

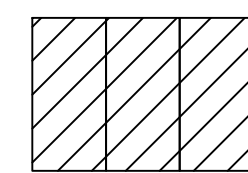
# PROJECT NAME: HENSLEY, DEVIN & KATELYNN

## 13-2016-1

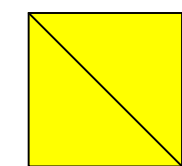
THIS DISTRIBUTED GENERATION FACILITY WAS INSTALLED  
IN ACCORDANCE WITH THE CURRENT STATE ADOPTED  
NATIONAL ELECTRICAL CODE

### DESIGN SUMMARY

- **SIZE:** 2.22 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:** Hyundai HiA-S370HI, 78.74"x 39.06"x 1.57" thick, 49.8 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



### CONTRACTOR

#### MOXIE SOLAR

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### OWNER

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### A H J

#### HARNETT COUNTY

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108 E Front Street  
Lillington, NC 27546

### UTILITY

#### DUKE ENERGY

(866) 233-2290

### REVISIONS

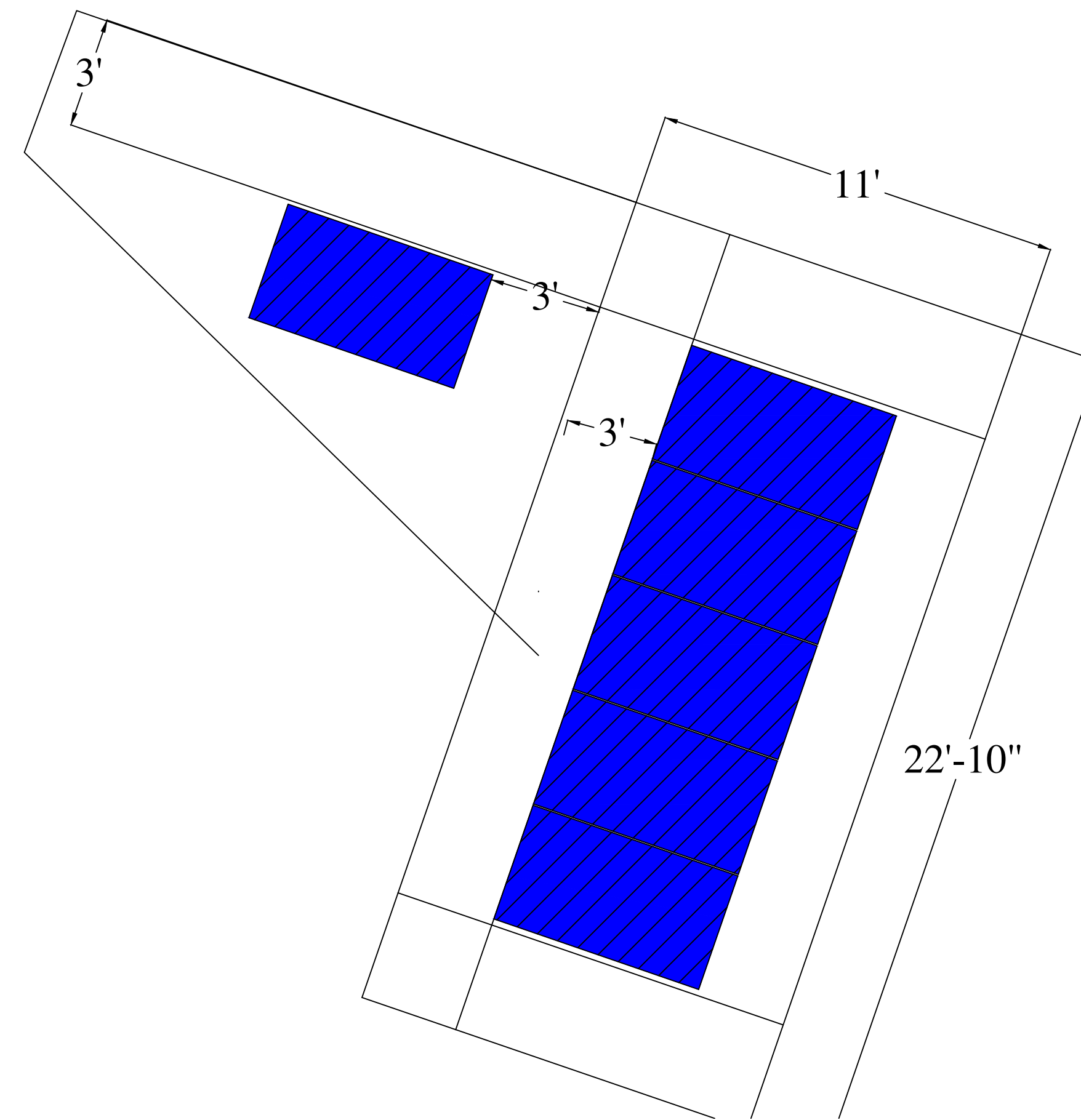
6/15/20	PLAN SET	
06/29/20	PLAN SET	
07/06/20	REV 1	AH
07/06/20	REV 2	AH
07/06/20	REV 3	AH

