237	252
	7	1500	1117	237	252
	8	1500	1117	224	238
	9	1500	1117	237	252
	10	1500	1117	237	252
	11	1500	1117	237	252
	12	1500	1117	237	252
	13	1500	1117	237	252
	14	1500	1117	237	252
	15	1500	1117	237	252
	16	1500	1117	237	252

INVERTER (XX)	CB# (YY)	MAX SYSTEM VOLTAGE	MAX POWER POINT VOLTAGE	MAX POWER POINT CURRENT	MAX SHORT CIRCUIT CURRENT
6	1	1500	1117	237	252
	2	1500	1117	237	252
	3	1500	1117	237	252
	4	1500	1117	237	252
	5	1500	1117	237	252
	6	1500	1117	237	252
	7	1500	1117	237	252
	8	1500	1117	237	252
	9	1500	1117	237	252
	10	1500	1117	237	252
	11	1500	1117	237	252
	12	1500	1117	237	252
	13	1500	1117	237	252
	14	1500	1117	237	252
	15	1500	1117	224	238
	16	1500	1117	237	252



TO BE POSTED AT INVERTERS ,
TRANSFORMERS, SECTIONALIZING CABINET
AND ANY DISCONNECT ON SITE
PER NEC 705.10 & NEC 690.56(B)

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SEAL:	
	DATE: 03/09/2020
Stephen A. Bray PROFESSIONAL ENGINEER CT LICENSE: 26657	PROJECT #: 2000500
	DRAWN BY: V. PISSAREVSKI
	CHECKED BY: R. VUDI

TITLE: **WARNING LABELS SHEET 4**

SHEET: **E-703**

REFERENCE MODULE SPECIFICATION SHEET

LR4-72HBD 415~435M

High Efficiency
Low LID Bifacial PERC with
Half-cut Technology

HI-MO4

10-year Warranty for Materials and Processing;
30-year Warranty for Extra Linear Power Output

30-year Power Warranty Annual Power Attenuation: -0.45%

84.95%

Additional Value from LONGI Solar's Linear Warranty

Standard Module Linear Power Warranty

100%
91.2%
87.7%
84.9%
80.7%

1 5 10 15 20 25 30

Complete System and Product Certifications
IEC 61215, IEC61730, UL1703
ISO 9001:2008: ISO Quality Management System
ISO 14001:2004: ISO Environment Management System
TS16949:1: Guideline for module design qualification and type approval
OHSAS 18001: 2007 Occupational Health and Safety

Front side performance equivalent to conventional low LID mono PERC:
- High module conversion efficiency (up to 19.4%)
- Better energy yield with excellent low irradiance performance and temperature coefficient
- First year power degradation <2%

Bifacial technology enables additional energy harvesting from rear side (up to 25%)

Glass/glass lamination ensures 30 year product lifetime, with annual power degradation < 0.45%, 1500V compatible to reduce BOS cost.

Solid PID resistance ensured by solar cell process optimization and careful module BOM selection

Reduced resistive loss with lower operating current

Higher energy yield with lower operating temperature

Reduced hot spot risk with optimized electrical design and lower operating current

LONGI
Room 801, Tower 3, Lujiazui Financial Plaza, No.826 Century Avenue, Pudong Shanghai, 200120, China
Tel: +86-21-80162606 E-mail: module@longi-silicon.com Facebook: www.facebook.com/LONGI Solar

Note: Due to continuous technical innovation, R&D and improvement, technical data above mentioned may be of modification accordingly. LONGI Solar have the sole right to make such modification at anytime without further notice; Demanding party shall request for the latest datasheet for such as contract need, and make it a constituting and binding part of lawful documentation duly signed by both parties.

