

# LYNCH RESIDENCE

UTILITY CONTACT: DARYL LYNCH

PROJECT NAME: DARYL LYNCH

3409 MUSKRAT CREEK DR

FORT COLLINS, CO 80528

PROPOSED PV SYSTEM SIZE: 6.720kW<sub>DC</sub>, 5.584kW<sub>AC</sub>  
ROOF MOUNTED PHOTOVOLTAIC SYSTEM

## PHOTOVOLTAIC SYSTEM DETAILS

- MODULES = REC REC420AA PURE 2 420W (16 PCS)
- INVERTER = ENPHASE IQ8AC-72-M-US (16 PCS)
- RACKING SYSTEM = IRONRIDGE XRI00 W/ HUG
- DATA ACQUISITION = ENPHASE IQ ENVOY

## AUTHORITY HAVING JURISDICTION

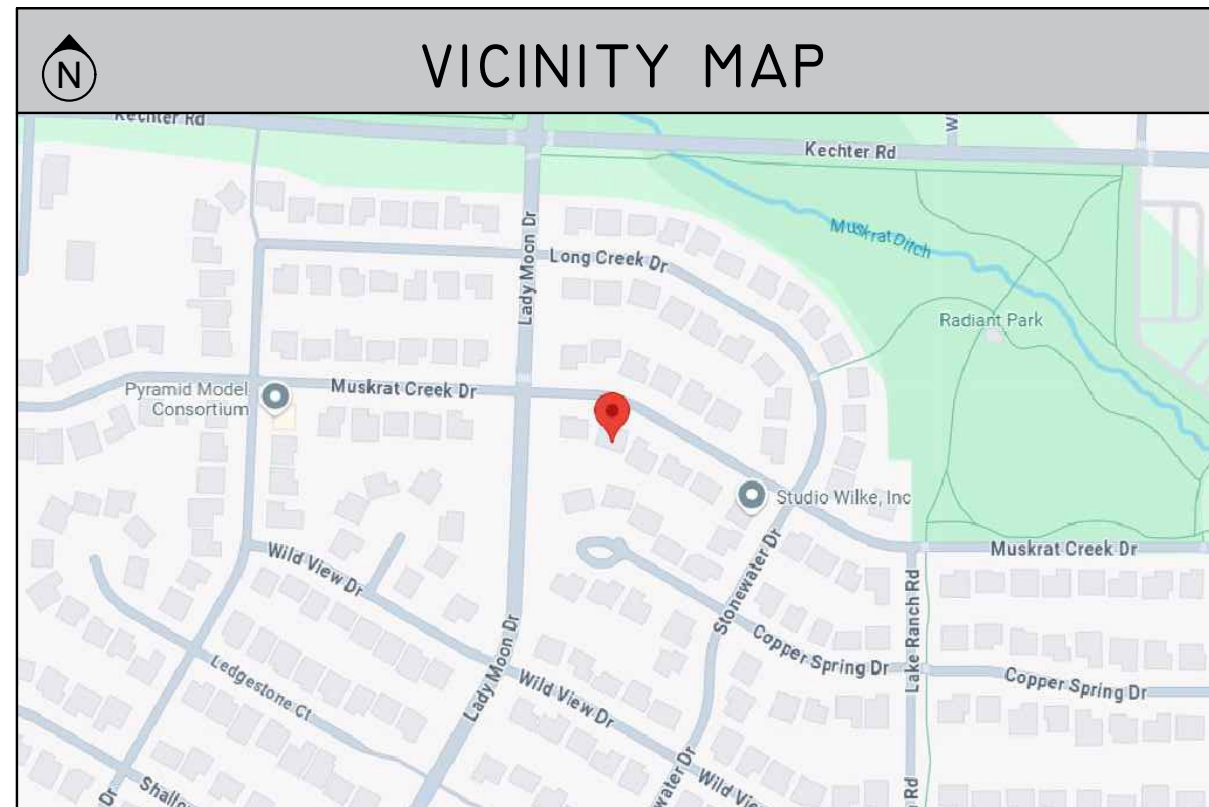
- BUILDING AUTHORITY = CITY OF FORT COLLINS
- CODE REFERENCE = 2023 NEC
- ELECTRICAL UTILITY COMPANY = FORT COLLINS UTILITY

