LODESTAR ENERGY

November 25, 2020

VIA ELECTRONIC DELIVERY

Attorney Melanie Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Petition 1412 – LSE Phoenix LLC ("Lodestar") for a Declaratory Ruling that No Certificate of Environmental Compatibility and Public Need is Required for the Construction, Operation and Maintenance of Solar Photovoltaic Facility in North Canaan, Connecticut

Dear Attorney Bachman:

In connection with the above-captioned petition, please find attached the following:

1. Smooth green snake planting plan as required by condition #3 of approval; and

2. Final electrical design drawings as required by condition #5 of approval.

Petitioner believes that, with these submissions, it has satisfied the conditions of its Council approval dated August 28, 2020. Please let me know if you have any questions.

Sincerely,

Carrie L. Ortolano

Enclosures

Planting Plan for the State Listed Smooth Greensnake

Lodestar Energy, LLC
North Canaan Solar Facility
100 Sand Road, North Canaan, Connecticut
NDDB Preliminary Assessment No.: 201913244

Prepared by Dennis P. Quinn
Quinn Ecological, LLC
November 2020

Smooth greensnakes (*Opheodrys vernalis*) are a grassland/early successional meadow dependent species. Because no greensnakes were detected during survey efforts the purpose of this planting plan is to maintain (not modify) the current site conditions to the greatest extent possible.

It is recommended that early successional habitat be maintained in open areas around the periphery of the solar installation and under solar panels to the greatest extent possible. These areas should be planted with New England Conservation/Wildlife Seed Mix (Table 1).

To maintain the early successional state of these habitat areas, an annual mowing cycle is recommended during the greensnakes dormancy period between November 15 and March 1.

Table 1. New England Conservation/Wildlife Seed Mix	
Common Name	**Botanical Name**
Virginia Wild Rye	*Elymus virginicus*
Little Bluestem	*Schizachyrium scoparium*
Big Bluestem	*Andropogon gerardii*
Red Fescue	*Festuca rubra*
Switch Grass	*Panicum virgatum*
Partridge Pea	*Chamaecrista fasciculata*
Panicledleaf Tick Trefoil	*Desmodium paniculatum*
Indian Grass	*Sorghastrum nutans*
Blue Vervain	*Verbena hastata*
Butterfly Milkweed	*Asclepias tuberosa*
Black Eyed Susan	*Rudbeckia hirta*
Heath Aster	*Aster pilosum*
Common Sneezeweed	*Helenium autunale*
Early Goldenrod	*Solidago juncea*
Upland Bentgrass	*Agrostis perennans*

7½"

DANGER
PV SYSTEM
AC DISCONNECT
HIGH VOLTAGE-KEEP AWAY
AUTHORIZED PERSONNEL ONLY
TURN OFF INVERTER PRIOR TO OPERATING AC DISCONNECT

3" — A

3½"

WARNING
PV SYSTEM
DISCONNECT SWITCH
ELECTRIC SHOCK HAZARD
TERMINALS ON THE LINE
AND LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

2" — B

6"

PHOTOVOLTAIC
AC DISCONNECT
¼" — 3/16"

AC DISCONNECT RATINGS:
MAXIMUM CURRENT: 2500/3 AMPS/POLE
MAXIMUM VOLTAGE: 600 VOLTS AC

3½" (TYP.) — C

6"

PHOTOVOLTAIC
DC DISCONNECT
¼" — 3/16"

DC DISCONNECT RATINGS:
MAXIMUM SYSTEM VOLTAGE: 1445 VDC
MAX SHORT-CIRCUIT CURRENT: 217 A/POLE

3½" (TYP.) — D

7"

CAUTION: SOLAR CIRCUIT — F

0.5" — 1"

8"

CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED — G

0.5" — 1"

3½"

DANGER
PV SYSTEM
DC DISCONNECT
SWITCH
HIGH VOLTAGE
KEEP AWAY
AUTHORIZED PERSONNEL ONLY

2" — E

4"

INVERTER
INVERTER-"X"

1" — H

3½"

WARNING
ELECTRIC SHOCK HAZARD

UNGROUNDED DC SYSTEM
OPERATING AT 1500 V DC

2" — J

6"

