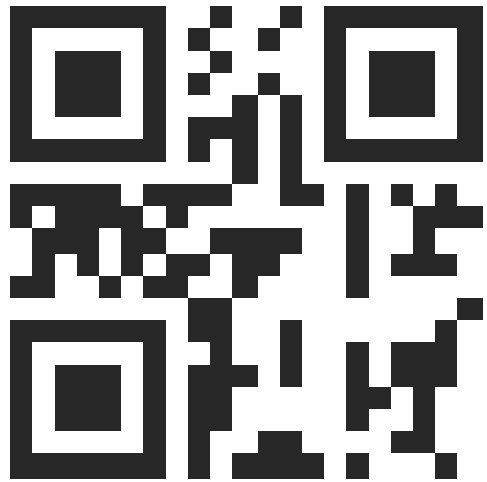


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PV MATERIAL SUMMARY: DISTRIBUTOR	
SIL-440 QD	27
MCI-2	9
Tesla PW3 1707000-xx-y	1
Tesla GW3 1841000-01-y	1
2065063-00-X	1
XR-10-184B	9
XR-10-168B	6
XR10-BOSS-01-M1	6
UFO-CL-01-B1	42
UFO-END-01-B1	24
XR-LUG-03-A1	9
4 IN QB2 (NCSN provided)	55
GC66803 Geocel Sealant	4
SOLADECK 0799-5B	1
SOLAR MESH-P-8	2
SNRAC 242-04105	60





CLIENT INFO

MARY LANG
220 WINDSWEPT WAY
FUQUAY-VARINA, NC 27526

PROJECT INFO

DC INPUT: 11.880 kW
AC OUTPUT: 11.500 kW
DOI INSPT. METHOD: OPTION 2



300 Fayetteville St.
#1430
Raleigh, NC 27602
919-274-9905
ModelEnergy.com

P-1194



CODE REFERENCES

NATIONAL ELECTRICAL CODE v. 2017
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NC BUILDING CODE v. 2018
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ACSE v. 7-10