## DESIGN CRITERIA

- DESIGN WIND LOAD = 140MPH
- DESIGN ROOF SNOW LOAD = 30PSF
- EXPOSURE CATEGORY = B
- HIGH TEMP (ASHRAE 2% HIGH) = 34°C
- LOW TEMP (ASHRAE EXTREME LOW) = -25°C
- ROOF TYPE = ASPHALT SHINGLE

## SHEET INDEX

PV-G.0	GENERAL INFO
PV-A.1	ARRAY LAYOUT
PV-A.2	ATTACHMENT DETAIL
PV-E.1	LINE DIAGRAM
PV-E.2	ELECTRICAL CALCS
PV-P.1	PLACARDS



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SOLAR INDIVIDUAL PERMIT PACKAGE

SYSTEM DETAILS: 6.720kW<sub>DC</sub>, 5.584kW<sub>AC</sub>  
• 16 REC REC420AA PURE 2 MODULES  
• 16 ENPHASE IQ8AC-72-M-US INVERTERS

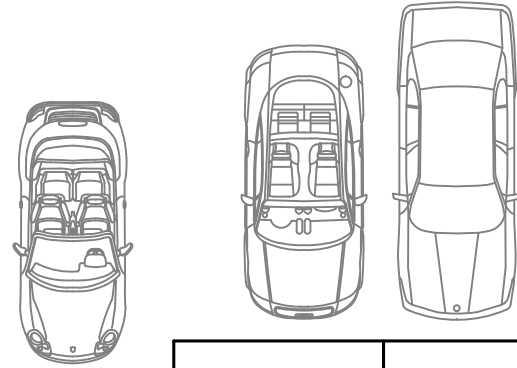
CONTACT: DAVIS FOGERTY  
• DAVIS.FOGERTY@NAMASTESOLAR.COM  
• (303) 447-0300

DRAFTER: LEROY FRANKLIN  
VERSION 1 PUBLISHED 2025.04.02

GENERAL  
INFO  
NOT TO SCALE  
PV-G.0

## ROOF CONSTRUCTION

- ROOF TYPE = ASPHALT SHINGLE
- PV ARRAY = 333 SQUARE FEET
- MAX RAFTER ATTACHMENT SPAN = 48"
- MAX DECKING ATTACHMENT SPAN = 32" FOR LANDSCAPE OR 24" FOR PORTRAIT ORIENTATION
- MAX RAFTER CANTILEVER = 19.2"
- MAX DECKING CANTILEVER = 12.8" OR 9.6"
- ATTACHMENTS SHALL BE STAGGERED SO THE LOAD IS DISTRIBUTED EVENLY TO RAFTERS UNDERNEATH THE ARRAY



- MAIN SERVICE METER - EXTERIOR
- MAIN SERVICE PANEL - EXTERIOR
- UTILITY PV AC DISCONNECT - EXTERIOR
- PV AC COMBINER PANEL - EXTERIOR
- SUBPANEL - INTERIOR

