

THIS DISTRIBUTED GENERATION FACILITY WAS INSTALLED
IN ACCORDANCE WITH THE CURRENT STATE ADOPTED
NATIONAL ELECTRICAL CODE



CONTRACTOR

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OWNER

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UTILITY

DUKE ENERGY

(866) 233-2290

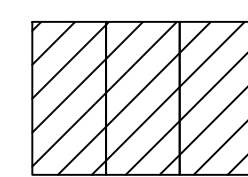
REVISIONS

6/15/20	PLAN SET	
06/29/20	PLAN SET	
07/06/20	REV 3	AH
08/05/20	REV 4	AH
08/10/20	REV5	AH

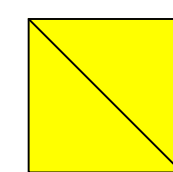
DESIGN SUMMARY

DESIGN SUMMARY

- **SIZE:** 2.400 kW PV Solar System (6 modules)
- **STYLE:** Residential, asphalt shingle roof, flush mount, grid tied, net-metered
- **LOCATION:** Southeast & North West facing roofs of home
- **ORIENTATION:** Portrait, 20°pitch, 108° & 289° azimuth
- **MODULE:** Hanwha Q.PEAK DUO L-G5.2 400W, 79.3"x 39.4"x 1.38" thick, 51.8 lbs
- **RACKING:** Iron Ridge XR-100 with asphalt shingle flashings
- **INVERTER:** Enphase IQ7+ Microinverters
- **VOLTAGE:** 120/240V, 1Φ
- **MONITORING:** Enphase Enlighten Online Monitoring



