

SCOPE OF WORK

SYSTEM SIZE: 19.58kW DC, 14.85kW AC
MODULES: (45) HD HUNDAYI HIN-T435NF(BK) 435W
INVERTERS: (45) ENPHASE: IQ8M-72-2-US MICROINVERTERS
RACKING: IRONRIDGE AIRE RAIL A1
ATTACHMENT: IRONRIDGE AIRE DOCK, WITH L-FOOT

EXISTING SYSTEM:
SYSTEM SIZE: 22.95kW DC, 17.55kW AC
MODULES: (54) HANWHA QCELLS Q.TRON BLK M-G2+ 425W
INVERTERS: (54) ENPHASE: IQ8M-72-2-US MICROINVERTERS

ARRAY TILT: #1 - 27°
ARRAY AZIMUTH: #1 - 59°

ELECTRICAL INFORMATION
UTILITY COMPANY: EVERSOURCE
MAIN SERVICE AMPERAGE: 400A

BUILDING INFORMATION: TWO STORY HOUSE
APN #: PRSM106553
ROOF TYPE: COMP. SHINGLE
NUMBER OF LAYERS: 01
ROOF TRUSSES: 2"X8" @ 24" O.C.

CODE SUMMARY

THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODE
2021 NFPA 1 AS AMENDED BY SAF-FMO 300
2021 INTERNATIONAL BUILDING CODE (IBC)
2021 INTERNATIONAL RESIDENTIAL CODE (IRC)
2018 INTERNATIONAL ENERGY CONSERVATION CODE (IEC)
2021 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
2021 INTERNATIONAL MECHANICAL CODE (IMC)
2021 INTERNATIONAL PLUMBING CODE (IPC)
2020 NATIONAL ELECTRICAL CODE (NEC)
STATE FIRE CODE SAF-C 6000

SHEET INDEX

PV-0 COVER SHEET
PV-1 SITE PLAN
PV-2 ARRAY DETAIL
PV-2A STRING LAYOUT
PV-3 ATTACHMENT DETAILS
PV-4 ELECTRICAL LINE DIAGRAM
PV-5 ELECTRICAL CALCULATION
PV-6 PLACARDS
PV-7+ MANUFACTURER SPEC SHEET

GENERAL NOTES:

- PV INSTALLATION COMPLIES WITH THE NEC 2020 ARTICLE 690.12(B)(2).
- PHOTOVOLTAIC SYSTEM IS UNGROUNDED. NO CONDUCTORS ARE SOLIDLY GROUNDED IN THE INVERTER. SYSTEM COMPLIES WITH 690.35.
- MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
- INVERTER CONFORMS TO AND IS LISTED UNDER UL 1741.
- RACKING CONFORMS TO AND IS LISTED UNDER UL 2703.
- RAPID SHUTDOWN REQUIREMENTS MET WHEN INVERTERS AND ALL CONDUCTORS ARE WITHIN ARRAY BOUNDARIES PER NEC 690.12(1).
- CONSTRUCTION FOREMAN TO PLACE CONDUIT RUN PER 690.31(G).
- ARRAY DC CONDUCTORS ARE SIZED FOR DERATED CURRENT.
- 14.32 AMPS MODULE SHORT CIRCUIT CURRENT.
- 22.34 AMPS DERATED SHORT CIRCUIT CURRENT [690.8 (a) & 690.8 (b)].

LEGEND AND ABBREVIATIONS

 UTILITY METER

 MAIN PANEL

 SUB-PANEL

 PV LOAD CENTER

 DEDICATED PV METER

 INVERTER(S) WITH INTEGRATED DC DISCONNECT AND AFCI

 AC DISCONNECT(S)

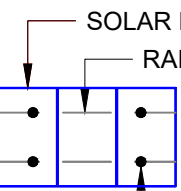
 DC DISCONNECT(S)

 FUSED AC DISCONNECT

 COMBINER BOX

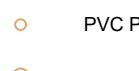
 AUTOMATIC TRANSFER SWITCH

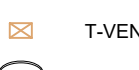
 ENPHASE MICROINVERTER

 SOLAR MODULES
RAIL

 STANDOFFS & FOOTINGS

 CHIMNEY

 ATTIC VENT

 FLUSH ATTIC VENT

 PVC PIPE VENT

 METAL PIPE VENT

 T-VENT

 SATELLITE DISH

 PROPERTY LINE

 INTERIOR EQUIPMENT SHOWN AS DASHED

 HARDSCAPE

 FIRE SETBACKS

 ACCESS PATHWAY

A
AC
AFCI

AZIM
COMP
DC
(E)
EXT
FRM
INT
LBW
MAG
MSP
(N)
NTS
OC
PRE-FAB
PSF

PV
TL
TYP
V
W

AMPERE
ALTERNATING CURRENT
ARC FAULT CIRCUIT INTERRUPTER
AZIMUTH
COMPOSITION
DIRECT CURRENT
EXISTING
EXTERIOR
FRAMING
INTERIOR
LOAD BEARING WALL
MAGNETIC
MAIN SERVICE PANEL
NEW
NOT TO SCALE
ON CENTER
PRE-FABRICATED
POUNDS PER SQUARE FOOT
PHOTOVOLTAIC
TRANSFORMERLESS
TYPICAL
VOLTS
WATTS

1 AERIAL VIEW
PV-0 SCALE: NTS

2 VICINITY MAP
PV-0 SCALE: NTS

ADDITIONAL NOTE:

- EXPANSION SYSTEM. PROJECT INCLUDES SKIRT ON THE LEFT, RIGHT, AND BOTTOM OF THE ARRAY.
- THE SREC ACCOUNT IS UNDER GERALD SIMPKINS, cunstlue1214@gmail.com
- 400AMP SINGLE PHASE SERVICE.
- LOWER EDGE OF EACH ROOF HAS A METAL SECTION, STANDING SEAM.

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24 CHARTER ST.
EXETER, NH 03833
(603) 570-2607

