EAST HADDAM INLAND WETLANDS AND WATERCOURSES COMMISSION
LAND USE OFFICE
(860) 873-5031
HOURS: Mon., Wed., & Thurs. 9 a.m.-4 p.m. / Tues. 9 a.m.-7 p.m. / Fri. 9 a.m.-12 NOON

APPLICATION FOR PERMIT

PROCEDURE:

PERMITS: Pursuant to sections 22a, 36 through 22a, 45 of the Connecticut General Statutes, the Inland Wetlands and Watercourses Commission shall approve, issue with modifications or deny permits for all activities in areas with soil types designated as poorly drained, very poorly drained, alluvial and flood plain; or within the regulated area.

WHO MAY APPLY: Application must be made by the property owner of record or the duly authorized agent of such owner, such authorization shall be in writing.

SUBMISSION OF APPLICATION: A complete application shall consist of:

1. The completed application form
2. Site Plan
3. Fee: (See attached fee schedule) ($60.00 goes to DEP - P.A. 92-235)
4. The Commission may require additional information as it deems necessary. (The applicant should understand that this application is to be considered complete only when all information and documents required by the Commission have been submitted.)

DATE OF RECEIPT: The date of receipt shall be the date of the next regularly scheduled meeting or thirty-five (35) days from the date of the application, whichever is sooner.

PUBLIC HEARING: All public hearings shall commence no later than sixty-five (65) days after receipt of an application, the hearing shall be completed within thirty-five (35) days of its commencement, and action shall be taken within thirty-five (35) days of its commencement. In the absence of a public hearing, action shall be within sixty-five (65) days from the date of receipt. The applicant may consent to one or more extension of the periods provided the total extension of all such periods shall not be for longer than sixty-five (65) days.

APPEAL: Any person aggrieved by any order, decision or action may, within fifteen (15) days after publication of such order, decision or action, appeal to the Superior Court for Middlesex County.

THE APPLICATION SHOULD BE SUBMITTED FOURTEEN (14) DAYS PRIOR TO ITS REGULAR MEETING IN ORDER FOR THE APPLICATION TO BE REVIEWED IN THE FIELD - WEATHER AND TIME PERMITTING.

THE APPLICANT SHOULD BE FAMILIAR WITH THE INLAND WETLANDS AND WATERCOURSES COMMISSION REGULATIONS, REVISED OCTOBER 1, 2004.

IWWC-W-21-17
11/16/21

II. EAST HADDAM INLAND WETLANDS AND WATERCOURSES COMMISSION APPLICATION FORM **Please fill out all pages**

DATE RECEIVED _____ **FEE RECEIVED** 135.00 - 10/28/21

NAME OF APPLICANT Robin Klein

HOME ADDRESS _____ **PHONE** 617-653-9307

BUSINESS ADDRESS 5 A St. Auburn, Ma 01501 **PHONE** 617-653-9307

RECORD OWNER Gary Bogan

HOME ADDRESS 26 Grist Mill Rd. East Haddam, Ct. 06469 **PHONE** _____

BUSINESS ADDRESS _____ **PHONE** _____

APPLICANT'S INTEREST IF NOT THE OWNER Contractor

PROPERTY LOCATION
26 Grist Mill Rd.
East Haddam, CT 06469

ASSESSOR'S MAP NO. _____ **LOT NO.** _____ **LOT SIZE** _____

THE PURPOSE AND A DESCRIPTION OF THE PROPOSED ACTIVITY
Install ground mounted solar array of 24 panels with 448.88 S.F. @ 9.12 kW DC with a 10' trench involved

ACREAGE OF WETLANDS AND WATERCOURSES PROPOSED TO BE ALTERED
_____ **ACRES or** _____ **SQUARE FEET**

ACREAGE OF UPLAND REVIEW AREA PROPOSED TO BE ALTERED
_____ **ACRES or** _____ **SQUARE FEET**

SOIL TYPE (S) _____ **ACRES or** _____ **SQUARE FEET**

LINEAL FEET OF STREAM ALTERATION PROPOSED _____ **FEET**

ACREAGE OF WETLANDS OR WATERCOURSES CREATED _____ **ACRES or** _____ **SQUARE FEET**

____Yes ___ No Is work proposed in or near (400 ft) of the vernal pool area? (If yes see and fill out forms in Appendices C&D)

____ Are all erosion and sediment control measures clearly drawn on the map(s) and described in the narrative?

____Other management practices and mitigation measures which may be considered as a condition of issuing a permit for the proposed regulated activity including, but not limited to, measures to
(1) prevent or minimize pollution or other environmental damage,

(2) maintain or enhance existing environmental quality, or

(3) in the following order of priority: restore, enhance and create productive wetlands

____Alternatives considered and subsequently rejected by the applicant and why the alternative as set forth in the application was chosen; all such alternatives shall be diagramed on a site plan or drawing.

____ Site plans showing the existing condition and the proposed activity in relation to wetlands and watercourses and identifying any further activities associated with, or reasonably related to, the proposed regulated activity which are made inevitable by the proposed regulated activity and which may have an impact on wetlands or watercourses;

____ A description of the proposed construction or the erection of structures on the affected property, including blueprints, engineering and architectural plans or designs, where available or reasonably attainable. Such descriptions shall include the purposes of such construction or activity.

____ Names and mailing addresses of adjacent landowners within 100 feet of all property lines. Supply on a separate sheet.

____ A completed DEP reporting form; the Agency shall revise or correct the information provided by the applicant and submit the form to the Commissioner of Environmental Protection in accordance with Section 22a-39-14 of the Regulations of Connecticut State Agencies;

____ Any other information the Agency deems necessary to the understanding of what the applicant is proposing; and

____ Submission of the appropriate filing fee based on the fee schedule established in the Town of East Haddam Ordinance Book and listed in Appendix F of these regulations;

____ For subdivision and resubdivision applications, the applicant shall submit an application that includes all of the criteria for a complete Planning and Zoning application, including the mapping and narrative in the Four Step Process to create a Subdivision required in Section 3 of the East Haddam subdivision Regulations.

I, the undersigned, under penalties of false statement, hereby certify,

1) that the information supplied herein is accurate

2) that I am familiar with the Inland/Wetlands Regulations of the Town of East Haddam

3) that I will comply with said Inland/Wetlands Regulations in all respects

4) that any permit or approval granted to me is predicated upon this application and all documentation and testimony in support hereof, and that any error, omission, or misrepresentation may be grounds for subsequent rescission or modification of said permits or approval/and

5) I understand that the issuance of this permit shall not be considered to constitute compliance with any other regulation (s), ordinance (s) or law nor relieve the undersigned from the responsibility to obtain any permits hereunder.

Signature of Owner Gary Bogan

Authorized Agent Robin Klein

Date 10/27/21

For Office Use Only:

Date that map (s) and fee are received _____

On-Site Inspection Date _____

Additional Notes _____

NO FEWER THAN TEN (10) COPIES OF PROPOSED PLANS SHALL BE SUBMITTED FOR REVIEW. (LESS MAY BE SUBMITTED IF APPROVAL BY THE INLAND WETLANDS AND WATERCOURSE COMMISSION ENFORCEMENT OFFICER)

Appendix E Fee Schedule

A. **Permits**

1. Residential accessory buildings, and uses

a. Declaratory Ruling – permitted uses.....	0
b. Summary Ruling...(application)	$75
c. Plenary Ruling (when a public hearing is involved)	$200
Also, per every 100 square feet of disturbed regulated area (wetlands and watercourses) in which an activity is proposed.	$50

2. Residential - New house or major reconstruction.
Major reconstruction is considered work valued at 50% or greater of the present structure

a. Declaratory permitted uses	0
b. Summary Ruling (application)	$75
c. Plenary Ruling (when a public hearing is involved)	$200
Also, per every 100 square feet of proposed disturbance in the upland review area (100 feet from the regulated area) in which the activity is proposed.	$25
Per every 100 square feet of disturbance in the regulated area (wetlands and watercourses) in which the activity is proposed.	$50

3. Commercial Use

a. Declaratory Ruling – permitted uses.....	0
b. Summary Ruling	$200
c. Plenary Ruling.....	$300
Also, per every 100 square feet of disturbance in the 100 foot upland review area in which the activity is proposed	$50
Per every 100 square feet of disturbance in the regulated area in which an activity is proposed...	$100
4. Modification of a previous approval.....	$75
5. Wetlands Map Amendments.....	$200

B. Subdivision Review - per lot fee

1. Per lot fee
   a. 2-5 lots..... $100

   b. 6-10 lots..... $200

   c. 11 or more lots..... $300

2. Any activity (ies) requiring permitting will include the following fees.
   a. Per every 100 square feet of proposed disturbance of the 100 foot upland review area in which the activity is proposed. $50

   b. Per every 100 square feet of proposed disturbance of the regulated area in which an activity is proposed. $100

Resubmitted Plans

Each time plans are resubmitted with substantial new and revised information there shall be charged a flat fee charge of $50 per lot re-submittal fee. This flat fee is for the entire proposal and not just for the lots affected.

C. The applicant or the agent shall submit calculations of the area for the amount of work proposed in the upland review area and the regulated area. The Inland Wetlands Enforcement Officer or the Town Engineer will review the calculations.

D. Public Act 235 - per application **$60**

Appendix C - Vernal Pool Inventory Worksheet - please supply one sheet per vernal pool

Applicant name _____

Property address _____

Approximate location of the vernal pool _____

Physical Characteristics

Size of Vernal Pool - Surface area measured from the perimeter of the high water line.