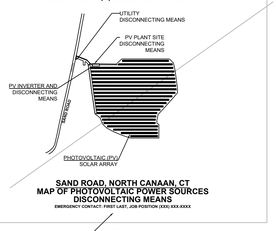
WARNING

THIS PANEL HAS SECONDARY
POWER SOURCE FROM A
PHOTOVOLTAIC SYSTEM

TURN OFF AND LOCKOUT THE
PHOTOVOLTAIC SYSTEM DISCONNECT
PRIOR TO SERVICING PANEL

3½" (TYP.) — K

CAUTION
POWER TO THIS FACILITY IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECT(S) LOCATED AS SHOWN



SAND ROAD, NORTH CANAAN, CT
MAP OF PHOTOVOLTAIC POWER SOURCES
DISCONNECTING MEANS
EMERGENCY CONTACT: FIRST LAST, JOB POSITION (XXX-XXX-XXXX

INFORMATION TO BE PROVIDED BY OWNER — L

PV LABELING KEYNOTES

- A — DANGER LABEL FOR 600V AC DISCONNECTS, ONE PER AC DISCONNECT.
- B — WARNING LABEL FOR PV DISCONNECTS, EQUIPMENT; LABEL ON ALL OPERABLE SWITCHES INCLUDING DC DISCONNECTS, AND AC DISCONNECTION POINTS
- C — AC DISCONNECT LABEL WITH SYSTEM SPECIFICATIONS APPLIED TO ALL PHOTOVOLTAIC DISCONNECTS. EACH SWITCH WILL HAVE A UNIQUE LABEL. SEE AC DISCONNECT LABELING CHART FOR CURRENT AND VOLTAGE VALUES FOR EACH DISCONNECT.
- D — PHOTOVOLTAIC DC DISCONNECT OPERATING SPECIFICATIONS LABEL APPLIED TO ALL DC DISCONNECTS. EACH SWITCH WILL HAVE A UNIQUE LABEL. SEE DC DISCONNECT LABELING CHART FOR CURRENT AND VOLTAGE FOR EACH DISCONNECT.
- E — DC DISCONNECT GENERIC WARNING APPLIED TO ALL DC DISCONNECT SWITCHES. DISREGARD IF MANUFACTURER INCLUDES WARNING LABEL.
- F — WARNING LABEL FOR CONDUITS, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES AND JUNCTION/PULL BOXES
- G — WARNING LABEL FOR MAIN DISCONNECT (TO BE MADE WITH REFLECTIVE MATERIAL).
- H — EACH INVERTER SHALL BE LABELED WITH ITS INVERTER IDENTIFICATION NUMBER.
- J — GROUND FAULT WARNING LABEL APPLIED TO ALL INVERTERS.
- K — WARNING LABEL FOR PV ELECTRICAL PANEL PV-AC-1
- L — PLACARD TO BE PLACED ON WOOD POLE UNDER MAIN SERVICE DISCONNECT (TO BE MADE WITH REFLECTIVE MATERIAL).

PV LABELING GENERAL NOTES

1. LABELS AND MARKINGS SHALL BE APPLIED BUT NOT LIMITED TO ENCLOSURE OR COVERS OF PULL BOXES, JUNCTION BOXES AND CONDUIT BODIES PER THE REQUIREMENTS OF NEC 690 PART IV.
2. SOLAR MODULES ARE SUPPLIED FROM THE MANUFACTURER WITH MARKINGS PRE-APPLIED TO MEET THE REQUIREMENTS OF NEC.
3. TEXT LABELS WILL BE ETCHED WITH WHITE GRAPHICS ONTO 1/16" RED PLASTIC PLACARDS. THE LABEL WILL BE ATTACHED TO THE APPROPRIATE COMPONENT ENCLOSURES IN CONSPICUOUS PLACES USING TWO PART EPOXY.
4. EACH INVERTER SHALL BE LABELED WITH ITS INVERTER IDENTIFICATION NUMBER ETCHED WITH WHITE GRAPHICS ONTO 1/8" RED PLASTIC PLACARDS.