## FIRE SETBACKS

- 18" FROM RIDGE WITH TWO 36" PATHWAYS ON SEPARATE ROOF PLANES

PV MODULE ARRAY 1

PV MODULE ARRAY 2



ARRAY INFORMATION		
	ARRAY 1	ARRAY 2
MOD QTY	11	5
TILT	27°	27°
AZIMUTH	200°	200°

STRING CONFIGURATION	
STRINGS	QTY
STRING 1	8
STRING 2	8

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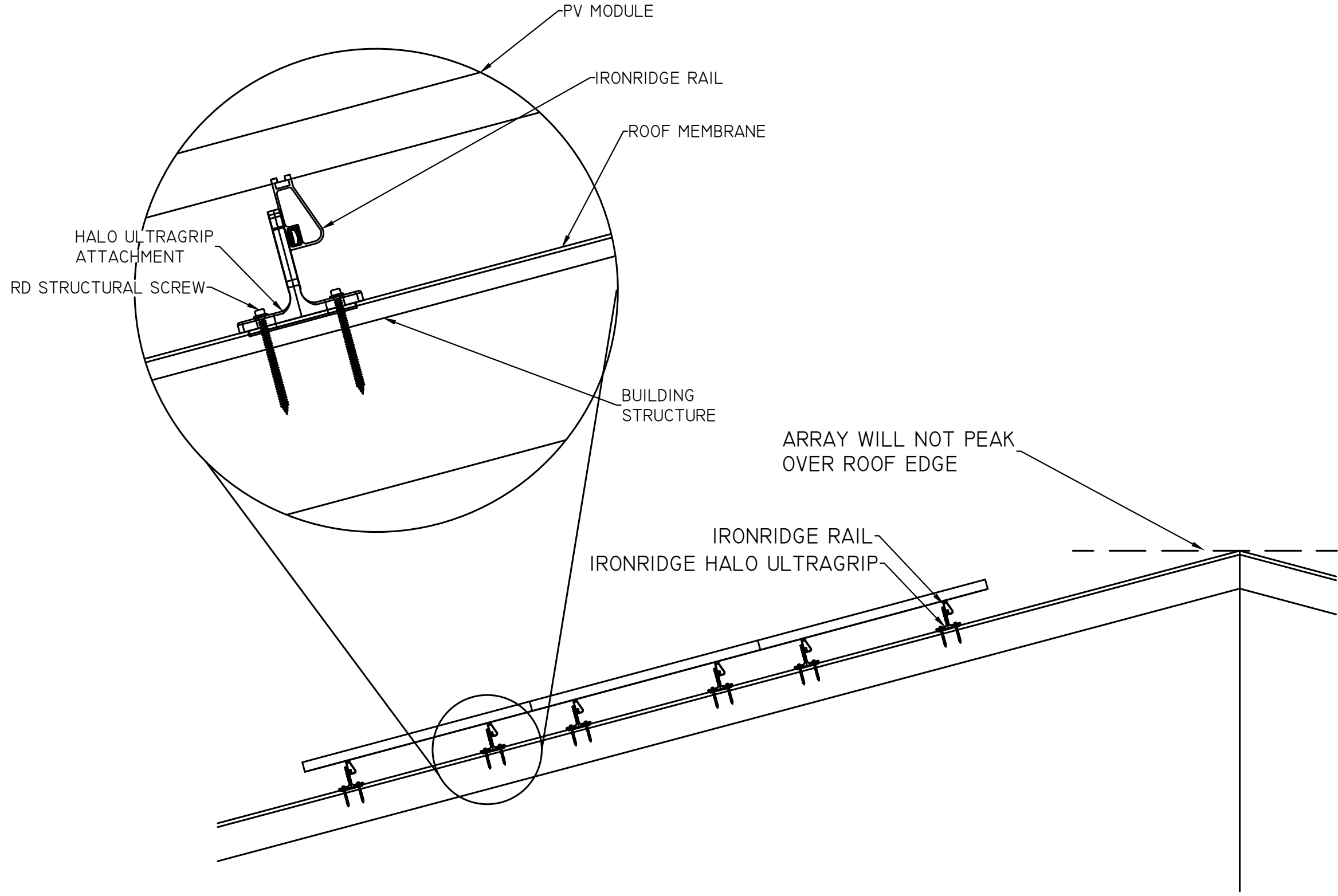
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ARRAY  
LAYOUT  
3/32" = 1'-0"  
PV-A.1