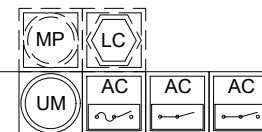
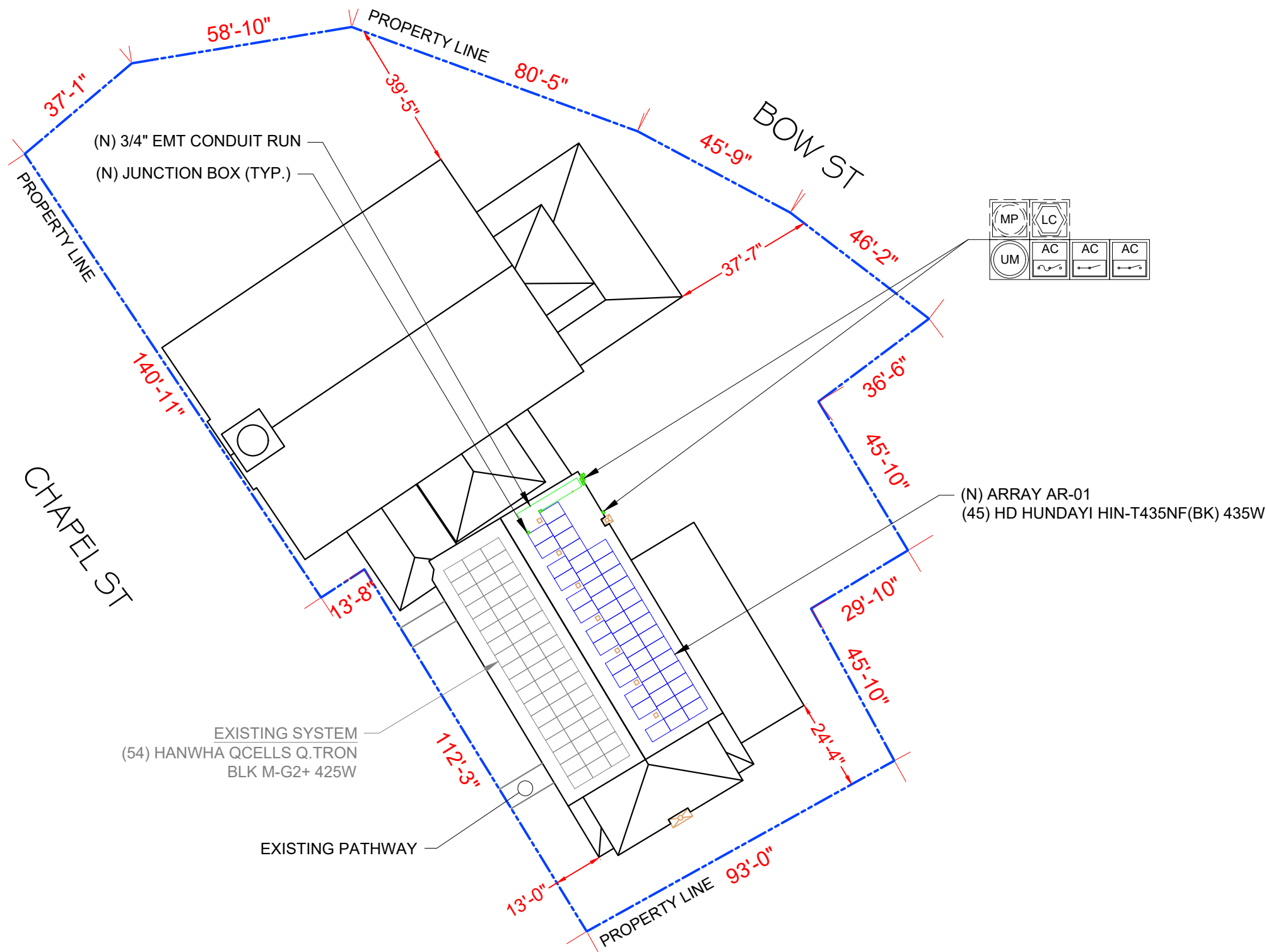
REVISIONS		
DESCRIPTION	DATE	REV

PROJECT NAME & ADDRESS

ST. JOHN'S EPISCOPAL CHURCH

100 CHAPEL ST,
PORTSMOUTH, NH 03801
PHONE #: (603) 988-8347
EMAIL: reginnhny@outlook.com
19.58kW DC PHOTOVOLTAIC SYSTEM

SALES PERSON
STEVE
SHEET NAME
COVER SHEET
SHEET SIZE
ANSI B 11" X 17"
SHEET NUMBER
PV-0



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SALES PERSON

STEVE

SHEET NAME

SITE PLAN

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-1

1

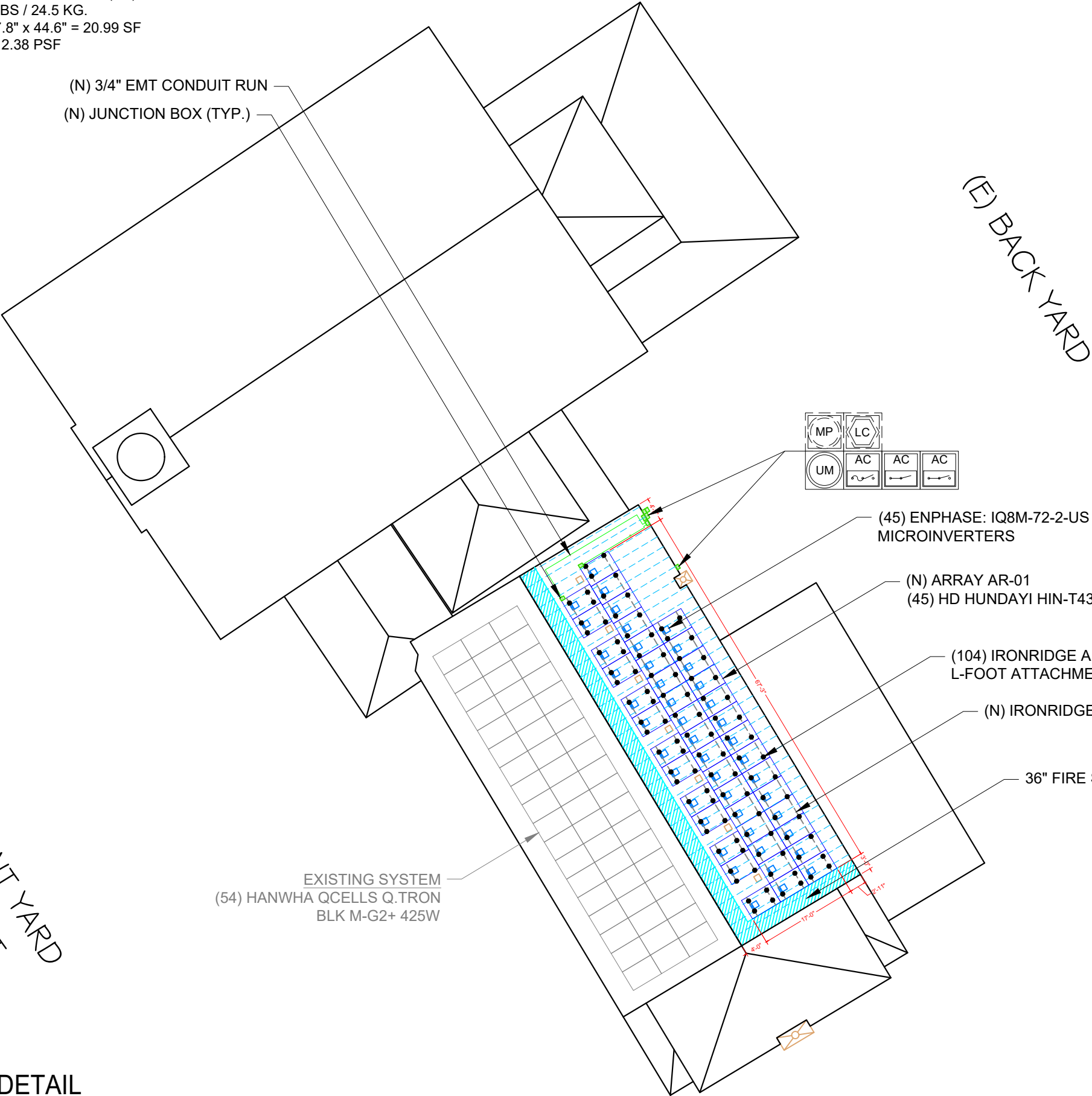
SITE PLAN

PV-1

SCALE: 1/32" = 1'-0"

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 45 MODULES
MODULE TYPE = HD HUNDAYI HIN-T435NF(BK) 435W
MODULE WEIGHT = 50.01 LBS / 24.5 KG.
MODULE DIMENSIONS = 67.8" x 44.6" = 20.99 SF
UNIT WEIGHT OF ARRAY = 2.38 PSF



ROOF DESCRIPTION				
ROOF TYPE			COMP. SHINGLE	
ROOF	ARRAY TILT	AZIMUTH	TRUSSES SIZE	TRUSSES SPACING
#1	27°	59°	2"X8"	24" O.C.
ARRAY AREA				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	45	2078.01	6677.88	31.12

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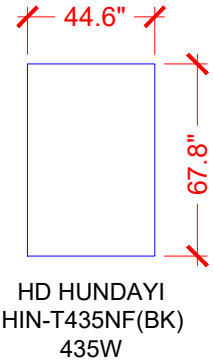
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SALES PERSON
STEVE
SHEET NAME
ARRAY DETAIL
SHEET SIZE
ANSI B 11" X 17"
SHEET NUMBER
PV-2