PV PLAN AND RISER KEYNOTES

1. NOT USED
2. GROUP OF (16) INVERTERS MOUNTED TO GALVANIZED STEEL UNI-STRUT STRUCTURE AND STAINLESS STEEL HARDWARE. SEE DETAIL ON E-3. COORDINATE FINAL LOCATION IN FIELD.
3. COMBINER MOUNTED TO GALVANIZED STEEL UNI-STRUT STRUCTURE AND STAINLESS STEEL HARDWARE. COMBINER SHALL BE AT LEAST 24" ABOVE GRADE AND MOUNTED TO SIDE OR BACK OF RACKING. COORDINATE PRECISE LOCATION IN FIELD.
4. 2#10 PV WIRE MOUNTED TO PV RACKING AND CONNECTED TO PV MODULE. PROVIDE MC4 FITTINGS AS REQUIRED. PROVIDE EQUIPMENT GROUNDING. PROVIDE #10 EGC IN CONDUIT OR #6 EGC WHEN EXPOSED & VULNERABLE TO POTENTIAL DAMAGE.
5. #8 AWG COPPER BONDING JUMPER BETWEEN RACKING SYSTEMS
6. 2#10 + 1#10 GND PV WIRE, SLEEVE IN CONDUIT TO COMBINER BOX. PROVIDE WEATHER HEAD AT TOP OF RACKING SIDE CONDUIT TO PREVENT WATER BUILDUP WITHIN CONDUIT. PROVIDE BUSHINGS AND EQUIPMENT GROUND BAR WITHIN JBOX.
7. DIRECT BURIED FEEDERS TO INVERTER. REFER TO FEEDER SCHEDULE.
8. TYPICAL PV MODULE MOUNTED TO RBI GROUND MOUNTED RACKING SYSTEM. PROVIDE EQUIPMENT GROUNDING AS REQUIRED BY NEC.

FEEDER SCHEDULE

FEEDER NAME	Voc MAX	Voc MAX (WARM TEMP)	Impp MAX	LENGTH	FEEDER SIZE	VOLTAGE DROP AT Voc MAX
FA	1445 V.	896 V.	173.3 A.	415'	2#350 KCMIL & #1/0 EGC.	1.21%
FB	1445 V.	896 V.	173.3 A.	340'	2#350 KCMIL & #1/0 EGC.	1.09%
FC	1445 V.	896 V.	173.3 A.	220'	2#350 KCMIL & #1/0 EGC.	0.90%
FD	1445 V.	896 V.	173.3 A.	145'	2#350 KCMIL & #1/0 EGC.	0.78%
FE	1445 V.	896 V.	174.2 A.	120'	2#350 KCMIL & #1/0 EGC.	0.74%
FF	1445 V.	896 V.	174.2 A.	95'	2#350 KCMIL & #1/0 EGC.	0.70%
FG	1445 V.	896 V.	174.2 A.	80'	2#350 KCMIL & #1/0 EGC.	0.68%
FH	1445 V.	896 V.	174.2 A.	60'	2#350 KCMIL & #1/0 EGC.	0.64%
FI	1445 V.	896 V.	174.2 A.	45'	2#350 KCMIL & #1/0 EGC.	0.62%
FJ	1445 V.	896 V.	174.2 A.	50'	2#350 KCMIL & #1/0 EGC.	0.63%
FK	1445 V.	896 V.	174.2 A.	75'	2#350 KCMIL & #1/0 EGC.	0.66%
FL	1445 V.	896 V.	174.2 A.	140'	2#350 KCMIL & #1/0 EGC.	0.76%
FM	1445 V.	896 V.	174.2 A.	175	2#350 KCMIL & #1/0 EGC.	0.84%
FN	1445 V.	896 V.	174.2 A.	245'	2#350 KCMIL & #1/0 EGC.	0.93%
FO	1445 V.	896 V.	174.2 A.	265'	2#350 KCMIL & #1/0 EGC.	0.97%
FP	1445 V.	896 V.	174.2 A.	325'	2#350 KCMIL & #1/0 EGC.	1.07%

GENERAL NOTE:
- WIRE SIZES INDICATED SHALL BE DIRECT BURIED ALUMINUM FEEDERS BASED ON SOUTHWIRE 2000 VOLT ALUMINUM TYPE PV (SPEC 45410).
- ASHRAE DATA USED BASED ON HARTFORD BRADLEY INTERNATIONAL AIRPORT; HIGH TEMP 35 DEGREE C, LOW TEMP -20 DEGREE C.
- 'FX' FEEDER FROM CORRESPONDING 'CX' COMBINER TO 'IX' INVERTER