### DESIGN SUMMARY

# 01

**BUILD SUMMARY**

- **MODULE:** QTY (6) HiA-S370HI, 78.74"x 39.06"x 1.57" thick, 49.8 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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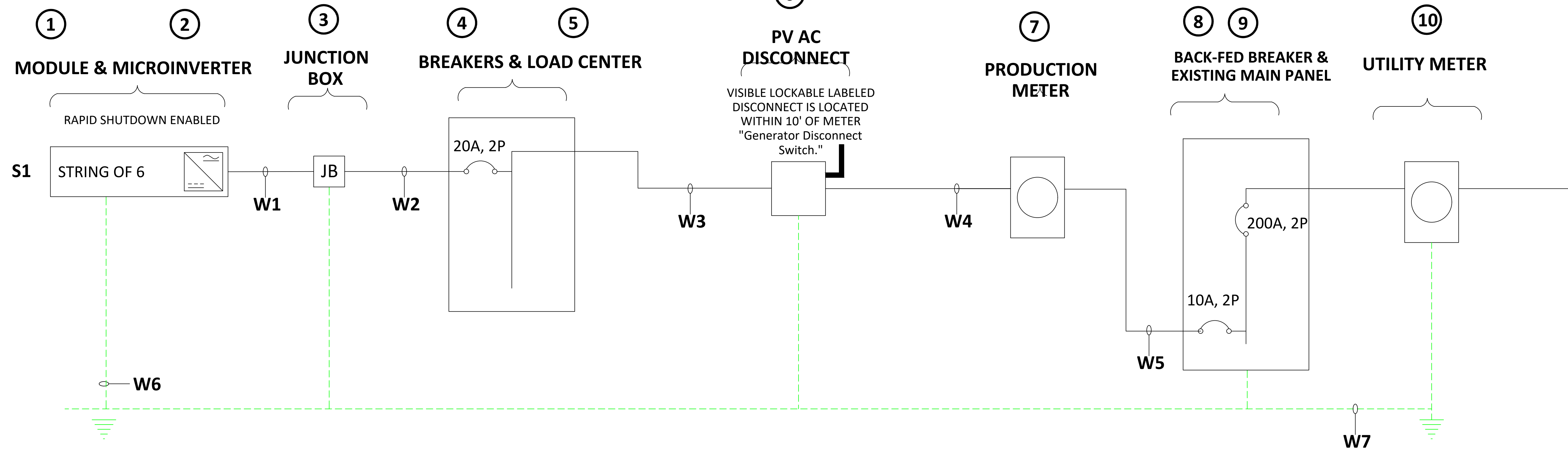
6/15/20	PLAN SET	
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07/06/20	REV 3	AH

**BUILD SUMMARY**

**02**

# PROJECT NAME: HENSLEY, DEVIN & KATELYNN

## 13-2016-1

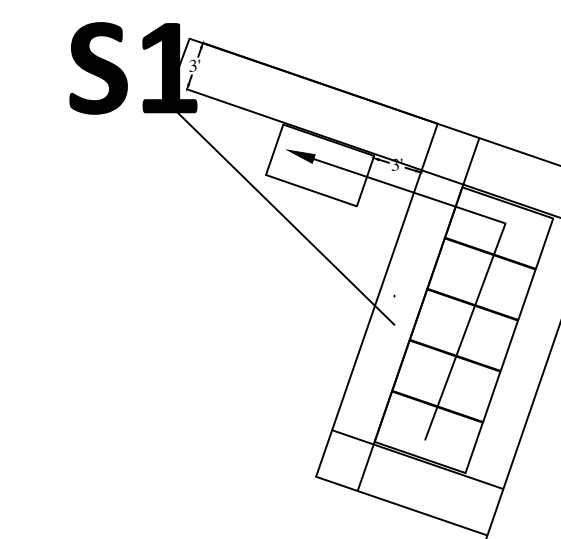


### 1 ONE-LINE ELECTRICAL DIAGRAM - 2.22 KW (DC)

03 NO SCALE

EQUIPMENT SCHEDULE							
TAG	ITEM	TAG	MAKE	MODEL	VOLTAGE	QTY	LOCATION
1	MODULE		HYUNDAI	HIA-S370HI 370W(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	PRODUCTION METER		BY UTILITY	BY UTILITY	120/240V, 1Φ	1	BLD EXTERIOR
8	BACK-FED BREAKER		SEIMENS	10A, 2-POLE Q210	120/240V, 1Φ	1	MAIN PANEL
9	MAIN PANEL		SEIMENS	200A ENCLOUSRE 200A MAIN	120/240V, 1Φ	1	BLD INTERIOR
10	UTILITY METER		ITRON	CL200	120/240V, 1Φ	1	BLD EXTERIOR

mov					
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 PRODUCTION METER	THWN-2, Cu	#10	¾"	5 FT
W5	PRODUCTION METER 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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6/15/20 PLAN SET

