

NEW PHOTOVOLTAIC SYSTEM 11.52 kW

32 VINEYARD MEADOW FARMS RD, WEST TISBURY, MA 02575, USA



**GREENTECH
RENEWABLES**

CONTRACTOR



FARLEY BUILT, INC.

PROJECT NAME & ADDRESS

HAYNES
32 VINEYARD MEADOW FARMS RD, WEST TISBURY, MA 02575, USA

SIGNATURE WITH SEAL

sealed 01dec2022 mike@h2dc.com
H2DC PLLC MA CoA#: 001239603
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- NOT AN AS BUILT DRAWING SET -

GENERAL NOTES

- 1.1.1 PROJECT NOTES:
1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
1.1.4 GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE MICROINVERTER IN ACCORDANCE WITH NEC 690.41(B)
1.1.5 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4: PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY
1.1.6 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.
1.1.7 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4 (D). SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3].
1.1.8 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
- 1.2.1 SCOPE OF WORK:
1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR GROUND-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT
- 1.3.1 WORK INCLUDES:
1.3.2 PV RACKING SYSTEM INSTALLATION - SUN ACTION TRACKERS
1.3.3 PV MODULE AND INVERTER INSTALLATION - Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W / ENPHASE IQ8A-72-2-US
1.3.4 PV EQUIPMENT GROUND MOUNT
1.3.5 PV SYSTEM WIRING TO A GROUND-MOUNTED JUNCTION BOX
1.3.6 PV LOAD CENTERS (IF INCLUDED)
1.3.7 PV METERING/MONITORING (IF INCLUDED)
1.3.8 PV DISCONNECTS
1.3.9 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
1.3.10 PV FINAL COMMISSIONING
1.3.11 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
1.3.12 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE

PROJECT INFORMATION

OWNER
NAME: HAYNES

CONTRACTOR INFORMATION:
CONTRACTOR NAME: FARLEY BUILT, INC.
PROJECT MANAGER: SAM HALL
EMAIL: sam@farleybuilt.com
PH: (617) 320-1876

SCOPE OF WORK

NEW SYSTEM SIZE : STC : 24 X 480W= 11.52 kW DC
PTC : 24 X 497.2W = 11.93 kW DC
AC SIZE: 8.37 kW AC
(24) Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W
(24) ENPHASE IQ8A-72-2-US

ATTACHMENT TYPE: SUN ACTION TRACKERS
MSP UPGRADE: YES

AUTHORITIES HAVING JURISDICTION
BUILDING : TOWN OF WEST TISBURY
UTILITY : EVERSOURCE

DESIGN SPECIFICATION

OCCUPANCY: - GROUP B
CONSTRUCTION: - TYPE 2
ZONING: - TOWN OF WEST TISBURY
GROUND SNOW LOAD - 25 PSF
WIND EXPOSURE - C
WIND SPEED - 134 MPH

APPLICABLE CODES & STANDARDS

BUILDING: IBC 2015, IRC 2015
ELECTRICAL: NEC 2020
FIRE: IFC 2015

VICINITY MAP



SATELLITE VIEW



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REV	DESCRIPTION	DATE	PERMIT PLAN
A		12/01/2022	

SHEET TITLE	
COVER PAGE	
DRAWN DATE	12/01/2022
DRAWN BY	JK
REVIEWED BY	VN
SHEET NUMBER	
T-001	

NOTES

1. EXISTING PLUMBING VENTS, SKYLIGHTS, EXHAUST OUTLETS, VENTILATIONS INTAKE AIR OPENINGS SHALL NOT BE COVERED BY THE SOLAR PHOTOVOLTAIC SYSTEM.
2. EQUIPMENT. INVERTERS, MOTOR GENERATORS, PHOTOVOLTAIC MODULES, SOURCE-CIRCUIT COMBINERS, AND CHARGE CONTROLLERS INTENDED FOR USE IN PHOTOVOLTAIC POWER SYSTEMS SHALL BE IDENTIFIED AND LISTED FOR THE APPLICATION. (NEC 690.4(B))
3. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED, INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND NON ROOF SWITCHES. ROOF SWITCHES TO BE NEMA 4 RATED.
4. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
5. PROTECTION DEVICES FOR PV SOURCE CIRCUITS AND PV OUTPUT CIRCUITS ALSO CONNECTED TO SOURCES HAVING SIGNIFICANTLY HIGHER CURRENT AVAILABILITY (E.G., PARALLEL STRINGS OF MODULES, UTILITY POWER), SHALL BE PROTECTED AT THE SOURCE FROM OVERCURRENT. [NEC 690.9(A)]
6. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION THAT CONTROLS SPECIFIC CONDUCTORS. [NEC 690.12]
7. THE UTILITY INTERACTIVE INVERTERS SHALL AUTOMATICALLY DE-ENERGIZE ITS OUTPUT TO THE CONNECTED ELECTRICAL PRODUCTION AND DISTRIBUTION NETWORK UPON LOSS OF VOLTAGE IN THE SYSTEM AND SHALL REMAIN IN THAT STATE UNTIL THE ELECTRICAL PRODUCTION AND DISTRIBUTION NETWORK VOLTAGE HAS BEEN RESTORED. [NEC 705.41]
8. ALL CONDUCTOR EXPOSED TO WEATHER SHALL BE LISTED & IDENTIFIED FOR USE IN DIRECT SUNLIGHT. [CEC 310.10(D)(1)]
9. THE MODULE CONDUCTORS MUST BE TYPE USE-2 OR LISTED FOR PHOTOVOLTAIC (PV) WIRE. (NEC 690.31(C))
10. ALL CONDUCTORS SHALL BE MARKED ON EACH END FOR UNIQUE IDENTIFICATION.
11. AN INSULATED GROUNDED CONDUCTOR OF 6 AWG OR SMALLER SHALL BE IDENTIFIED AS A CONTINUOUS WHITE FINISH. [NEC 200.6]
12. THE OUTPUT OF AN INTERCONNECTED ELECTRICAL POWER SOURCE SHALL BE PERMITTED TO BE CONNECTED TO THE LOAD SIDE. INTERCONNECTING PROVISIONS FOR OTHER POWER SOURCES SHALL COMPLY WITH 705.12(B)(1) THROUGH 705.12(B)(5)
13. EACH SOURCE INTERCONNECTION OF ONE OR MORE POWER SOURCES INSTALLED IN ONE SYSTEM SHALL BE MADE AT A DEDICATED CIRCUIT BREAKER OR FUSIBLE DISCONNECTING MEANS [NEC 705.12(B)(1)]
14. THE SUM OF THE AMPERE RATING OF THE OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO THE BUSBAR OR CONDUCTOR SHALL NOT EXCEED 120% OF THE RATING OF BUSBAR OR CONDUCTOR. [NEC 705.12(B)(2)(3)(B)]
15. A CONNECTION AT EITHER END, BUT NOT BOTH ENDS, OF A CENTER-FED PANEL BOARD IN DWELLINGS SHALL BE PERMITTED WHERE THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR DOES NOT EXCEED 120 PERCENT OF THE CURRENT RATING OF THE BUSBAR. [NEC 705.12(B)(2)(3)(D)]
16. EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUS BAR OR CONDUCTOR

- SHALL BE MARKED TO INDICATE THE PRESENCE OF ALL SOURCES. [NEC 705.12(B)(3)]
17. CIRCUIT BREAKER, IF BACKFED, SHALL BE SUITABLE FOR SUCH OPERATION. [NEC 705.12(B)(4)]
 18. TO MINIMIZE OVERHEATING OF THE BUSBAR IN PANELBOARD, THE PANELBOARD MAIN CIRCUIT BREAKER AND THE PV POWER SOURCE CIRCUIT BREAKER SHALL BE PHYSICALLY LOCATED AT THE OPPOSITE END OF THE BUSBAR.
 19. ALL THE NEC REQUIRED WARNING SIGNS, MARKINGS, AND LABELS SHALL BE POSTED ON EQUIPMENT AND DISCONNECTS PRIOR TO ANY INSPECTIONS TO BE PERFORMED BY THE BUILDING DEPARTMENT INSPECTOR.
 20. WHERE PV SYSTEM DC CIRCUIT'S RUN INSIDE A BUILDING, THEY SHALL BE CONTAINED IN METAL RACEWAYS TYPE MC METAL CLAD CABLE OR METAL ENCLOSURES FROM POINT OF PENETRATION OF THE SURFACE OF THE BUILDING TO THE FIRST READILY ACCESSIBLE DISCONNECTING MEANS. [NEC 690.31(G)]
 21. FLEXIBLE, FINE-STRANDED CABLES SHALL BE TERMINATED ONLY WITH TERMINALS, LUGS, DEVICES OR CONNECTOR THAT ARE IS IN ACCORDANCE WITH NEC 110.14
 22. CONNECTORS SHALL BE OF LATCHING OR LOCKING TYPE. CONNECTORS THAT ARE READILY ACCESSIBLE AND OPERATING AT OVER 30V DC OR 15V AC SHALL REQUIRE TOOL TO OPEN AND MARKED "DO NOT DISCONNECT UNDER LOAD" OR "NOT FOR CURRENT INTERRUPTING". [NEC 690.33(C) & (E)(2)]
 23. EQUIPMENT GROUNDING CONDUCTOR FOR PV MODULES SMALLER THAN 6AWG SHALL BE PROTECTED FROM PHYSICAL DAMAGE BY A RACEWAY OR CABLE ARMOR. NEC 690.46 & 250.120(C)]
 24. AN EQUIPMENT GROUNDING CONDUCTOR SHALL NOT BE SMALLER THAN 14 AWG. [NEC 690.45]
 25. FINE STRANDED CABLES USED FOR BATTERY TERMINALS, DEVICES, AND CONNECTIONS REQUIRE LUGS AND TERMINALS IS IN ACCORDANCE WITH NEC 110.14
 26. GROUNDING ELECTRODE CONDUCTOR(S) SHALL BE INSTALLED IN ONE CONTINUOUS LENGTH WITHOUT A SPLICE OR JOINT. IF NECESSARY, SPLICES OR CONNECTIONS SHALL BE MADE AS PERMITTED. (NEC 250.64 C)
 27. ALL SMOKE ALARMS, CARBON MONOXIDE ALARMS AND AUDIBLE NOTIFICATION DEVICES SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 217 AND UL 2034. THEY WILL BE INSTALLED IN ACCORDANCE WITH NFPA 72 AND NFPA 720.(IRC 2019 R314 & R315).
 28. SMOKE ALARMS AND CARBON MONOXIDE ALARMS WILL BE RETROFITTED INTO THE EXISTING DWELLING. THESE SMOKE ALARMS ARE REQUIRED TO BE IN ALL BEDROOMS, OUTSIDE EACH BEDROOM, AND AT LEAST ONE ON EACH FLOOR OF THE HOUSE CARBON MONOXIDE ALARMS ARE REQUIRED TO BE RETROFITTED OUTSIDE EACH BEDROOM AND AT LEAST ONE ON EACH FLOOR OF THE HOUSE. THESE ALARMS MAY BE SOLELY BATTERY OPERATED IF THE PHOTOVOLTAIC PROJECT DOES NOT INVOLVE THE REMOVAL OF INTERIOR WALL AND
 23. CEILING FINISHES INSIDE THE HOME, OTHERWISE, THE ALARMS MUST BE HARD WIRED AND INTERCONNECTED.