INVERTER SCHEDULE: IA THRU IP

MANUFACTURER & MODEL	OUTPUT CURRENT	OUTPUT POWER	MPPTV	WARRANTY
SUNGLOW SG125HV	120A	125KW	860-1250	5 YEARS

1. INVERTERS MEET UL1741 TO AUTOMATICALLY DISCONNECT FROM THE ELECTRIC UTILITY GRID UPON LOSS OF UTILITY POWER.
2. PROVIDE WITH FACTORY SURGE PROTECTION OPTION, INTEGRAL TO INVERTER.

COMBINER SCHEDULE: CA THRU CP

MANUFACTURER & MODEL	NUMBER OF INPUTS	INPUT FUSE	NEMA RATING	WARRANTY
SOLECTRIA XGI 1500 REMOTE COMBINER	20	20 AMP	4X	5 YEARS

1. PROVIDE WITH FACTORY INSTALLED SURGE PROTECTION DEVICE.
2. PROVIDE WITH DC DISCONNECT

PV MODULE SCHEDULE

MANUFACTURER & MODEL	Pmax(STC)	Voc	Vmp	Imp	Isc
JA SOLAR JAM72S09-395/PR	395W	49.64V	40.48V	9.76A	10.27A

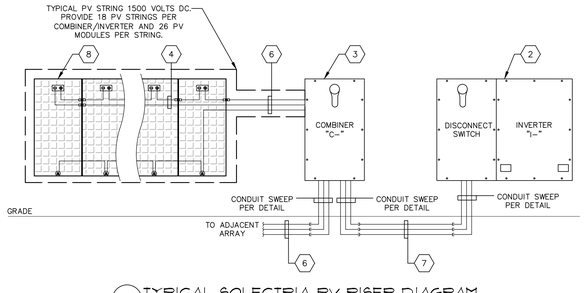
1. MODULE ATTRIBUTES:
   A. DIMENSIONS: 79.3" X 39.4" X 1.38
   B. WEIGHT: 51.8 LBS
   C. EFFICIENCY: 395 W - 19.8%