SITE CONDITIONS

WIND SPEED: 120 MPH
RISK CATEGORY: II
EXPOSURE: B
SNOW: 15 PSF

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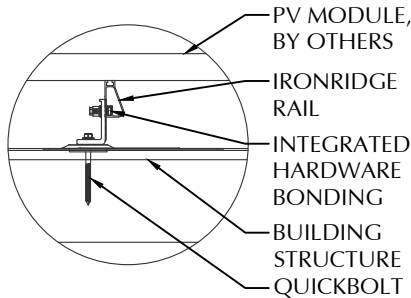
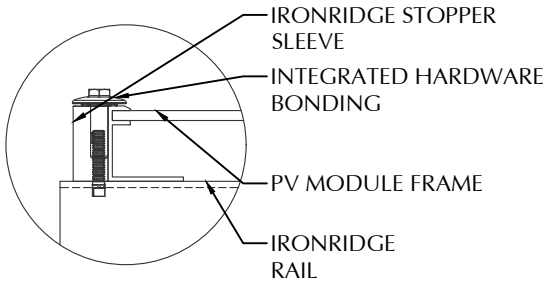
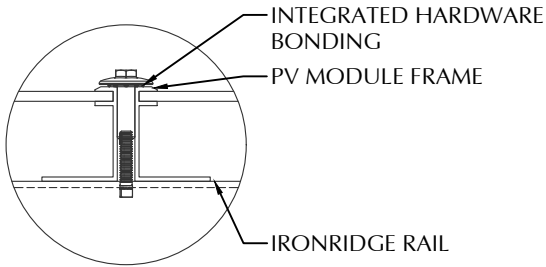
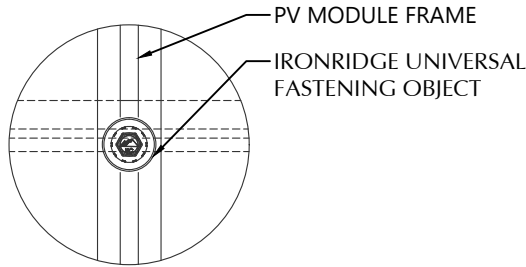
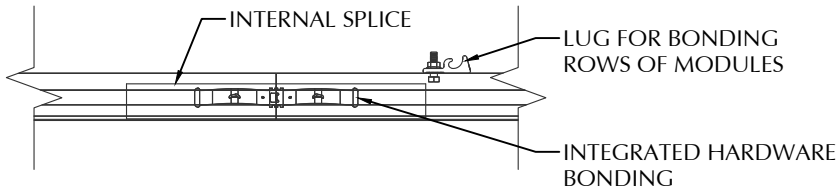
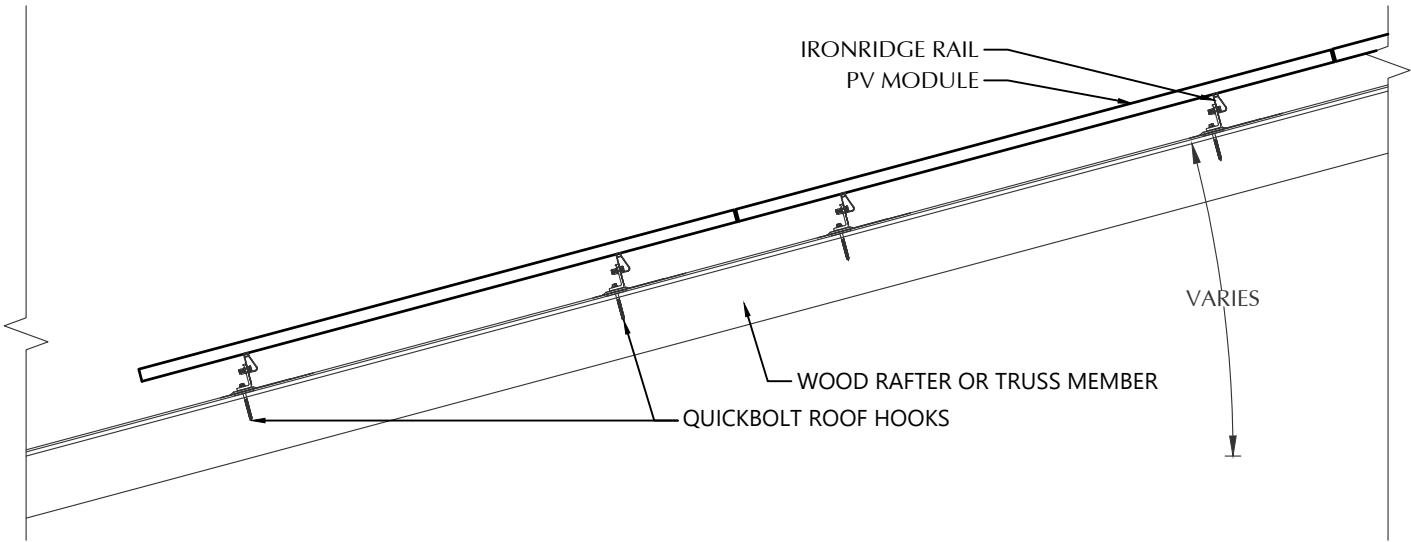
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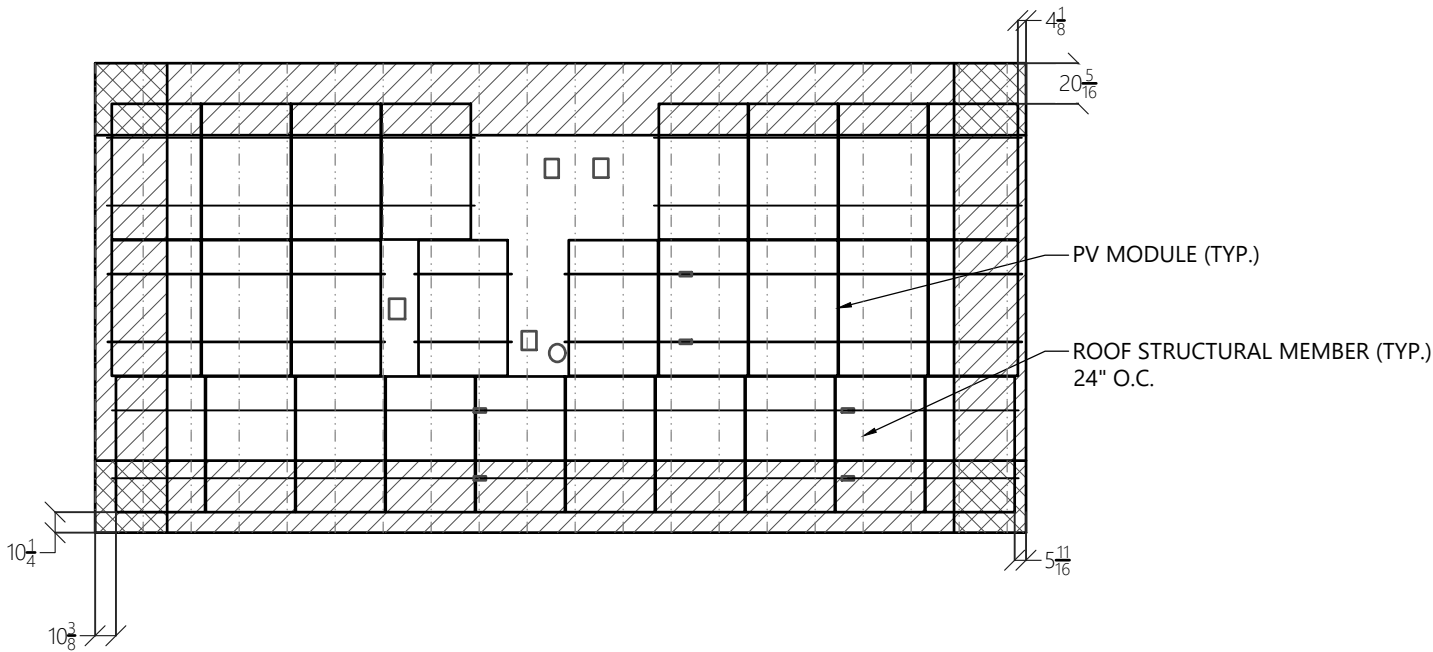
PV SYSTEM COVER PAGE

