

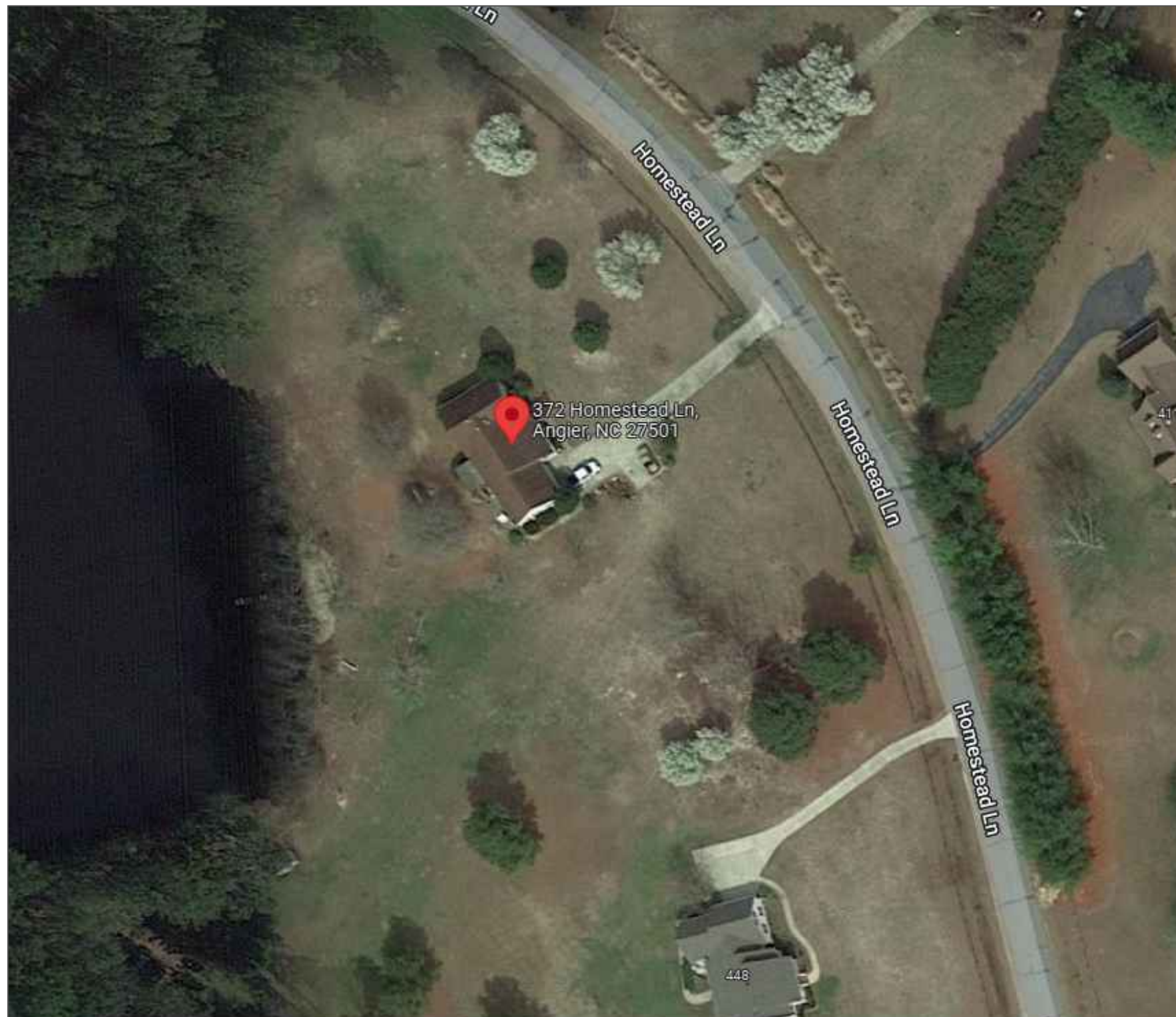
SCOPE OF WORK

TO INSTALL A RESIDENTIAL ROOFTOP SOLAR PHOTOVOLTAIC (PV) SYSTEM.
 THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE
 UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT.
 THE PV SYSTEM DOES NOT INCLUDE BATTERIES.

ELECTRICAL NOTES

- 1) ALL EQUIPMENT TO BE LISTED BY THE UL OR OTHER NRTL AND LABELED FOR ITS APPLICATION.
- 2) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600V AND 90°C WET ENVIRONMENT.
- 3) WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- 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.
- 9) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR THE ILSCO GBL-4DBT LAY-IN LUG.
- 10) THE POLARITY OF THE GROUNDED CONDUCTORS IS (positive/negative) OR THE DC SIDE OF THE PV SYSTEM IS UNGROUNDED AND SHALL COMPLY WITH NEC 690.35

VICINITY MAP



CONTRACTOR



1023 S MIAMI BLVD
 DURHAM, NC 27703
 (919) 508-6907
 NC ELE LICENSE #: 34789
 NC GC LICENSE #: 84770

PROJECT & CLIENT INFORMATION

**MCKENNIES RESIDENCE
 NEW SOLAR PV SYSTEM**
 SYSTEM SIZE: 6.57 KW DC
 SYSTEM SIZE: 7.6 KW AC

SABRINA MCKENNIES
 372 HOMESTEAD LN
 ANGIER, NC 27501
 (919) 889-9459

ENGINEER OF RECORD

DRAWING BY

DAB

REVISIONS

DESCRIPTION	DATE	#	BY
RELEASED FOR PERMITTING	3/31/2022	1	CST

SHEET SIZE

**ANSI B
 11" X 17"**

DATE

3/31/2022

SHEET NAME

**GENERAL
 INFORMATION**

SHEET NUMBER

COVER

NCDOI REQUIREMENTS

OPTION 2



WEIGHT OF PV SYSTEM ON ROOF:

2.5958 PSF

EXISTING ROOF MATERIAL TYPE:

ASPHALT SHINGLE (SINGLE LAYER)