PV Solar Array
Roof of building



Enphase Microinverter Array



AC Solar Disconnect
Building Exterior



PV Solar Dedicated Load Center
Building Exterior



Main Service Panel
Building Interior



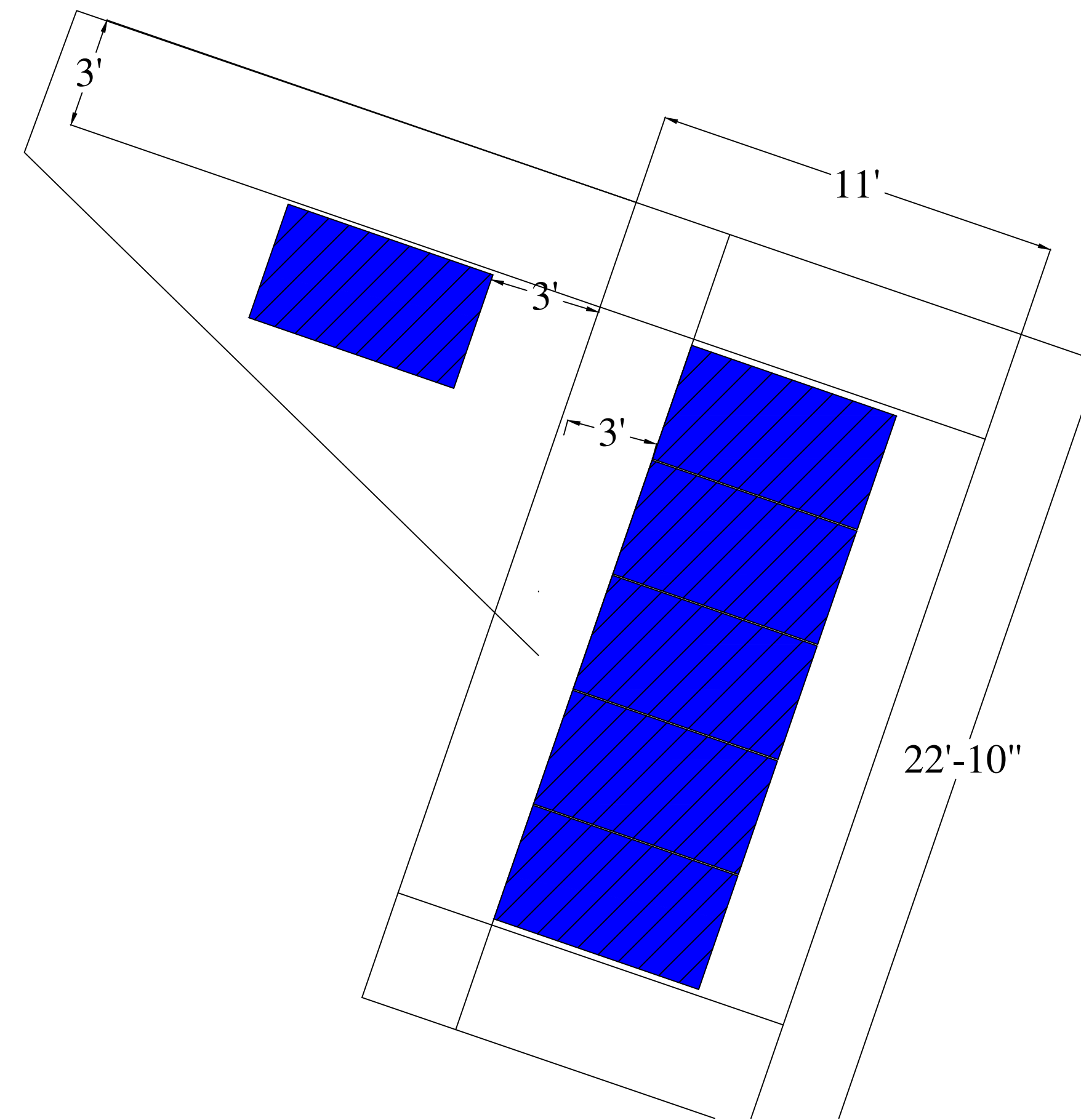
Utility Meter
Building Exterior





BUILD SUMMARY

- **MODULE:** QTY (6) Q.PEAK DUO L-G5.2 400W, 79.3"x 39.4"x 1.38" thick, 51.8 lbs
- **STRUCTURE:** Wood Prefabricated 2"x 4" Trusses @ 24" OC
- **RACKING:** Iron Ridge XR-100. Run rails across the trusses. Penetrate every 4ft or less into trusses. Installer must verify all penetrations are secure and centered in wood members. Any damaged wood members must be repaired immediately by scab, sister, or full replacement. Max Rail Overhang = 19" from last attachment point. Module Overhang = 18" .
- **ACCESS:** 2-story residence.
- **INVERTERS:** Mount Microinverters at the module locations.
- **MONITORING:** Enphase Enlighten online monitoring utilizing existing wireless router.
- **ADDITIONAL WORK:** None



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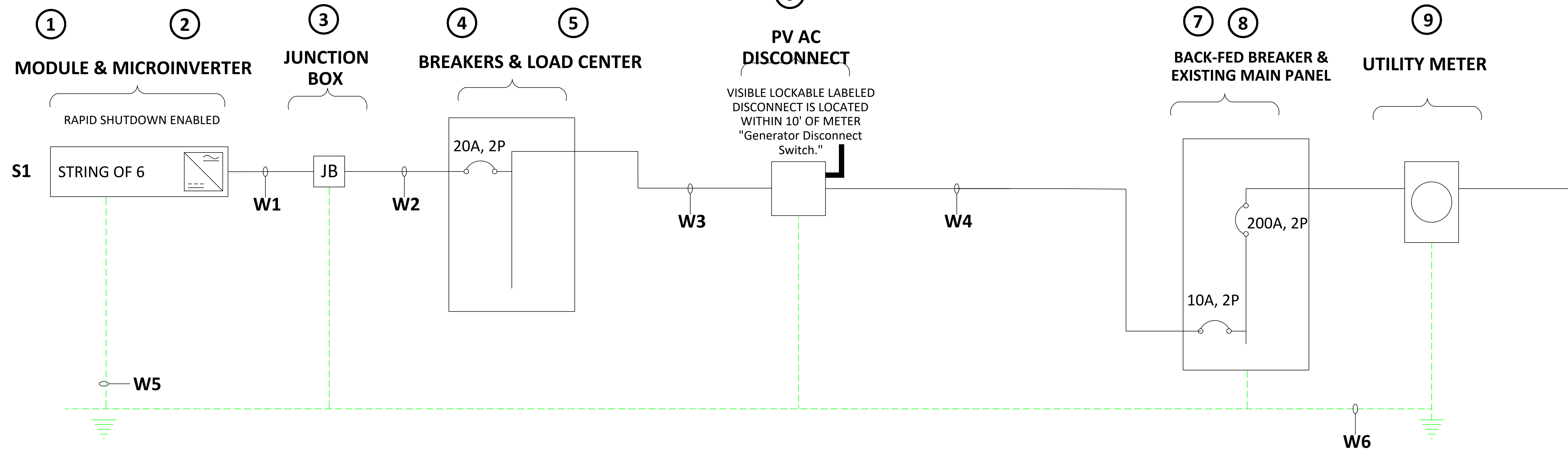
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08/10/20	REV5	AH