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SYSTEM DETAILS: 6.720kW<sub>DC</sub>, 5.584kW<sub>AC</sub>  
 • 16 REC REC420AA PURE 2 MODULES  
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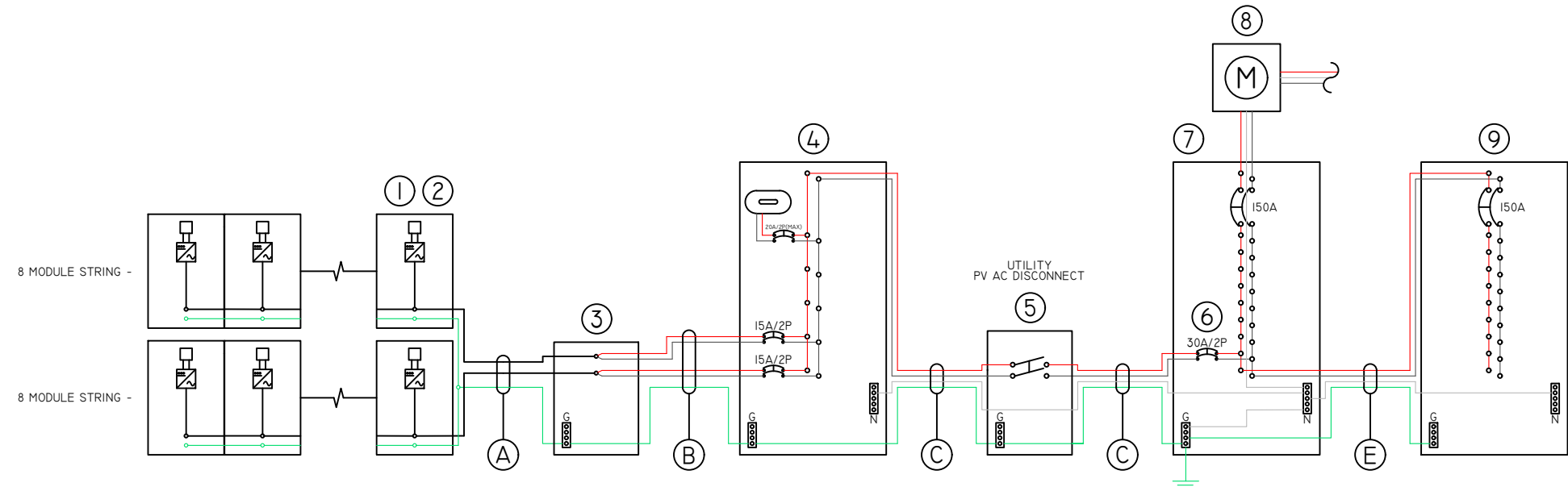
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ATTACHMENT  
 DETAILS  
 NOT TO SCALE  
 PV-A.2

ELECTRICAL EQUIPMENT SCHEDULE		DER PV SYSTEM SIZE 6.720kW <sub>DC</sub> , 5.584kW <sub>AC</sub>
KEY	QTY	NOTES
1	16	(N) REC REC420AA PURE 2 PV MODULE, FLUSH MOUNTED TO ROOF, 420W (dc)
2	16	(N) ENPHASE IQ8AC-72-M-US MICROINVERTER, MOUNTED TO RACKING, SINGLE PHASE, 240V, 349W (ac)
3	2	(N) PV ROOF JUNCTION BOX (NEMA 3R), MOUNTED TO ROOF UNDERNEATH ARRAY
4	1	(N) ENPHASE IQ COMBINER 5, 125A BUS, MLO, 240V 2X15A/2P PV BREAKERS & 1X20A/2P(MAX) MONITORING BREAKER
5	1	(N) UTILITY PV AC DISCONNECT, UNFUSED, NEMA 3R, 30A CONTINUOUS RATED, 240V (LOCKABLE W/ VISIBLE OPEN & READILY ACCESSIBLE)
6	1	(N) 1X30A/2P PV BREAKER (LOCATED ON OPPOSITE END OF BUSBAR FROM MAIN BREAKER IN MAIN SERVICE PANEL)
7	1	(E) MAIN SERVICE PANEL, 150A BUS, 150A MAIN, 240V
8	1	(E) UTILITY METER, 200A, 120/240V, 1-PHASE, 3-WIRE
9	1	(E) SUBPANEL, 150A BUS, (N) 150A MAIN, 240V

CONDUCTOR SCHEDULE			
KEY	QTY	CONDUCTORS	CONDUIT
A	2	#12 CU (2 WIRE ENPHASE Q CABLE)	FREE AIR OR 1/2" (OR LARGER) EMT
	1	#10 CU EGC (THHN/THWN2)	
B	4	#12 CU (THHN/THWN2/NM-B)	1/2" (OR LARGER) FMC/EMT
	1	#12 CU EGC (THHN/THWN2/NM-B)	
C	3	#10 CU (THHN/THWN2)	1/2" (OR LARGER) FMC/EMT
	1	#10 CU EGC (THHN/THWN2)	
E		EXISTING	

- GENERAL
- (N) NEW & (E) EXISTING
  - PLACARDING AS REQUIRED PER NEC 690.7, 690.12, 690.13, 690.15, 690.31, 705.10, 705.12
  - PLACARD AT METER INDICATING "PHOTOVOLTAIC SYSTEM CONNECTED"
  - SERVICE DISCONNECTS SHALL BE GROUPED AND/OR MARKED WITH LOCATION DESCRIPTION(S)
  - GEC SHALL BE CONTINUOUS PER 250.64(C)