(45) HD HUNDAYI HIN-T435NF(BK) 435W MODULE

(5) BRANCH OF 9 MODULES CONNECTED IN PARALLEL



(E) FRONT YARD
CHAPEL ST

(E) BACK YARD

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	45	HD HUNDAYI HIN-T435NF(BK) 435W MODULES
INVERTER	45	ENPHASE: IQ8M-72-2-US MICROINVERTERS
AC DISCONNECT	1	AC DISCONNECT: 240V, 200AMP, NEMA 3R, UL LISTED LOCKABLE AND NON-FUSIBLE
AC DISCONNECT	1	AC DISCONNECT: 240V, 200AMP, LOCKABLE KNIFE HANDLE DISCONNECT
FUSED AC DISCONNECT	1	AC DISCONNECT: 240V, 200AMP, FUSED NEMA 3R, UL LISTED WITH 175A FUSES
PV LOAD CENTER	1	200A PV LOAD CENTER, 240V
ATTACHMENT	104	IRONRIDGE AIRE DOCK, WITH L-FOOT ATTACHMENTS
RAILS	23	IRONRIDGE AIRE RAIL A1 170"
RAIL SPLICE	14	SPLICE KIT
MID CLAMPS	72	MID CLAMP
END CLAMPS	36	END CLAMP
GROUNDING LUG	9	IRONRIDGE LUG

603
SOLAR

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EMAIL: reginhny@outlook.com
19.58kW DC PHOTOVOLTAIC SYSTEM