**GENERAL CONDUCTOR INSULATION KEY
DC CONDUCTORS**

POSITIVE(UNGROUND)	RED
NEGATIVE(UNGROUND)	BLACK

480/277V AC CONDUCTORS

PHASE L1	BROWN
PHASE L2	ORANGE
PHASE L3	YELLOW

120/208V OR 240V AC CONDUCTORS

PHASE L1	BLACK
PHASE L2	RED (SEE NOTE)
PHASE L3	BLUE
NEUTRAL	WHITE OR GREY
GROUND	GREEN OR BARE Cu

NOTE: THREE PHASE HIGH LEG MUST BE IN ORANGE COLOUR PER NFPA 70.

GROUND FAULT PROTECTION

1. PHOTOVOLTAIC INVERTERS SHALL BE EQUIPPED WITH DC GROUND FAULT PROTECTION. INVERTERS ARE ALSO EQUIPPED WITH ANTI-ISLANDING CIRCUITRY. DISCONNECTING MEANS
 1. MEANS SHALL BE PROVIDED TO ISOLATE EACH SOURCE CIRCUIT FROM THE SYSTEM.
 2. WHERE A CIRCUIT GROUNDING CONNECTION IS NOT DESIGNED TO BE AUTOMATICALLY INTERRUPTED AS PART OF THE GROUND-FAULT PROTECTION, A SWITCH OR CIRCUIT BREAKER USED AS A DISCONNECTING MEANS SHALL NOT HAVE A POLE ON THE GROUNDED CONDUCTOR.
 3. THE GROUNDED CONDUCTOR MAY HAVE A BOLTED OR TERMINAL DISCONNECTING MEANS TO ALLOW MAINTENANCE OR TROUBLESHOOTING BY QUALIFIED PERSONNEL.
 4. EQUIPMENT SUCH AS PHOTOVOLTAIC SOURCE CIRCUITS, OVER CURRENT DEVICES, AND BLOCKING DIODES SHALL BE PERMITTED ON THE PHOTOVOLTAIC SIDE OF THE PHOTOVOLTAIC DISCONNECTING MEANS.
 5. MEANS SHALL BE PROVIDED TO DISCONNECT INVERTERS FROM ALL UNGROUNDED CONDUCTORS OF ALL SOURCES. IF THE EQUIPMENT IS ENERGIZED FROM MORE THAN ONE SOURCE, THE DISCONNECTING MEANS SHALL BE GROUPED AND IDENTIFIED.
 6. A SINGLE DISCONNECTING MEANS SHALL BE PERMITTED FOR THE COMBINED OUTPUT OF ONE OR MORE INVERTERS IN A GRID INTERACTIVE SYSTEM.
 7. DISCONNECTING MEANS SHALL BE PROVIDED TO DISCONNECT A FUSE FROM ALL SOURCES OF SUPPLY IF THE FUSE IS ENERGIZED FROM BOTH DIRECTIONS AND IS ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS. SUCH A FUSE IN A PHOTOVOLTAIC SOURCE CIRCUIT SHALL BE CAPABLE OF BEING DISCONNECTED INDEPENDENTLY OF FUSES IN OTHER PHOTOVOLTAIC SOURCE CIRCUITS.



GREENTECH RENEWABLES



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SHEET TITLE

NOTES

DRAWN DATE	12/01/2022
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SHEET NUMBER

G-001

LEGEND

- - - PROPERTY LINE

[JB] - JUNCTION BOX



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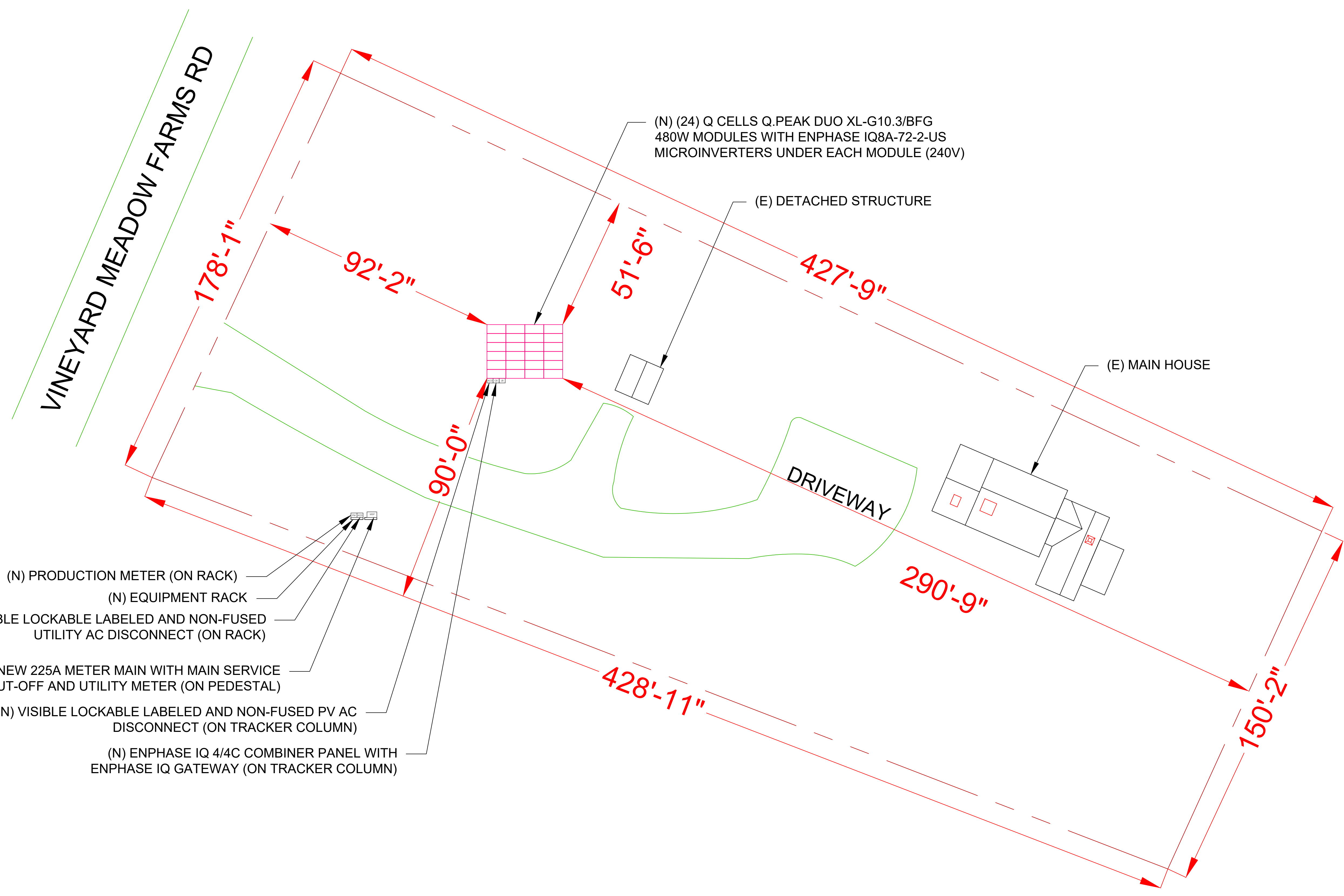
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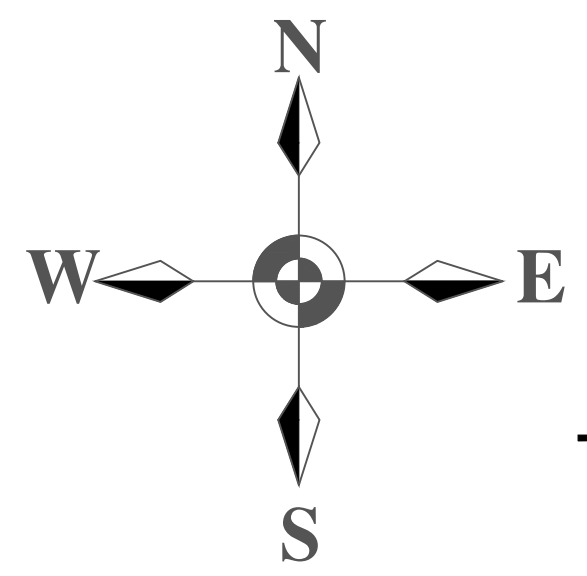
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SITE PLAN

DRAWN DATE	12/01/2022
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SHEET NUMBER
A-101



- (N) PRODUCTION METER (ON RACK)
- (N) EQUIPMENT RACK
- (N) VISIBLE LOCKABLE LABELED AND NON-FUSED UTILITY AC DISCONNECT (ON RACK)
- (N) NEW 225A METER MAIN WITH MAIN SERVICE SHUT-OFF AND UTILITY METER (ON PEDESTAL)
- (N) VISIBLE LOCKABLE LABELED AND NON-FUSED PV AC DISCONNECT (ON TRACKER COLUMN)
- (N) ENPHASE IQ 4/4C COMBINER PANEL WITH ENPHASE IQ GATEWAY (ON TRACKER COLUMN)



1 | **SITE PLAN**
SCALE: 1"=20'-0"

- MODULE STRING 1
- MODULE STRING 2
- MODULE STRING 3

(24) Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MODULES WITH (24) ENPHASE IQ8A-72-2-US MICROINVERTERS
 (03) STRINGS OF 8 MODULES CONNECTED IN PARALLEL.