Greater than 2,500 ft² _____

1,000 – 2,500 ft² _____

Less than 1,000 ft² _____

Size of Upland Habitat - Amount of undisturbed forest adjacent to the pool or system. (Intact canopy and natural ground cover)

Greater than 30 acres _____

20 – 30 acres _____

15 – 20 acres _____

Less than 15 acres _____

Road Proximity - Distance to closest road.

Less than 500 feet _____

Greater than 500 feet _____

Greater than 1,000 feet _____

Closest Road Composition

Road is paved _____

Road has curbs _____

Connectivity to other Vernal Pools - Distance to next closest vernal pool.

Less than 500 feet to one other pool _____

Less than 1,000 feet to two or more pools _____

Biological Characteristics

Observation	**(Presence of)**		
Obligate Vertebrate Vernal Pool Species	**Eggs**	**Larvae**	**Adults**
Spotted salamander *(Ambystoma maculatum)*	____	____	____
Jefferson salamander *(Ambystoma jeffersonianum)*	____	____	____
Marbled salamander *(Ambystoma opacum)*	____	____	____
Wood frog *(Rana sylvatica)*	____	____	____
Eastern Spadefoot Toad *(Scaphiopus h. holbrookii)*	____	____	____
Invertebrate Vernal Pool Species			
Fairy Shrimp *(Anostraca sp.)*	____	____	____

Briefly describe all of the methods used to survey the vernal pool:

List date(s) of field visit(s):

Name: _____

Signature: _____

Date: _____

Appendix D - Vernal Pool Impact Worksheet

(please supply one per vernal pool)

Applicant name: _____

Property address: _____

Approximate location of vernal pool: _____

1. Does the proposed plan involve disturbance within 100 ft of a vernal pool? _____

   a) If so, what is/are the type(s) of disturbance(s) proposed within this area?

2. Does the proposed plan involve disturbance within 400 ft of a vernal pool? _____

   a) If so, what is/are the type(s) of disturbance(s) proposed within this area?

3. Review areas versus proposed disturbed areas.

   a) What is the area, calculated in square feet, measured from the edge of the pool extending one hundred (100) feet from the edge of the pool?
   _____ sq. ft.

   What is the area that is proposed to be disturbed within the above measured area?_____ sq. ft.

   b) What is the area, calculated in square feet, measured from one hundred (100) feet from the edge of the pool to four hundred (400) feet from the edge of the pool?_____ sq. ft.

   What is the area that is proposed to be disturbed within the above measured area? _____ sq. ft.

4. Does the proposed plan involve new road construction within 400 ft. of a vernal Pool?_____

   a) If so, will the new road(s) be paved? _____

   b) Will the new road(s) be curbed? _____

   c) What is the estimated daily traffic volume from 6 p.m. to 12 a.m.? ___cars/hr

5. Does the proposed plan involve the installation of erosion and sedimentation control

measures within 400 ft of a vernal pool? _____

6. Will the proposed project result in an **increase** or **decrease** in the surface or subsurface water flow to the vernal pool? _____

a) If so, by how much per 10 year storm event? _____cu ft/sec

Name: _____

Signature: _____

Date: _____

I.W.W.C.APPLICATION WORK SHEET - OFFICE USE ONLY

Applicant's Name _____

Proposed Activity _____

Location: _____ M_____ L_____

Land Surveyor/Engineer: _____

Attorney: _____

Date of receipt _____ Complete Application _____

Decision w/in 65 days _____

If P.H. is held/to be w/in 65 days of receipt _____

Legal notice in papers _____

Notice to interested parties and abutting properties _____

P.H. to be completed w/in 35 days _____

Decision w/in 35 days _____

Extensions (can only total 65 days) _____

Decisions published 15 days _____

Applicant notified by certified mail 15 days _____

AZIMUTH AND TILT ANGLE

	ROOF					
	A	B	C	D	E	F
AZIMUTH	180°					
TILT ANGLE	25°					
MODULE COUNT	24					
SOLAR ACCESS						
TSRF AVERAGE						
INVERTERS	SOLAR EDGE SE7600H-USRGM	1				
OPTIMIZER	SOLAR EDGE P401	24				

	MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:
	HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+ 380W	24			24

SHEET INDEX

PV1	TITLE SHEET
PV2	SITE PLAN
PV3	ELECTRICAL LINE DIAGRAM / DETAILS
PV3.1	ELECTRICAL LINE DIAGRAM / DETAILS
PV4	EQUIPMENT LABELS
PV4.1	PLACARD
PV5	ARRAY SECTION
PV6	ARRAY PLAN
PV7	PROPERTY PLAN
	STRUCTURAL ENGINEERING CALS (IF REQ.)

APPLICABLE CODES

2017 NATIONAL ELECTRICAL CODE (NFPA 70)

2018 INTERNATIONAL RESIDENTIAL CODE (IRC) AS AMENDED

OCCUPANCY & CONSTRUCTION TYPE

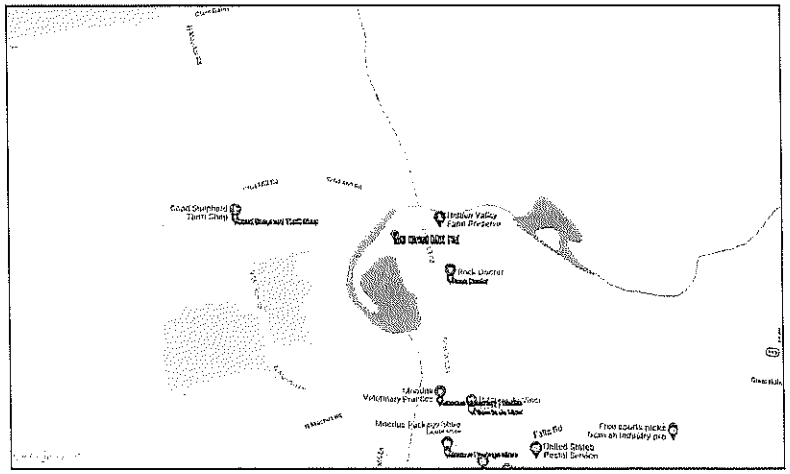
OCCUPANCY - R3

CONSTRUCTION - SB

CONSTRUCTION NOTES

A. A LADDER SHALL BE IN PLACE FOR ANY INSPECTIONS IN COMPLIANCE WITH OSHA REGULATIONS.
B. PV MODULES ARE NON-COMBUSTIBLE IN NATURE.
C. THIS SYSTEM IS A UTILITY INTERACTIVE (GRID CONNECTED) SYSTEM AND DOES NOT HAVE STORAGE BATTERIES.
D. A GROUND ELECTRODE SYSTEM WILL BE PROVIDED IN ACCORDANCE WITH NEC 690.47 & 250.50 - 250.166. GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED WHEN BONDED AT THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE, OR IS ONLY METALLIC WATER PIPING, A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8FT GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO GREATER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE GROUNDING SYSTEM.
E. EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONNECTION POINTS IDENTIFIED IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
F. THE EXPOSED METALLIC TABS OF THE SOLAREDGE OPTIMIZERS SHALL BE BONDED AND/OR GROUNDED PER NEC 690.45(A) AND THE MANUFACTURERS' INSTRUCTIONS.
G. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER NEC 110.26.
H. ALTERNATE POWER SOURCE PLACARD SHALL BE PLASTIC, ENGRAVED IN A CONTRASTING COLOR (WHITE). THIS PLAQUE WILL BE PERMANENTLY ATTACHED & UV RESISTANT.
I. ALL PLAQUES AND SIGNS WILL BE INSTALLED AS REQUIRED BY 2017 NEC.
J. A SMOKE DETECTOR, APPROVED AND LISTED BY THE STATE FIRE MARSHAL, SHALL BE INSTALLED IN EACH DWELLING WHEN A PERMIT FOR ALTERATIONS, REPAIRS OR ADDITIONS EXCEEDS $1,000.00. A BATTERY POWERED SMOKE DETECTOR SATISFIES THE REQUIREMENTS FOR A SMOKE DETECTOR. APPROVED COMBINED SMOKE ALARMS AND CARBON DIOXIDE ALARMS SHALL BE ACCEPTABLE. A CARBON MONOXIDE DETECTOR SHALL BE INSTALLED IN THE SPECIFIC EXISTING DWELLING UNIT THAT HAVE ATTACHED GARAGES OR FUEL-BURNING APPLIANCES FOR WHICH A PERMIT IS ISSUED FOR ALTERATIONS, REPAIRS OR ADDITIONS EXCEEDING $1,000.00. LISTED SINGLE- OR MULTI-STATION CARBON MONOXIDE ALARMS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS AND ON EVERY LEVEL OF A DWELLING UNIT INCLUDING BASEMENTS. COMBINED SMOKE/CARBON MONOXIDE ALARMS MAY BE USED. THE ALARM SHALL RECEIVE ITS PRIMARY POWER FROM THE BUILDING WIRING EXCEPT IT IS PERMITTED TO BE SOLELY BATTERY OPERATED WHERE REPAIRS OR ALTERATIONS DO NOT RESULT IN THE REMOVAL OF WALL AND CEILING FINISHES OR THERE IS NO ACCESS BY MEANS OF AN ATTIC.
K. THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE BETWEEN THE GROUNDING ELECTRODE AND THE PANEL (OR INVERTER) IF SMALLER THAN #6 AWG COPPER WIRE AS PER NEC 250-64B. THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AS BUSBARS WITHIN LISTED EQUIPMENT AS PER NEC 250.64C.
L. ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE BUILDING CODE OF THE LOCAL JURISDICTION.
M. PV SYSTEMS CONNECTION IN THE SWITCH GEAR (PANEL) SHALL BE POSITIONED AT THE OPPOSITE END FROM THE INPUT FEEDER LOCATION OR MAIN CIRCUIT LOCATION AS PER NEC 705.12(D)(7).
N. ALL EQUIPMENT SUPPLIED SHALL BE UL LISTED OR LISTED BY A LISTING AGENCY RECOGNIZED BY THE STATE IN WHICH THE SYSTEM IS CONSTRUCTED.
O. AC DISCONNECTS SHALL BE IN COMPLIANCE WITH NEC 690.17.
P. ALL DC CONDUCTORS SHALL BE 90° RATED THHW, THWN-2, USE-2 OR PV WIRE. ALL AC CONDUCTORS SHALL BE 75° RATED THWN WIRE.
Q. THE UTILITY DISCONNECT HAS VISIBLE BLADES, IS LOCKABLE AND IS ACCESSIBLE TO THE UTILITY 24/7.
R. ALL BREAKERS SHALL BE SUITABLE FOR BACKFEED. WHEN BACKFED BREAKER IS THE METHOD OF UTILITY INTERCONNECTION THE BREAKER SHALL NOT READ 'LINE AND LOAD'.
S. COORDINATE ANY POWER OUTAGE WITH LOCAL UTILITY AND PROPERTY OWNER. NOTIFY UTILITY BEFORE ACTIVATION OF PV SYSTEM.
T. CITY BUILDING INSPECTOR SHALL INSPECT ACCESSIBLE STRUCTURAL CONNECTIONS AND THE HOUSE CURRENT SIDE OF THE SYSTEM, ALL OTHER EQUIPMENT SHALL BE UL LISTED AND APPROVED.
U. PHOTOVOLTAIC MODULES SHALL NOT BE INSTALLED OVER ANY ATTIC, PLUMBING OR MECHANICAL VENT. PLUMBING VENTS TO EXTEND A MIN OF 6" ABOVE ROOF OR MODULE. NO BLDG, PLBG OR MECH VENTS TO BE COVERED, OBSTRUCTED OR ROUTED AROUND MODULES.
V. ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER THE OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT A STRONG POINT OF BUILDING CONSTRUCTION. FIELD VERIFY EXACT LOCATION.
W. THE DISCHARGE OF POLLUTANTS TO ANY STORM DRAINAGE SYSTEM IS PROHIBITED. NO SOLID WASTE, PETROLEUM BYPRODUCTS, SOIL PARTICULATE, CONSTRUCTION WASTE MATERIAL OR WASTEWATER GENERATED ON CONSTRUCTION SITE OR BY CONSTRUCTION ACTIVITIES SHALL BE PLACED, CONVEYED OR DISCHARGED INTO THE STREET, GUTTER OR STORM DRAIN SYSTEM.
X. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE AND WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE.
Y. PAINT SURFACE MOUNTED CONDUIT TO MATCH EXISTING STRUCTURE.