06/29/20 PLAN SET

07/06/20 REV 1 AH

07/06/20 REV 2 AH

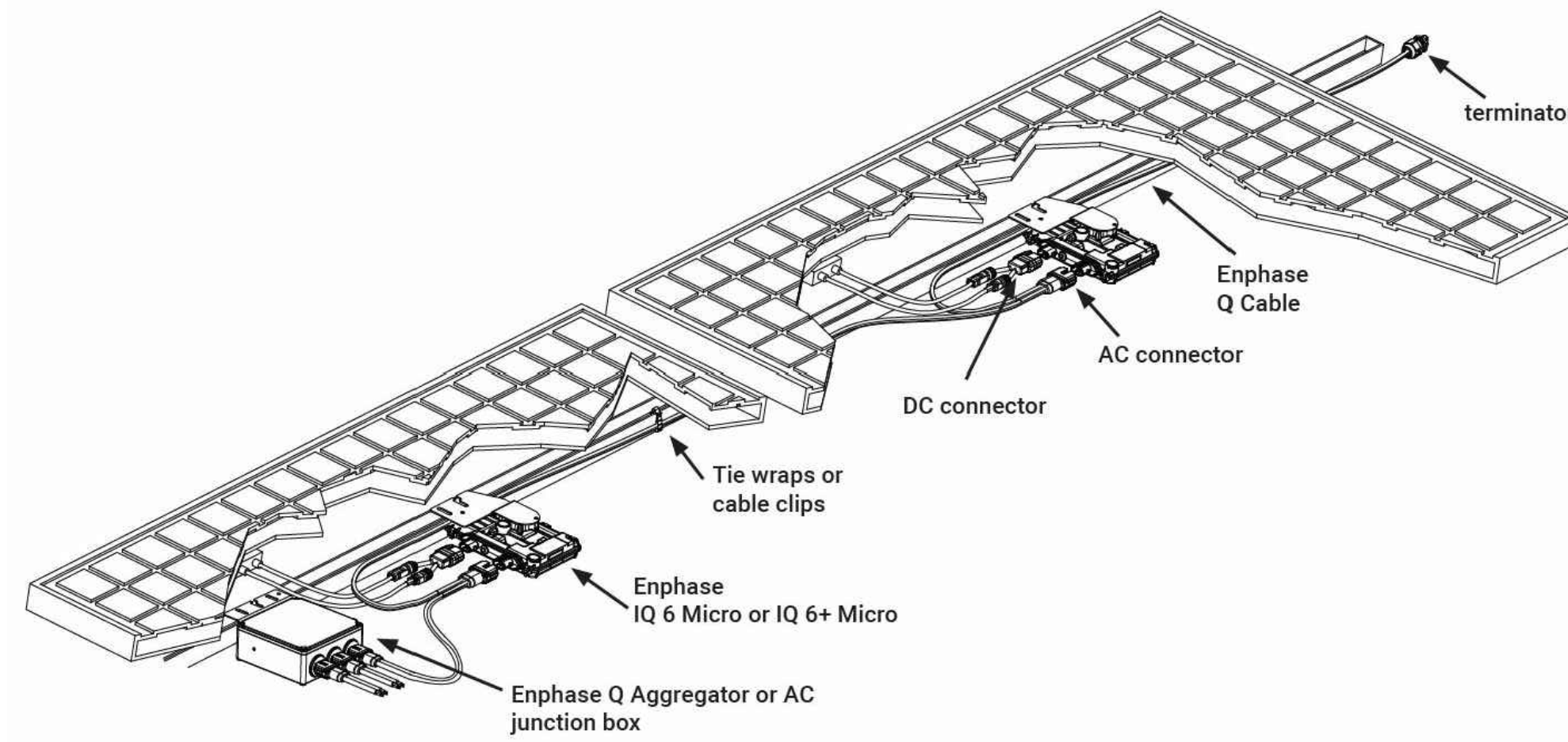
07/06/20 REV 3 AH

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

**Hyundai HiA-S370HI**

**NEC 690.7 MAXIMUM VOLTAGE**

690.7(A): Maximum Photovoltaic System Voltage  
 HIA-S370HI Module Voc = 47.40V  
 Module  $V_{max} = (25^{\circ}C - (-40^{\circ}C))(-0.0031V/^{\circ}C)(47.40V) + (47.40V) = 56.83V$  (DC)  
 Module  $V_{max}$  Output = 56.83V (DC) < IQ7+ MicroInverter  $V_{max}$  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:  $1.21A \times 5 \times 125\% = 9.075A \rightarrow 10$  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** MODULE AND MICROINVERTER CONNECTION DETAIL

**04** NO SCALE

FlashFoot2



**2** IRON RIDGE ASPHALT SHINGLE FLASHING DETAIL

**04** 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** PHOTOVOLTAIC MARKING AND LABELING

**04** NO SCALE

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6/15/20 PLAN SET

06/29/20 PLAN SET

07/06/20 REV 1 AH

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DETAILS & CALCULATIONS