LEGEND

- PROPERTY LINE
- JUNCTION BOX

ARRAY (S)

ARRAY 1 DUAL AXIS TILT - 0° TO 60°
 DUAL AXIS AZIMUTH - (-120° TO +120°)
 MODULE - 24



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CONTRACTOR

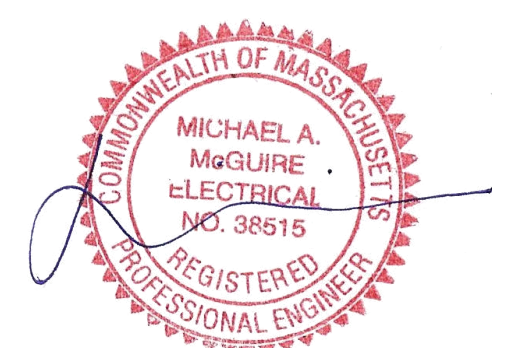


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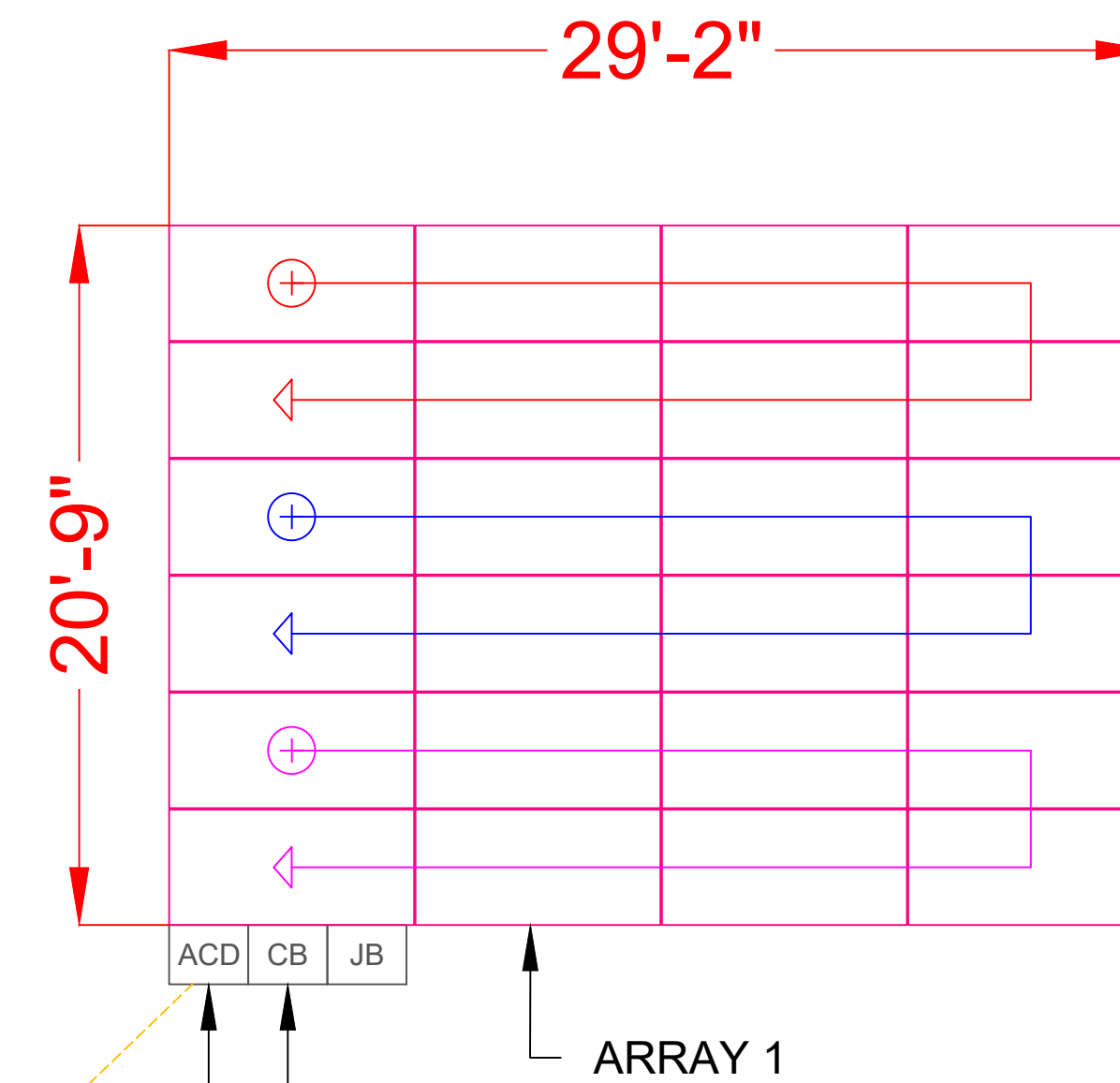
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ELECTRICAL PLAN

DRAWN DATE 12/01/2022
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SHEET NUMBER
A-102

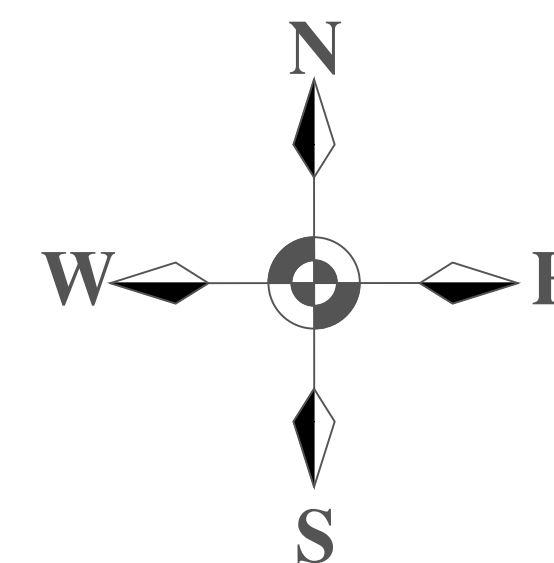


(N) (24) Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MODULES WITH ENPHASE IQ8A-72-2-US MICROINVERTERS UNDER EACH MODULE (240V)

(N) ENPHASE IQ 4/4C COMBINER PANEL WITH ENPHASE IQ GATEWAY (ON TRACKER COLUMN)
 (N) VISIBLE LOCKABLE LABELED AND NON-FUSED PV AC DISCONNECT (ON TRACKER COLUMN)

(N) TRENCH ~112'

- (N) NEW 225A METER MAIN WITH MAIN SERVICE SHUT-OFF AND UTILITY METER (ON PEDESTAL)
- (N) VISIBLE LOCKABLE LABELED AND NON-FUSED UTILITY AC DISCONNECT (ON RACK)
- (N) PRODUCTION METER (ON RACK)
- (N) EQUIPMENT RACK



1 | ELECTRICAL PLAN
SCALE: 3/16" = 1'-0"