PROJECT LOCATION WIND ZONE:

120 MPH

DESIGN SPECIFICATIONS

CONSTRUCTION TYPE	SINGLE-FAMILY
ZONING	RESIDENTIAL
GROUND SNOW LOAD	20 PSF
WIND EXPOSURE CATEGORY	CATEGORY C
WIND SPEED	120 MPH
UTILITY PROVIDER	DUKE ENERGY PROGRESS
AHJ	TOWN OF ANGIER (HARNETT COUNTY)

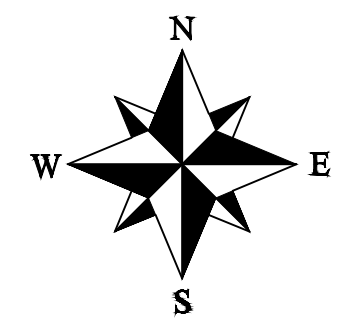
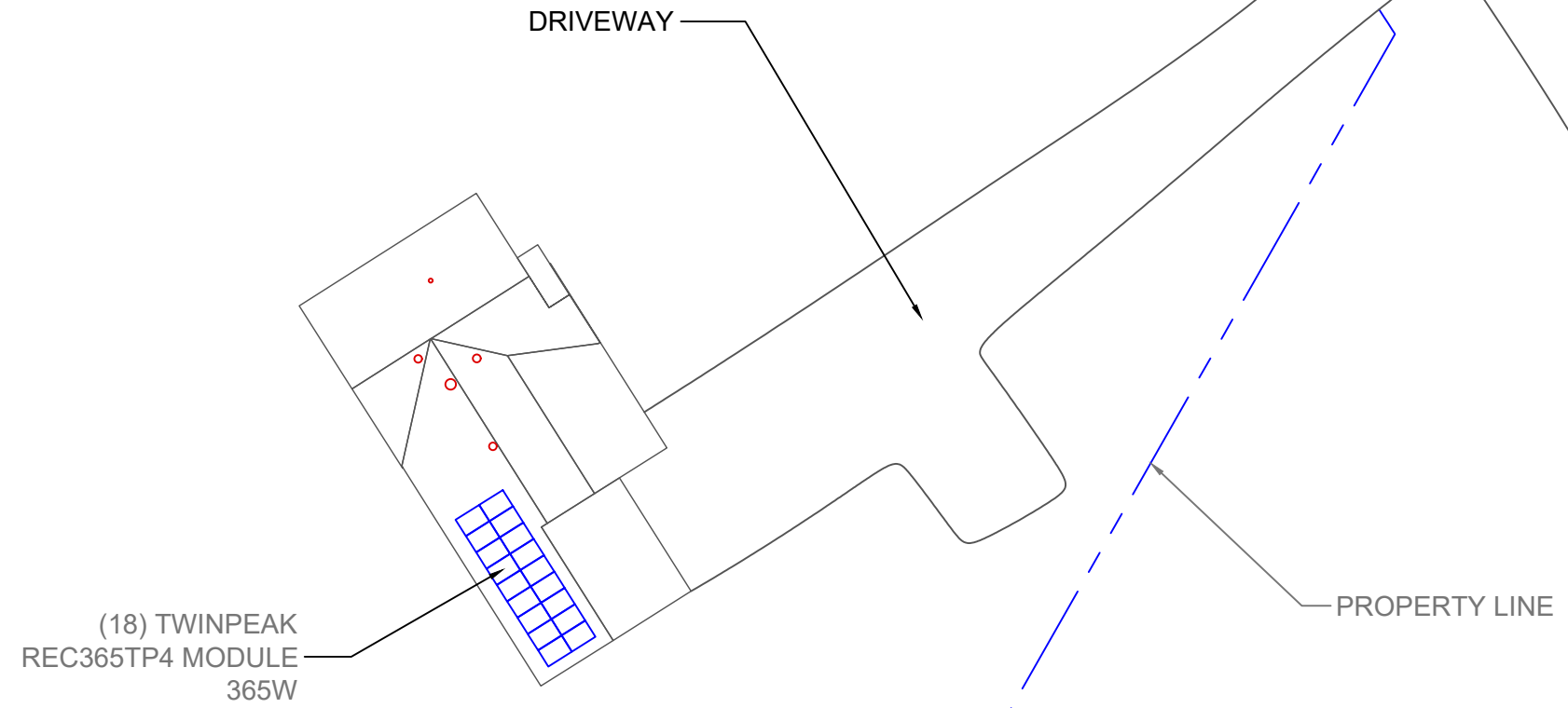
SYSTEM SPECIFICATIONS


SOLAR MODULES	(18) TWINPEAK REC365TP4 MODULE 365W
POWER OPTIMIZERS	(18) SOLAREEDGE P401
INVERTER(S)	(1) SOLAREEDGE SE7600H-US000BNU4
SOLAR MOUNTS	SNAPNRACK SPEEDSEAL FOOT
SOLAR RACKING SYSTEM	SNAPNRACK ULTRA RAIL 40 WITH SNAPNRACK SKIRTING
MONITORING	YES
POINT OF INTERCONNECT	BUCHANAN BTC 4/0-10 TAP CONNECTORS IN MSP

SHEET INDEX		GOVERNING CODES
COVER	GENERAL INFORMATION	NFPA 70 NATIONAL ELECTRICAL CODE 2017
PV-1	SITE PLAN	2018 INTERNATIONAL BUILDING CODE
PV-2	ROOF LAYOUT AND MOUNTING DETAIL	2018 NORTH CAROLINA BUILDING CODE
PV-3	ELECTRICAL SCHEMATIC	2018 NORTH CAROLINA RESIDENTIAL CODE
PV-4	AMPACITY CALCULATIONS AND WIRE SIZING	UNDERWRITERS LABORATORIES (UL) STANDARDS
PV-5	LABELING SCHEDULE	OSHA 29 CFR 1910.269
CUTSHEETS	MANUFACTURER SPECIFICATION SHEETS	NORTH CAROLINA DEPARTMENT OF INSURANCE