SALES PERSON
STEVE

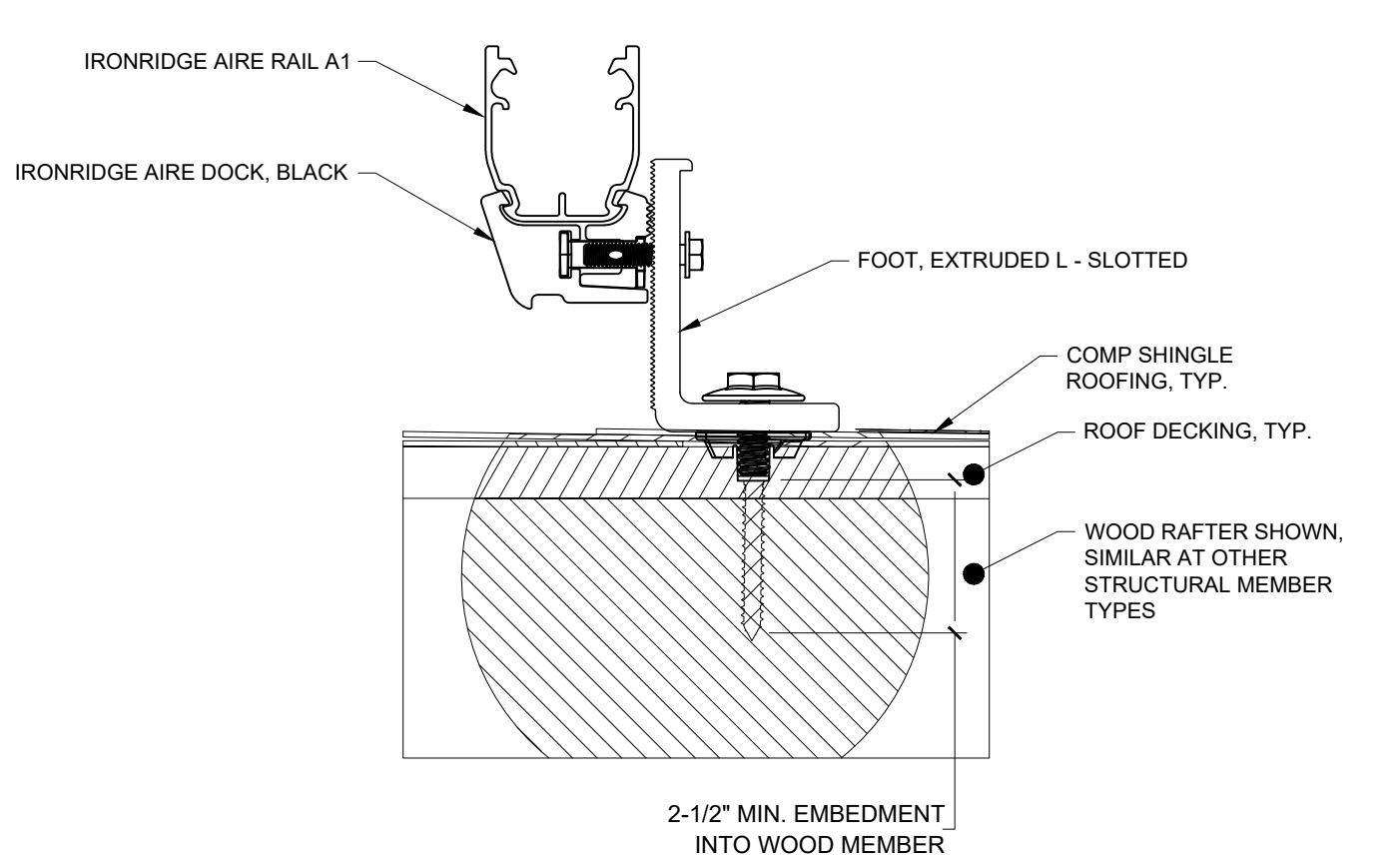
SHEET NAME
STRING LAYOUT

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

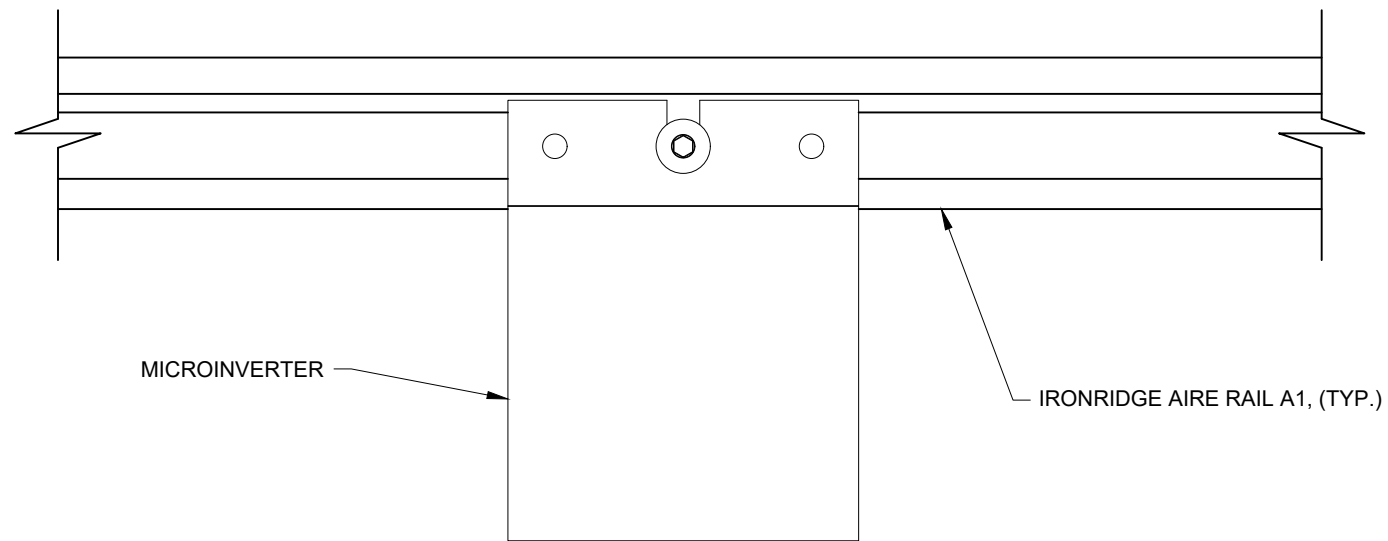
PV-2A



1 ATTACHMENT DETAIL

PV-3

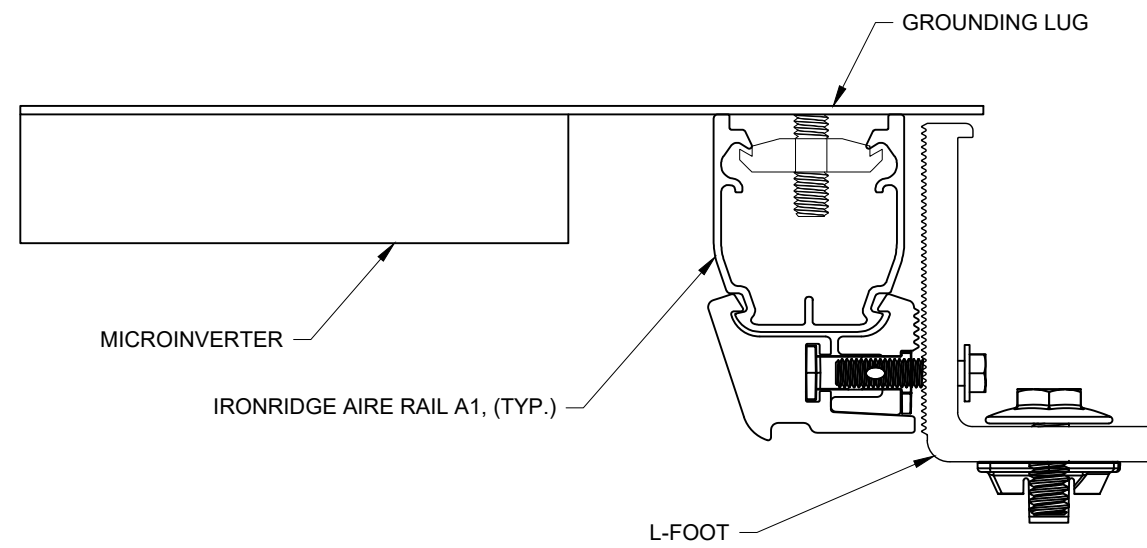
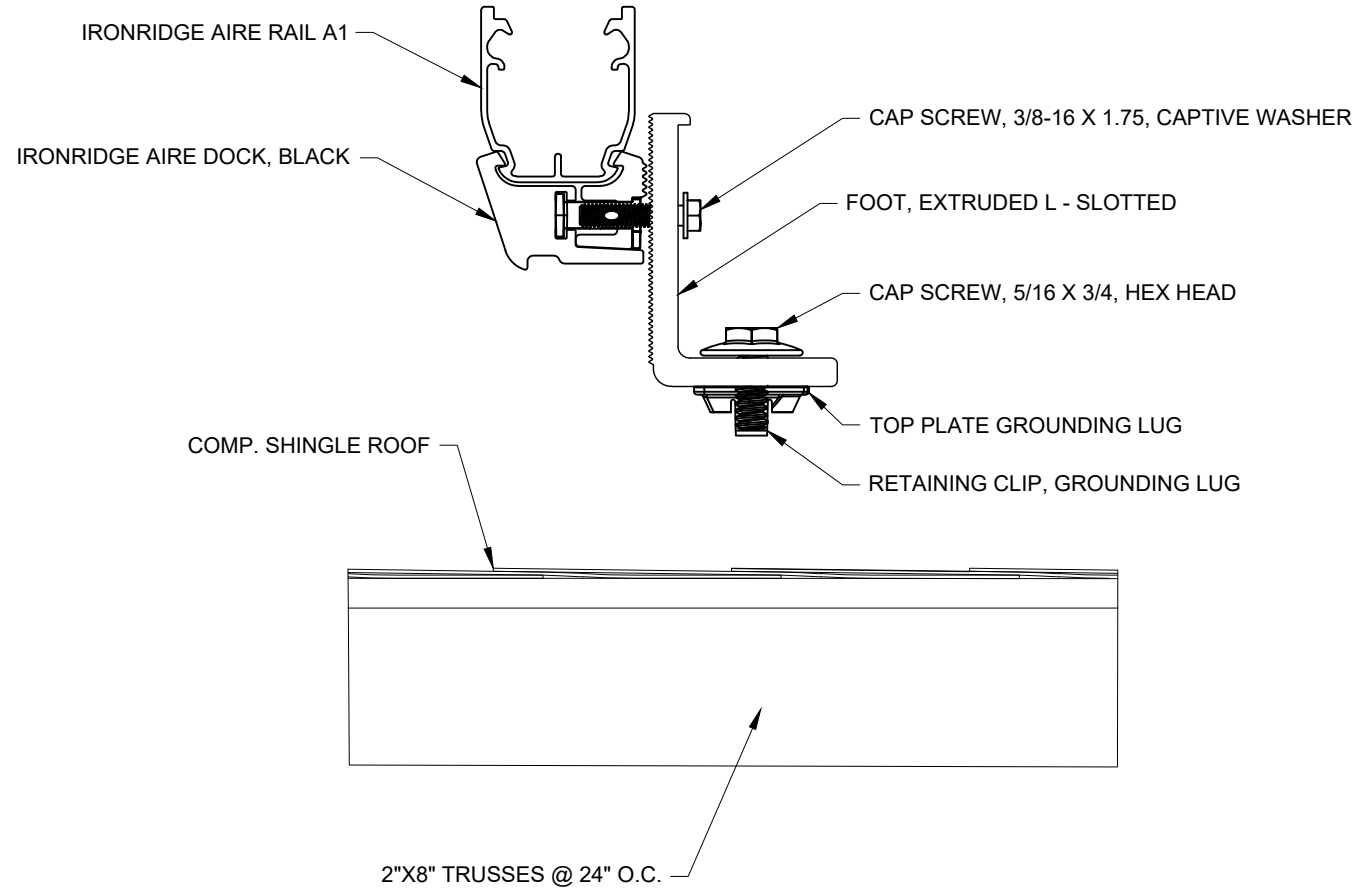
SCALE: NTS