PV-1.1

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1 ROOF FASTENER DETAIL
NOT TO SCALE



2 ROOF A ARRAY LAYOUT
1/8" = 1'-0"

STATEMENT OF STRUCTURAL COMPLIANCE

THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PROPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING ARRANGEMENT DETAILED WITHIN THESE DRAWINGS.

NAME: ANDREW W. KING, PE

SIGNED:

PV MODULES

MAKE	SILFAB
MODEL	SIL-440 QD
WIDTH	44.60 IN
LENGTH	67.80 IN
THICKNESS	35 MM
WEIGHT	46.30 LBS.
ARRAY AREA	567 SQFT.
ARRAY WEIGHT	1417 LBS.

ROOF SUMMARY

STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 4
SPACING	24 IN O.C.
ALLOWABLE SPAN	88 IN
PITCH	5/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	COMPOSITE
THICKNESS	7/16 IN
WEIGHT	1.60 LBS/SQFT
ROOFING:	
TYPE	ASPHALT SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.30 LBS/SQFT.

ROOF MOUNT SUMMARY

MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	72 IN	24 IN
WIND ZONE 2	48 IN	19 IN
WIND ZONE 3	24 IN	11 IN

ROOF LOADING

GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD	20 LBS./SQFT.
DEAD LOAD	
ROOFING	3.9 LBS/SQFT.
PV ARRAY	2.5 LBS./SQFT.
TOTAL	6.4 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-23.0 LBS./SQFT.
UPLIFT ZONE 2	-38.0 LBS./SQFT.
UPLIFT ZONE 3	-57.1 LBS./SQFT.
DOWNWARD	13.6 LBS./SQFT.
FASTENER LOAD:	
UPLIFT ZONE 1	-387 LBS.
UPLIFT ZONE 2	-426 LBS.
UPLIFT ZONE 3	-320 LBS.
DOWNWARD	229 LBS.

ROOF MOUNT & FASTENER

ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	4 IN QB2
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HEX LAG BOLT
MATERIAL	304 SS
SIZE	5/16" X 4" (1/2" HEX)
GENERAL:	
WEIGHT	0.65 LBS.
FASTENERS PER MOUNT	1
MAX. PULL-OUT FORCE	960.0 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480.0 LBS.

MOUNTING RAILS

MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.036 LBS/IN
SPACING	34 IN



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PV SYSTEM STRUCTURAL

PV-2.1

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CONDUCTOR SCHEDULE

TAG	CURRENT CARRYING CONDUCTORS			GROUNDING CONDUCTORS			CONDUIT/RACEWAY			NOTES
	QTY.	SIZE	INSULATION	QTY.	SIZE	INSULATION	QTY.	SIZE	LOCATION	
C1	6	10 AWG	PV WIRE	1	6 AWG	BARE	-	-	FREE AIR	1,5
C2	6	10 AWG	THWN-2	1	10 AWG	THWN-2	1	3/4"	EXT/INT	2,4,5
C3	3	6 AWG	THWN-2	1	10 AWG	THWN-2	1	1"	EXTERIOR	2,4,5
C4	3	4/0 AWG ALUMINUM	XHHW	1	6 AWG	THWN-2	1	2"	EXT/INT	2,4,5,6
C5	3	4/0 AWG ALUMINUM	XHHW	1	-	-	1	2"	EXTERIOR	2,4,5
C6	2	6 AWG	THWN	1	10 AWG	THWN	1	3/4"	INTERIOR	2,4,5