PROPERTY PLAN

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



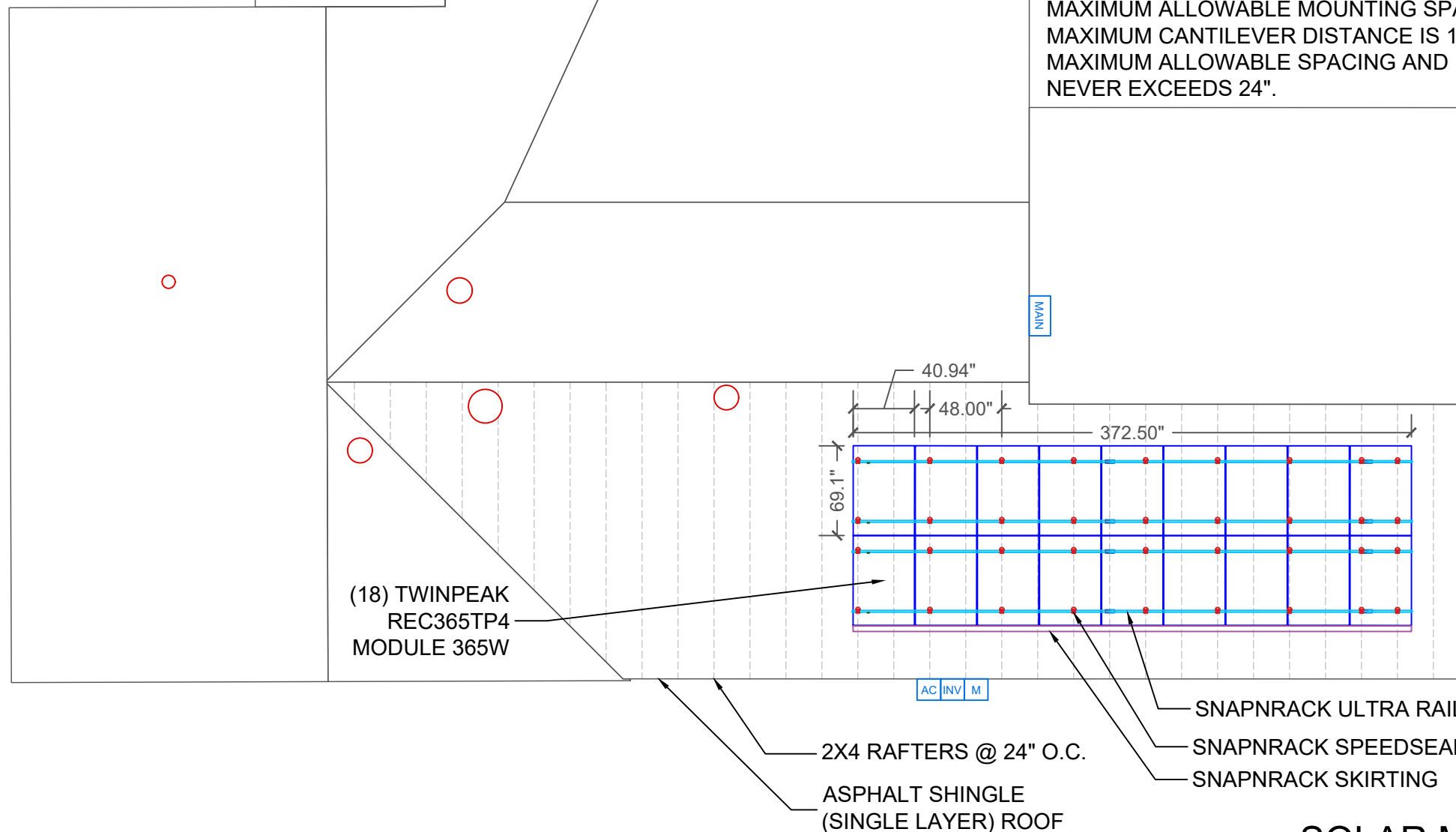
CONTRACTOR			
			
1023 S MIAMI BLVD DURHAM, NC 27703 (919) 508-6907 NC ELE LICENSE #: 34789 NC GC LICENSE #: 84770			
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DATE			
3/31/2022			
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SITE PLAN			
SHEET NUMBER			
PV-1			

ROOF PLAN

SCALE: 1/8"=1'-0"

ROOF 1 PITCH: 30°
ROOF 1 AZIMUTH: 238°

NOTE:
MAXIMUM ALLOWABLE MOUNTING SPACING IS 56".
MAXIMUM CANTILEVER DISTANCE IS 1/3 OF THE
MAXIMUM ALLOWABLE SPACING AND
NEVER EXCEEDS 24".



LOAD CALCULATIONS

NUMBER OF MODULES	18	
MODULE WEIGHT	44	LBS
MODULE SQ FT	19.7	SQ FT
TOTAL MODULE WEIGHT	792	LBS
TOTAL MODULE SQ FT	354.6	SQ FT
NUMBER OF PORTRAIT	18	
NUMBER OF LANDSCAPE	0	
NUMBER OF OPTIMIZERS	18	
WEIGHT PER OPTIMIZER	1.5	LBS
TOTAL OPTIMIZER WEIGHT	27	LBS
TOTAL LENGTH OF RAIL	125	LF
RAIL WEIGHT PER FOOT	0.56	LBS
TOTAL RAIL WEIGHT	70	LBS
NUMBER OF MOUNTS	36	
WEIGHT PER MOUNT	0.554	LBS
WEIGHT PER SYSTEM	19.944	LBS
NUMBER OF MID CLAMPS	32	
MID CLAMP WEIGHT	0.17	LBS
WEIGHT PER SYSTEM	5.44	LBS
NUMBER OF END CLAMPS	8	
END CLAMP WEIGHT	0.24	LBS
WEIGHT PER SYSTEM	1.92	LBS
NUMBER OF SPLICES	8	
WEIGHT PER SPLICE	0.52	LBS
WEIGHT PER SYSTEM	4.16	LBS
TOTAL ARRAY WEIGHT	920.464	LBS
POINT LOAD	25.568444	LBS/FT
TOTAL ARRAY AREA	354.6	SQ FT
ARRAY DEAD LOAD	2.5958	PSF