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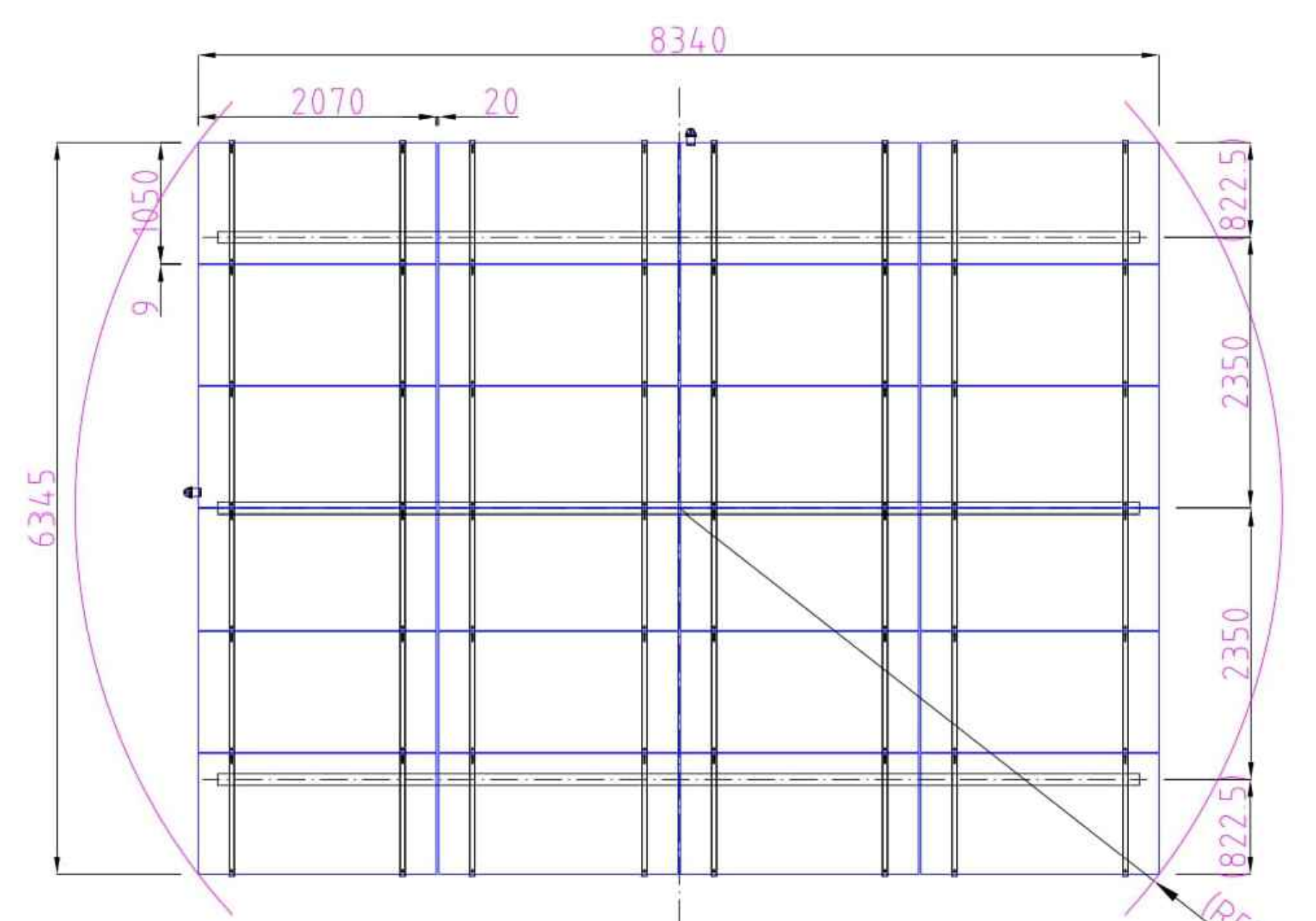
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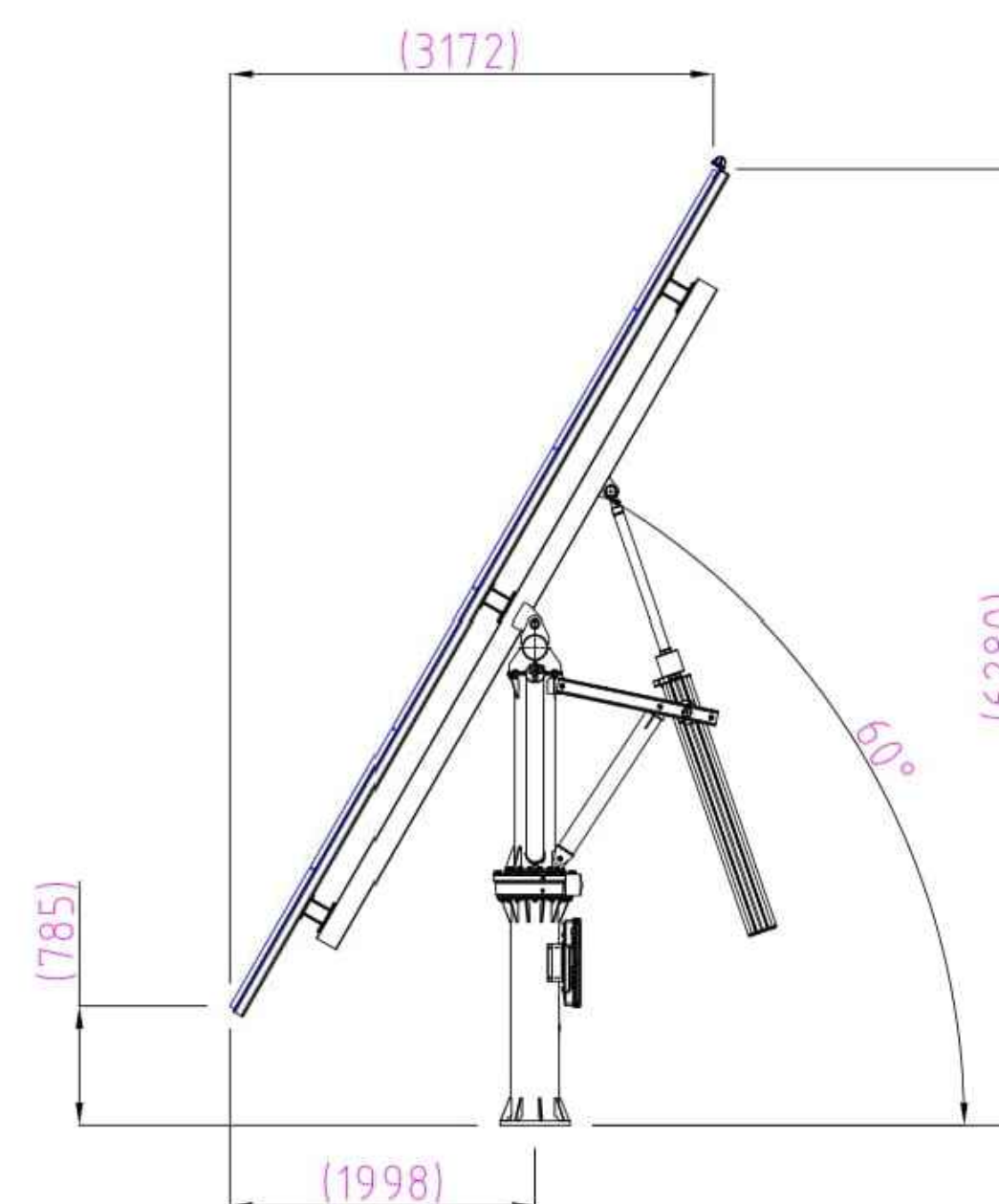
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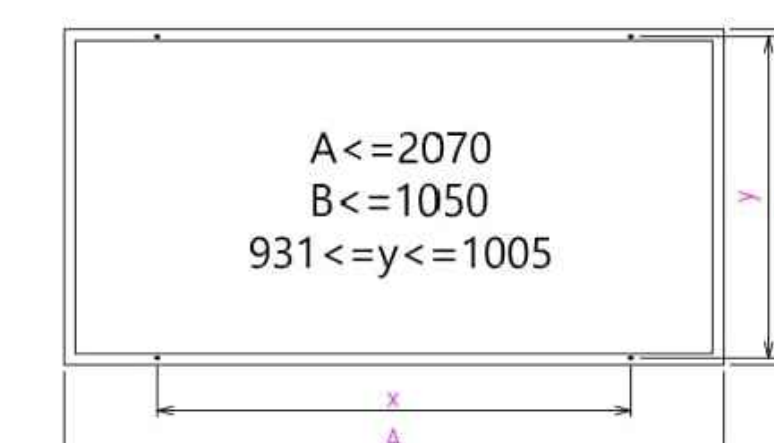
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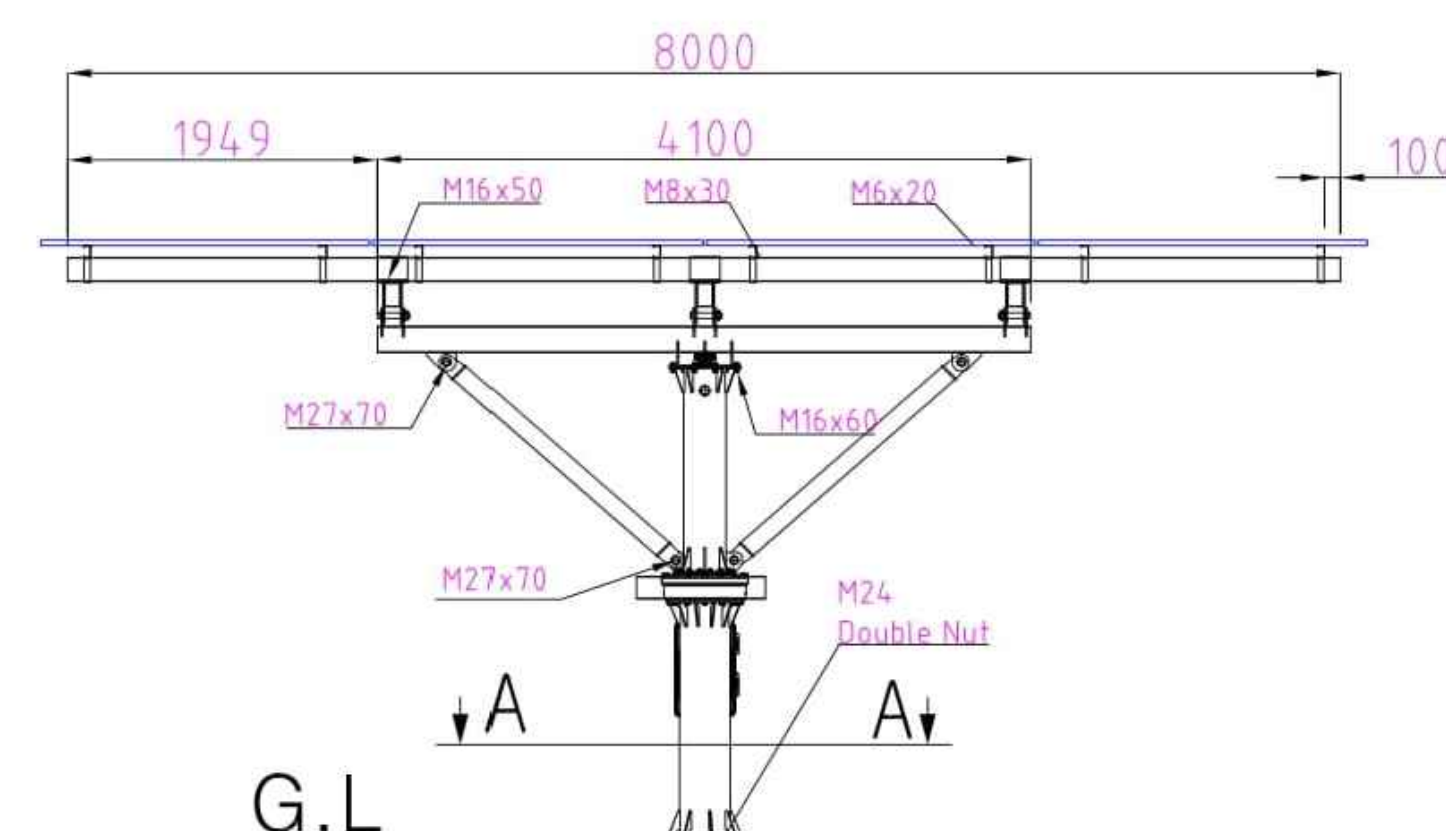
Module array