ELECTRICAL PV SYMBOL LIST

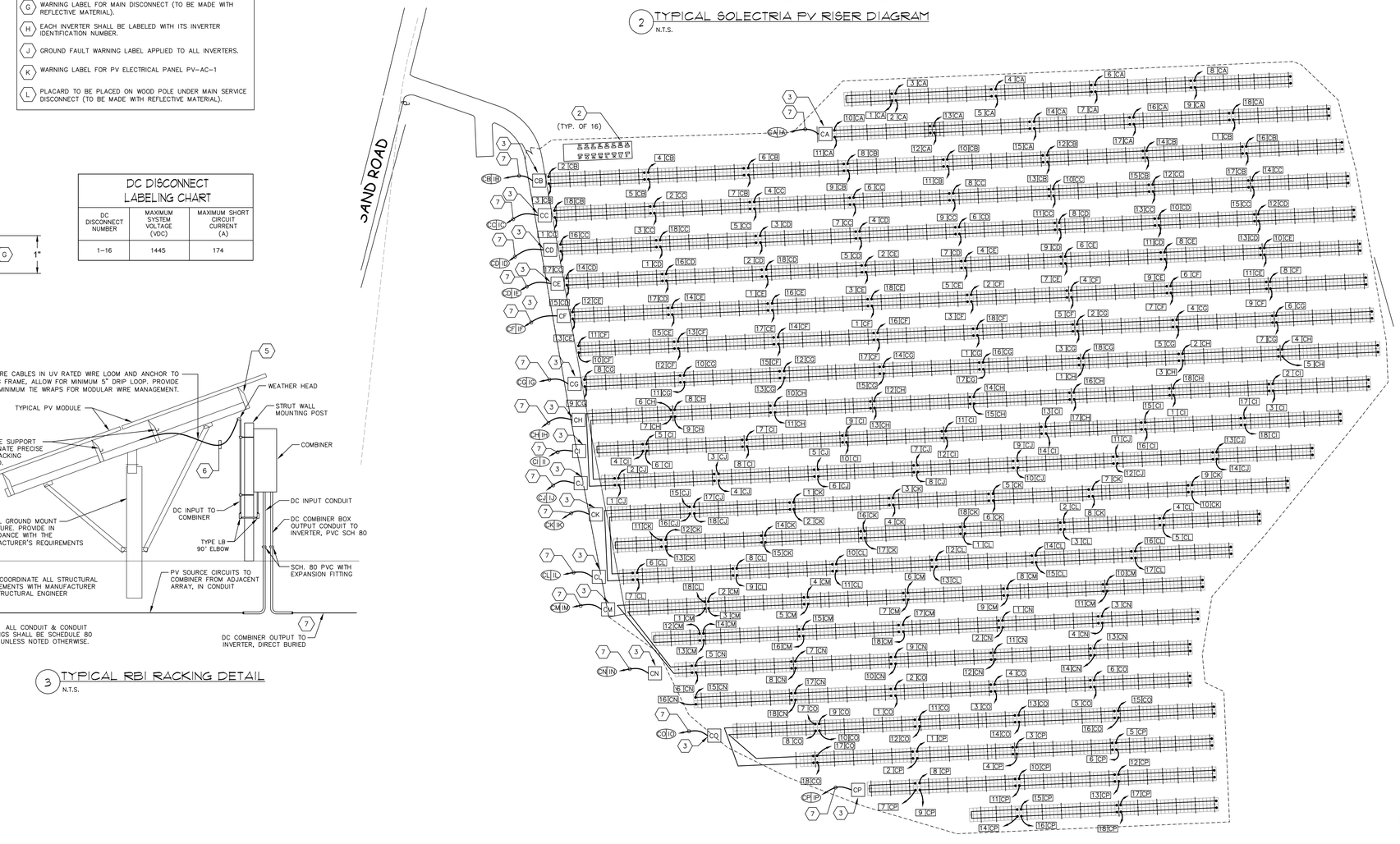
SYMBOL	DESCRIPTION
C–	COMBINER BOX. REFER TO COMBINER BOX SCHEDULE
I–	INVERTER. REFER TO INVERTER SCHEDULE
	PV WIRING HOME RUN: WIRING TO EQUIPMENT INDICATED.
PV STRING AND COMBINER LABEL	PV COMBINER / PV STRING
PV COMBINER AND INVERTER LABEL	PV INVERTER / PV COMBINER
OR OR	PV MODULE SHOWN DIAGRAMMATICALLY CONNECTED TO PV STRING. PROVIDE PV STRING CONFIGURATION IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS.
OR	PV MODULE MOUNTED TO GROUND MOUNTED RACKING SYSTEM. CONNECT TO COMBINER/INVERTER INDICATED

WARNING - UNDERGROUND UTILITIES

THE CONTRACTOR IS TO BE FULLY RESPONSIBLE FOR CONTACTING THE LOCAL CABLE TELEVISION COMPANY, POWER COMPANY, TELEPHONE COMPANY, GAS COMPANY, WATER AND SEWER COMPANY AND ANY OTHER UTILITY COMPANY WITHIN THE AREA PRIOR TO PROCEEDING WITH ANY EXCAVATION. BY LAW, THE CONTRACTOR IS REQUIRED TO CALL BEFORE DOING ANY EXCAVATION, DIGGING HOLES OR DRIVING POSTS REGARDLESS OF WHETHER IT IS WITHIN THE STREET LINE OR ON PRIVATE PROPERTY. OBTAIN INFORMATION REGARDING THE EXISTENCE AND LOCATION OF ANY UNDERGROUND FACILITIES BY CALLING 1-800-922-4455. ALL DIRECT BURIED CONDUCTORS SHALLBE INSTALLED IN ACCORDANCE WITH THE NEC AND PER THE CONDUCTOR MANUFACTURER'S EQUIPMENT.