VICINITY MAP



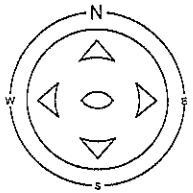
BRIGHT PLANET SOLAR 103A MILLBURY ST, AUBURN MA 01501 888-997-4469	SIGNATURE:	PROJECT #	BPS136186	REV	DATE	DESCRIPTION
		SYSTEM SIZE	9.12kW/DC 7.6kW/AC		—	—
	CONTRACTOR LICENSE:	DATE:	10/19/2021 4:38:55 PM		—	—
	DATE: 10/19/2021 4:38:55 PM	DESIGNER:	K. SPARKS		—	—

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: TITLE SHEET

SHEET #: PV1

AZIMUTH AND TILT ANGLE						
	ROOF					
	A	B	C	D	E	F
AZIMUTH	180°					
TILT ANGLE	25°					
MODULE COUNT	24					
SOLAR ACCESS						
TSRF AVEREAGE						
INVERTERS	SOLAR EDGE SE7600H-USRGM	1				
OPTIMIZER	SOLAR EDGE P401	24				
	MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:	
	HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+ 380W	24			24	

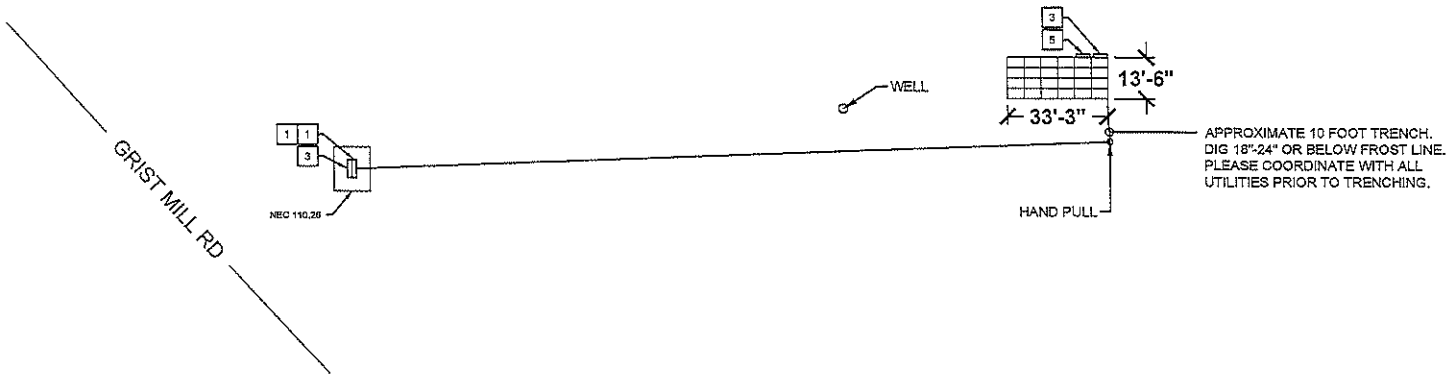


SCALE: 1"=40'

NOTES:
1. PROPERTY IS ON SEPTIC SYSTEM
2. A LOCATE COMPANY WILL BE CONTACTED TO LOCATE ALL UTILITIES LINES.

1	MAIN SERVICE PANEL
2	UTILITY METER
3	AC DISCONNECT
4	NOT USED
5	INVERTER & INTEGRATED DC DISCONNECT
5.1	NOT USED

EXISTING HOUSE
1510 SQFT.
HEIGHT:18'



BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE: 10/19/2021 4:38:56 PM

PROJECT #	BPS136186		
SYSTEM SIZE	9.12kW/DC	7.6kW/AC	
DATE:	10/19/2021 4:38:56 PM		
DESIGNER:	K. SPARKS		

REV	DATE	DESCRIPTION
	—	—
	—	—
	—	—

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: SITE PLAN

SHEET #: PV2

OPTIMIZER SPECIFICATIONS

MAKE AND MODEL	SOLAR EDGE P401			
	INPUTS		OUTPUTS	
MAX INPUT VOLTAGE AT VOC/MIN	60	[V]	60	MAX OUTPUT VOLTAGE
MAX SHORT CIRCUIT CURRENT Isc	11	[A]	15	MAX OUTPUT CURRENT
MAX DC INPUT CURRENT	13.75	[A]	15	ACTUAL STRING OUTPUT CURRENT
RATED INPUT DC POWER	401	[W/V]	400	ACTUAL STRING OUTPUT VOLTAGE

NOTE 1: OPTIMIZERS TO BE GROUNDED USING 1/4" HEX HEAD BOLT, WASHER, NUT, FOR TOP RAIL MOUNT. SUPPLIED SST STAR WASHER.

PV MODULE #1 SPECIFICATIONS

MAKE AND MODEL		HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+ 380W	TEMP ADJUSTED VALUES
MAX POWER-POINT CURRENT (I_{MP})	[A]	10.01	
MAX POWER-POINT VOLTAGE (V_{MP})	[V]	37.95	32.6
OPEN CIRCUIT VOLTAGE (V_{OC})	[V]	45.04	50.1
SHORT CIRCUIT CURRENT (I_{SC})	[A]	10.5	
MAX SERIES FUSE (OCPD)	[A]	20	
MAX POWER (P_{MAX})	[W]	380	
MAX VOLTAGE (V_{DC})	[V]	1000	

INVERTER SPECIFICATIONS

MANUFACTURER AND MODEL		SOLAR EDGE SE7600H-USRGM
MAX DC INPUT VOLTAGE	[V]	480
MAX OUTPUT POWER	[W]	7600
NOMINAL DC INTPUT VOLTAGE	[V]	400
NOMINAL AC OUTPUT VOLTAGE	[V]	240
MAX CONTINUOUS OUTPUT CURRENT	[A]	32
MAX FUSE (OCPD)	[A]	40
MAX DC INPUT CURRENT *	[A]	20

* DC CURRENT LIMITED BY INVERTER AT DC DISCONNECT.
NOTE: SOLAR EDGE INVERTERS & OPTIMIZERS WITH INTEGRATED GROUND MEET THE REQUIREMENTS FOR UNGROUNDED PV POWER SYSTEMS IN SECTIONS 690.35 & 690.41 OF THE 2008, 2011, 2014 NEC, AND 2017 NEC (2019 CEC). THEREFORE GROUND FAULT REQ. OF 690.35 ARE MET AND SIZING OF EQUIPMENT GROUND PER 690.45 & 250.122 ARE SATISFIED.