BUILD SUMMARY

PROJECT NAME: HENSLEY, DEVIN & KATELYNN

13-2016-1

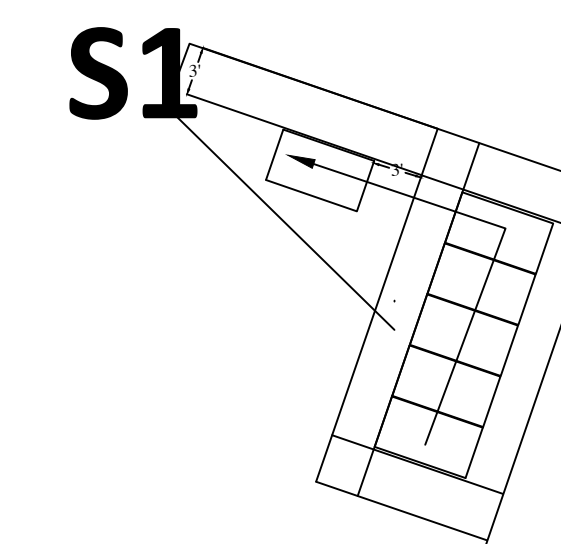


1 ONE-LINE ELECTRICAL DIAGRAM - 2.400 KW (DC)

03 NO SCALE

EQUIPMENT SCHEDULE							
TAG	ITEM	TAG	MAKE	MODEL	VOLTAGE	QTY	LOCATION
1	MODULE		HANWHA	Q.PEAK DUO L-G5.2 400W (DC)	DC	6	ROOF TOP
2	MICROINVERTER		ENPHASE	IQ7PLUS-72-2-US 290W(AC)	120/240V, 1Φ	6	ROOF TOP
3	JUNCTION BOX		SOLADECK	0799	120/240V, 1Φ	1	ROOF TOP
4	BREAJERS		EATON	20A,2P BR220	120/240V, 1Φ	1	LOAD CENTER
5	LOAD CENTER		ENPHASE	IQ COMBINER X-IQ-AM1-240-3	120/240V, 1Φ	1	BLD EXTERIOR
6	DISCONNECT		EATON	30A ENCLOSURE NON FUSED	120/240V, 1Φ	1	BLD EXTERIOR
7	BACK-FED BREAKER		SEIMENS	10A, 2-POLE Q210	120/240V, 1Φ	1	MAIN PANEL
8	MAIN PANEL		SEIMENS	200A ENCLOUSRE 200A MAIN	120/240V, 1Φ	1	BLD INTERIOR
9	UTILITY METER		ITRON	CL200	120/240V, 1Φ	1	BLD EXTERIOR

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TAG	RUN	CONDUCTOR TYPE	GUAGE	CONDU IT	RUN LENGTH
W1	ARRAY TO JUNCTION BOX	ENPHASE Q Cable	#12	¾"	60 FT
W2	JUNCTION BOX TO LOAD CENTER	THWN-2,CU	#10	¾"	30 FT
W3	INVERTER TO DISCONNECT	THWN-2, Cu	#10	¾"	20 FT
W4	DISCONNECT TO BACK-FED	THWN-2, Cu	#10	¾"	5 FT
W5	GROUND ELECTRODE	BARE, Cu	#6	-	-
W6	EQUIPMENT GROUND	THWN-2, Cu	#6 (MIN)	-	85 FT