2 MICROINVERTER DETAIL

PV-3

SCALE: NTS



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SALES PERSON

STEVE

SHEET NAME

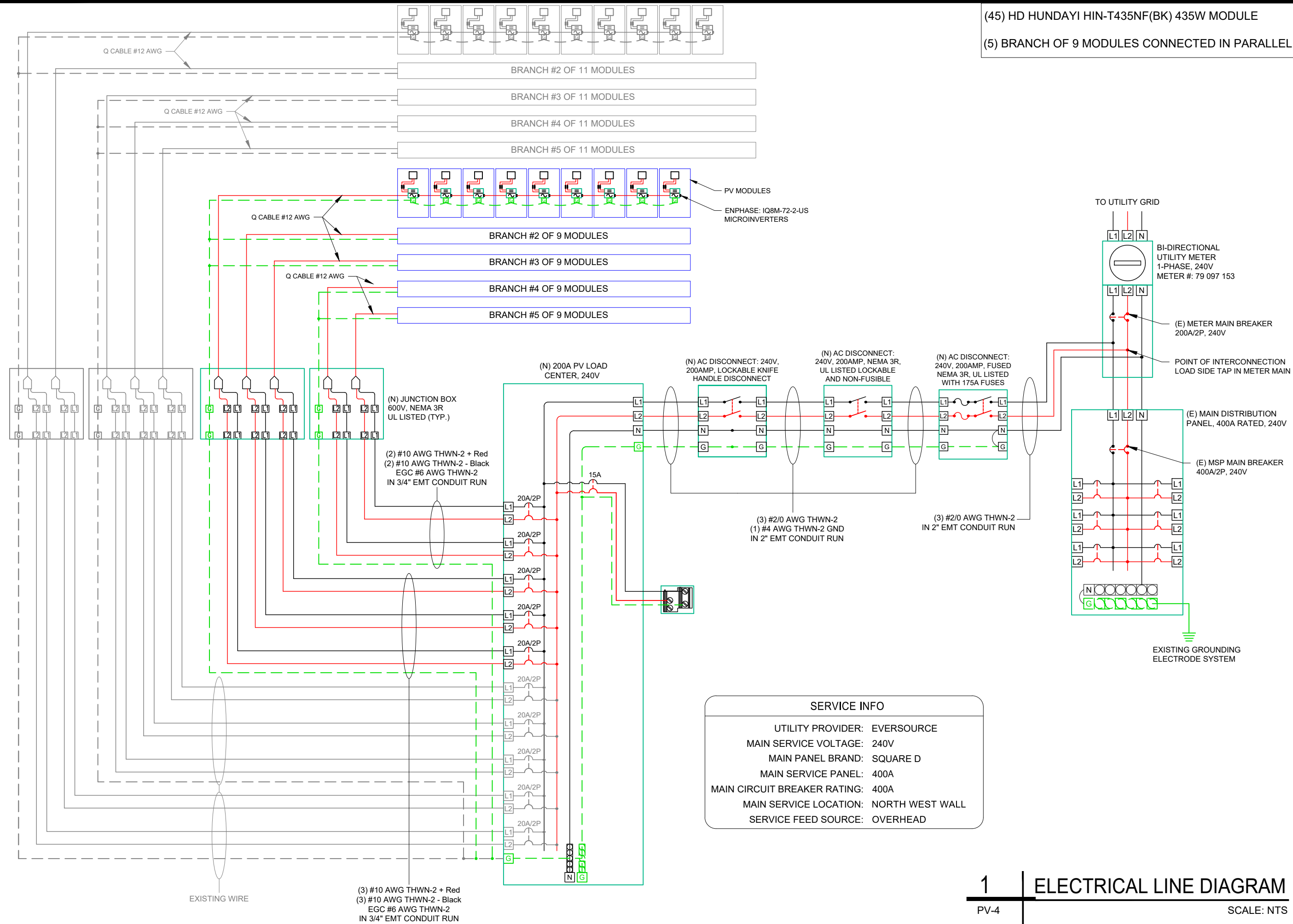
ATTACHMENT
DETAILS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-3



(45) HD HUNDAYI HIN-T435NF(BK) 435W MODULE
(5) BRANCH OF 9 MODULES CONNECTED IN PARALLEL

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PHONE #: (603) 988-8347
EMAIL: regimhny@outlook.com
19.58kW DC PHOTOVOLTAIC SYSTEM

SALES PERSON	
STEVE	

SHEET NAME	
ELECTRICAL LINE DIAGRAM	

SHEET SIZE	
ANSI B 11" X 17"	

SHEET NUMBER	
PV-4	

AC CONDUCTOR AMPACITY CALCULATIONS:
FROM ROOF TOP JUNCTION BOX TO PV LOAD CENTER

AMBIENT TEMPERATURE ADJUSTMENT FOR EXPOSED CONDUIT
PER NEC 310.15(B)(2)(c): + 22°
EXPECTED WIRE TEMP (°C): 33° + 22°
TEMP CORRECTION PER TABLE 310.15: 0.76
#OF CURRENT CARRYING CONDUCTORS: 6
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a): 0.80
CIRCUIT CONDUCTOR SIZE: 10 AWG
CIRCUIT CONDUCTOR AMPACITY: 40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B):
1.25 X MAX AC OUTPUT CURRENT X # OF INVERTERS PER STRING
BRANCH #1 TO #5 : 1.25 X 1.35 X 9 = 15.19A

DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.15
TEMP CORR. PER NEC TABLE 310.15 X
CONDUIT FILL CORR. PER NEC 310.15(B)(2)(a) X
CIRCUIT CONDUCTOR AMPACITY = 0.76 X 0.80 X 40 = 24.32A

AC CONDUCTOR AMPACITY CALCULATIONS:
FROM PV LOAD CENTER TO FUSED AC DISCONNECT

EXPECTED WIRE TEMP (°C): 33°
TEMP CORRECTION PER NEC TABLE 310.15: 0.96
CIRCUIT CONDUCTOR SIZE: 2/0 AWG
CIRCUIT CONDUCTOR AMPACITY: 195A
#OF CURRENT CARRYING CONDUCTORS: 3
CONDUIT FILL PER NEC 310.15(B)(2)(a): 1
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(B):
1.25 X OUTPUT CURRENT OF LOAD CENTER
1.25 X 1.35 X 45 = 75.94A + (E) 91.13A = 167.06A

DERATED AMPACITY OF CIRCUIT CONDUCTORS PER NEC TABLE 310.15:
TEMP CORR. PER NEC 310.15 X
CONDUIT FILL CORR. PER NEC 310.15(B)(2)(a) X
CIRCUIT CONDUCTOR AMPACITY =
0.96 X 1.00 X 195 = 187.2A

ELECTRICAL NOTES

- 1. NO DC CONDUCTORS PRESENT.
- 2. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- 3. ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- 4. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- 5. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- 6. WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- 7. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- 8. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION AND WHERE REQUIRED.
- 9. MODULE SUPPORT RAIL TO BE BONDED TO COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- 10. THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE.

ENPHASE: IQ8M-72-2-US MICROINVERTERS		
Input Data (DC)		
	Recommended Input Power (STC)	260-460W +
	Maximum Input DC Voltage	60V
	Peak Power Tracking Voltage	16V-58V
	Operating Range	22V-58V
	Min. / Max. Start Voltage	60V
	Max DC Short Circuit Current	25A
Output Data (AC)		
	Peak Output Power	330W
	Nominal Output Current	1.35A
	Nominal Voltage / Range	240V/211-264V
	Nominal Frequency / Range	60 Hz
	Extended Frequency / Range	47-68 Hz
	Power Factor at rated power	1.0
	Maximum unit per 20A Branch Circuit	11 (240 VAC)

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-21°
AMBIENT TEMP (HIGH TEMP 2%)	33°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	55°
CONDUCTOR TEMPERATURE RATE	90°



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19.58kW DC PHOTOVOLTAIC SYSTEM

SALES PERSON
STEVE

SHEET NAME
ELECTRICAL CALCULATION

SHEET SIZE
ANSI B 11" X 17"

SHEET NUMBER
PV-5

⚠

WARNING

ELECTRICAL SHOCK HAZARD

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

LABEL LOCATION:
INVERTER(S), AC DISCONNECT(S), AC COMBINER PANEL (IF APPLICABLE).

⚠

WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL LOCATION:
UTILITY SERVICE METER AND MAIN SERVICE PANEL.

⚠

WARNING

INVERTER OUTPUT CONNECTION

DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
ADJACENT TO PV BREAKER (IF APPLICABLE).

⚠

WARNING

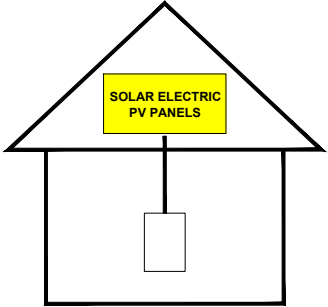
PHOTOVOLTAIC SYSTEM COMBINER PANEL

DO NOT ADD LOADS

LABEL LOCATION:
PHOTOVOLTAIC AC COMBINER (IF APPLICABLE).

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.



LABEL LOCATION:
ON OR NO MORE THAT 1 M (3 FT) FROM THE SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED.

PHOTOVOLTAIC AC DISCONNECT

MAXIMUM AC OPERATING CURRENT: 167.06 AMPS

NOMINAL OPERATING AC VOLTAGE: 240 VAC

LABEL LOCATION:
AC DISCONNECT(S), PHOTOVOLTAIC SYSTEM POINT OF INTERCONNECTION.