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**ROOF LAYOUT &
DETAIL DRAWINGS**

SHEET NUMBER

PV-2

Flashings/Mounts

Manufacturer	SnapRack
Mount Type	SpeedSeal
Fastener Type	Lag Screw
Fastener Material	18-8 Stainless Steel
Fastener Size	5/16" x 4"
L-Foot Material	Aluminum
Sealing Washer	EPDM Bonded SS
Sealing Washer Size	5/16" ID x 3/4" OD
Weight	0.554 Lbs.
Structural	IBC Compliant
UL Listing	UL 2703

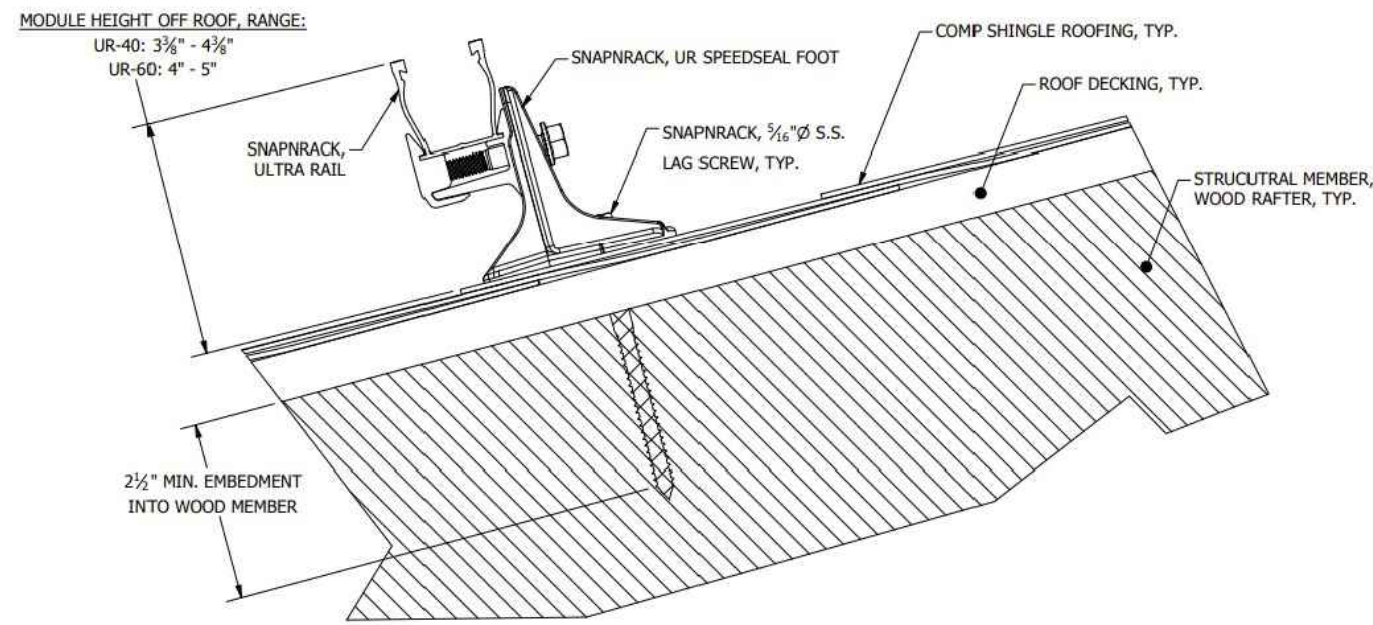
Racking

Manufacturer	SnapRack
Model Number	Ultra Rail 40
Length	172"
Width	1.54"
Height	1.89"
Weight	0.56 Lbs./Ft
Material	Aluminum
Structural	IBC Compliant
UL Listing	UL 2703

LEGEND

UTILITY METER	DC DISCONNECT	PV METER	RAILS
MAIN SERVICE PANEL	JUNCTION BOX	EXTERIOR CONDUIT	GROUNDING
INVERTER	SUBPANEL	GAS METER	RAIL SPLICE
AC DISCONNECT	LOAD CENTER	FLASHINGS	

SOLAR MOUNTING DETAIL



Ampacity Calculations

Wiring Location: Module to Power Optimizer (Direct Current)
 Wiring Location: Inverter to Service Entrance (Alternating Current)
 All calculations show minimum sizing for ampacity
 Actual wire sizing may be larger for voltage drop or other factors
 All calculations are according to the 2017 National Electric Code

Modules: REC TwinPeak REC365TP4
 Inverter: SolarEdge SE7600H-US

Initial Input Values

Isc (Short Circuit Current)	11.32				
Number of circuits	11.32	x	1	=	11.32
Maximum Circuit Current (NEC 690.8 (A)(1+2))	11.32	x	156%	=	17.6592
Minimum Overcurrent Device	25	A	Series Fuse Rating by Manufacturer		
	Size AWG #				
Chosen Conductor Type (THHN, RHW-2, or USE-2)	10				

Conductor Derating

NEC 690.31 © ref (NEC 310.16)					
Conductor 90°C Ampacity	40				
Conduit Fill Derating	1-3	40	x	1	= 40
Temperature Derating (°F)	141-149	40	x	0.65	= 26

Ampacity vs Overcurrent

Device					
Conductor Ampacity Check	26		17.6592		OK
Conductor to Overcurrent Check	26		25		OK

Input Data Into Yellow Fields
 Green Field must say OK

Use this calculation for over current protection and wire sizing for stringers coming from Solar Panels.
 Isc comes from manufacturer

Ampacity Calculations

Wiring Location: Inverter to Service Entrance (Alternating Current)
 All calculations show minimum sizing for ampacity
 Actual wire sizing may be larger for voltage drop or other factors
 All calculations are according to the 2017 National Electric Code