V10

LR4-72HBD 415~435M

Design (mm)	Mechanical Parameters	Operating Parameters
	Cell Orientation: 144 (6x6) Junction Box: IP68, three diodes Output Cable: 4mm ² , 300mm in length, length can be customized Glass: Dual glass 2.2mm tempered glass Frame: Anodized aluminum alloy frame Weight: 22.5kg Dimensions: 2131x1032x35mm Packaging: 30pcs per pallet 350pcs per 40'HC 600pcs per 40'HQ	Operational Temperature: -40°C ~ +85°C Power Output Tolerance: C ⁺ ±5W Voc and Isc Tolerance: ±2% Maximum System Voltage: DC1500V (IEC/UL) Maximum Series Fuse Rating: 32A Nominal Operating Cell Temperature: 45±2°C Safety Class: Class II Fire Rating: UL type 3 Bifaciality: Cladding 20%

Electrical Characteristics	Test uncertainty for Pmax: ±3%					
Model Number	LR4-72HBD-415M	LR4-72HBD-420M	LR4-72HBD-425M	LR4-72HBD-430M	LR4-72HBD-435M	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	415	308.6	420	332.3	425	316.0
Open Circuit Voltage (Voc/V)	49.0	45.6	49.2	45.8	49.4	46.0
Short Circuit Current (Isc/A)	10.89	8.82	10.96	8.87	11.02	8.93
Voltage at Maximum Power (Vmp/V)	40.6	37.7	40.8	37.9	41.0	38.1
Current at Maximum Power (Imp/A)	10.23	8.19	10.30	8.25	10.37	8.30
Module Efficiency(%)	18.5	18.7	18.7	19.0	19.2	19.4

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25°C, Spectra at AM1.5
 NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20°C, Spectra at AM1.5, Wind at 1m/s

Electrical characteristics with different rear side power gain (reference to 425W front)	Pmax/W	Voc/V	Isc/A	Vmp/V	Imp/A	Pmax gain
446	49.4	11.58	41.0	10.88	5%	
468	49.4	12.13	41.0	11.40	10%	
489	49.5	12.68	41.1	11.92	15%	
510	49.5	13.23	41.1	12.44	20%	
531	49.5	13.78	41.1	12.96	25%	

Temperature Ratings (STC)	Mechanical Loading
Temperature Coefficient of Isc: -0.060%/°C	Front Side Maximum Static Loading: 5400Pa
Temperature Coefficient of Voc: -0.300%/°C	Rear Side Maximum Static Loading: 2400Pa
Temperature Coefficient of Pmax: -0.370%/°C	Hailstone Test: 25mm Hailstone at the speed of 23m/s

I-V Curve

Current-Voltage Curve (LR4-72HBD-415M)

Power-Voltage Curve (LR4-72HBD-425M)

Current-Voltage Curve (LR4-72HBD-435M)

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V10

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SEAL:

STEPHEN A. BRAY
 PROFESSIONAL ENGINEER
 CT LICENSE: 26657

KMB DESIGN GROUP
 kmbdg.com
 1800 ROUTE 14, SUITE 200
 WALL, NJ 07719
 (732) 382-5633
 FOR ALL QUESTIONS, PLEASE CONTACT
 STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020
 PROJECT #: 2000500
 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI


TITLE:
**SPECIFICATION SHEET
 MODULE**

SHEET:
E-800

REFERENCE INVERTER SPECIFICATION SHEET

SUNGROW

SG2500U
Turnkey Station for North America 1500 Vdc System



High Yield

- Advanced three-level technology, max. efficiency 98.8%, CEC efficiency 98.5%
- Effective cooling, 1.1 overload capacity, no derating up to 122°F
- Max. DC/AC ratio more than 1.5

Easy D&M

- Integrated current and voltage monitoring function for online analysis and fast trouble shooting
- Modular design, easy for maintenance
- Convenient external LCD

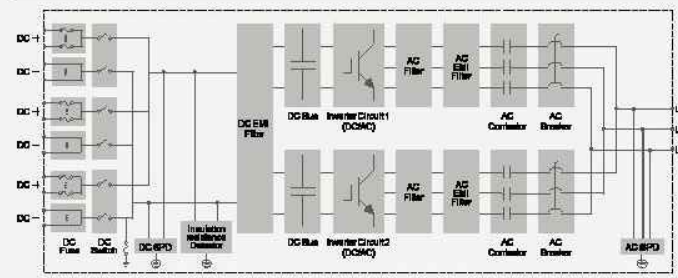
Saved Investment

- Low transportation and installation cost due to 10-foot container design
- 1600V DC system, low system cost
- Integrated LV auxiliary power supply