DATA PER PANEL

NOMINAL OPERATING AC VOLTAGE -	240	V
NOMINAL OPERATING AC FREQUENCY-	60	Hz
MAXIMUM AC POWER-	325	VA
MAXIMUM AC CURRENT-	1.35	A
MAXIMUM OVERCURRENT DEVICE RATING FOR AC MODULE PROTECTION PER CIRCUIT-	20	A

LABEL LOCATION:
COMBINER BOX

- NOTES AND SPECIFICATIONS:
- SIGNS AND LABELS SHALL MEET THE REQUIREMENTS OF THE 2020 ARTICLE 110.21(B), UNLESS SPECIFIC INSTRUCTIONS ARE REQUIRED BY SECTION 690, OR IF REQUESTED BY THE LOCAL AHJ.
 - SIGNS AND LABELS SHALL ADEQUATELY WARN OF HAZARDS USING EFFECTIVE WORDS, COLORS AND SYMBOLS.
 - LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN.
 - LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
 - SIGNS AND LABELS SHALL COMPLY WITH ANSI Z535.4-2011, PRODUCT SAFETY SIGNS AND LABELS, UNLESS OTHERWISE SPECIFIED.
 - DO NOT COVER EXISTING MANUFACTURER LABELS.

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SALES PERSON

STEVE

SHEET NAME

PLACARDS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-6

HD HYUNDAI SOLAR MODULE

NF(BK) Series

Premium N-Type TOPCon Module

HIN-T430NF(BK) | HIN-T435NF(BK) | HIN-T440NF(BK)



22.53%
High Efficiency



High-End
TOPCon
Technology



Higher
Bifaciality



Long-Term
Reliability



Compatible
with Carport
Applications



For Residential
(Full Black Design)

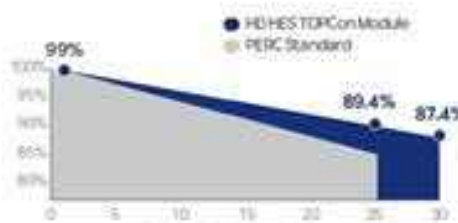
HD Hyundai's Warranty Provisions

25
YEARS

• 25-Year Product Warranty
Materials and workmanship

30
YEARS

• 30-Year Performance Warranty
First year degradation: 1%
Linear warranty after initial year
with 0.41% annual degradation,
87.4% is guaranteed up to 30 years



Certification



ISO 9001: Quality management system
ISO 14001: Environmental management system
ISO 45001: Occupational health and safety management system
UL 61730: Photovoltaic (PV) module safety certification (UL 61730)
UL 61731: PV system component testing
UL 61732: PV system component testing
IEC 61215: Type A: Outdoor operating conditions (P1) testing
IEC 61215: Type B: Outdoor operating conditions (P2) testing
IEC 61215: Type C: Outdoor operating conditions (P3) testing

Electrical Characteristics

HiN-Tx.xxNF(BK)		HiN-T430NF(BK)		HiN-T435NF(BK)		HiN-T440NF(BK)	
Item	Unit	BNPI			BNPI	BNPI	
Nominal output (Pmax)	W	430	476	435	482	440	488
Open circuit voltage (Voc)	V	38.4	38.4	38.6	38.6	38.8	38.8
Short circuit current (Isc)	A	14.25	15.79	14.32	15.87	14.39	15.94
Voltage at Pmax (Vmpp)	V	31.9	31.9	32.1	32.1	32.3	32.3
Current at Pmax (Impp)	A	13.48	14.94	13.56	15.02	13.63	15.10
Module efficiency	%	22.02		22.28		22.53	
Power Class Sorting	W	0 ~ +5					
Temperature coefficient of Pmax	%/K	-0.30					
Temperature coefficient of Voc	%/K	-0.25					
Temperature coefficient of Isc	%/K	0.046					
Bifaciality	%	80%±10%					

*STC: Irradiance 1,000 W/m², cell temperature 25°C, AM=1.5 / Test uncertainty for Pmax ±3%, Voc ±3%, Isc ±3%
**The electrical properties of BNPI are measured under the irradiance corresponding to 1000 W/m² on the module front and 135 W/m² on the module rear.

Additional Power Gain from rear side

Pmpp gain	Pmpp[W]	Vmpp[V]	Impp[A]	Voc[V]	Isc[A]
5%	458	32.30	14.18	38.80	14.97
15%	493	32.30	15.27	38.80	16.12
25%	528	32.40	16.36	38.90	17.27

*Electrical characteristics with different rear power gain (reference to 440W)

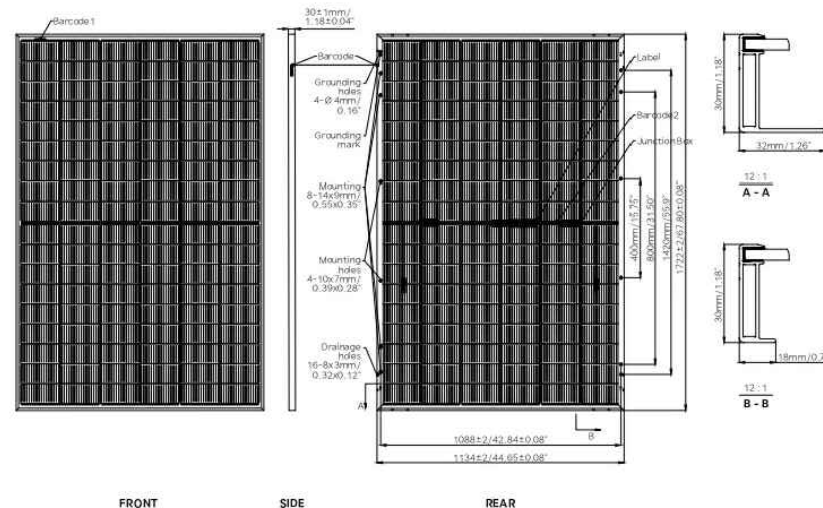
Mechanical Characteristics

Dimensions	1,722mm (L) x 1,134mm (W) x 30mm (H) (67.8in x 44.6in x 1.2in)
Weight	24.5 kg (50.01lbs)
Solar Cells	N-Type TOPCon, 108 (6x18) monocrystalline 16BB half-cut bifacial cells
Output Cables	Cable: (+)1,200mm(47.2in), (-)1,200mm(47.2in) / Customized length available Connector: Stäubli MC4 genuine Connector / Compatible, IP68
Junction Box	3-part, 3 bypass diodes, IP68 rated
Construction	Front: 2.0mm(0.08in) semi-tempered solar glass with high transmittance and anti-reflective coating Rear: 2.0mm(0.08in) semi-tempered solar glass
Frame	Anodized aluminum alloy

Shipping Configurations

Packing Direction	Vertical	Packing pallet weight (kg)	912
Container Size (HC)	40'	Modules Per Pallet (pcs)	36
Pallets Per Container	22	Modules Per Container (pcs)	792

Module Diagram (unit : mm)

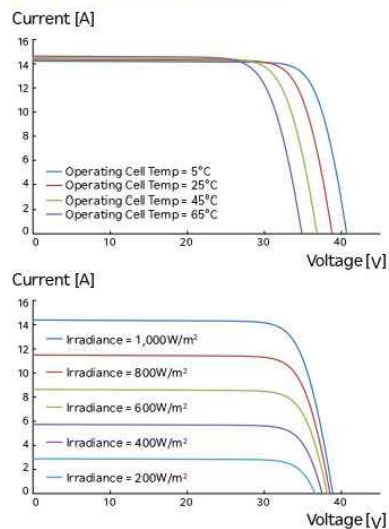


Installation Safety Guide

- Only qualified personnel should install or perform maintenance.
- Be aware of dangerous high DC voltage.
- Do not handle or install modules when they are wet.