NOTES:

- MANUFACTURER PROVIDED, UL LISTED WIRING HARNESS FOR USE ON EXPOSED ROOFS
- CONDUIT SIZE SHOWN IS CODE MINIMUM. LARGER SIZES ARE ALLOWED.
- EXISTING CONDUCTORS, FIELD VERIFY
- EQUIPMENT TERMINAL RATING SHALL BE A MINIMUM OF 75°C AT BOTH END OF CONDUCTOR
- PLEASE REFERENCES NOTES ON PV-4.1 FOR ADDITIONAL DETAIL
- SERVICE & FEEDER GROUNDED CONDUCTORS MAY BE SIZED SMALLER THAN UNGROUNDED CONDUCTORS PER NEC 310.15(B)(7)

ENERGY MANAGEMENT

MAKE	TESLA
MODEL	BACKUP GATEWAY 3
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
DISCONNECT CURR.	200 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	YES
MAIN BREAKER RATING	200 AMPS

- TROUGH MAY BE USED IF NECESSARY
- INSTALL 200A MAIN BREAKER THAT WILL SERVE AS THE NEW SERVICE DISCONNECT SWITCH
- LAND POWERWALL 3 VIA 60A BREAKER ON INTERNAL PANELBOARD
- INSTALL BONDING JUMPER FROM NEUTRAL TO GROUND
- FEED BACKED-UP LOADS PANEL VIA BACKUP LUGS

PV MODULE

MAKE	SILFAB
MODEL	SIL-440 QD
NOM. POWER (PNOM)	440 WATTS
NOM. VOLT. (VMPP)	33.4 VOLTS
O.C. VOLT (VOC)	39.0 VOLTS
MAX. SYS. VOLT.	1000 VOLTS
NOM. CURR. (IMPP)	13.2 AMPS
S.C. CURR. (ISC)	14.2 AMPS
TEMP. COEF. (PMPP)	-0.29 %/C
TEMP. COEF. (Voc)	-0.24 %/C
MAX SERIES FUSE	25 AMPS
UL COMPLIANT (Y/N)	YES

MAX. DC VOLTAGE CALCULATION

$V_{OC}MAX = V_{OC} * (1 + (TMIN - TSTC) * (VTC / 100))$	
$V_{OC}MAX$	42.10
MAX STRING VOLTAGE	378.9

MAX. DC CURRENT CALCULATION

$I_{SC}MAX = I_{SC} * TCX$	
$I_{SC}MAX$ (AMPS)	17.78

EV CHARGER

MAKE	TESLA
MODEL	UNIVERSAL WALL CONNECTOR
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
UL LIST. (Y/N)	YES

MID-CIRCUIT INTERRUPTER

MAKE	TESLA
MODEL	MCI-2
ENCL. RATING	NEMA 4X / IP65
DC INPUT:	
CONNECTOR TYPE	MC4
MAX IN-LINE PV MODULES	3
MAX MCI PER STRING	5
MAX. SYSTEM VOLTAGE	1000 VOLTS
NOM. CURRENT (Imp)	15.00 AMPS
MAX. CURRENT (Isc)	19.00 AMPS
RSD COMPLIANT (Y/N)	YES
UL COMPLIANT (Y/N)	YES

JUNCTION BOX

MAKE	SOLADECK
PROTECT. RATING	NEMA TYPE 3R
UL LIST. (Y/N)	YES

BACKED-UP LOADS PANEL (EXISTING)

MAKE	EATON-CUTLER HAMMER
MODEL	CHP42B200X7
ENCL. RATING	NEMA TYPE 1
VOLT. RATING	240
BUS RATING	225 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	YES
MAIN BREAKER RATING	200 AMPS

- RE-FEED BACKED-UP LOADS PANEL VIA GATEWAY OUTPUTS
- REMOVE N/G BOND, SEPARATE NEUTRALS AND GROUNDS
- INSTALL EV CHARGER ON 60A BREAKER