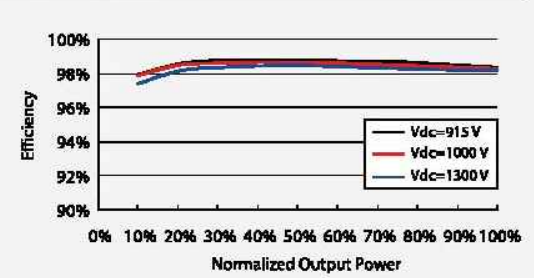
Grid Support

- Complies with UL 1741, UL 1741 SA, IEEE 1547, Rule 21 and NEC 2014/2017
- Grid support including LHVRT, LHVRT, power ramp rate control, active and reactive power support

Circuit Diagram



Efficiency Curve



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Input (DC)	SG2500U
Max. PV input voltage	1500V
Min. PV input voltage / Startup input voltage	800 V / 840 V
MPP voltage range for nominal power	800 – 1300 V
No. of independent MPP inputs	1
No. of DC inputs	18 – 21
Max. PV input current	3509 A
Max. DC short-circuit current	4900 A
PV array configuration	Negative grounding

Output (AC)	SG2500U
AC output power	2750 kVA @ 45 °C (113 °F) / 2500 kVA @ 50 °C (122 °F)
Max. AC output current	2808 A
Nominal AC voltage	550 V
AC voltage range	484 - 605 V
Nominal grid frequency / Grid frequency range	60 Hz / 55 – 65 Hz
THD	< 3% (at nominal power)
DC current injection	< 0.5 % I _n
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / Connection phases	3 / 3

Protection	SG2500U
DC input protection	Load break switch + fuse
AC output protection	Circuit breaker
Overvoltage protection	DC Type II / AC Type II
Grid monitoring / Ground fault monitoring	Yes / Yes
Insulation monitoring	Optional
Night SVQ function	Optional
Overheat protection	Yes

General Data	SG2500U
Dimensions (W*H*D)	2991*2850*2438 mm 117.8"*114.0"*96.0"
Weight	8.9 T 19211.8 lb
Isolation method	Transformerless
Degree of protection	NEMA 3R
Auxiliary power supply	120 Vac, 5 kVA / Optional: 480 Vac, 30 kVA
Operating ambient temperature range	-30 to 60 °C (> 50 °C derating) -22 to 140 °F (> 122 °F derating)
Allowable relative humidity range (non-condensing)	0 – 95 %
Cooling method	Temperature controlled forced air cooling
Max. operating altitude	4000 m (> 2000 m derating) 13123 ft (> 6581 ft derating)
Display	Touch screen
Communication	Standard: RS485, Ethernet; Optional: optical fiber
Compliance	UL 1741, IEEE 1547, UL 1741 SA, NEC 2014/2017
Grid support	Night SVQ function (optional), LHVRT, LHVRT, active & reactive power control and power ramp rate control, Volt-var, Frequency-wait

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15

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Stephen A. Bray
PROFESSIONAL ENGINEER
CT LICENSE: 26557



DATE: **03/09/2020**

PROJECT #: **2000500**


DRAWN BY: **V. PISSAREVSKI**

CHECKED BY: **R. VUDI**

TITLE:
**SPECIFICATION SHEET
INVERTER**

SHEET:
E-801

REFERENCE TRACKER SPECIFICATION SHEET




MECHANICAL SYSTEMS OVERVIEW

COMPONENT DATA SHEET

With over 5GW of solar trackers delivered on five continents, NEXTracker's NX Horizon™ is the world's leading single-axis tracker. The NX Horizon is a self-powered, decentralized tracking system where each row is independent of one another - an industry first. Prior to this pioneering innovation, single-axis trackers included a drive shaft connecting each row, which impeded overall operations and maintenance of solar power plants. For NX Horizon, each row is driven by a brushless DC motor coupled to a slew gear. Power for the motor is provided by our patent-pending Self-Powered Controller (SPC) and a dedicated PV module.