Nominal Module Operation Temperature	44°C ± 2°C
Operating Temperature	-40°C ~ +85°C
Maximum System Voltage	DC 1,500 V
Maximum Reverse Current	30A
Maximum Test Load *See Installation Manual	Front 5,400Pa *Rear 5,400Pa
Fire Performance	Type 29

I-V Curves (HIN-T440NF(BK))



Sales & Marketing
hes.sales@hd.com

HD Hyundai Energy Solutions reserves the right to update or modify the specifications and features listed in this datasheet without prior notice. Always check the latest version of the datasheet for accurate information. Before using the product, please refer to the Installation and Operation Manual and Warranty. We retain the right of final interpretation.

603 SOLAR

24 CHARTER ST.
EXETER, NH 03833
(603) 570-2607

REVISIONS

DESCRIPTION	DATE	REV

PROJECT NAME & ADDRESS

ST. JOHN'S EPISCOPAL CHURCH
100 CHAPEL ST.,
PORTSMOUTH, NH 03801
PHONE #: (603) 988-8347
EMAIL: regimhny@outlook.com
19.58kW DC PHOTOVOLTAIC SYSTEM

SALES PERSON

STEVE

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-7



DATA SHEET



IQ8M and IQ8A Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has superfast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the IQ Battery, IQ Gateway, and the Enphase App monitoring and analysis software.



IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.



Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.



IQ8 Series Microinverters are UL listed as PV Rapid Shutdown Equipment and conform with various regulations, when installed according to manufacturer's instructions.

*Only when installed with IQ System Controller 2, meets UL 1741.
**IQ8M and IQ8A support split-phase, 240V installations only.

Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produce power even when the grid is down*
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid support**
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547:2018 (UL 1741-SB 3rd Ed.)

Note:

IQ8 Microinverters cannot be mixed together with previous generations of Enphase microinverters (IQ7 Series, IQ6 Series, etc.) in the same system.

IQ8M and IQ8A Microinverters

INPUT DATA (DC)		IQ8M-72-2-US	IQ8A-72-2-US
Commonly used module pairings ¹	W	260 – 460	295 – 500
Module compatibility		54-cell / 108 half-cell, 60-cell / 120 half-cell, 66-cell / 132 half-cell and 72-cell / 144 half-cell	
MPPT voltage range	V	30 – 45	32 – 45
Operating range	V	16 – 58	
Min. / Max. start voltage	V	22 / 58	
Max. input DC voltage	V	60	
Max. continuous input DC current	A	12	
Max. input DC short-circuit current	A	25	
Max. module I _{sc}	A	20	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
PV array configuration		1x 1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)		IQ8M-72-2-US	IQ8A-72-2-US
Peak output power	VA	330	366
Max. continuous output power	VA	325	349
Nominal (L-L) voltage / range ²	V	240 / 211 – 264	
Max. continuous output current	A	1.35	1.45
Nominal frequency	Hz	60	
Extended frequency range	Hz	47 – 68	
AC short circuit fault current over 3 cycles	Arms	2	
Max. units per 20 A (L-L) branch circuit ³		11	
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.8	97.7
CEC weighted efficiency	%	97.5	97
Night-time power consumption	mW	60	
MECHANICAL DATA			
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)	
Relative humidity range		4% to 100% (condensing)	
DC Connector type		MC4	
Dimensions (H x W x D)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection – no fans	
Approved for wet locations		Yes	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure	
Environ. category / UV exposure rating		NEMA Type 6 / outdoor	
COMPLIANCE			
Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, IEEE 1547:2018 (UL 1741-SB 3 rd Ed.), FCC Part 15 Class B, ICES-0003 Class B, CAN / CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shutdown Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.		

(1) Pairing PV modules with wattage above the limit may result in additional clipping losses. See the compatibility calculator at <https://link.enphase.com/module-compatibility>. (2) Nominal voltage range can be extended beyond nominal if required by the utility. (3) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.



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100 CHAPEL ST.,
PORTSMOUTH, NH 03801

PHONE #: (603) 988-8347

EMAIL: reginnhny@outlook.com

19.58kW DC PHOTOVOLTAIC SYSTEM

SALES PERSON

STEVE

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

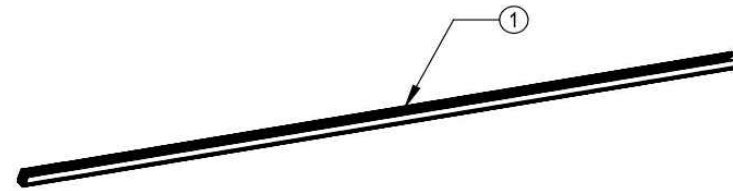
SHEET NUMBER

PV-8



AIRE RAIL A1

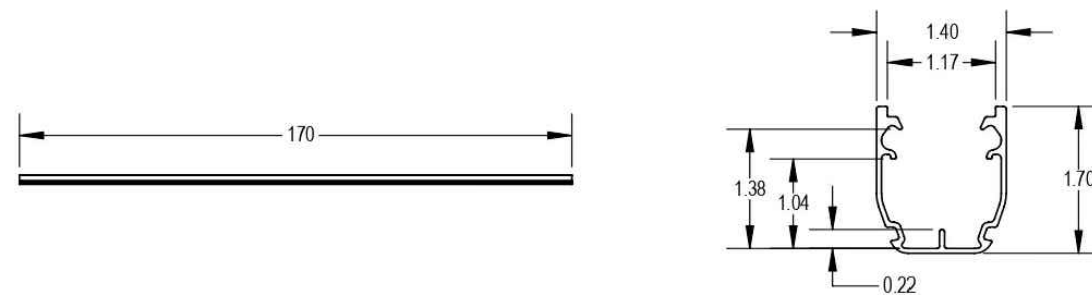
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ITEM NO	DESCRIPTION	QTY IN KIT
1	Aire Rail, A1, Black(or Clear), 170	1

Part Number	Description
AE-A1-170B	AIRE RAIL, A1, BLACK, 170
AE-A1-170M	AIRE RAIL, A1, MILL, 170

1) Aire A1



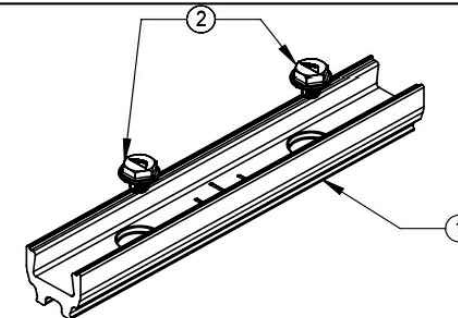
Part Number	Material	Value
AE-A1-170B	6000-Series Aluminum	Black
AE-A1-170M	6000-Series Aluminum	Clear

v1.0



AIRE TIE, A1

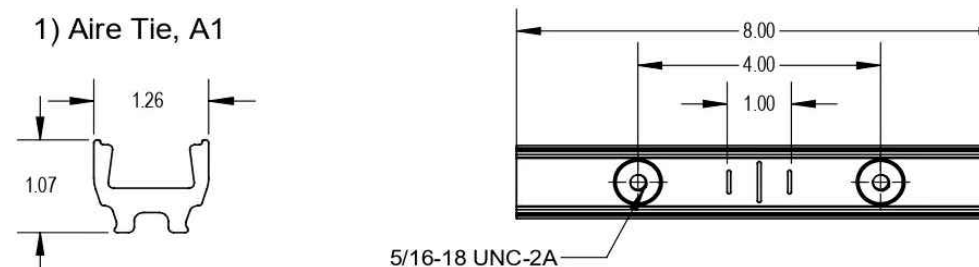
Cut Sheet



ITEM NO	DESCRIPTION	QTY IN KIT
1	Aire Tie, A1	1
2	Aire Splc Bolt, Hex	2

Part Number	Description
AE-A1TIE-01-M1	AIRE TIE, A1 (BONDED SPLICE)