Modules: REC TwinPeak REC365TP4
 Inverter: SolarEdge SE7600H-US

Initial Input Values

Inverter Continuous AC Output Combined (Watts)	7600				
Minimum Operating Voltage	240				

	Watts		Volts	=	Amps
	7600	/	240	=	32
Inverter Continuous AC Amps	32				
Number of Inverters	32	x	1	=	32

Overcurrent Device Rating

NEC 690.8 (B)(3)	32	x	125%	=	40
Minimum Overcurrent Device	40	Amps			
Circuit Breaker Size per NEC 240.6(A)	40	Amps			

Size AWG #

Chosen Conductor Type	8				
THHN, THWN, RHW-2 or USE-2					

Conductor Derating

NEC 690.31© ref (NEC 310.16)					
Conductor 90°C Ampacity	55				
Conduit Fill Derating	1-3	55	x	1	= 55
Temperature Derating (°F)	105-113	55	x	0.87	= 47.85

Ampacity vs Overcurrent

Device					
Conductor Ampacity Check	47.85		40		OK
Conductor to Overcurrent Check	47.85		40		OK

Input Data into Yellow Fields
 Green Fields must say OK

Use this calculation for over current protection and wire sizing for inverter

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AMPACITY
 CALCULATIONS

SHEET NUMBER

PV-4

PV LABELS

- SIGNAGE REQUIREMENTS**
- > WARNING SIGNS OR LABELS SHALL COMPLY WITH NEC 110.21(B)
 - > MIN. 3/8" LETTER HEIGHT
 - > ALL CAPITAL LETTERS
 - > ARIAL OR SIMILAR FONT
 - > REFLECTIVE, WEATHER RESISTANT MATERIAL, UL 969

PHOTOVOLTAIC SYSTEM
⚠ DC DISCONNECT ⚠

RATED MMP CURRENT	AMPS
RATED MPP VOLTAGE	VOLTS
MAX SYSTEM VOLTAGE	VDC
MAX CIRCUIT CURRENT	AMPS

NEC 690.53 1

APPLY TO:
INVERTER

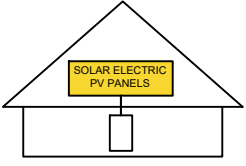
WARNING: PHOTOVOLTAIC POWER SOURCE

NEC 690.31(G)(3)(4) 2

APPLY TO:
SOLAR DC RACEWAYS
DC JUNCTION BOXES

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) 3

APPLY TO:
MAIN SERVICE DISCONNECT

⚠ WARNING

ELECTRIC SHOCK HAZARD

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

NEC 690.13(B) 4

APPLY TO:
DISCONNECTS
COMBINER BOXES

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

NEC 690.56(C)(3) 5

APPLY TO:
INVERTERS

PHOTOVOLTAIC SYSTEM
⚠ AC DISCONNECT ⚠

OPERATING VOLTAGE	VAC
OPERATING CURRENT	AMPS

NEC 690.54 6

APPLY TO:
AC DISCONNECT

⚠ 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) 7

APPLY TO:
SERVICE PANEL(S)

⚠ WARNING

THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT

NEC 690.31 (I) 8

APPLY TO:
INVERTER(S)

MAIN PV SYSTEM DISCONNECT

NEC 690.13 (B) 9

APPLY TO:
MAIN AC DISCONNECT

CONTRACTOR



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SHEET NAME
LABELING SCHEDULE

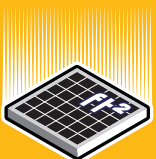
SHEET NUMBER
PV-5

REC TWINPEAK 4 BLACK SERIES

PREMIUM SOLAR PANELS WITH SUPERIOR PERFORMANCE

REC TwinPeak 4 Black Series solar panels feature an aesthetically-pleasing full-black design with high panel efficiency and power output, enabling customers to get the most out of the space used for the installation.

Combined with industry-leading product quality and the reliability of a strong and established European brand, REC TwinPeak 4 Black Series panels are ideal for residential and commercial rooftops worldwide.