PV INTERCONNECTION: BREAKER IN MAIN SERVICE PANEL



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• 16 REC REC420AA PURE 2 MODULES  
• 16 ENPHASE IQ8AC-72-M-US INVERTERS

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**LINE**  
**DIAGRAM**  
NOT TO SCALE  
**PV-E.1**

REC REC420AA PURE 2 MODULE SPECIFICATIONS & CALCULATIONS			
ITEM	NOTE / CALC	UNIT	INSTALLED DETAIL
LOCATION			FORT COLLINS, CO 80528
AMBIENT HIGH TEMPERATURE (T <sub>MAX</sub> )	ASHRAE 2%	°C	34
AMBIENT LOW TEMPERATURE (T <sub>MIN</sub> )	ASHRAE EXTREME MIN	°C	-25
MODULE TEST TEMPERATURE (T <sub>TEST</sub> )	MODULE SPEC	°C	25
DELTA LOW TEMPERATURE (T <sub>D</sub> )	T <sub>MIN</sub> - T <sub>TEST</sub>	°C	-50
MODULE POWER STC (P)	MODULE SPEC	WATTS (W)	420
MODULE OPERATING VOLTAGE (V <sub>MP</sub> )	MODULE SPEC	VOLTS (V)	42.20
MODULE OPEN-CIRCUIT VOLTAGE (V <sub>OC</sub> )	MODULE SPEC	VOLTS (V)	49.10
MODULE COEFFICIENT, VOLT/TEMP (COEFF)	MODULE SPEC	(%/°C) / 100	-0.0024
MODULE OPERATING CURRENT (I <sub>MP</sub> )	MODULE SPEC	AMPS (A)	9.96
MODULE SHORT-CIRCUIT CURRENT (I <sub>SC</sub> )	MODULE SPEC	AMPS (A)	10.74
MODULE MAX VOLTAGE (V <sub>MAXMOD</sub> )	(V <sub>OC</sub> + V <sub>OC</sub> (T <sub>D</sub> *COEFF))	VOLTS (dc)	54.99
MODULE MAX CURRENT (I <sub>MAX</sub> )	(I <sub>SC</sub> * 1.25)	AMPS (dc)	13.43
MIN AMPACITY REQUIRED PER NEC	(I <sub>MAX</sub> * 1.25)	AMPS (dc)	16.78

ENPHASE IQ8AC-72-M-US INVERTER SPECIFICATIONS & CALCULATIONS			
ITEM	NOTE / CALC	UNIT	INSTALLED DETAIL
INVERTER MAX POWER (W <sub>AC MAX</sub> )	INVERTER SPEC	WATTS (Ac)	349
INVERTER INPUT VOLTAGE (V <sub>DC MAX</sub> )	INVERTER SPEC	VOLTS (dc)	60
INVERTER OUTPUT VOLTAGE (V <sub>AC NOM</sub> )	INVERTER SPEC	VOLTS (Ac)	240
INVERTER OUTPUT FREQUENCY	INVERTER SPEC	HERTZ	60
INVERTER OUTPUT CURRENT (I <sub>AC</sub> )	INVERTER SPEC	AMPS (Ac)	1.45
INVERTER PHASE	INVERTER SPEC	PHASE	1
COMPLIANCE	INVERTER SPEC		UL1741/IEEE1547
INVERTER GROUNDING	INVERTER SPEC		ISOLATED
INVERTER QUANTITY MAX PER BRANCH CIRCUIT	INVQTY <sub>BC</sub>	QUANTITY	8
MAX BRANCH CIRCUIT OUTPUT (I <sub>MAXBC</sub> )	(I <sub>AC</sub> *INVQTY <sub>BC</sub> )	AMPS (Ac)	11.60
INVERTER QUANTITY TOTAL	INVQTY	QUANTITY	16
MAX OUTPUT CURRENT (I <sub>MAXAC</sub> )	(I <sub>AC</sub> *INVQTY*1.25)	AMPS (Ac)	29.00