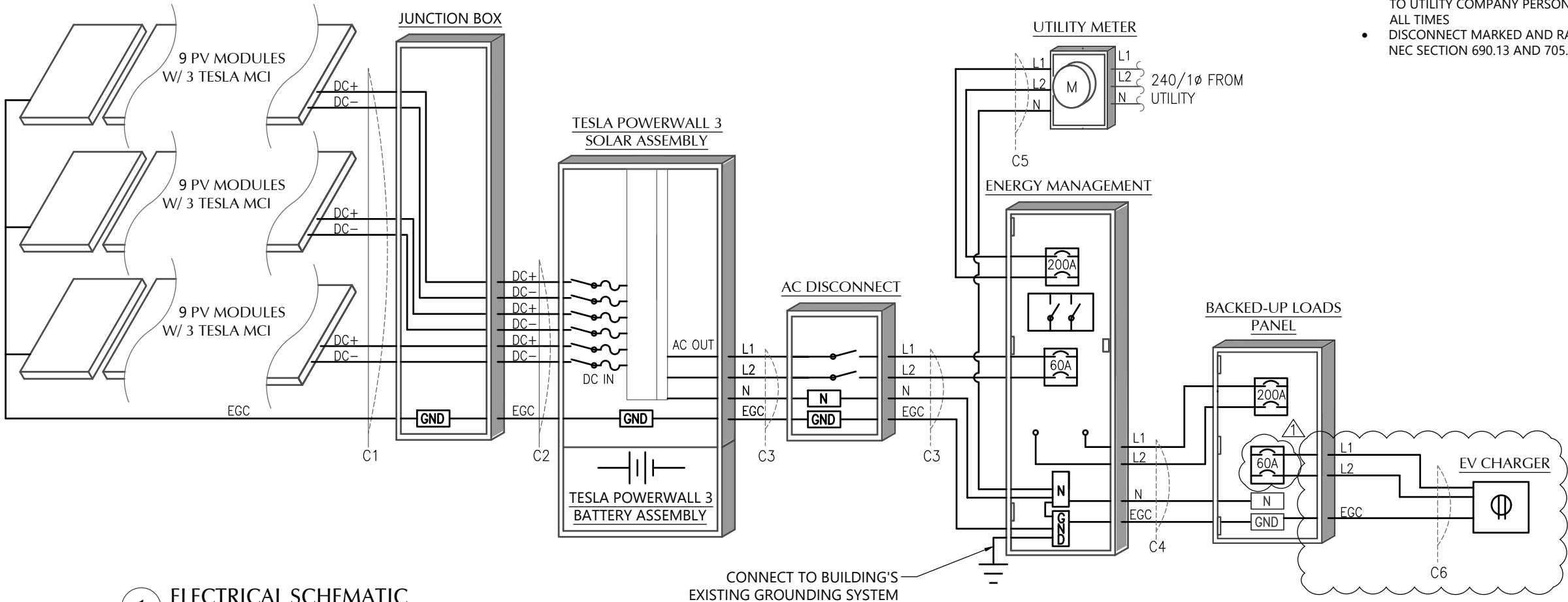
DC/AC INVERTER & BATTERY

MAKE	TESLA POWERWALL 3
MODEL	1707000-XX-Y
DC INPUT:	
MAX POWER	20000 WATTS
INPUT VOLT. RANGE	60-550 VOLTS
MPPT VOLT. RANGE	60-480 VOLTS
MAX. CURR. (Imp / Isc)	13 / 15 AMPS
STRING INPUTS	6 MPPTs
AC OUTPUT:	
MAX. CONT. POWER	11500 WATTS
NOM. VOLT.	120 / 240 VOLTS
MAX. CONT. CURRENT	48.00 AMPS
RAPID SHUTDOWN (Y/N)	YES
PROTECT. RATING	NEMA TYPE 3R
BATTERY INFO:	
USABLE ENERGY	13.5 kWh
NOM. VOLT.	240 VOLTS
MAX. CONT. CHARGE	5000 WATTS
MAX. CONT. DISCHARGE	11500 WATTS
UL LIST. (Y/N)	YES

AC DISCONNECT

MAKE	GENERIC
MODEL	NA
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
AMP RATING	60 AMPS
UL LIST. (Y/N)	YES
FUSED (Y/N)	NO
FUSE RATING	N/A

- LOAD-BREAK RATED
- VISIBLE OPEN
- LOCKABLE IN OPEN POSITION
- INSTALL ADJACENT TO METER
- DISCONNECT TO BE READILY ACCESSIBLE TO UTILITY COMPANY PERSONNEL AT ALL TIMES
- DISCONNECT MARKED AND RATED PER NEC SECTION 690.13 AND 705.10



1 ELECTRICAL SCHEMATIC

NTS



CLIENT INFO

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220 WINDSWEEP WAY
FUQUAY-VARINA, NC 27526

PROJECT INFO

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DOI INSPT. METHOD: OPTION 2

Model Energy

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P-1194



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SITE CONDITIONS

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PV SYSTEM
ELECTRICAL

PV-3.1

WARNING: PHOTOVOLTAIC
POWER SOURCE

NEC 690.31 (G)(3)&(4)
PLACE ON ALL JUNCTION BOXES, EXPOSED RACEWAYS, AND OTHER
WIRING METHODS EVERY 10' AND ON EVERY SECTION SEPARATED BY
ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.