EXISTING MAIN SERVICE PANEL

MANUFACTURER:	EXISTING	
PANEL MODEL NUMBER:		
VOLTAGE:	240v	[V]
PHASES:	1	ø
BOX/BUSS RATING:	200	[A]
MAIN BREAKER:	200	[A]
PV SYSTEM BREAKER SIZE	40	[A]
#OF SPARE BREAKERS		3

CALCS: PER NEC/CEC 705.12(B)(2)(3)(b)

Buss			MAX
200	* 1.2	=	240
MCB	PV BRK		
200	+ 40	=	240

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

NOTE 1: IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE VERIFIABLE GROUNDING ELECTRODE, IT IS THE PV CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE. NOTE 2: ENSURE G.E.C. INSTALLED AS PER NEC 690.47 & 250.64.

STRING CALCULATIONS

1 CIRCUIT WITH 12 - SOLAR EDGE P401 OPTIMIZERS IN SERIES

4560W	/	400V	ACTUAL STRING CURRENT	11.40A
400V	/	12	ACTUAL VOLTAGE PER OPTIMIZER	33.3V
1	X	400V	MAX SYSTEM VOLTAGE	400V
1	X	15A	MAX SYSTEM CURRENT	15A
12	X	380W	<---ACTUAL | MAX POWER DC--->	4560W

STRING CALCULATIONS

1 CIRCUIT WITH 12 - SOLAR EDGE P401 OPTIMIZERS IN SERIES

4560W	/	400V	ACTUAL STRING CURRENT	11.40A
400V	/	12	ACTUAL VOLTAGE PER OPTIMIZER	33.3V
1	X	400V	MAX SYSTEM VOLTAGE	400V
1	X	15A	MAX SYSTEM CURRENT	15A
12	X	380W	<---ACTUAL | MAX POWER DC--->	4560W

BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

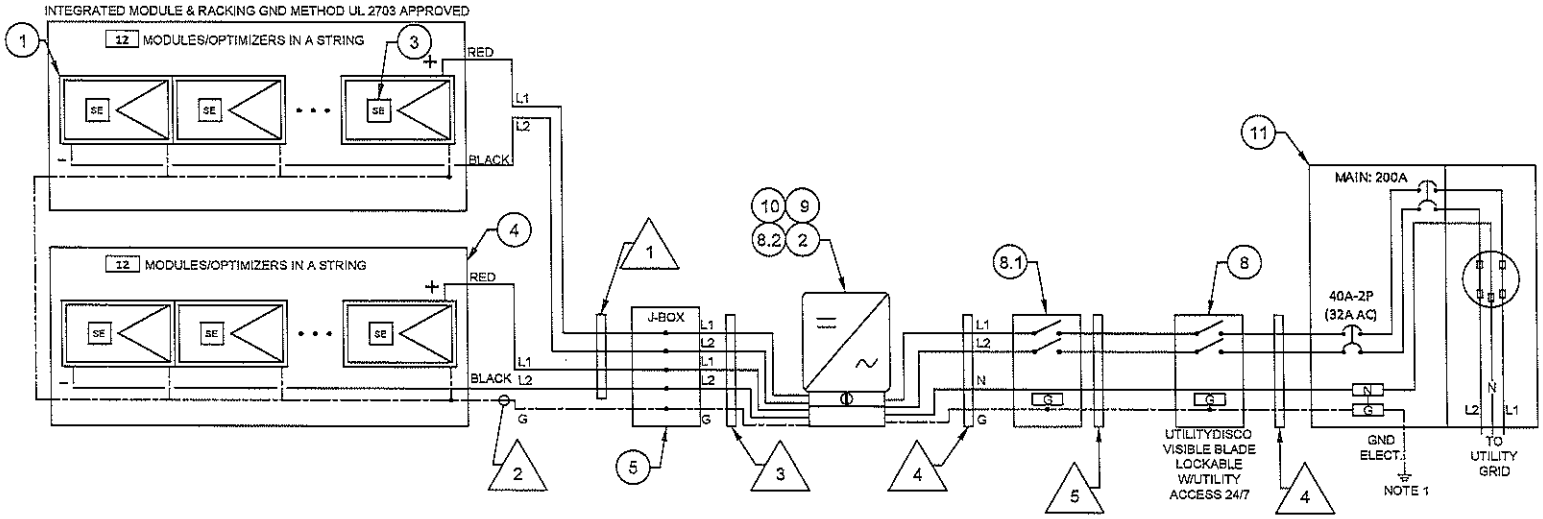
DATE: 10/19/2021 4:38:58 PM

PROJECT #	BPS136186	REV	DATE	DESCRIPTION	
SYSTEM SIZE	9.12kW/DC 7.6kW/AC		—	—	
DATE:	10/19/2021 4:38:58 PM		—	—	
DESIGNER:	K. SPARKS		—	—	

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: RISER DIAGRAM

SHEET #: PV3



EQUIPMENT SCHEDULE

TAG	DESCRIPTION	MANUFACTURER	PART NUMBER	NOTES
1	SOLAR PV MODULE #1	HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+	HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+ 380	QUANTITY 24
2	INVERTER #1	SOLAR EDGE SE7600H-USRGM	SOLAR EDGE SE7600H-USRGM	QUANTITY 1
3	OPTIMIZER	SOLAR EDGE P401		QUANTITY 24
4	RACKING	SNAPNRACK	SNAPNRACK ULTRA	SEE RACKING SPECIFICATIONS
5	J-BOX			SELECTED IN FIELD
6	GROUNDING	SNAPNRACK	SNAPNRACK ULTRA	MODULE TO RAIL/RAIL TO J-BOX
7	NOT USED			
7.1	NOT USED			
7.2	NOT USED			
7.3	NOT USED			
8	AC (UTILITY) DISCONNECT	SQUARE D OR EQUAL	DU222RB,240V,60A,2P,3R	NEMA 3R
8.1	AC DISCONNECT #2	SQUARE D OR EQUAL	DU222RB,240V,60A,2P,3R	NEMA 3R
8.2	DC DISCONNECT	SOLAR EDGE		INTEGRAL TO INVERTER
9	RAPID SHUTDOWN	SOLAR EDGE		INTEGRAL TO INVERTER
10	REVENUE METER	SOLAR EDGE	US000NNR2	INTEGRAL TO INVERTER
11	EXISTING MAIN SERVICE PANEL	EXISTING		

CONDUIT AND CONDUCTOR SCHEDULE

TAG	DESCRIPTION OF CONDUCTOR TYPE	CONDUCTOR SIZE (AWG)	# OF CONDUCTORS	CONDUIT TYPE	CONDUIT SIZE
1	PV WIRE	#10	4	IN FREE AIR	
2	EGC/GEC	#6	1	IN FREE AIR	SOLID BARE
3	THWN-2	#10 & #6	4 & (1)G	EMT	3/4"
4	THWN-2	#8 & #10	3 & (1)G	EMT	3/4"
5	THWN-2	#6 & #8	3 & (1)G	PVC	1"

CONDUCTOR CALCULATIONS:

3) 15 x 1.25 = 18.75a
#10AWG = 40a
310.15(B)(c) = 54°C
T690.31(A) 18.75a / 0.76 = 24.67a
T310.15(B)(B)(a) = 24.67a / 0.8 = 30.84a
30.84a < 40a

4) 32 x 1.25 = 40a
#8AWG = 50a
T310.15(B)(2)(a) = 35°C
40a / 0.96 = 41.67a
41.67a < 50a

1. ALL CONDUCTORS ARE DESIGNED FOR LESS THAN 2% VOLTAGE DROP.
2. ALL EXTERIOR CONDUITS SHALL HAVE WATERPROOF FITTINGS.

BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE: 10/19/2021 4:39:00 PM

PROJECT #	BPS136186	REV	DATE	DESCRIPTION
SYSTEM SIZE	9.12kW/DC 7.6kW/AC		—	—
DATE:	10/19/2021 4:39:00 PM		—	—
DESIGNER:	K. SPARKS		—	—

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: RISER DIAGRAM

SHEET #: PV3.1

NOTE: PLAQUES SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH NON CORROSIVE, POP-RIVETS, SCREWS, OR APPROVED ADHESIVE.

(1) LOCATION: MAIN SERVICE PANEL & AC DISCONNECT

⚠ WARNING

ELECTRIC SHOCK HAZARD

DO NOT TOUCH TERMINALS
TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

PHOTOVOLTAIC MODULES PRODUCE DC VOLTAGE WHENEVER THEY ARE EXPOSED TO SUNLIGHT

(2) LOCATION: MAIN SERVICE PANEL PV BACK-FED BREAKER

⚠ WARNING

INVERTER OUTPUT CONNECTION

DO NOT RELOCATE THIS OVERCURRENT DEVICE

(3) LOCATION: MAIN SERVICE PANEL PV BACK-FED BREAKER

⚠ WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

(4) LOCATION: UTILITY METER

⚠ WARNING

THIS SERVICE METER IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM

(5) LOCATION: PV SUB PANEL (IF USED)

⚠ WARNING

PHOTOVOLTAIC SYSTEM COMBINER PANEL

DO NOT ADD LOADS

(6) CONDUIT, RACEWAYS & ENCLOSURES

WARNING: PHOTOVOLTAIC POWER SOURCE

(7) LOCATION: DC DISCONNECT/INVERTER #1

PHOTOVOLTAIC SYSTEM DC DISCONNECT	
MAXIMUM CIRCUIT CURRENT	20 A
MAXIMUM SYSTEM VOLTAGE	480 V
MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-to-DC CONVERTER	15 A

(8) LOCATION: MAIN SERVICE PANEL

PV SYSTEM POINT OF CONNECTION

SOLAR PV SYSTEM AC POINT OF CONNECTION

MAX AC OUTPUT CURRENT	32 A
MAX NOMINAL AC VOLTAGE	240 V

THIS PANEL FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)