CONDUCTOR SIZING CALCULATIONS										
KEY	SIZE	CU/AL	INSULATION	CALC. TYPE	AMPACITY (A) W/O DERATES	TEMP. DERATE	FILL DERATE	RESULT (A)	REQ'D (A)	OCPD
A	#12	CU	ENPHASE Q CABLE	COU	30	0.96	0.80	23.04	11.60	
				TERM	25			25	14.50	
B	#12	CU	THHN/THWN2	COU	30	0.96	0.80	23.04	11.60	
				TERM	25			25	14.50	15A
C	#10	CU	THHN/THWN2	COU	40	0.96	1.00	38.40	23.20	
				TERM	35			35	29.00	30A

1. CONDITION OF USE (COU): (AMPACITY \* TEMP. DERATE \* FILL DERATE) VS. REQ'D (IMAX)  
2. TERMINALS (TERM): AMPACITY AT TERMINALS. VS. REQ'D, (IMAX \* 1.25)  
3. ALL WIRES SIZED #10 OR LESS ARE IN COMPLIANCE WITH 2023 NEC 240.4(D).  
4. ALL OVERCURRENT PROTECTION SIZED IN COMPLIANCE WITH 2023 240.4(B) TO PROTECT CONDUCTORS  
5. FEEDER CONDUCTORS CAN BE SIZED IN ACCORDANCE WITH 2023 NEC 310.12(B) IF SUPPLYING THE ENTIRE LOAD ASSOCIATED WITH THE DWELLING.

INTERCONNECTION CALCULATIONS		
MAIN SERVICE PANEL		
ITEM	UNIT	PANEL
BUS RATING	AMPS	150
MAIN DISCONNECT	AMPS	150
ALLOWED PV PER NEC	AMPS	30
PV OCPD USED	AMPS	30*

\*BACKFED BREAKER PER 2023 NEC 705.12(B)(2)



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ELECTRICAL  
CALCS  
NOT TO SCALE  
PV-E.2

**PHOTOVOLTAIC  
AC DISCONNECT**

NEC 690.13(B):  
(1) LOCATED AT AC DISCONNECT

**⚠ CAUTION:  
MULTIPLE SOURCES  
OF POWER**  
IN CASE OF PV SYSTEM EMERGENCY  
CALL NAMASTE SOLAR:  
303-447-0300

NEC 705.10  
(1) LOCATED AT MAIN BILLING METER

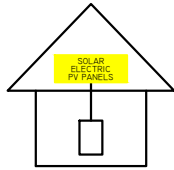
**RAPID SHUTDOWN SWITCH  
FOR SOLAR PV SYSTEM**

NEC 690.12(D)(2):  
(1) LOCATED AT AC DISCONNECT

**PV COMBINER PANEL  
DO NOT ADD LOADS**

(1) LOCATED AT PV AC COMBINER PANEL

**SOLAR PV SYSTEM EQUIPPED  
WITH RAPID SHUTDOWN**

<b>TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY</b>	
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NEC 690.12(D):  
(1) LOCATED AT RAPID SHUTDOWN SERVICE DISCONNECT

**⚠ WARNING  
POWER SOURCE  
OUTPUT CONNECTION  
DO NOT RELOCATE**

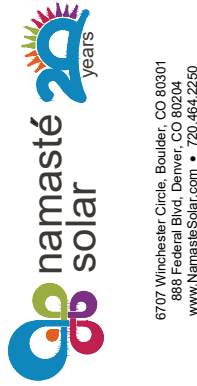
NEC 705.12(B):  
(1) LOCATED AT PV BREAKER

**Ⓢ PHOTOVOLTAIC  
SYSTEM CONNECTED Ⓢ**

(1) PLACARD LOCATED AT MAIN BILLING METER

**WARNING**  
THIS EQUIPMENT FED BY MULTIPLE SOURCES.  
TOTAL RATING OF ALL OVERCURRENT DEVICES  
EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE  
SHALL NOT EXCEED AMPACITY OF BUSBAR

NEC 705.12(B)(3):  
(1) LOCATED AT PV AC COMBINER PANEL OR PROTECTED LOADS PANEL



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**PV-P.1**

**\*\*ALL PLACARDING TO COMPLY WITH THE 2023 NATIONAL ELECTRICAL CODE\*\***