RAPID SHUTDOWN
SWITCH FOR
SOLAR PV SYSTEM

NEC 690.56 (C)(3)
PLACE ON RAPID SHUTDOWN SWITCH OR EQUIPMENT
WITH INTEGRATED RAPID SHUTDOWN *REFLECTIVE*

PV SYSTEM
DISCONNECT

NEC 690.13 (B)
PLACE ON PV SYSTEM DISCONNECTING MEANS.

DIRECT CURRENT
PHOTOVOLTAIC POWER SOURCE

MAXIMUM VOLTAGE 600 VDC
MAX CIRCUIT CURRENT 53.34 AMPS

NEC 690.53
PLACE ON ALL DC DISCONNECTING MEANS

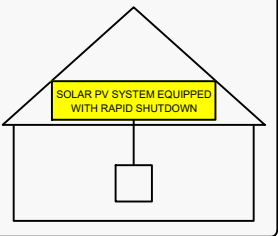
PHOTOVOLTAIC SYSTEM
AC DISCONNECT

OPERATING VOLTAGE 240 VOLTS
OPERATING CURRENT 48.0 AMPS

NEC 690.54
PLACE ON INTERCONNECTION
DISCONNECTING MEANS

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



NEC 690.56 (C)(1)(a)
PLACE WITHIN 3FT OF SERVICE DISCONNECTING MEANS TO
WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL
INDICATE THE LOCATIONS OF RAPID SHUTDOWN SWITCHES

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)(2)(3)(c)

WARNING
THREE POWER SOURCES

SOURCES: UTILITY GRID, BATTERY
AND PV SOLAR ELECTRIC SYSTEM

NEC 705.12(B)(3)
PLACE ON ALL EQUIPMENT THAT IS SUPPLIED
BY THREE POWER SOURCES

SERVICE DISCONNECT LOCATED:

PV/BATTERY DISCONNECT LOCATED:

NEC 705.10
PLACE AT SERVICE EQUIPMENT AND
PV SYSTEM DISCONNECTING MEANS.

LABEL NOTES:

- LABELS SHOWN ARE NOT TO SCALE.
- LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
- DC CONDUIT SHALL BE MARKED WITH REQUIRED LABEL EVERY 10 FEET.
- PHOTOVOLTAIC SYSTEMS SHALL BE PERMANENTLY MARKED AT VARIOUS EQUIPMENT LOCATIONS TO IDENTIFY THAT A PHOTOVOLTAIC SYSTEM IS INSTALLED AND THAT VARIOUS DANGERS ARE PRESENT.
- EACH PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED TO IDENTIFY IT AS A PHOTOVOLTAIC SYSTEM DISCONNECT.
- WHERE ALL TERMINALS OF A DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A WARNING SIGN SHALL BE MOUNTED ON OR ADJACENT TO THE DISCONNECT.
- A PERMANENT LABEL FOR THE DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE SHALL BE PROVIDED AT THE DC DISCONNECT MEANS.
- A PERMANENT PLAQUE OR DIRECTORY, DENOTING ALL ELECTRIC POWER SOURCES SERVING THE PREMISES, SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT LOCATIONS OF ALL POWER PRODUCTION SOURCES.
- LABELS WILL BE APPLIED IN ACCORDANCE WITH THE NEC. SOME LABELS SHOWN MAY NOT BE NECESSARY.

WIRING NOTES:

- CONDUCTORS SHALL BE COPPER OR ALUMINUM, RATED AT NOT LESS THAN 600 VOLTS
- MINIMUM SIZE SHALL BE #14 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- EXPOSED WIRING CONDUCTOR INSULATION SHALL BE TYPE PV WIRE, USE-2, OR RHW-2 WHERE THE OUTER LAYER OF THE INSULATION IS UV, SUNLIGHT, AND MOISTURE RESISTANT. CABLE ASSEMBLIES SHALL BE TYPE DG. BARE CONDUCTORS SHALL BE A MINIMUM OF #6 AWG.
- EXTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN-2 AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), RIGID POLYVINYL CHLORIDE CONDUIT(PVC), RIGID METALLIC CONDUIT (RMC), LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC), OR LIQUIDTIGHT FLEXIBLE NON METALLIX CONDUIT (LFNC). SE-TYPE CABLE CAN BE USED AS AN ALTERNATIVE. ADDITIONAL WIRING METHODS SHALL BE PERMITTED ONLY WHEN IN COMPLIANCE WITH ALL NEC REQUIREMENTS.
- INTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN-2 OR XHHW AND INSTALLED IN ELECTRICAL METALLIC TUBING (EMT), FLEXIBLE METAL CONDUIT(FMC), LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC), LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC). TYPE SE, NM, AND MC CABLE ASSEMBLIES SHALL ALSO BE PERMITTED. ADDITIONAL WIRING METHODS SHALL BE PERMITTED ONLY WHEN IN COMPLIANCE WITH ALL NEC REQUIREMENTS.
- BURIED WIRING CONDUCTOR INSULATION SHALL BE RATED FOR DIRECT BURIAL WHEN INSTALLED OUTSIDE OF RACEWAY. CONDUCTOR INSULATION SHALL BE TYPE THWN-2 OR XHHW AND INSTALLED IN RIGID PVC, RIGID METALLIC CONDUIT, OR HDPE. ADDITIONAL WIRING METHODS SHALL BE PERMITTED ONLY WHEN IN COMPLIANCE WITH ALL NEC REQUIREMENTS.
- USE SCHEDULE 40 PVC OUTDOORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE OR BELOW FLOOR SLAB. USE SCHEDULE 80 PVC OUTDOORS WHERE SUBJECT TO PHYSICAL DAMAGE
- MINIMUM CONDUIT SIZE TO BE 1/2".
- WIRING METHODS TO CONFORM TO CHAPTER 3 OF THE NEC.

CONSTRUCTION NOTES:

- ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE NEC, STATE, AND LOCAL APPLICABLE CODES.
- FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS, BEST PRACTICES, AND SPECIFICATIONS.
- ENSURE REQUIRED MAINTENANCE ACCESS AND CLEARANCES ARE
- FUSES 0 - 600 AMPS SHALL BE UL CLASS "RK-1" LOW PEAK DUAL ELEMENT TIME DELAY WITH 200,000 AMPERE INTERRUPTING RATING A, UNLESS NOTED OTHERWISE.
- ALL TERMINALS, SPlicing CONNECTORS, LUGS, ETC SHALL BE IDENTIFIED FOR USE WITH THE MATERIAL (CU/AL) OF THE CONDUCTOR AND SHALL BE PROPERLY INSTALLED.
- ALL PENETRATIONS THROUGH EXTERIOR ROOFS SHALL BE FLASHED IN A WATERPROOF MANNER.
- ALL PENETRATIONS THROUGH ATTIC FIRE BARRIERS SHALL BE SEALED WITH FIRE-BARRIER SEALANT CAULK.
- SUPPORT ALL CONDUIT AND EQUIPMENT IN ACCORDANCE W/ NEC. ANY SUSPENDED MATERIALS SHALL BE DIRECTLY SUPPORTED BY THE BUILDING STRUCTURE.
- A NORTH CAROLINA REGISTERED DESIGN PROFESSIONAL WILL BE REQUIRED TO SEAL THE STRUCTURAL DESIGN AT THE TIME OF PERMIT APPLICATION IF ANY OF THE FOLLOWING EXIST AND ARE ATTESTED TO BY THE APPLICANT:
 - THE WEIGHT OF THE PV SYSTEM EXCEEDS THREE (3) POUNDS PER SQUARE FOOT(PSF)
 - THE ROOF POSSESSES MORE THAN ONE (1) LAYER OF ASPHALT SHINGLES
 - THE ROOFING MATERIAL CONSISTS OF A TYPE OTHER THAN ASPHALT SHINGLES OR METAL
 - THE ROOF IS LOCATED IN A 140 MPH OR GREATER WIND ZONE