(9) LOCATION: MAIN SERVICE PANEL

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

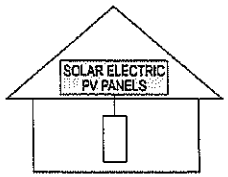
(10) LOCATION: INVERTER

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

(11) LOCATION: MAIN PANEL

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY

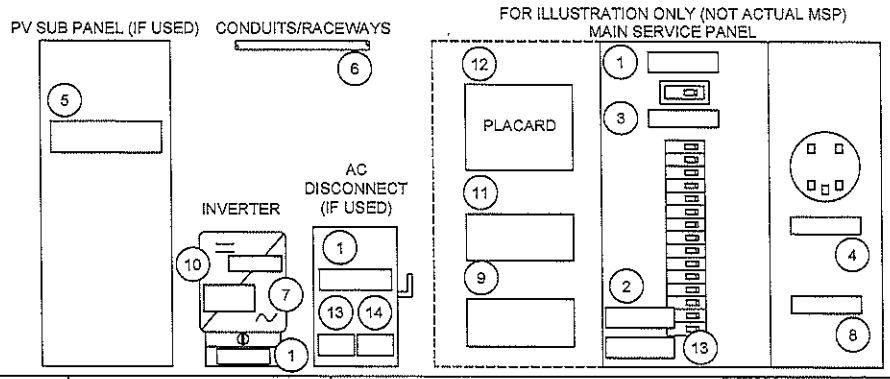


(13) LOCATION: MAIN SERVICE PANEL / AC DISCONNECT

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

(14) LOCATION: AC DISCONNECT

PHOTOVOLTAIC AC DISCONNECT

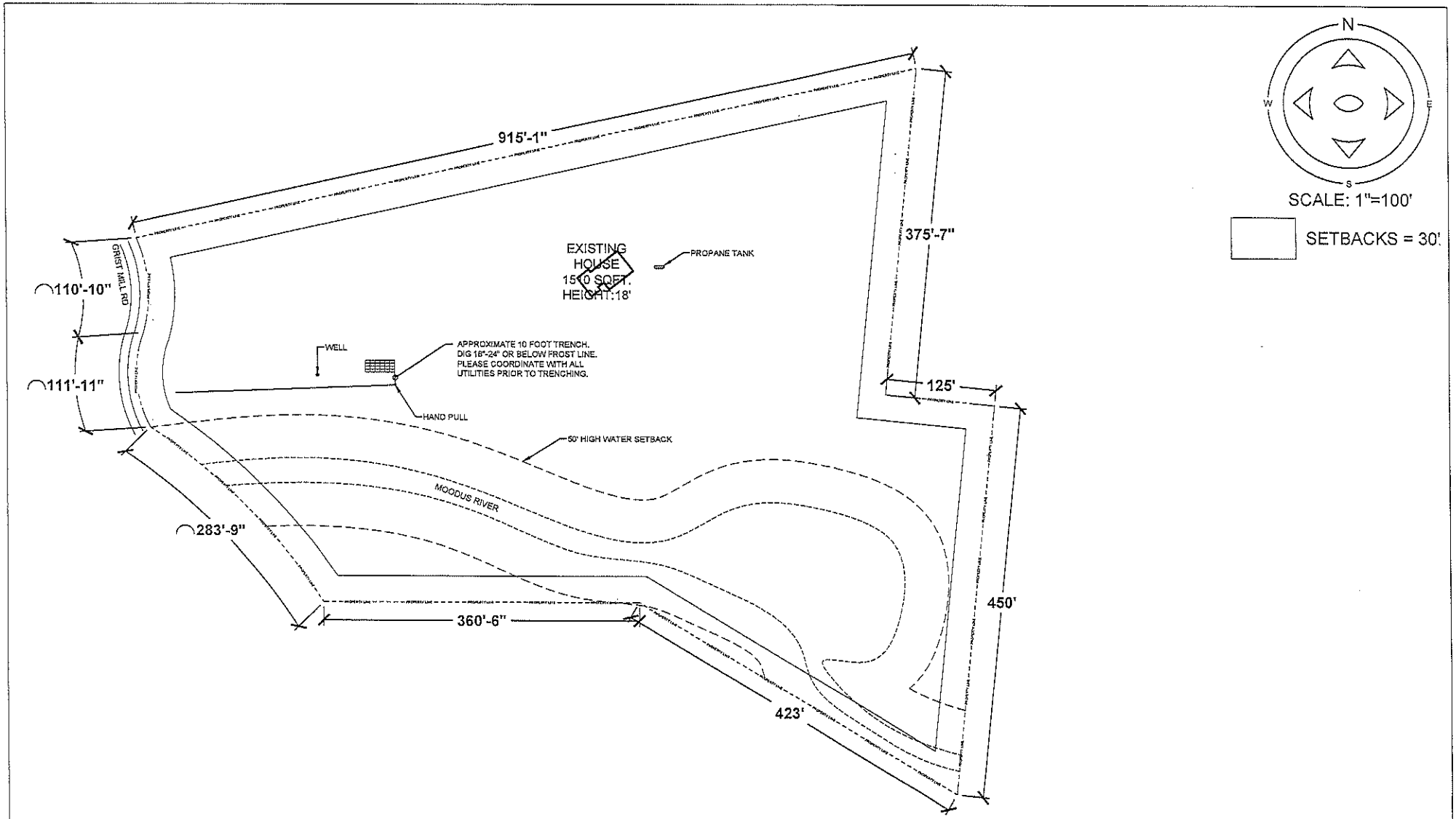


BRIGHT PLANET SOLAR 103A MILLBURY ST, AUBURN MA 01501 888-997-4469	SIGNATURE:	PROJECT #	BPS136186	REV	DATE	DESCRIPTION
		SYSTEM SIZE	9.12kW/DC 7.6kW/AC		—	—
	CONTRACTOR LICENSE:	DATE:	10/19/2021 4:39:01 PM		—	—
	DATE: 10/19/2021 4:39:01 PM	DESIGNER:	K. SPARKS		—	—

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: EQUIPMENT LABELS

SHEET #: PV4



BRIGHT PLANET SOLAR 103A MILLBURY ST, AUBURN MA 01501 888-997-4469	SIGNATURE: CONTRACTOR LICENSE: DATE: 10/19/2021 4:39:02 PM	PROJECT #	BPS136185	REV	DATE	DESCRIPTION
		SYSTEM SIZE	9.12kW/DC 7.6kW/AC		—	—
		DATE:	10/19/2021 4:39:02 PM		—	—
		DESIGNER:	K. SPARKS		—	—

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: PROPERTY PLAN
SHEET #: PV7

AZIMUTH AND TILT ANGLE

	ROOF					
	A	B	C	D	E	F
AZIMUTH	180°					
TILT ANGLE	25°					
MODULE COUNT	24					
SOLAR ACCESS						
TSFR AVEREAGE						
INVERTERS	SOLAR EDGE SE7600H-USRGM	1				
OPTIMIZER	SOLAR EDGE P401	24				

MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:
HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+ 380W	24			24

SHEET INDEX

PV1	TITLE SHEET
PV2	SITE PLAN
PV3	ELECTRICAL LINE DIAGRAM / DETAILS
PV3.1	ELECTRICAL LINE DIAGRAM / DETAILS
PV4	EQUIPMENT LABELS
PV4.1	PLACARD
PV5	ARRAY SECTION
PV6	ARRAY PLAN
PV7	PROPERTY PLAN
	STRUCTURAL ENGINEERING CALS (IF REQ.)