**MORE POWER
OUTPUT PER FT²**



**FEATURING REC'S PIONEERING
TWIN DESIGN**



**100%
PID FREE**

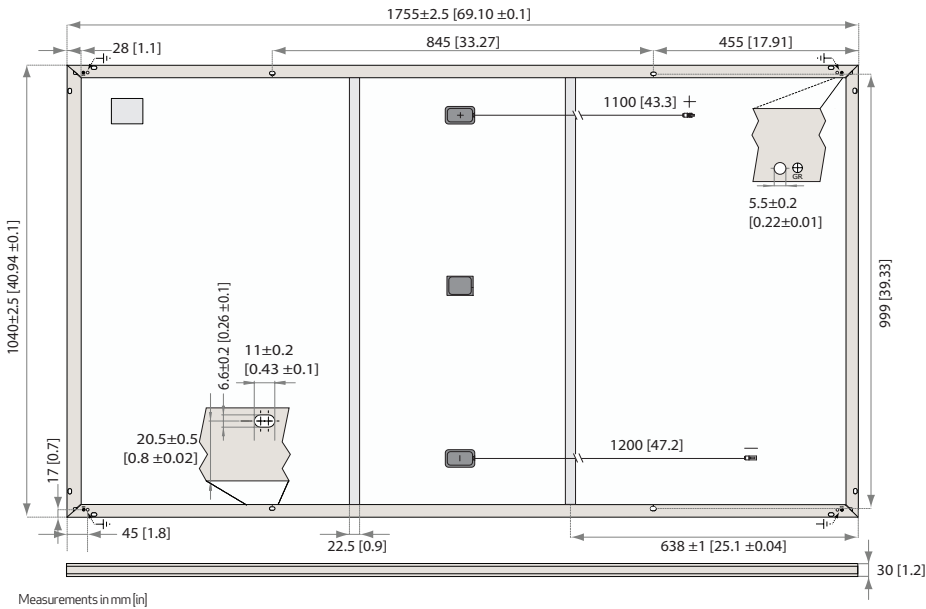


**SUPER-STRONG
FRAME**



ELIGIBLE

REC TWINPEAK 4 BLACK SERIES



GENERAL DATA

Cell type:	120 half-cut mono c-Si p-type cells 6 strings of 20 cells in series
Glass:	0.13" (3.2 mm) solar glass with anti-reflection surface treatment
Backsheet:	Highly resistant polymeric construction (black)
Frame:	Anodized aluminum (black)
Junction box:	3-part, 3 bypass diodes, IP68 rated in accordance with IEC 62790
Cable:	12 AWG (4 mm ²) PV wire, 43 + 47" (1.1 m + 1.2 m) in accordance with EN 50618
Connectors:	Stäubli MC4 PV-KBT4/KST4, 12 AWG (4 mm ²) in accordance with IEC 62852 IP68 only when connected
Origin:	Made in Singapore

MECHANICAL DATA

Dimensions:	69.1 x 40.94 x 1.2 in (1755 x 1040 x 30 mm)
Area:	19.70 sq ft (1.83 m ²)
Weight:	44.0 lbs (20.0 kg)

ELECTRICAL DATA @ STC

Product code*: RECxxxTP4 Black

Power Output - P _{MAX} (Wp)	355	360	365	370
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V _{MPP} (V)	33.5	33.9	34.3	34.7
Nominal Power Current - I _{MPP} (A)	10.60	10.62	10.65	10.68
Open Circuit Voltage - V _{OC} (V)	40.5	40.6	40.8	41.0
Short Circuit Current - I _{SC} (A)	11.19	11.26	11.32	11.38
Panel Efficiency (%)	19.4	19.7	20.0	20.3

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of P_{MAX}, V_{OC} & I_{SC} ±3% within one watt class. *Where xxx indicates the nominal power class (P_{MAX}) at STC above.

ELECTRICAL DATA @ NMOT

Product code*: RECxxxTP4 Black

Power Output - P _{MAX} (Wp)	269	272	276	280
Nominal Power Voltage - V _{MPP} (V)	31.4	31.7	32.1	32.5
Nominal Power Current - I _{MPP} (A)	8.56	8.58	8.60	8.63
Open Circuit Voltage - V _{OC} (V)	37.9	38.0	38.2	38.4
Short Circuit Current - I _{SC} (A)	9.04	9.10	9.15	9.19

Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s). *Where xxx indicates the nominal power class (P_{MAX}) at STC indicated above.

CERTIFICATIONS

IEC 61215:2016, IEC 61730:2016, UL 61730 (Pending)
ISO 14001:2004, ISO 9001:2015, OHSAS 18001:2007,
IEC 62941



WARRANTY

	Standard	REC ProTrust	
Installed by an REC Certified Solar Professional	No	Yes	Yes
System Size	Any	≤25 kW 25-500 kW	
Product Warranty (yrs)	20	25	25
Power Warranty (yrs)	25	25	25
Labor Warranty (yrs)	0	25	10
Power in Year 1	98%	98%	98%
Annual Degradation	0.5%	0.5%	0.5%
Power in Year 25	86%	86%	86%

See warranty documents for details. Conditions apply.

MAXIMUM RATINGS

Operational temperature:	-40 ... +185°F (-40 ... +85°C)
Maximum system voltage:	1000 V
Maximum test load (front):	+7000 Pa (146 psf)*
Maximum test load (rear):	-4000 Pa (83.5 psf)*
Max series fuse rating:	25 A
Max reverse current:	25 A

* See installation manual for mounting instructions.
Design load = Test load / 1.5 (safety factor)

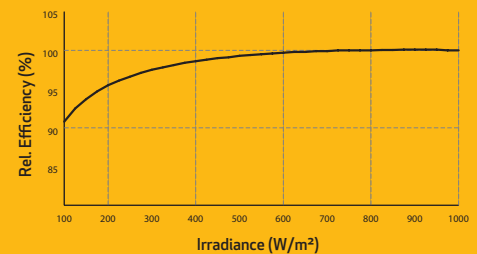
TEMPERATURE RATINGS*

Nominal Module Operating Temperature:	44.6°C (±2°C)
Temperature coefficient of P _{MAX} :	-0.34 %/°C
Temperature coefficient of V _{OC} :	-0.26 %/°C
Temperature coefficient of I _{SC} :	0.04 %/°C

*The temperature coefficients stated are linear values

TEMPERATURE RATINGS

Typical low irradiance performance of module at STC.



Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.



Specifications subject to change without notice.

Ref: PV-DS-07-29 Rev.-A 05.21

Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505

POWER OPTIMIZER



PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

/ Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P401 (for high power 60 and 72 cell modules)	P405 (for high-voltage modules)	P485 (for high-voltage modules)	P505 (for higher current modules)		
INPUT										
Rated Input DC Power ⁽¹⁾	320	350	370	400	405		485	505	W	
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	60	125 ⁽²⁾		83 ⁽²⁾	Vdc	
MPPT Operating Range	8 - 48		8 - 60	8 - 80	8-60	12.5 - 105		12.5 - 83	Vdc	
Maximum Short Circuit Current (Isc)	11	11.02	11	10.1	11.75	11		14	Adc	
Maximum DC Input Current	13.75			12.5	14.65	12.5		17.5	Adc	
Maximum Efficiency	99.5								%	
Weighted Efficiency	98.8							98.6	%	
Overtoltage Category	II									
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)										
Maximum Output Current	15								Adc	
Maximum Output Voltage	60				85				Vdc	
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)										
Safety Output Voltage per Power Optimizer	1 ± 0.1								Vdc	
STANDARD COMPLIANCE										
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3									
Safety	IEC62109-1 (class II safety), UL1741									
Material	UL94 V-0, UV Resistant									
RoHS	Yes									
INSTALLATION SPECIFICATIONS										
Maximum Allowed System Voltage	1000								Vdc	
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters									
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1			129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 153 x 29.5 / 5.1 x 6 x 1.16	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9		129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in	
Weight (including cables)	630 / 1.4			750 / 1.7	655 / 1.5	845 / 1.9		1064 / 2.3	gr / lb	
Input Connector	MC4 ⁽³⁾						Single or dual MC4 ⁽³⁾⁽⁴⁾	MC4 ⁽³⁾		
Input Wire Length	0.16 / 0.52				0.16 or 0.9 / 0.52 or 2.95 ⁽⁵⁾	0.16 / 0.52			m / ft	
Output Wire Type / Connector	Double Insulated / MC4									
Output Wire Length	0.9 / 2.95			1.2 / 3.9						m / ft
Operating Temperature Range ⁽⁶⁾	-40 to +85 / -40 to +185								°C / °F	
Protection Rating	IP68 / NEMA6P									
Relative Humidity	0 - 100								%	