2 TYPICAL SOLECTRIA PV RISER DIAGRAM
N.T.S.



1 PV SITE PLAN
1"=40'-0"

3 TYPICAL RBI RACKING DETAIL
N.T.S.

DC DISCONNECT LABELING CHART

DC DISCONNECT NUMBER	MAXIMUM SYSTEM VOLTAGE (VDC)	MAXIMUM SHORT CIRCUIT CURRENT (A)
1–16	1445	174

CES
Consulting Engineering Services, Inc.
811 Middle Street
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Fax. (860) 632-1708
CES #2020274.00

LODESTAR ENERGY

SAND ROAD
NORTH CANAAN, CT 06018

REVISIONS

NO.	DATE	DESCRIPTION

SAND ROAD SOLAR

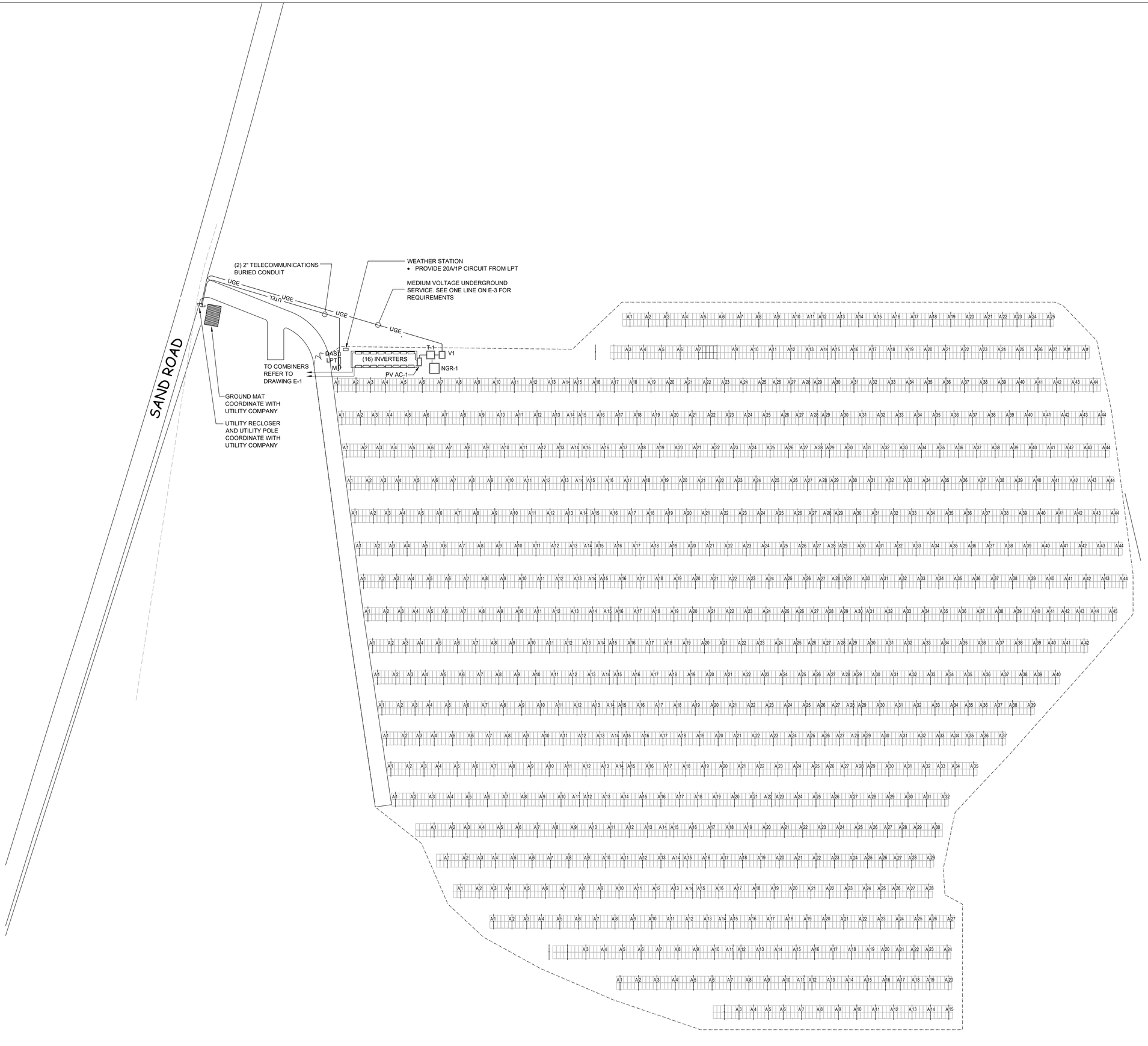
SAND ROAD
NORTH CANAAN, CONNECTICUT

PV SITE PLAN

DATE: 11/20/2020
PROJECT NO: 2018-059
DRAWN: AOK
CHECKED: SAS
ISSUED FOR: PERMIT
REVISIONS:

SHEET NO.