BRUSHLESS DC MOTOR SPECIFICATIONS

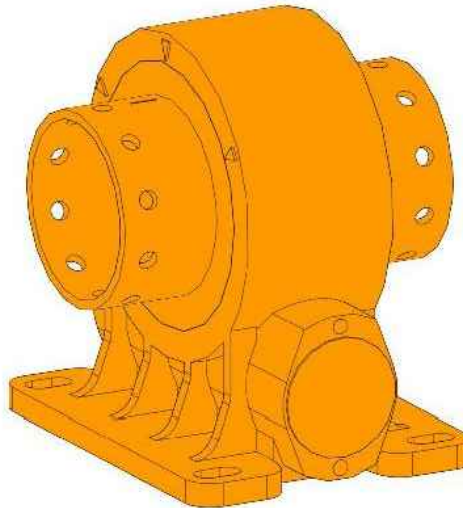
MECHANICAL		POWER RATINGS	
Protection Class	IP 65	Nominal Voltage	24 V DC
Isolation Class	EN62114 (120C)	Motor Continuous Current (85C)	< 6.25 A
Certification	UL 1004-1	No load Current at 24VDC (85C)	< 1 A
Operating Temperature	-40°C to 85°C	Max Power at Rated Torque	150 W
Motor Type	Brushless		
Weight	1.7kg	OUTPUT	
Relative Humidity	0-95%	Rated Gear Output Torque	150 N-m
		(1 hr. continuous)	



BRUSHLESS MOTOR

SLEW GEAR SPECIFICATIONS

MECHANICAL	
Protection Class	IP 55 per IEC60529
Ambient Temp. Range	-40C to 60C
Housing Material	Ductile Iron
Rotation Range	±65°
Weight	77.5kg



SLEW GEAR

The NX Horizon slew gear is a single stage, worm gear speed reducer. The slew gear is designed to adjust the tracker tilt position to follow the sun each day, as well as hold the tracker position fixed during periods of wind stow. The brushless motor is directly coupled to the input worm shaft of the slew gear, with the tracker torque tubes permanently connected to the output collars. The slew gear is sealed and requires no scheduled maintenance for the life of the product.



NX Horizon Solar Tracker
UL 2703 & 3703 Certified

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6200 Paseo Padre Parkway | Fremont, CA 94555 | USA | +1 510 270 2500 | nextracker.com Document Number: PDM-000106 Revision: A

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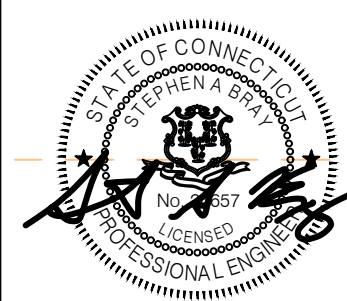



ENERPARC INC.
1999 Harrison St, Ste 830
Oakland, CA 94612, USA

PROJECT NAME:
NORTH STONINGTON

PROJECT ADDRESS:
ELLA WHEELER RD,
NORTH STONINGTON, CT 06359
41°25'9.71"N, 71°50'4.83"W

SEAL:





1800 ROUTE 14, SUITE 200
WALL, NJ 07719
(732) 395-5433
FOR ALL QUESTIONS, PLEASE CONTACT
STEVE FOX - PROJECT MANAGER

DATE: 03/09/2020

PROJECT #: 2000500

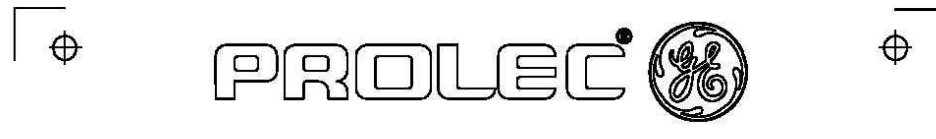
DRAWN BY: V. PISSAREVSKI

CHECKED BY: R. VUDI

TITLE: SPECIFICATION SHEET TRACKER

SHEET: E-802

REFERENCE TRANSFORMER NAMEPLATE READING



3 PHASE PADMOUNTED TRANSFORMER CLASS KNAN
 65°C RISE 60HERTZ MFG DATE SER

kVA 2750 IMPEDANCE @ 65°C RATED VOLTS %
 HV 13800 ORDER NUM RIBS13
 LV 550Y/317 BL HV 95 BL LV 30 MAT HV AI MAT LV AI

FUSERS	CAT. No.	MANUFACTURER
EXP	9F58AM0402	GE
CLF	9F58CB0150	MERSEN

STEP-UP OPERATION
 GALLONS OF NATURAL ESTER 631

MASS	kg	pounds
CORE & COIL WINDING (HEAVIEST PART)	3016	6647
TANK	2024	4460
LIQUID NATURAL ESTER	2155	4749
TOTAL WT	7195	15856

TAP CHANGER	VOLTAGE	65°C AMPS
1/A	14490	109.6
2/B	14145	112.2
3/C	13800	115.1
4/D	13455	118.0
5/E	13110	121.1

PHASOR DIAGRAM
 H1 H2 H3 X1 X2 X3

CONNECTION DIAGRAM
 H1A H1B H2A H2B H3A H3B X1 X2 X3

UL LISTED

MAXIMUM OPERATING PRESSURES OF LIQUID PRESERVATION SYSTEM: 40 PSI (2.76 bar) POSITIVE AND 34 PSI (2.34 bar) NEGATIVE
 FILL CHECKED FOR LEAKS BY 90 PSI (6.2 bar) PRESSURE
 LIQUID LEVEL BELOW TOP SURFACE OF THE HIGHEST POINT OF ANY INSULATED TERMINAL BLANKS AT 20°C IS 200 mm (7.9 in)
 LEAK TEST CHECKS 11 mm (0.43 in) PER CHANGE IN TEMPERATURE
 PERMANENT PRESSURE SYSTEMS: NONE AT RATED VOLTAGE AT 20°C MIN
 CONTAINS NO DETECTABLE LEVEL OF POT (LESS THAN 1 PPM) AT THE TIME OF MANUFACTURE
 MADE IN MEXICO PROLEC DE INTERNACIONAL S. DE RL. DE C.V. www.prolec.com

IMPEDANCE MEETS ANSI STANDARDS WITH TOLERANCE OF +/-7.5%
 ACTUAL TESTED IMPEDANCE WILL BE STAMPED ON NAME PLATE

Draftsman: AJM	Customer/Project Name: SUNGROW USA CORPORATION	Calc. Number:
Reviewer: BDM	Title: NAMEPLATE	
App: BDM	Description: 2750 KVA, 3 PHASE, 60 HERTZ, 13800-5500Y/317 VOLT 65 °C RISE LIQ. - REC. COOLING WIND	
Sheet 1 of 1	PROLEC GE logo	DRAWING NUMBER: RII513COA
Rev. 0		

REV	DESCRIPTION	DATE
A	INITIAL 10% SET SUBMISSION	01/10/20
B	UPDATED LAYOUT PER SITING PLAN	03/05/20
C	UPDATED LAYOUT WITH LONGI 435	03/30/20
D	UPDATED LAYOUT WITH 33% GCR	04/06/20
E	UPDATED LAYOUT PER COMMENTS	4/12/20
F	60% DESIGN SET	4/16/20
G	RE-SUBMITTED 60% DESIGN SET	5/10/20
H	90% DESIGN SET	5/18/20
0	ISSUE FOR PERMIT SET	5/28/20
-	-	-

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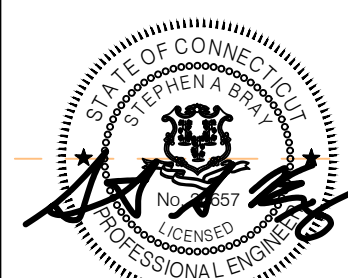


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SEAL:



Stephen A. Bray
 PROFESSIONAL ENGINEER
 CT LICENSE: 26657



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 DRAWN BY: V. PISSAREVSKI
 CHECKED BY: R. VUDI

TITLE:
**SPECIFICATION SHEET
 TRANSFORMER**

SHEET:
E-803