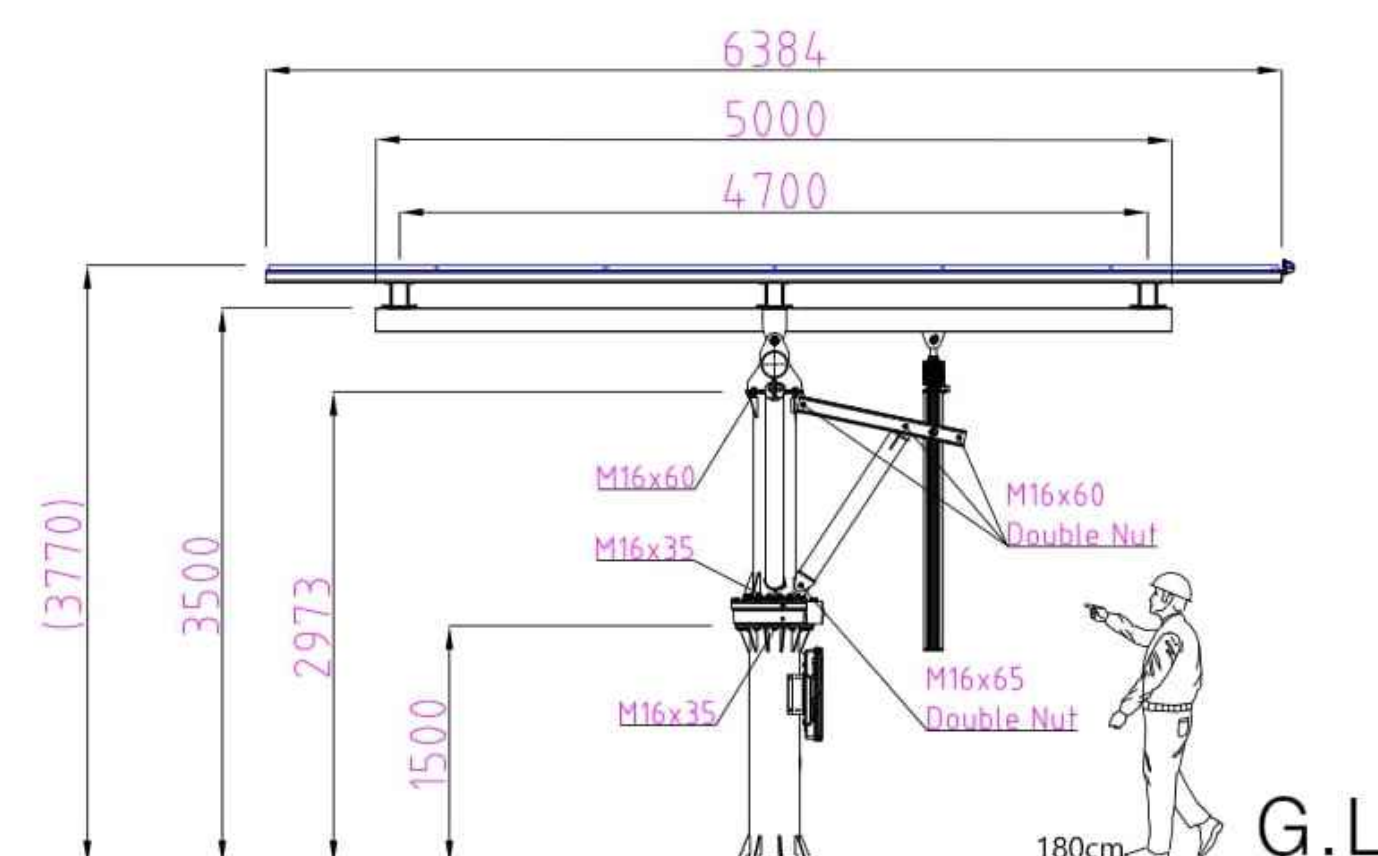
Side view(60°)



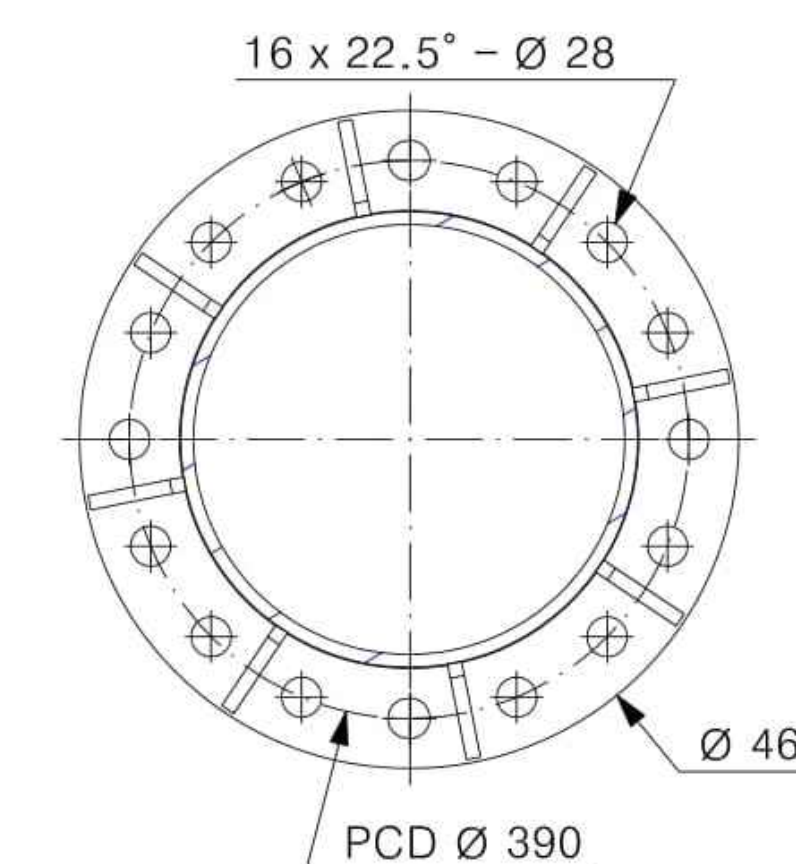
Module Layout



Front view



Side view(0°)

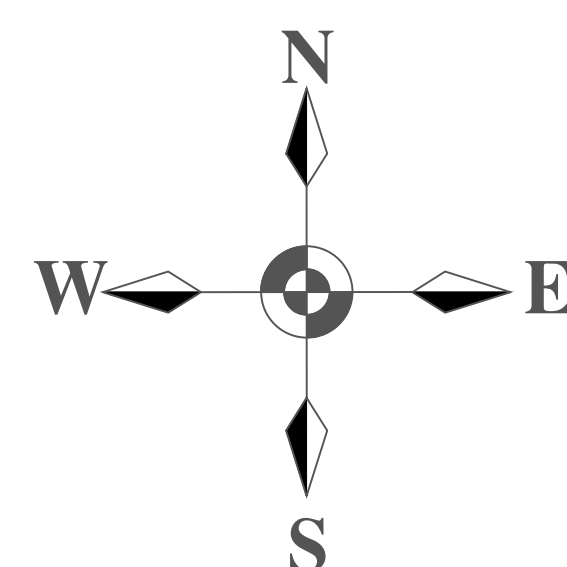


Detail Section View A-A (1:9)

- All dimensions in mm. Not to scale.
- Layout/Drawing is for reference use only.
- Prohibit counterfeiting, unauthorized copy, and opening public.
- Return to authorized department immediately after competing the work.
- Control strictly in accordance with classified documents.
- Should have legal responsibility for information spill without permission.



Product	DualTrack 24M [Standard V1]	Qty	Approved By
Part Name	Layout Drawing	Material	Checked By
DWG No.	PST-2AL-24M	Weight(Kg)	Designed By
		General Tolerance	Drawn By
		Projection	Date