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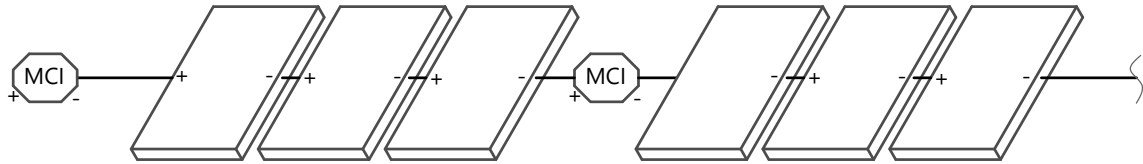
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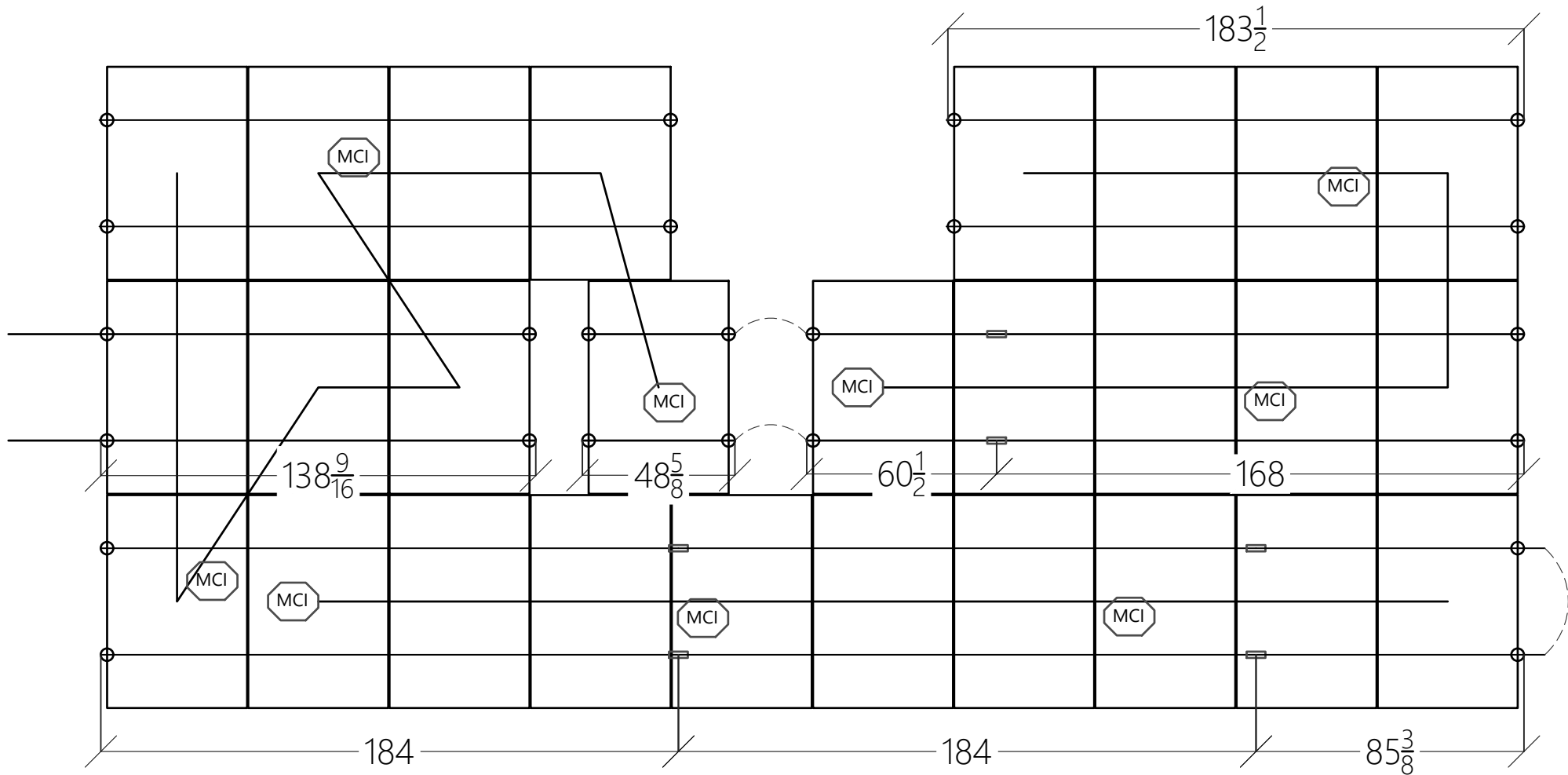
PV SYSTEM
EQUIPMENT LABELS

PV-4.1

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1 STRING WIRING + MCI DETAIL
NOT TO SCALE



1 ARRAY LAYOUT DETAIL
NOT TO SCALE



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SITE CONDITIONS

WIND SPEED: 120 MPH
RISK CATEGORY: II
EXPOSURE: B
SNOW: 15 PSF

SHEET INDEX

PV-1: COVER SHEET
PV-2: PV STRUCTURAL
PV-3: PV ELECTRICAL
PV-4: PV EQUIPMENT LABELS
PV-5: PV INSTALL GUIDE

VERSIONS

FOR:	DESIGNER	DATE
CONSTRUCTION	CRM	7/24/2025
REVISION Δ	CRM	8/4/2025

PV SYSTEM INSTALL
GUIDE

PV-5.1