APPLICABLE CODES

2017 NATIONAL ELECTRICAL CODE (NFPA 70)

2018 INTERNATIONAL RESIDENTIAL CODE (IRC) AS AMENDED

OCCUPANCY & CONSTRUCTION TYPE

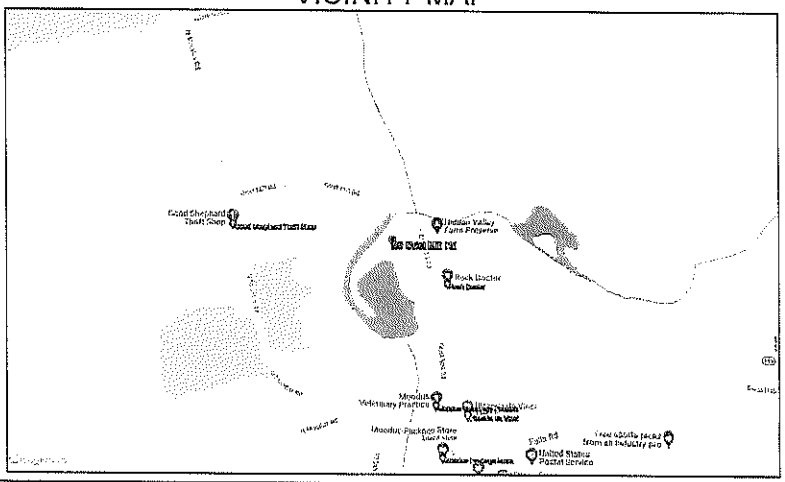
OCCUPANCY - R3

CONSTRUCTION - 5B

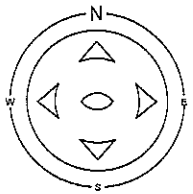
CONSTRUCTION NOTES

A. A LADDER SHALL BE IN PLACE FOR ANY INSPECTIONS IN COMPLIANCE WITH OSHA REGULATIONS.
B. PV MODULES ARE NON-COMBUSTIBLE IN NATURE.
C. THIS SYSTEM IS A UTILITY INTERACTIVE (GRID CONNECTED) SYSTEM AND DOES NOT HAVE STORAGE BATTERIES.
D. A GROUND ELECTRODE SYSTEM WILL BE PROVIDED IN ACCORDANCE WITH NEC 690.47 & 250.50 - 250.166. GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED WHEN BONDED AT THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE, OR IS ONLY METALLIC WATER PIPING, A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8FT GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO GREATER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE GROUNDING SYSTEM.
E. EACH MODULE WILL BE GROUNDED USING THE SUPPLIED CONNECTION POINTS IDENTIFIED IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
F. THE EXPOSED METALLIC TABS OF THE SOLAREDGE OPTIMIZERS SHALL BE BONDED AND/OR GROUNDED PER NEC 690.45(A) AND THE MANUFACTURERS' INSTRUCTIONS.
G. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER NEC 110.26.
H. ALTERNATE POWER SOURCE PLACARD SHALL BE PLASTIC, ENGRAVED IN A CONTRASTING COLOR (WHITE). THIS PLAQUE WILL BE PERMANENTLY ATTACHED & UV RESISTANT.
I. ALL PLAQUES AND SIGNS WILL BE INSTALLED AS REQUIRED BY 2017 NEC.
J. A SMOKE DETECTOR, APPROVED AND LISTED BY THE STATE FIRE MARSHAL, SHALL BE INSTALLED IN EACH DWELLING WHEN A PERMIT FOR ALTERATIONS, REPAIRS OR ADDITIONS EXCEEDS $1,000.00. A BATTERY POWERED SMOKE DETECTOR SATISFIES THE REQUIREMENTS FOR A SMOKE DETECTOR. APPROVED COMBINED SMOKE ALARMS AND CARBON DIOXIDE ALARMS SHALL BE ACCEPTABLE. A CARBON MONOXIDE DETECTOR SHALL BE INSTALLED IN THE SPECIFIC EXISTING DWELLING UNIT THAT HAVE ATTACHED GARAGES OR FUEL-BURNING APPLIANCES FOR WHICH A PERMIT IS ISSUED FOR ALTERATIONS, REPAIRS OR ADDITIONS EXCEEDING $1,000.00. LISTED SINGLE- OR MULTI-STATION CARBON MONOXIDE ALARMS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS AND ON EVERY LEVEL OF A DWELLING UNIT INCLUDING BASEMENTS. COMBINED SMOKE/CARBON MONOXIDE ALARMS MAY BE USED. THE ALARM SHALL RECEIVE ITS PRIMARY POWER FROM THE BUILDING WIRING EXCEPT IT IS PERMITTED TO BE SOLELY BATTERY OPERATED WHERE REPAIRS OR ALTERATIONS DO NOT RESULT IN THE REMOVAL OF WALL AND CEILING FINISHES OR THERE IS NO ACCESS BY MEANS OF AN ATTIC.
K. THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE BETWEEN THE GROUNDING ELECTRODE AND THE PANEL (OR INVERTER) IF SMALLER THAN #6 AWG COPPER WIRE AS PER NEC 250-64B. THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AS BUSBARS WITHIN LISTED EQUIPMENT AS PER NEC 250.64C.
L. ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THE BUILDING CODE OF THE LOCAL JURISDICTION.
M. PV SYSTEMS CONNECTION IN THE SWITCH GEAR (PANEL) SHALL BE POSITIONED AT THE OPPOSITE END FROM THE INPUT FEEDER LOCATION OR MAIN CIRCUIT LOCATION AS PER NEC 705.12(D)(7).
N. ALL EQUIPMENT SUPPLIED SHALL BE UL LISTED OR LISTED BY A LISTING AGENCY RECOGNIZED BY THE STATE IN WHICH THE SYSTEM IS CONSTRUCTED.
O. AC DISCONNECTS SHALL BE IN COMPLIANCE WITH NEC 690.17.
P. ALL DC CONDUCTORS SHALL BE 90° RATED THHW, THWN-2, USE-2 OR PV WIRE. ALL AC CONDUCTORS SHALL BE 75° RATED THWN WIRE.
Q. THE UTILITY DISCONNECT HAS VISIBLE BLADES, IS LOCKABLE AND IS ACCESSIBLE TO THE UTILITY 24/7.
R. ALL BREAKERS SHALL BE SUITABLE FOR BACKFEED. WHEN BACKFED BREAKER IS THE METHOD OF UTILITY INTERCONNECTION THE BREAKER SHALL NOT READ 'LINE AND LOAD'.
S. COORDINATE ANY POWER OUTAGE WITH LOCAL UTILITY AND PROPERTY OWNER. NOTIFY UTILITY BEFORE ACTIVATION OF PV SYSTEM.
T. CITY BUILDING INSPECTOR SHALL INSPECT ACCESSIBLE STRUCTURAL CONNECTIONS AND THE HOUSE CURRENT SIDE OF THE SYSTEM, ALL OTHER EQUIPMENT SHALL BE UL LISTED AND APPROVED.
U. PHOTOVOLTAIC MODULES SHALL NOT BE INSTALLED OVER ANY ATTIC, PLUMBING OR MECHANICAL VENT. PLUMBING VENTS TO EXTEND A MIN OF 6" ABOVE ROOF OR MODULE. NO BLDG, PLBG OR MECH VENTS TO BE COVERED, OBSTRUCTED OR ROUTED AROUND MODULES.
V. ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER THE OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT A STRONG POINT OF BUILDING CONSTRUCTION. FIELD VERIFY EXACT LOCATION.
W. THE DISCHARGE OF POLLUTANTS TO ANY STORM DRAINAGE SYSTEM IS PROHIBITED. NO SOLID WASTE, PETROLEUM BYPRODUCTS, SOIL PARTICULATE, CONSTRUCTION WASTE MATERIAL OR WASTEWATER GENERATED ON CONSTRUCTION SITE OR BY CONSTRUCTION ACTIVITIES SHALL BE PLACED, CONVEYED OR DISCHARGED INTO THE STREET, GUTTER OR STORM DRAIN SYSTEM.
X. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE AND WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE.
Y. PAINT SURFACE MOUNTED CONDUIT TO MATCH EXISTING STRUCTURE.

VICINITY MAP


Good Shepherd Parish Group
Linden Valley Farm Property
Rock Hacker
Moodus Veterinary Practice
Moodus-Packwoods Store
Moodus Post Office
Moodus Pharmacy
Moodus Medical Center
Moodus Family Practice
Moodus Auto Parts
Moodus Auto Body
Moodus Auto Repair
Moodus Auto Sales
Moodus Auto Service

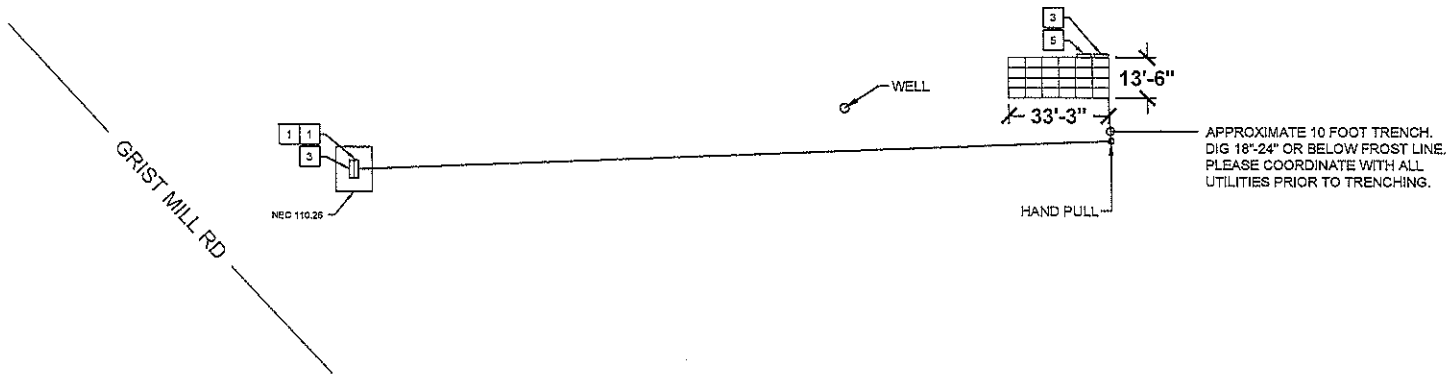
AZIMUTH AND TILT ANGLE						
	ROOF					
	A	B	C	D	E	F
AZIMUTH	180°					
TILT ANGLE	25°					
MODULE COUNT	24					
SOLAR ACCESS						
TSFR AVEREAGE						
INVERTERS	SOLAR EDGE SE7600H-USR6M	1				
OPTIMIZER	SOLAR EDGE P401	24				
	MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:	
	HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+380W	24			24	



SCALE: 1"=40'

NOTES:
1. PROPERTY IS ON SEPTIC SYSTEM
2. A LOCATE COMPANY WILL BE CONTACTED TO LOCATE ALL UTILITIES LINES.