(1) Rated power of the module at STC will not exceed the optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed

(2) NEC 2017 requires max input voltage be not more than 80V

(3) For other connector types please contact SolarEdge

(4) For dual version for parallel connection of two modules use P485-4NMDMRM. In the case of an odd number of PV modules in one string, installing one P485 dual version power optimizer connected to one PV module. When connecting a single module seal the unused input connectors with the supplied pair of seals

(5) Longer inputs wire length are available for use. For 0.9m input wire length order P401-xxxLxxx

(6) For ambient temperature above +85°C / +185°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

PV System Design Using a SolarEdge Inverter ⁽⁷⁾⁽⁸⁾	Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400, P401	8	10	18	
	P405, P485, P505	6	8	14	
Maximum String Length (Power Optimizers)		25	25	50 ⁽⁹⁾	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400-US)	5250	6000 ⁽¹⁰⁾	12750 ⁽¹¹⁾	W
Parallel Strings of Different Lengths or Orientations	Yes				

(7) For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf

(8) It is not allowed to mix P405/P485/P505 with P320/P340/P370/P400/P401 in one string

(9) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement

(10) For 208V grid: it is allowed to install up to 6,500W per string when the maximum power difference between each string is 1,000W

(11) For 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W

Energy Meter with Modbus Connection

for North America

SE-MTR240-NN-S-S1

METERING



Energy Meter for Residential Installations:

- Simple installations and connectivity
- Type NEMA 3R enclosure for outdoor protection
- Provides high accuracy meter readings
- Communicates over RS485 to provide monitoring data
- Suitable for export limitation, consumption monitoring and StorEdge™ applications

/ Energy Meter with Modbus Connection for North America

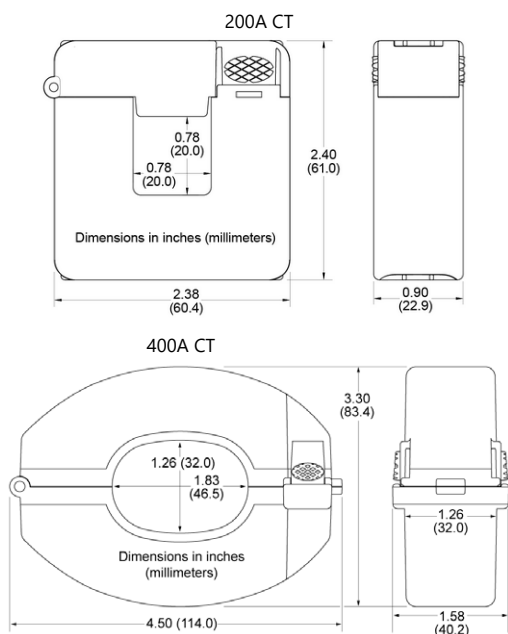
SE-MTR240-NN-S-S1

SUPPORTED INVERTERS	SINGLE PHASE INVERTERS		UNITS
ELECTRICAL SERVICE			
AC Input Voltage (Nominal)	240		Vac
AC Frequency (Nominal)	60		Hz
Max AC Input Current	100		mA
Connector Type	Terminal block - 22 to 12		AWG
Grids supported	L1 / L2 / N / PE L1 / L2 / PE		
Power Consumption (Nominal)	3		W
METER ACCURACY (@ 77°F / 25°C, PF:0.7- 1)			
1 - 100% of Rated Current CT	±1.0		%
CURRENT TRANSFORMERS⁽¹⁾			
Nominal Input (at CT Rated Current)	CT1, CT2: 0.333		Vac RMS
Rated RMS current ⁽²⁾	200	400	A
Dimensions (Internal / External)	0.8 x 0.8; 2.4 x 2.4 / 20 x 20; 61 x 61	1.26 x 1.83; 3.3 x 4.5 / 32 x 46.5; 83.4 x 114	in/mm
STANDARD COMPLIANCE			
Safety	UL 1741:2010 Ed.2(Supplement SA)+R: 07 Sep 2016		
Emissions	FCC 47 CFR Part 15 Subpart B		
ENVIRONMENTAL			
Operating Temperatures	-40 to +140 / -40 to +60		°F / °C
Relative Humidity (noncondensing)	5-90		%
Enclosure type	High impact, ABS and/or ABS/PC plastic UL 94V-0, IEC FV-0		
Protection Rating	NEMA Type 3R		
INSTALLATION SPECIFICATIONS			
Dimensions (HxWxD)	8.1 x 12.4 x 4.6 / 206.6 x 316 x 117.5		in / mm
Weight	3.9 / 1.8		lb / kg
Conduit Entry Diameters	0.75 or 1 / 19 or 25		in
Mounting Type	Bracket mount		