1 | ATTACHMENT PLAN

SCALE:NTS



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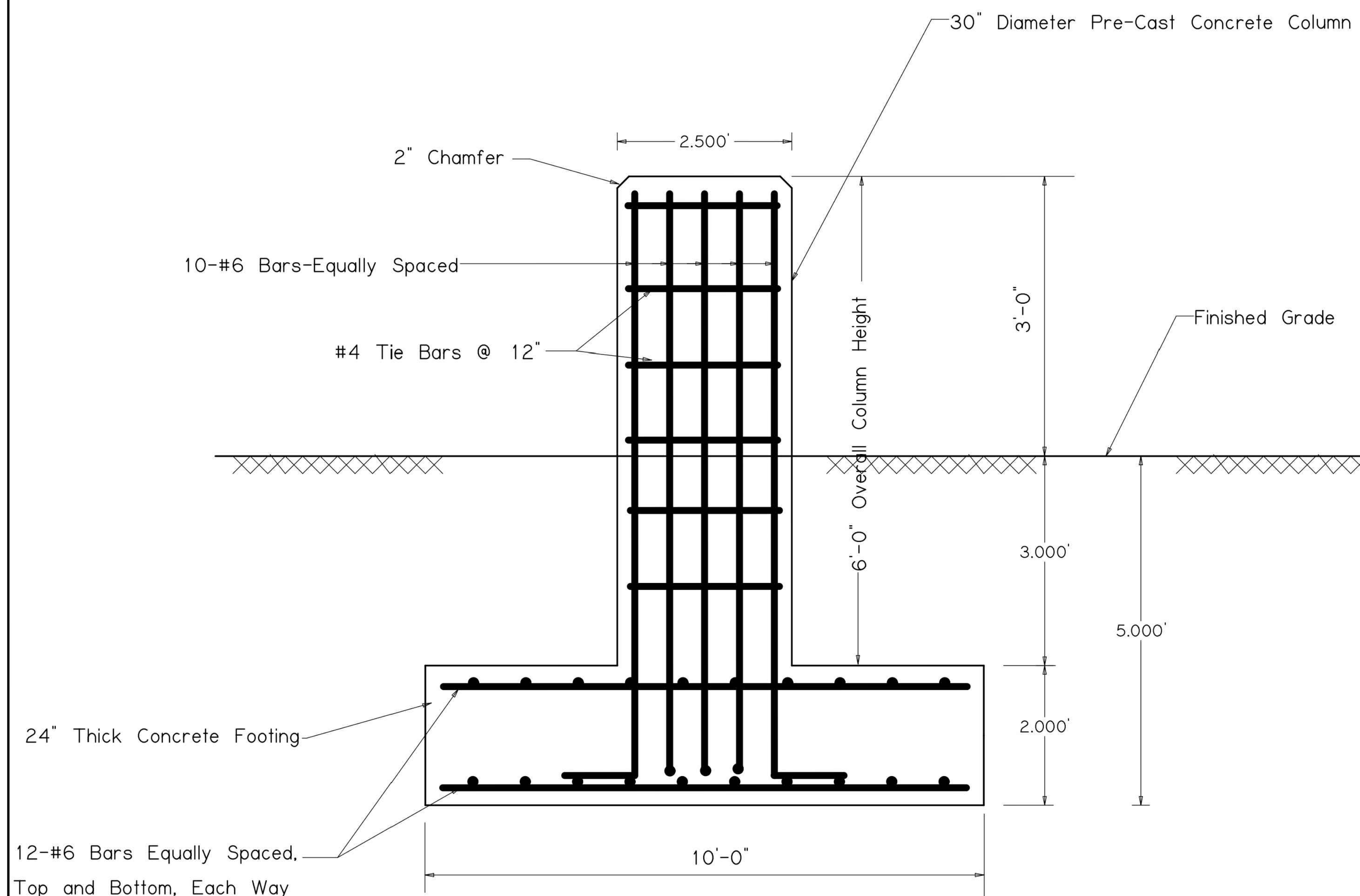
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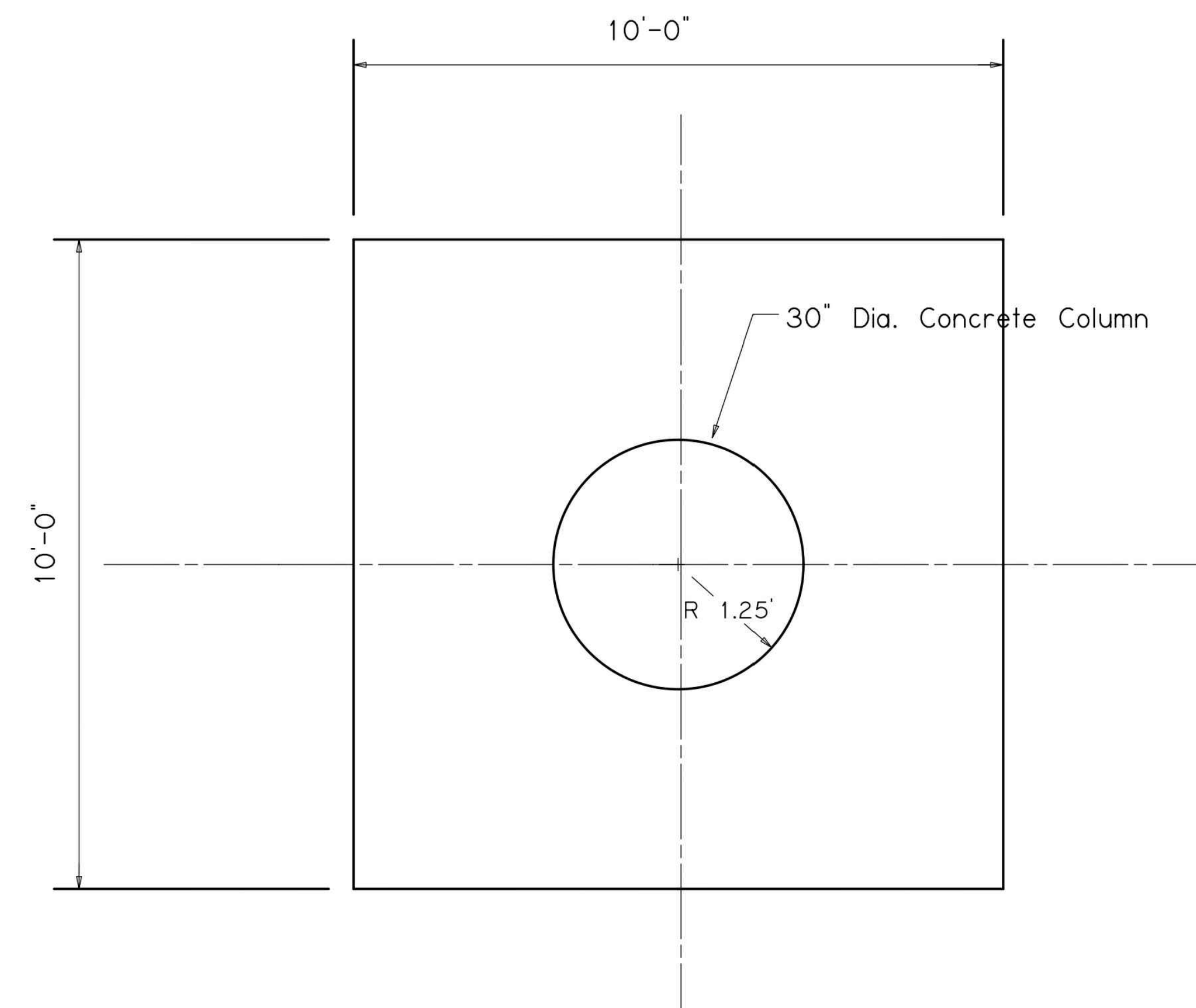
SHEET TITLE
FOUNDATION DETAILS

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SHEET NUMBER
A-104



SECTION



PLAN VIEW

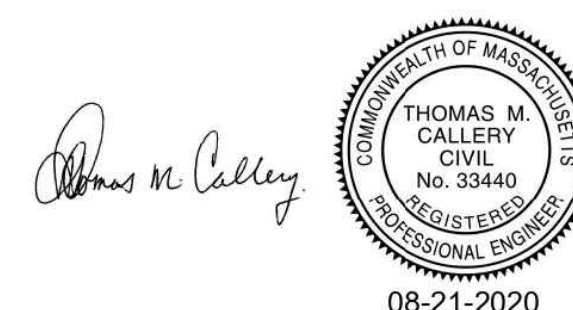
PROPOSED CONCRETE FOUNDATION

Scale: 1" = 1'-0"

CAPE COD, MASSACHUSETTS
DESIGN CRITERIA
WIND SPEED: 140 MPH GROUND SNOW LOAD: 25 PSF

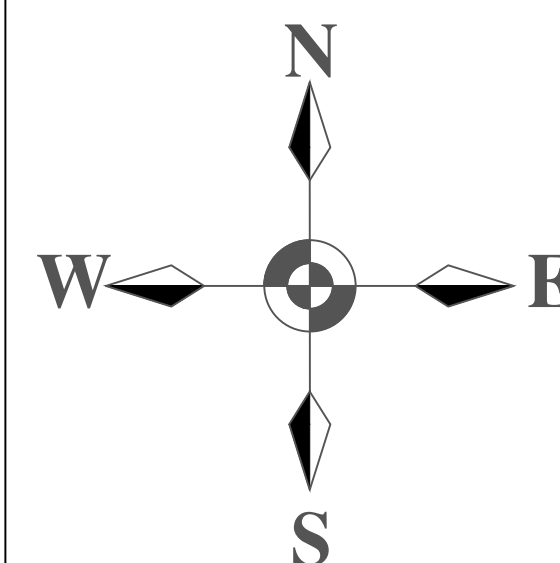
GENERAL CONSTRUCTION NOTES

1. Concrete shall be 5000 PSI (Min.) 28 Day Compressive Strength.
2. Reinforcing Steel shall be Grade 60.
3. Bottom of Footing shall be undisturbed native granular soil.
4. Backfill shall consist of clean sand & gravel and will be compacted to 95% Std. Proctor.



Packy Campbell

PreCast Concrete Foundation
For
24 Panel SunAction Solar Trackers



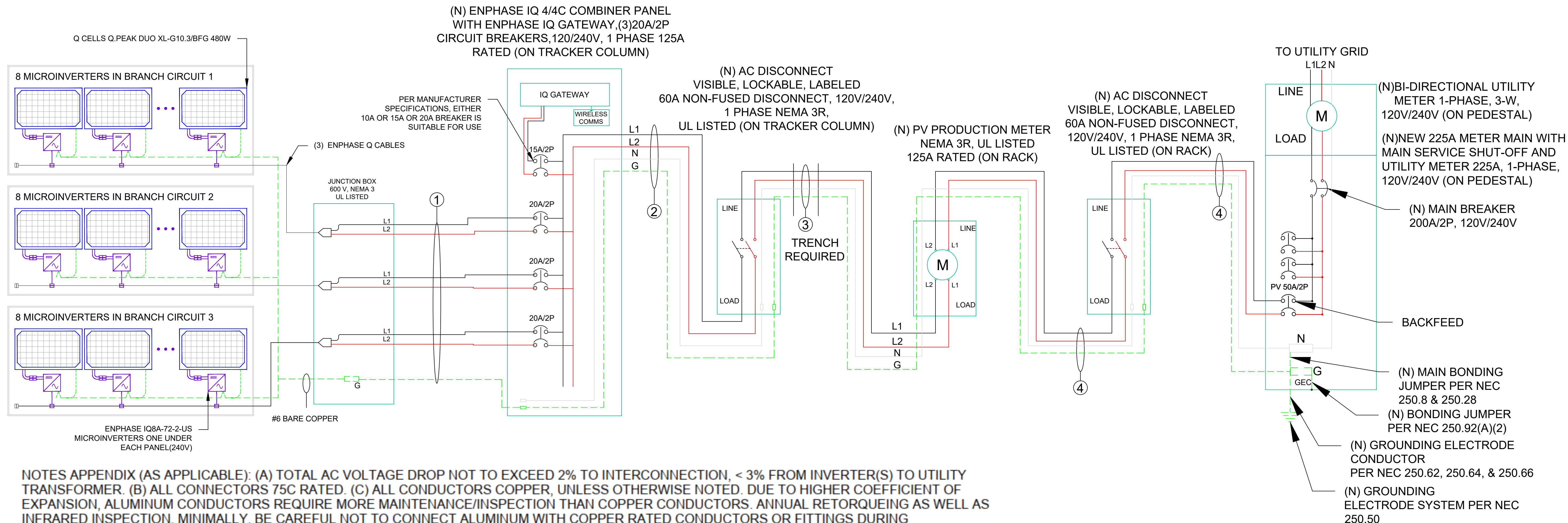
1 | FOUNDATION DETAILS

SCALE: NTS

DC SYSTEM SIZE: 11.52 kW DC
AC SYSTEM SIZE: 8.37 kW AC

(24) Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W MODULES
WITH (24) ENPHASE IQ8A-72-2-US MICROINVERTERS
(03) STRINGS OF 8 MODULES CONNECTED IN PARALLEL.