1	MAIN SERVICE PANEL
2	UTILITY METER
3	AC DISCONNECT
4	NOT USED
5	INVERTER & INTEGRATED DC DISCONNECT
5.1	NOT USED



BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE: 10/19/2021 4:38:56 PM

PROJECT #	BPS136186		REV	DATE	DESCRIPTION
SYSTEM SIZE	9.12kW/DC	7.6kW/AC		---	---
DATE:	10/19/2021 4:38:56 PM			---	---
DESIGNER:	K. SPARKS			---	---

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: SITE PLAN

SHEET #: PV2

OPTIMIZER SPECIFICATIONS				
MAKE AND MODEL	SOLAR EDGE P401			
	INPUTS		OUTPUTS	
MAX INPUT VOLTAGE AT VOC/MIN	60	[V]	60	MAX OUTPUT VOLTAGE
MAX SHORT CIRCUIT CURRENT Isc	11	[A]	15	MAX OUTPUT CURRENT
MAX DC INPUT CURRENT	13.75	[A]	15	ACTUAL STRING OUTPUT CURRENT
RATED INPUT DC POWER	401	[W/V]	400	ACTUAL STRING OUTPUT VOLTAGE
NOTE 1: OPTIMIZERS TO BE GROUNDED USING 1/4" HEX HEAD BOLT, WASHER, NUT, FOR TOP RAIL MOUNT. SUPPLIED SST STAR WASHER.				

PV MODULE #1 SPECIFICATIONS			
		HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+ 380W	TEMP ADJUSTED VALUES
MAKE AND MODEL			
MAX POWER-POINT CURRENT (I_{mp})	[A]	10.04	
MAX POWER-POINT VOLTAGE (V_{mp})	[V]	37.85	32.6
OPEN CIRCUIT VOLTAGE (V_{oc})	[V]	45.04	50.1
SHORT CIRCUIT CURRENT (I_{sc})	[A]	10.5	
MAX SERIES FUSE (OCPD)	[A]	20	
MAX POWER (P_{max})	[W]	380	
MAX VOLTAGE (V_{oc})	[V]	1000	

INVERTER SPECIFICATIONS		
MANUFACTURER AND MODEL		SOLAR EDGE SE7600H-USRGM
MAX DC INPUT VOLTAGE	[V]	480
MAX OUTPUT POWER	[W]	7600
NOMINAL DC INTPUT VOLTAGE	[V]	400
NOMINAL AC OUTPUT VOLTAGE	[V]	240
MAX CONTINUOUS OUTPUT CURRENT	[A]	32
MAX FUSE (OCPD)	[A]	40
MAX DC INPUT CURRENT *	[A]	20

* DC CURRENT LIMITED BY INVERTER AT DC DISCONNECT.
NOTE: SOLAR EDGE INVERTERS & OPTMIZERS WITH INTEGRATED GROUND MEET THE REQUIREMENTS FOR UNGROUNDED PV POWER SYSTEMS IN SECTIONS 690.35 & 690.41 OF THE 2008, 2011, 2014 NEC, AND 2017 NEC (2015 CEC). THEREFORE GROUND FAULT REQ. OF 690.35 ARE MET AND SIZING OF EQUIPMENT GROUND PER 690.45 & 250.122 ARE SATISFIED.

EXISTING MAIN SERVICE PANEL		
MANUFACTURER:	EXISTING	
PANEL MODEL NUMBER:		
VOLTAGE:	240v	[V]
PHASES:	1	ø
BOX/BUSS RATING:	200	[A]
MAIN BREAKER:	200	[A]
PV SYSTEM BREAKER SIZE	40	[A]
#OF SPARE BREAKERS		2

CALCS: PER NEC/CEC 705.12(B)(2)(3)(b)

Buss		MAX	
200	* 1.2 =	240	NEC/CEC 705.12(B)(2)(3)(b)
MCB	PV BRK		
200	+ 40 =	240	

NOTE 1: IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE VERIFIABLE GROUNDING ELECTRODE, IT'S THE PV CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE. NOTE 2: ENSURE G.E.C. INSTALLED AS PER NEC 690.47 & 250.64.

STRING CALCULATIONS				
1 CIRCUIT WITH 12 - SOLAR EDGE P401 OPTIMIZERS IN SERIES				
4560W	/	400V	ACTUAL STRING CURRENT	11.40A
400V	/	12	ACTUAL VOLTAGE PER OPTIMIZER	33.3V
1	X	400V	MAX SYSTEM VOLTAGE	400V
1	X	15A	MAX SYSTEM CURRENT	15A
12	X	380W	<---ACTUAL | MAX POWER DC--->	4560W

STRING CALCULATIONS				
1 CIRCUIT WITH 12 - SOLAR EDGE P401 OPTIMIZERS IN SERIES				
4560W	/	400V	ACTUAL STRING CURRENT	11.40A
400V	/	12	ACTUAL VOLTAGE PER OPTIMIZER	33.3V
1	X	400V	MAX SYSTEM VOLTAGE	400V
1	X	15A	MAX SYSTEM CURRENT	15A
12	X	380W	<---ACTUAL | MAX POWER DC--->	4560W

BrightPlanetSolar
BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

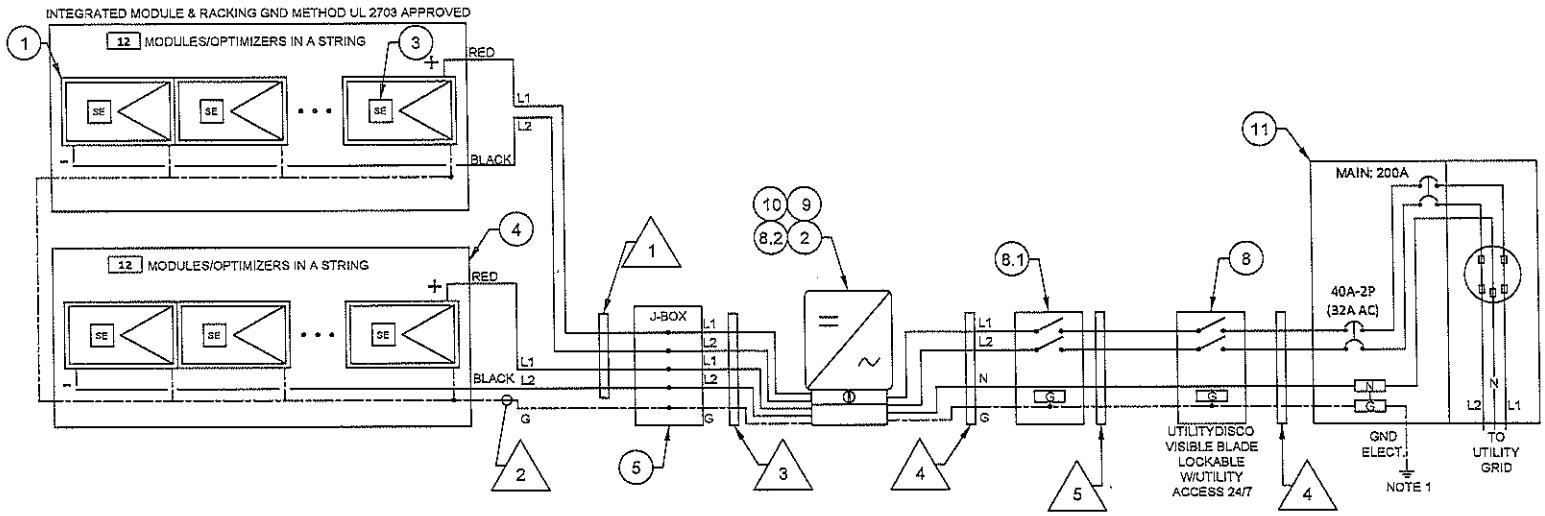
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DESIGNER:	K. SPARKS		—	—

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: RISER DIAGRAM

SHEET #: PV3



EQUIPMENT SCHEDULE				
TAG	DESCRIPTION	MANUFACTURER	PART NUMBER	NOTES
1	SOLAR PV MODULE #1	HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+	HANWHA Q-CELLS Q.PEAK DUO BLK ML-G9+ 380	QUANTITY 24
2	INVERTER #1	SOLAR EDGE SE7600H-USRGM	SOLAR EDGE SE7600H-USRGM	QUANTITY 1
3	OPTIMIZER	SOLAR EDGE P401		QUANTITY 24
4	RACKING	SNAPNRACK	SNAPNRACK ULTRA	SEE RACKING SPECIFICATIONS
5	J-BOX			SELECTED IN FIELD
6	GROUNDING	SNAPNRACK	SNAPNRACK ULTRA	MODULE TO RAIL/RAIL TO J-BOX
7	NOT USED			
7.1	NOT USED			
7.2	NOT USED			
7.3	NOT USED			
8	AC (UTILITY) DISCONNECT	SQUARE D OR EQUAL	DU222RB,240V,60A,2P,3R	NEMA 3R
8.1	AC DISCONNECT #2	SQUARE D OR EQUAL	DU222RB,240V,60A,2P,3R	NEMA 3R
8.2	DC DISCONNECT	SOLAR EDGE		INTEGRAL TO INVERTER
9	RAPID SHUTDOWN	SOLAR EDGE		INTEGRAL TO INVERTER
10	REVENUE METER	SOLAR EDGE	US000NNR2	INTEGRAL TO INVERTER
11	EXISTING MAIN SERVICE PANEL	EXISTING		

CONDUIT AND CONDUCTOR SCHEDULE					
TAG	DESCRIPTION OF CONDUCTOR TYPE	CONDUCTOR SIZE (AWG)	# OF CONDUCTORS	CONDUIT TYPE	CONDUIT SIZE
1	PV WIRE	#10	4	IN FREE AIR	
2	EGC/GEC	#6	1	IN FREE AIR	SOLID BARE
3	THWN-2	#10 & #6	4 & (1)G	EMT	3/4"
4	THWN-2	#8 & #10	3 & (1)G	EMT	3/4"
5	THWN-2	#6 & #8	3 & (1)G	PVC	1"

CONDUCTOR CALCULATIONS:

3) 15 x 1.25 = 18.75a
#10AWG = 40a
310.15(3)(c) = 54°C
T690.31(A) 18.75a / 0.76 = 24.67a
T310.15(B)(3)(a) = 24.67a / 0.8 = 30.84a
30.84a < 40a

4) 32 x 1.25 = 40a
#8AWG = 50a
T310.15(B)(2)(a) = 35°C
40a / 0.96 = 41.67a
41.67a < 50a

1. ALL CONDUCTORS ARE DESIGNED FOR LESS THAN 2% VOLTAGE DROP.
2. ALL EXTERIOR CONDUITS SHALL HAVE WATERPROOF FITTINGS.

BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:

CONTRACTOR LICENSE:

DATE: 10/19/2021 4:39:00 PM

PROJECT #	BPS136186	REV	DATE	DESCRIPTION
SYSTEM SIZE	8.12kW/DC 7.6kW/AC		—	—
DATE:	10/19/2021 4:39:00 PM		—	—
DESIGNER:	K. SPARKS		—	—

GARY BOGAN
29 GRIST MILL RD.
EAST HADDAM, CT 06469

SHEET TITLE: RISER DIAGRAM

SHEET #: PV3.1

NOTE: PLAQUES SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH NON CORROSIVE, POP-RIVETS, SCREWS, OR APPROVED ADHESIVE.