E-1



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SAND ROAD
NORTH CANAAN, CT 06018

REVISIONS		
NO.	DATE	DESCRIPTION

SAND ROAD SOLAR

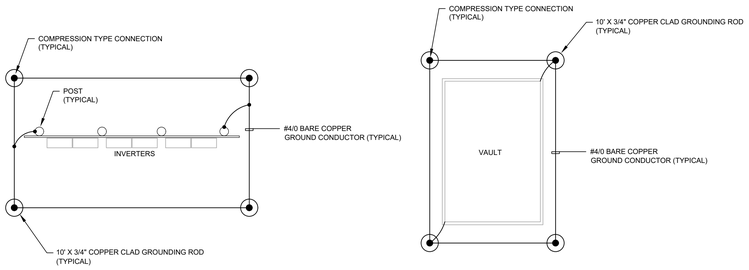
SAND ROAD
NORTH CANAAN, CONNECTICUT

ELECTRICAL SERVICE SITE PLAN

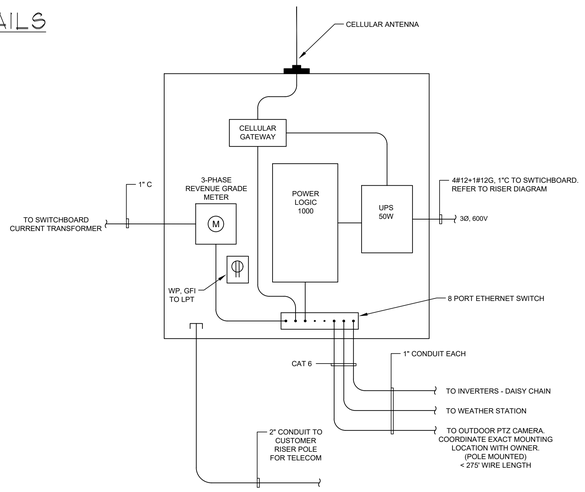
DATE:	11/20/2020
PROJECT NO:	2018-059
DRAWN:	BCC
CHECKED:	SAS
ISSUED FOR:	PERMIT
REVISIONS:	-

SHEET NO.

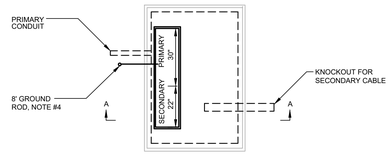
E-2



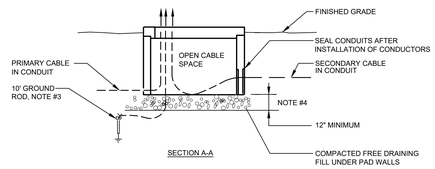
2 GROUNDING DETAILS
SCALE: N.T.S.