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06/29/20 PLAN SET

07/06/20 REV 3 AH

08/05/20 REV 4 AH

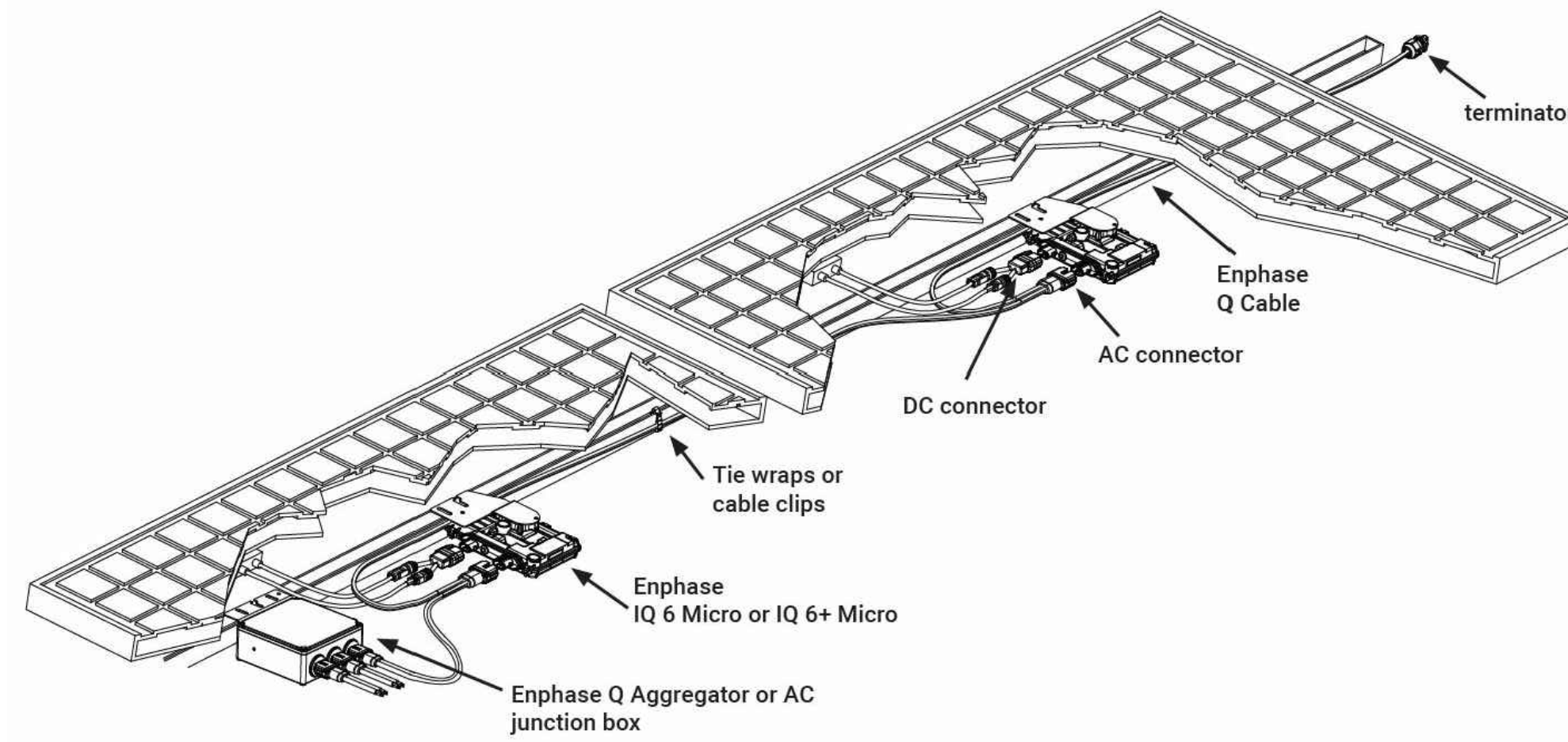
08/10/20 REV5 AH

ELECTRICAL

03



CODE REVIEW & CALCULATIONS



SOLAR PHOTOVOLTAIC (PV) SYSTEM WITH SOLAREEDGE

Inverter Type: IQ7Plus MicroInverters
 Minimum String Length: N/A
 Maximum String Length: 13 Panels @ 240V
 Nominal String Voltage: 240V (AC)
 Nominal Output Current (Per MicroInverter): 1.21A

Hanwha Q.PEAK DUO L-G5.2 400W

NEC 690.7 MAXIMUM VOLTAGE

690.7(A): Maximum Photovoltaic System Voltage
 Q.PEAK DUO L-G5.2 400W Module Voc = 49.00V
 Module $V_{max} = (25^{\circ}C - (-40^{\circ}C))(-0.0027V/^{\circ}C)(49.00V) + (49.00V) = 57.60V$ (DC)
 Module V_{max} Output = 57.60V (DC) < IQ7+ MicroInverter Vmax Input = 60V (DC)

NEC 690.8 CIRCUIT SIZING AND CURRENT

690.8(A)(1): Photovoltaic Source Circuit Currents
 Module to MicroInverter $I_{max} = 1.21A \times 6 \times 125\% = 9.075A$

690.8(A)(3): Inverter Output Circuit Current.
 MicroInverter Rated Continuous Output Power = 290W
 MicroInverter rated Continuous Output Current = 1.21A
 System $I_{max} = 9.075A$

NEC 690.9 OVERCURRENT PROTECTION

690.9(B): Overcurrent Device Ratings
 Disconnect Fuse: $1.21A \times 6 \times 125\% = 9.075A \rightarrow 10$ Amp OCPD

NEC 690.12 RAPID SHUTDOWN OF PV SYSTEMS ON BUILDINGS

PLAN: Rapid Shutdown enabled disconnect shall be located next to the service and be labeled in accordance with 690.56(B) and (C).

1 **04** **MODULE AND MICROINVERTER CONNECTION DETAIL**
 NO SCALE

FlashFoot2



2 **04** **IRON RIDGE ASPHALT SHINGLE FLASHING DETAIL**
 NO SCALE

SYSTEM AC DISCONNECT AT SERVICE

PHOTOVOLTAIC SYSTEM AC DISCONNECT
 MAXIMUM OPERATING AC CURRENT: 7.26 AMPS
 NOMINAL OPERATING AC VOLTAGE: 120/240 VAC

3 **04** **PHOTOVOLTAIC MARKING AND LABELING**
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DETAILS & CALCULATIONS