(1) LOCATION: MAIN SERVICE PANEL & AC DISCONNECT

⚠ WARNING

ELECTRIC SHOCK HAZARD

DO NOT TOUCH TERMINALS
TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

PHOTOVOLTAIC MODULES PRODUCE DC VOLTAGE WHENEVER THEY ARE EXPOSED TO SUNLIGHT

(2) LOCATION: MAIN SERVICE PANEL PV BACK-FED BREAKER

⚠ WARNING

INVERTER OUTPUT CONNECTION

DO NOT RELOCATE THIS OVERCURRENT DEVICE

(3) LOCATION: MAIN SERVICE PANEL PV BACK-FED BREAKER

⚠ WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

(4) LOCATION: UTILITY METER

⚠ WARNING

THIS SERVICE METER IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM

(5) LOCATION: PV SUB PANEL (IF USED)

⚠ WARNING

PHOTOVOLTAIC SYSTEM COMBINER PANEL

DO NOT ADD LOADS

(6) CONDUIT, RACEWAYS & ENCLOSURES

WARNING: PHOTOVOLTAIC POWER SOURCE

(7) LOCATION: DC DISCONNECT/INVERTER #1

PHOTOVOLTAIC SYSTEM DC DISCONNECT	
MAXIMUM CIRCUIT CURRENT	20 A
MAXIMUM SYSTEM VOLTAGE	480 V
MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-to-DC CONVERTER	15 A

(8) LOCATION: MAIN SERVICE PANEL

PV SYSTEM POINT OF CONNECTION
SOLAR PV SYSTEM AC POINT OF CONNECTION

MAX AC OUTPUT CURRENT	32 A
MAX NOMINAL AC VOLTAGE	240 V

THIS PANEL FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)

(9) LOCATION: MAIN SERVICE PANEL

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

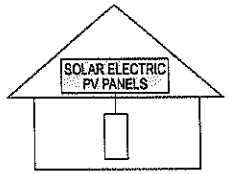
(10) LOCATION: INVERTER

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

(11) LOCATION: MAIN PANEL

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY

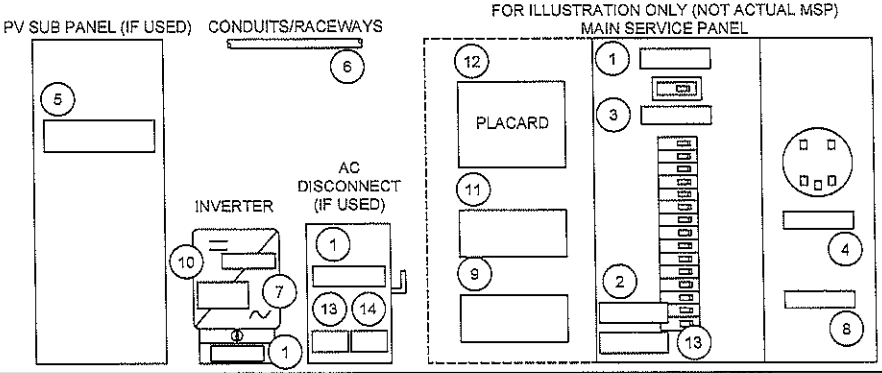


(13) LOCATION: MAIN SERVICE PANEL / AC DISCONNECT

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

(14) LOCATION: AC DISCONNECT

PHOTOVOLTAIC AC DISCONNECT

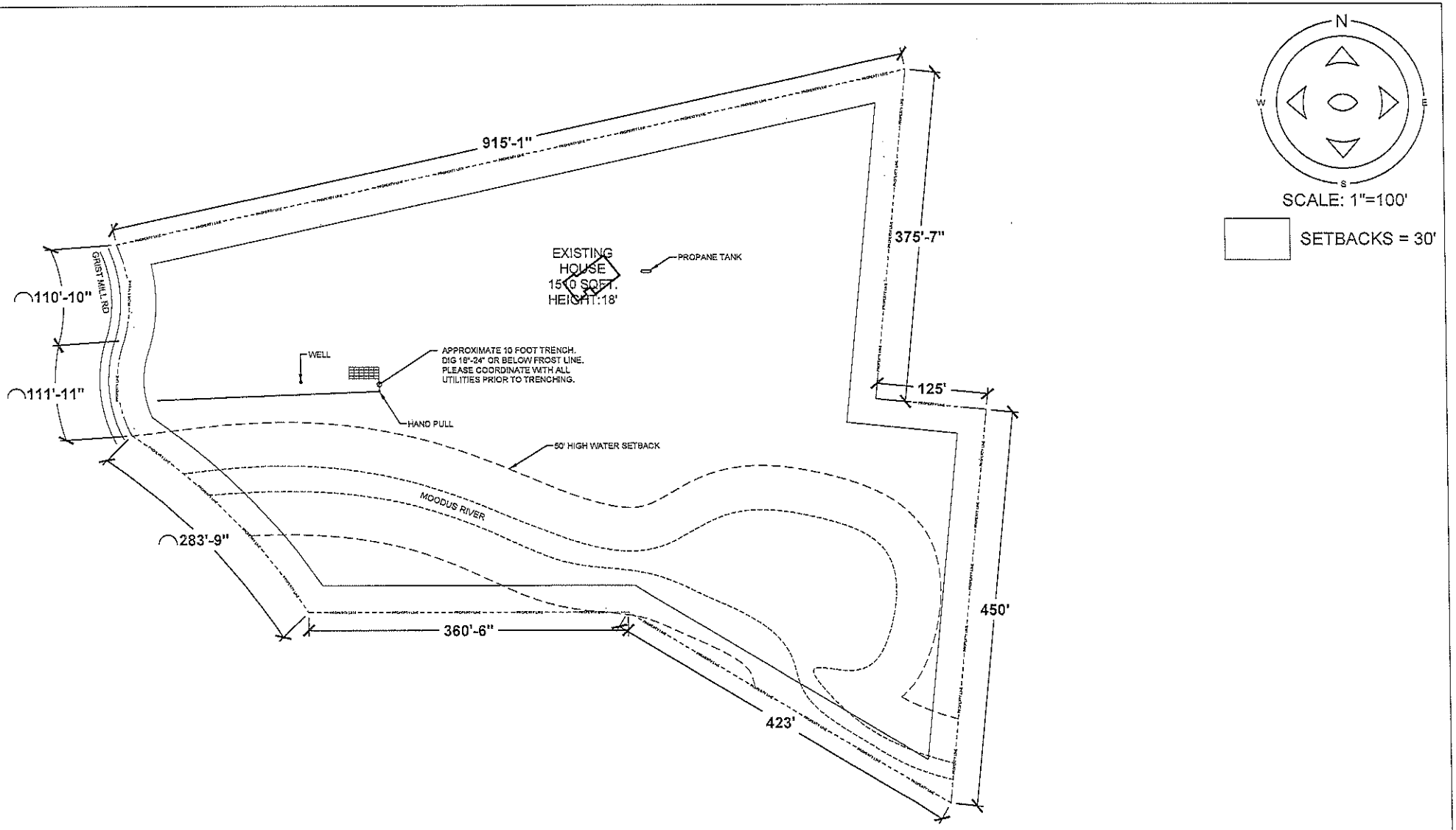


BRIGHT PLANET SOLAR 103A MILLBURY ST, AUBURN MA 01501 888-997-4469	SIGNATURE: CONTRACTOR LICENSE: DATE: 10/19/2021 4:39:01 PM	PROJECT #	BPS136186	REV	DATE / DESCRIPTION
		SYSTEM SIZE	9.12kW/DC 7.6kW/AC		— / —
		DATE:	10/19/2021 4:39:01 PM		— / —
		DESIGNER:	K. SPARKS		— / —

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SHEET TITLE: EQUIPMENT LABELS

SHEET #: PV4



BRIGHT PLANET SOLAR 103A MILLBURY ST, AUBURN MA 01501 888-997-4469	SIGNATURE: CONTRACTOR LICENSE: DATE: 10/19/2021 4:39:02 PM	PROJECT #	BPS136186	REV	DATE	DESCRIPTION
		SYSTEM SIZE	9.12kW/DC 7.6kW/AC		—	—
		DATE:	10/19/2021 4:39:02 PM		—	—
		DESIGNER:	K. SPARKS		—	—

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SHEET TITLE: PROPERTY PLAN

SHEET #: PV7