3 ENERGY DATA ACQUISITION SYSTEM (DAS) DETAIL
SCALE: N.T.S.



PLAN VIEW

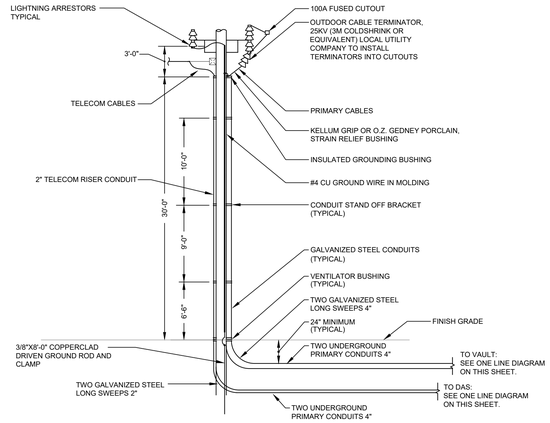


SECTION A-A

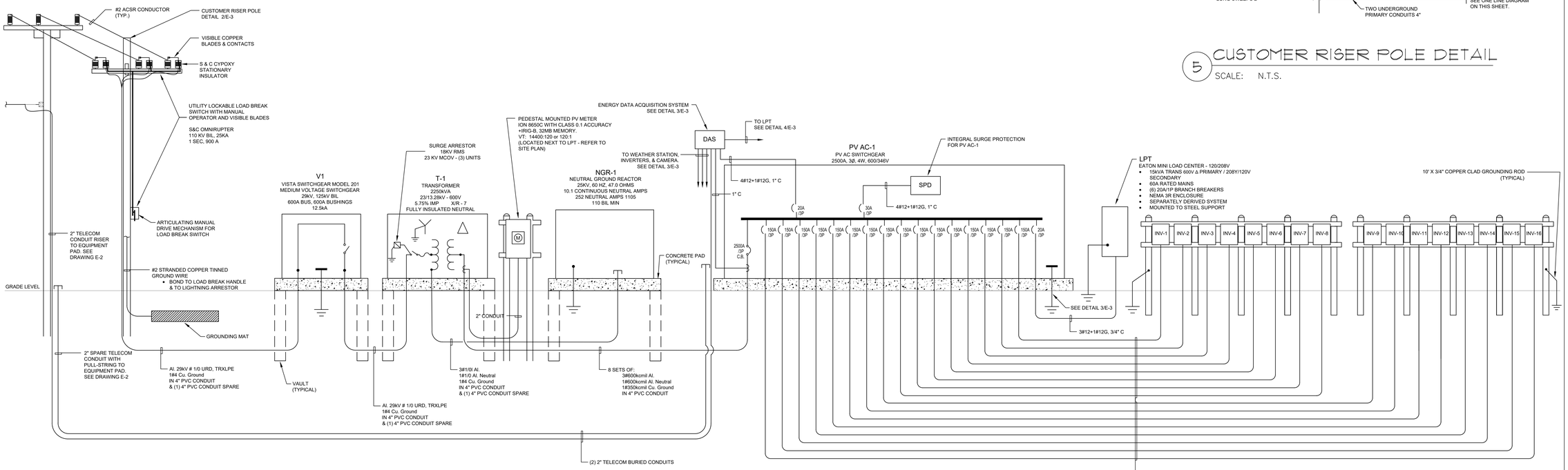
NOTES

1. PRIMARY CABLE
   A. INSTALL DIRECT BURIED CABLES A MINIMUM OF 30" BELOW GRADE.
   B. INSTALL CABLES IN CONDUIT A MINIMUM OF 24" BELOW GRADE.
   C. LOOP CABLES IN CABLE PIT BEFORE MAKING CONNECTIONS.
2. SECONDARY CABLE - LEAVE SLACK FOR FUTURE RECONNECTING TO TRANSFORMERS WITH HIGHER SECONDARY TERMINALS.
3. 3/4" COPPER GROUND ROD - INSTALL IN TRENCH AND CONNECT A #2 COPPER CONDUCTOR FROM ROD THROUGH PAD OPENING AND EXTENDING 5' ABOVE PAD.
4. THE EXCAVATION FOR THE PAD SHALL BE CARRIED TO A DEPTH OF 12" BELOW THE BOTTOM OF THE PAD WALLS. THE BACKFILL UNDER THE PAD WALLS SHALL BE A CLEAN GRAVEL, FREE OF FOREIGN MATTER AND CONSTRUCTION DEBRIS, AND IN ACCORDANCE WITH CONNECTICUT DOT SPEC M.02.06 GRADING "A". OR MASSACHUSETTS DPW SPEC M1.03.0 TYPE B. BACKFILL SHALL BE PLACED IN 6" LAYERS AND COMPACTED WITH MECHANICAL TAMPERS TO NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY STANDARD COMPACTION TESTS, AASHTO T180 OR ASTM D698.

4 CONCRETE TRANSFORMER PAD DETAIL
SCALE: N.T.S.



5 CUSTOMER RISER POLE DETAIL
SCALE: N.T.S.



1 ELECTRICAL ONE LINE DIAGRAM
SCALE: N.T.S.

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SAND ROAD SOLAR

SAND ROAD
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ELECTRICAL DETAILS

DATE: 11/20/2020
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SHEET NO.

E-3