ID	PARALLEL FEEDER	PHASE CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			NEUTRAL		GROUND CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			CONDUIT SIZE	CONDUIT TYPE
		QTY	SIZE	TYPE	QTY	SIZE	QTY	SIZE	TYPE		
1	1	6	AWG #10	THWN-2,COPPER		N/A	1	AWG #10	THWN-2,COPPER EGC	3/4"	EMT
2	1	2	AWG #8	THWN-2,COPPER	1	AWG #10	1	AWG #10	THWN-2,COPPER EGC	3/4"	EMT
3	1	2	AWG #6	THWN-2,COPPER	1	AWG #10	1	AWG #10	THWN-2,COPPER EGC	3/4"	PVC
4	1	2	AWG #8	THWN-2,COPPER	1	AWG #10	1	AWG #10	THWN-2,COPPER EGC	3/4"	EMT
E	EXISTING										



NOTES APPENDIX (AS APPLICABLE): (A) TOTAL AC VOLTAGE DROP NOT TO EXCEED 2% TO INTERCONNECTION, < 3% FROM INVERTER(S) TO UTILITY TRANSFORMER. (B) ALL CONNECTORS 75C RATED. (C) ALL CONDUCTORS COPPER, UNLESS OTHERWISE NOTED. DUE TO HIGHER COEFFICIENT OF EXPANSION, ALUMINUM CONDUCTORS REQUIRE MORE MAINTENANCE/INSPECTION THAN COPPER CONDUCTORS. ANNUAL RETORQUEING AS WELL AS INFRARED INSPECTION, MINIMALLY. BE CAREFUL NOT TO CONNECT ALUMINUM WITH COPPER RATED CONDUCTORS OR FITTINGS DURING CONSTRUCTION, TERMINALS SHOULD BE DUAL RATED. MATERIAL FOR NEUTRAL AND EGC SHOULD BE THE SAME IN A GIVEN SEGMENT. (D) OUTDOOR EQUIPMENT NEMA3R. (E) ALL CONDUCTORS FOR PV & ESS SYSTEMS MUST BE PROTECTED FROM ACCESS BY A FENCE OR SUITABLE COVER, OR OUT OF REACH. (F) PROPERTY LINES, BOUNDARIES AND ALL OTHER EXTERIOR MEASUREMENTS ARE FOR REFERENCE ONLY, AND MUST BE VERIFIED BY A LICENSED SURVEYOR OR CIVIL ENGINEER. (G) ENERGY STORAGE SYSTEMS ARE REQUIRED TO BE INSTALLED IN LOCATIONS AND CONTAINERS IN COMPLIANCE WITH THEIR LISTING REQUIREMENTS. (H) IF TRAVEL ACROSS A ROOF IS LIMITED TO FIRE SETBACK AREAS, FALL RESTRAINT SYSTEMS MAY BE REQUIRED. (I) NO PVC ALLOWED ON ROOF OR IN ATTIC. (J) MC4 CONNECTORS MAY NOT BE JOINED WITH 'MC4 COMPATIBLE' CONNECTORS. (K) FOR COMMERCIAL SYSTEMS - UNDER MODULE WIRE MANAGEMENT SYSTEMS ARE REQUIRED, RACEWAY FILL MUST NOT EXCEED 40% REFER TO LOCAL REGULATIONS FOR EXCEPTIONS. (L) FOR LINE SIDE TAPS, CONNECTION IN PANEL MUST NOT VIOLATE CONDITIONS OF ACCEPTABILITY FROM PANEL MANUFACTURER'S NRTL LISTING, OR FIELD LABEL REQUIRED. (M) PV WIRES MAY NOT BE LAID DIRECTLY ON ROOF, WIRE MANAGEMENT SUCH AS SNAKE TRAY, ETC. MUST BE USED 40% FILL MAX. (N) TY WRAPS FOR WIRE MANAGEMENT MUST BE STRUCTURAL (S21) UL APPROVED, OR SUN BUNDLER OR EQUAL. (O) DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING, WHEN INDICATED, IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS, AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. (P) BURIED CONDUITS UNDER AREAS SUBJECT TO VEHICLE TRAFFIC REQUIRE MIN 24" COVER. (Q) SOLAREEDGE INVERTERS MAY BE EQUIPPED WITH OCPD ON DC LINES, IF NOT EXTERNAL OCPD MAY BE REQUIRED FOR STRINGS NUMBERING 3 OR MORE. (R) BATTERIES MUST BE IN AN APPROVED BATTERY ENCLOSURE (SPECIFIED BY THE BATTERY MANUFACTURER), SUITABLE FOR THE LOCATION. (S) NM-B OR PAPER INSULATED CONDUCTORS MAY NOT BE USED EXTERIOR. INSTEAD USE THWN-2 OR EQUAL IN EMT CONDUIT. (T) FOR MULTIPLE BATTERIES/INVERTERS SHARING A COMMON DC BUS, OCPD PROTECTION IS REQUIRED ON BOTH SIDES OF THE BUS AND AT INVERTERS DUE TO 2 WAY CURRENTS. (U) FOR ALL COMMERCIAL SOLAR PROJECTS, THE DEVELOPER IS REQUIRED TO CONFIRM EXISTING ELECTRICAL SERVICE SIZE FROM THE UTILITY, AND MAY NOT RELY SOLELY ON EXISTING BREAKER SIZES.

SOLAR BREAKER LOCATED AT THE FURTHEST END OF BUSBAR FROM THE MAIN BREAKER OR FEEDER UNIT



GREENTECH RENEWABLES



FARLEY BUILT, INC.

PROJECT NAME & ADDRESS
HAYNES
32 VINEYARD MEADOW FARMS RD, WEST TISBURY, MA 02575, USA

SIGNATURE WITH SEAL
MICHAEL A. MAGUIRE
ELECTRICAL
REGISTERED PROFESSIONAL ENGINEER
sealed 01dec2022 mike@h2dc.com
H2DC PLLC MA Co#F: 001239603
ELECTRICAL ONLY
- NOT AN AS BUILT DRAWING SET -

REVISIONS	DATE	DESCRIPTION
REV A	12/01/2022	PERMIT PLAN

SHEET TITLE
LINE DIAGRAM

DRAWN DATE 12/01/2022
DRAWN BY JK
REVIEWED BY VN

SHEET NUMBER
E-601

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	Q CELLS Q.PEAK DUO XL-G10.3/BFG 480W
VMP	45.33V
IMP	10.59A
VOC	53.39V
ISC	11.12A
TEMP. COEFF. VOC	-0.27% / K
PTC RATING	497.2W
MODULE DIMENSION	87.2x41.1x1.38 (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	ENPHASE IQ8A-72-2-US
NOMINAL OUTPUT VOLTAGE	240VAC
NOMINAL OUTPUT CURRENT	1.45 A

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-17°
AMBIENT TEMP (HIGH TEMP 2%)	27°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	27°
CONDUCTOR TEMPERATURE RATE	90°

120% RULE FOR BACKFEED BREAKER
 ...NEC 705.12(B)(2)(3)(b)

MCB + PV BREAKER <= (1.2 x BUS BAR RATING)
 RATING RATING RATING
 (200 + 50) <= 1.2 x 225A
 250.00 <= 270.00 HENCE OK

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
0.80	4-6
0.70	7-9
0.50	10-20

AC WIRE CALCULATION													
WIRE ID	PARALLEL FEEDERS	EXPECTED WIRE TEMP (In Celsius)	TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	NO. OF CURRENT CARRYING CONDUCTORS	CONDUIT FILL CORRECTION PER CEC 310.15(B)(3)(a)	CIRCUIT CONDUCTOR SIZE	CIRCUIT CONDUCTOR AMPACITY @75°(PER FEEDER SET)	CIRCUIT CONDUCTOR AMPACITY @90°(PER FEEDER SET)	REQUIRED CIRCUIT CONDUCTOR AMPACITY PER CEC 690.8(A&B) 1.25 X I	DERATED AMPACITY OF CIRCUIT CONDUCTOR PER CEC TABLE 310.16 TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER CEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY @90°(PER FEEDER SET)	DERATED AMPACITY OF CIRCUIT CONDUCTOR IS GREATER THAN REQUIRED	ESTIMATED DISTANCE (FT)	EXPECTED VOLTAGE DROP (%)
1	1	27°	1.00	6	0.80	AWG #10	35A	40A	14.5A	32A	YES	10	0.13
2	1	27°	1.00	2	1	AWG #8	50A	55A	43.5A	55A	YES	10	0.25
3	1	27°	1.00	2	1	AWG #6	65A	75A	43.5A	75A	YES	112	1.80
4	1	27°	1.00	2	1	AWG #8	50A	55A	43.5A	55A	YES	20	0.51
												TOTAL VOLTAGE DROP (%)	2.69

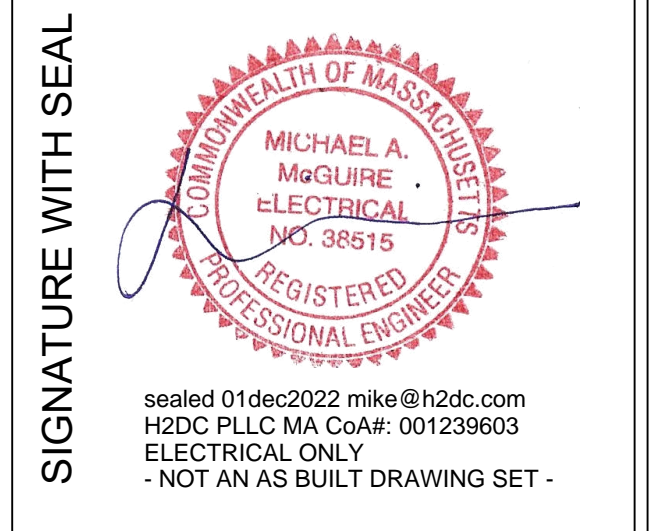


GREENTECH RENEWABLES



FARLEY BUILT, INC.