1) Aire Tie, A1



Property	Value
Material	6000 Series Aluminum
Finish	Mill

2) Aire Splc Bolt, Hex



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.0



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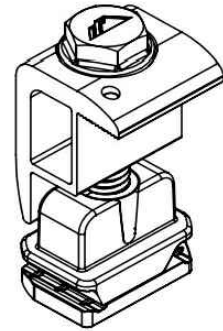
DATA SHEET

SHEET SIZE

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SHEET NUMBER

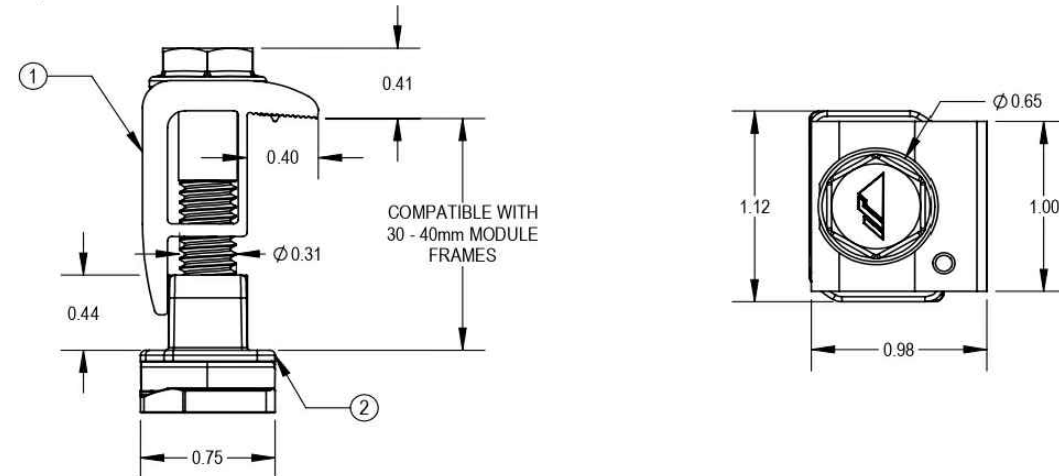
PV-9



ITEM NO	DESCRIPTION	QTY IN KIT
1	Aire Lock End, Black	1

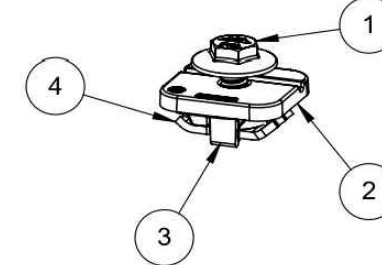
Part Number	Description
AE-END-01-B1	AIRE LOCK END, BLACK

1) Aire Lock End



Item No	Material	Value
1	300 Series Stainless Steel	Clear and Black
2	Polypropelene	Black

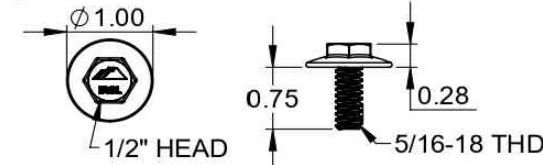
v1.0



ITEM NO.	DESCRIPTION	QTY IN KIT
1	CAP SCREW, 5/16 X 3/4, HEX HEAD	1
2	TOP PLATE GROUNDING LUG	1
3	RETAINING CLIP, GROUNDING LUG	1
4	T-NUT, SHEET METAL	1

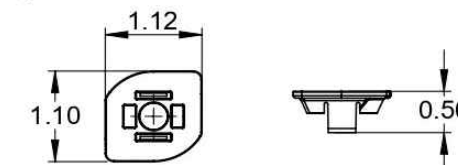
PART NUMBER	DESCRIPTION	WIRE SIZE RANGE (AWG)
AE-LUG-01-M1	AIRE LUG	6-10

1) CAP SCREW, 5/16 X 3/4



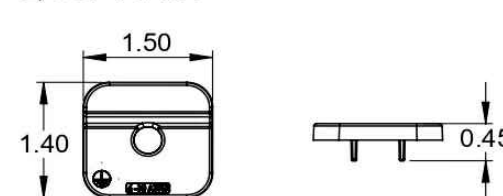
Property	Value
Material	300 Series Stainless Steel
Finish	Clear

3) RETAINING CLIP



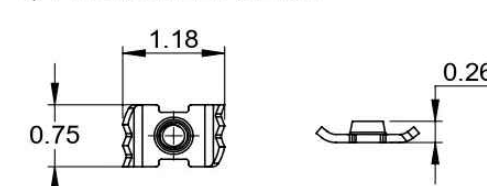
Property	Value
Material	Polypropylene
Finish	Black

2) TOP PLATE



Property	Value
Material	Tin Plated Aluminum
Finish	Clear Matte

4) T-NUT, SHEET METAL



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.0

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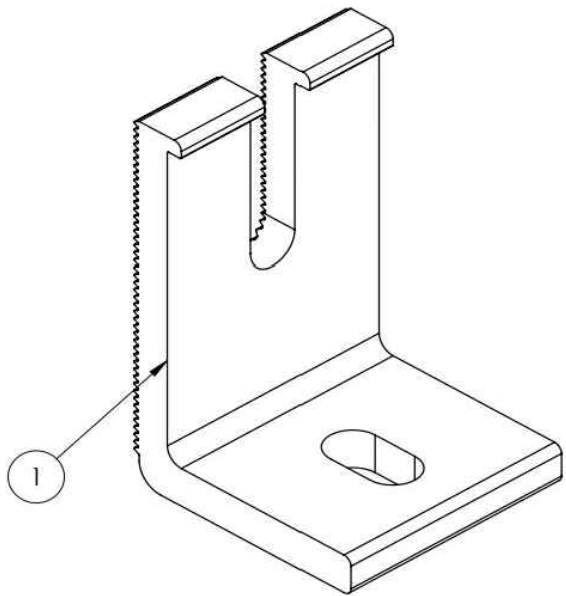
SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-10

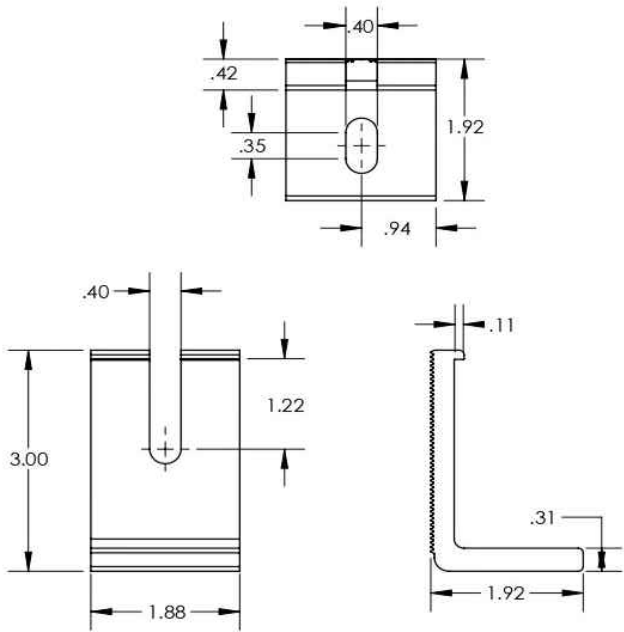
L-Foot



ITEM NO	DESCRIPTION	QTY IN KIT
1	FOOT, EXTRUDED L - SLOTTED	4

PART NUMBER	DESCRIPTION
FM-LFT-003	Kit, 4Pcs, Slotted L-Foot, Mill
FM-LFT-003-B	Kit, 4Pcs, Slotted L-Foot, Black

1) Foot, Extruded L - Slotted



v1.11

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PV-11



Existing Conditions



View from Bow Street