PROJECT NAME & ADDRESS
HAYNES
 32 VINEYARD MEADOW FARMS RD, WEST TISBURY, MA 02575, USA



REV	DESCRIPTION	DATE
A <td>PERMIT PLAN</td> <td>12/01/2022</td>	PERMIT PLAN	12/01/2022

SHEET TITLE
ELECTRICAL CALCULATIONS

DRAWN DATE 12/01/2022
 DRAWN BY JK
 REVIEWED BY VN

SHEET NUMBER
E-602

1 **WARNING**

THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT

LABEL LOCATION:
COMBINER BOX
(PER CODE: NEC 690.31(I))

2 **WARNING**

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

LABEL LOCATION:
COMBINER BOX, MAIN SERVICE PANEL
(PER CODE: NEC 110.27 (C))

3 **WARNING**

ELECTRIC SHOCK HAZARD

TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION:
COMBINER BOX, MAIN SERVICE PANEL, AC DISCONNECT
(PER CODE: NEC 690.13(B))

4 **WARNING - Electric Shock Hazard**

No user serviceable parts inside
Contact authorized service provider for assistance

LABEL LOCATION:
INVERTER, JUNCTION BOXES (ROOF),
(PER CODE: NEC690.13.G.3 & NEC 690.13.G.4)

5 **WARNING: DUAL POWER SOURCE**

SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
MAIN SERVICE PANEL, UTILITY METER
(PER CODE: NEC 705.12(B)(3-4) & NEC 690.59)

6 **WARNING: PHOTOVOLTAIC POWER SOURCE**

LABEL LOCATION:
CONDUIT, COMBINER BOX
(PER CODE: NEC690.31(G)(3)(4) & NEC 690.13(G)(4))

7 **WARNING**

POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE.

LABEL LOCATION:
MAIN SERVICE PANEL
(PER CODE: NEC 705.12 (B)(2)(c))

8 **PHOTOVOLTAIC**

AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT
(PER CODE: NEC 690.13 (B))

9 **! CAUTION !**

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

LABEL PER NEC 690.56(C)-
PROVIDE AT NEW SUB PANEL OR SERVICE PANEL FOR RAPID SHUTDOWN COMPLIANT SYSTEM

10 **DO NOT DISCONNECT UNDER LOAD**

LABEL LOCATION:
MAIN SERVICE PANEL
(PER CODE: NEC 690.15 (C) & NEC 690.33(E)(2))

WARNING

ELECTRIC SHOCK HAZARD

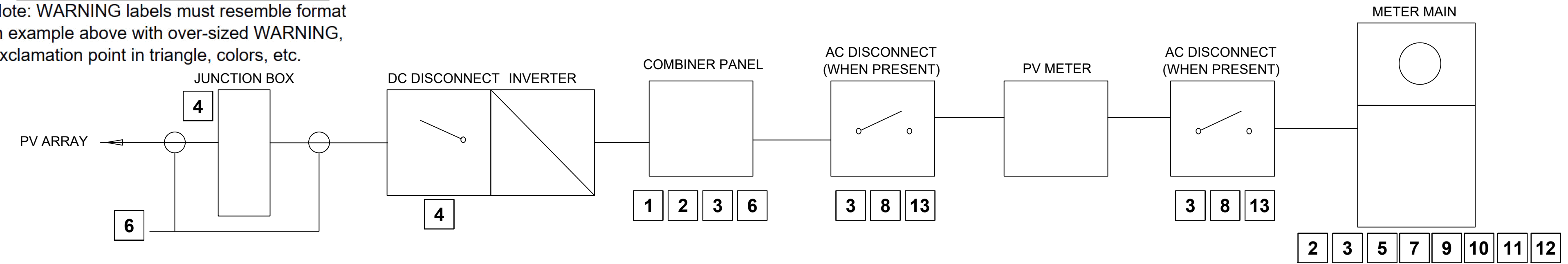
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE & LOAD SIDES MAY BE ENERGIZED IN OPEN POSITION
DO NOT DISCONNECT FUSES UNDER LOAD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

PHOTOVOLTAIC SYSTEM
DC DISCONNECT

AUTHORIZED PERSONNEL ONLY

Note: WARNING labels must resemble format in example above with over-sized WARNING, exclamation point in triangle, colors, etc.



11 **CAUTION**

PHOTOVOLTAIC SYSTEM DISCONNECT IS BACKFEED

LABEL LOCATION:
MAIN SERVICE PANEL
(PER CODE: NEC 690.13 (F), NEC 705.12(D)(3-4) & NEC 690.59)

12 **MAIN PHOTOVOLTAIC SYSTEM DISCONNECT**

LABEL LOCATION:
MAIN SERVICE PANEL
(PER CODE: NEC 690.13(B))

13 **PHOTOVOLTAIC AC DISCONNECT**

RATED AC OPERATING CURRENT: **34.8 A**

NOMINAL OPERATING AC VOLTAGE: **240 V**

LABEL LOCATION:
AC DISCONNECT
(PER CODE: NEC 690.54)

NOTE: MATERIALS USED FOR ALL MARKING SHALL BE REFLECTIVE, WEATHER RESISTANT AND SUITABLE FOR THE ENVIRONMENT. ALL LETTERS SHALL BE A MINIMUM HEIGHT OF 3/8", CAPITALIZED AND WHITE ON A RED BACKGROUND.

ADHESIVE FASTENED SIGNS:

- THE LABEL SHALL BE SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED.
- WHERE REQUIRED ELSEWHERE IN THIS CODE, ALL FIELD APPLIED LABELS, WARNINGS, AND MARKINGS SHOULD COMPLY WITH ANSI Z535.4 [NEC 110.21(B) FIELD MARKING].
- ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT [IFC 605.11.1.3]

13 **PHOTOVOLTAIC AC DISCONNECT**

RATED AC OPERATING CURRENT: **34.8 A**

NOMINAL OPERATING AC VOLTAGE: **240 V**

LABEL LOCATION:
AC DISCONNECT
(PER CODE: NEC 690.54)



GREENTECH RENEWABLES



FARLEY BUILT, INC.

PROJECT NAME & ADDRESS

HAYNES

32 VINEYARD MEADOW FARMS RD, WEST TISBURY, MA 02575, USA

SIGNATURE WITH SEAL

sealed 01dec2022 mike@h2dc.com
H2DC PLLC MA Co. # 001239603
ELECTRICAL ONLY
NOT AN AS BUILT DRAWING SET

REV	DESCRIPTION	DATE
A	PERMIT PLAN	12/01/2022

SHEET TITLE

WARNING LABELS

DRAWN DATE: 12/01/2022
DRAWN BY: JK
REVIEWED BY: VN

SHEET NUMBER

E-603



GREENTECH RENEWABLES

CONTRACTOR

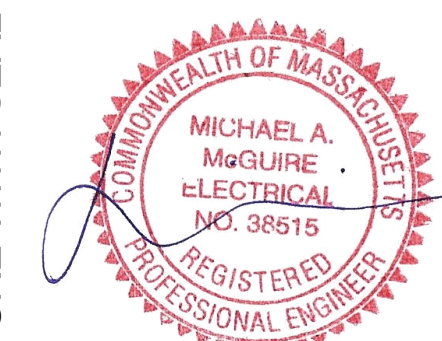


FARLEY BUILT, INC.

PROJECT NAME & ADDRESS

HAYNES
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RD, WEST TISBURY,
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REV	DESCRIPTION	DATE
A	PERMIT PLAN	12/01/2022

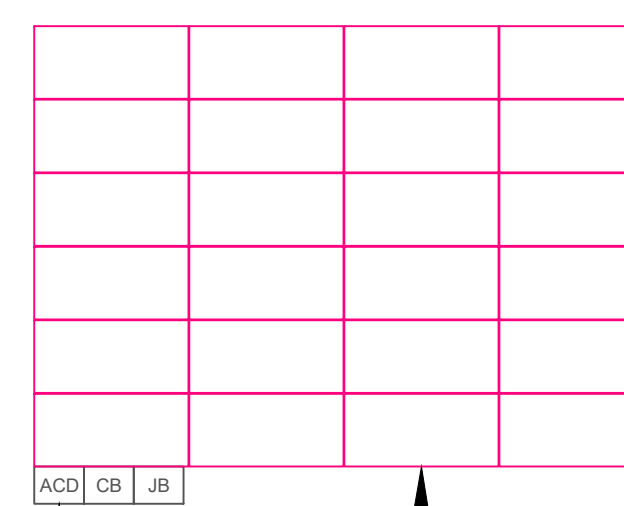
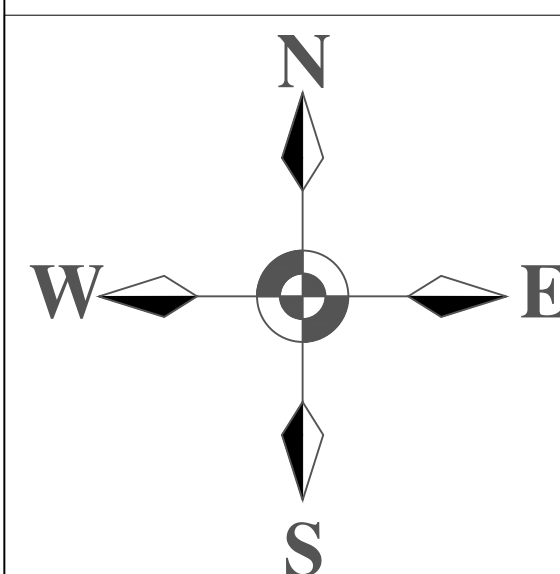
SHEET TITLE
PLACARDS

DRAWN DATE	12/01/2022
DRAWN BY	JK
REVIEWED BY	VN

SHEET NUMBER
E-604

CAUTION

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



PV DISCONNECT (ON TRACKER COLUMN)
PV ARRAY