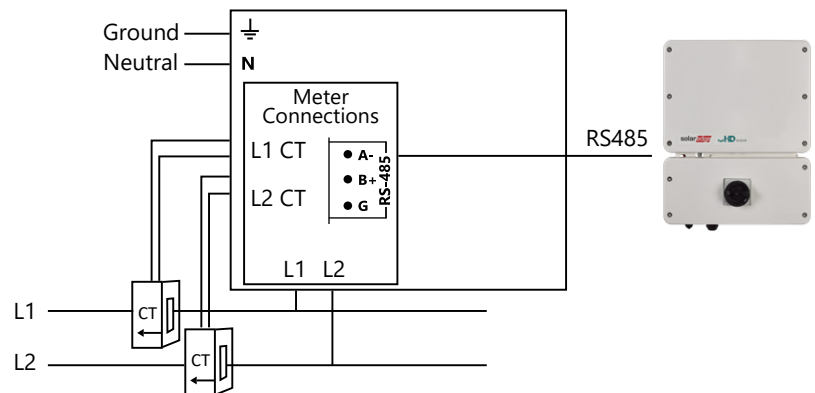
⁽¹⁾ Current Transformers should be ordered separately: SEACT0750-200NA-20 (200A) or SEACT1250-400NA-20 (400A), 20 per box

⁽²⁾ For other ratings contact SolarEdge

Current Transformer Dimensions



Connecting the Energy Meter



* Current Transformers (CTs) should be ordered separately: SEACT0750-200NA-20 (200A); SEACT1250-400NA-20 (400A). Each comes in boxes of 20.

Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US /
SE7600H-US / SE10000H-US / SE11400H-US



Optimized installation with HD-Wave technology

- / Specifically designed to work with power optimizers
- / Record-breaking efficiency
- / Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- / Fixed voltage inverter for longer strings
- / Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- / UL1741 SA certified, for CPUC Rule 21 grid compliance
- / Extremely small
- / Built-in module-level monitoring
- / Outdoor and indoor installation
- / Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

/ Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/
SE7600H-US / SE10000H-US / SE11400H-US

Model Number	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4							
OUTPUT								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5 ⁽¹⁾							Hz
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A
Power Factor	1, adjustable -0.85 to 0.85							
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
INPUT								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380				400			Vdc
Maximum Input Current @240V ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V ⁽²⁾	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600k Ω Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W

⁽¹⁾ For other regional settings please contact SolarEdge support

⁽²⁾ A higher current source may be used; the inverter will limit its input current to the values stated

/ Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/
SE7600H-US / SE10000H-US / SE11400H-US

Model Number	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Data, ANSI C12.20	Optional ⁽³⁾							
Inverter Commissioning	with the SetApp mobile application using built-in Wi-Fi Access Point for local connection							
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect							
STANDARD COMPLIANCE								
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07							
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)							
Emissions	FCC Part 15 Class B							
INSTALLATION SPECIFICATIONS								
AC Output Conduit Size / AWG Range	1" Maximum / 14-6 AWG			1" Maximum /14-4 AWG				
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1-2 strings / 14-6 AWG			1" Maximum / 1-3 strings / 14-6 AWG				
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174			21.3 x 14.6 x 7.3 / 540 x 370 x 185			in / mm	
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6			lb / kg	
Noise	< 25			<50			dBA	
Cooling	Natural Convection							
Operating Temperature Range	-40 to +140 / -40 to +60 ⁽⁴⁾							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							

⁽³⁾ Revenue grade inverter P/N: SExxxxH-US000BNC4

⁽⁴⁾ Full power up to at least 50°C / 122°F; for power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>

RSTC Enterprises, Inc.
2214 Heimstead Road
Eau Claire, WI 54703
715-830-9997



Outdoor Photovoltaic Enclosures

Composition/Cedar Roof System

ETL listed and labeled

Report # 3171411PRT-002 Revised May, 2018

- UL50 Type 3R, 11 Edition Electrical equipment enclosures
- CSA C22.2 No. 290 Nema Type 3R
- Conforms to UL 1741 Standard

0799 Series Includes:

- | | |
|----------|------------------|
| 0799 - 2 | Wire size 2/0-14 |
| 0799 - 5 | Wire size 14-6 |
| 0799 - D | Wire size 14-8 |

Models available in Grey, Black or Stainless Steel

Basic Specifications

Material options:

- Powder coated, 18 gauge galvanized 90 steel (1,100 hours salt spray)
- Stainless steel

Process - Seamless draw (stamped)

Flashing - 15.25" x 17.25"

Height - 3"

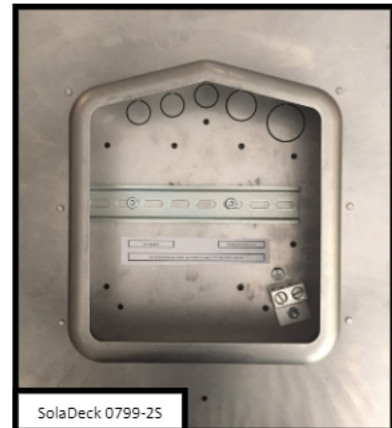
Cavity - 255 Cubic inches

Base Plate:

- Fastened to base using toggle fastening system
- 5 roof deck knockouts
- Knockout sizes: (3) .5", (1) .75" and (1) 1"
- 8", 35mm slotted din rail
- Ground Block

Passthrough and combiner kits are available for either AC or DC applications.

0799 Series



Eaton general duty cartridge fuse safety switch

DG222NRB

UPC:782113144221

Dimensions:

- **Height:** 14.37 IN
- **Length:** 7.35 IN
- **Width:** 8.4 IN

Weight:10 LB

Notes:Maximum hp ratings apply only when dual element fuses are used. 3-Phase hp rating shown is a grounded B phase rating, UL listed.

Warranties:

- Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

Specifications:

- **Type:** General duty, cartridge fused
- **Amperage Rating:** 60A
- **Enclosure:** NEMA 3R
- **Enclosure Material:** Painted galvanized steel
- **Fuse Class Provision:** Class H fuses
- **Fuse Configuration:** Fusible with neutral
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Three-wire
- **Product Category:** General duty safety switch
- **Voltage Rating:** 240V

Supporting documents:

- [Eatons Volume 2-Commercial Distribution](#)
- [Eaton Specification Sheet - DG222NRB](#)

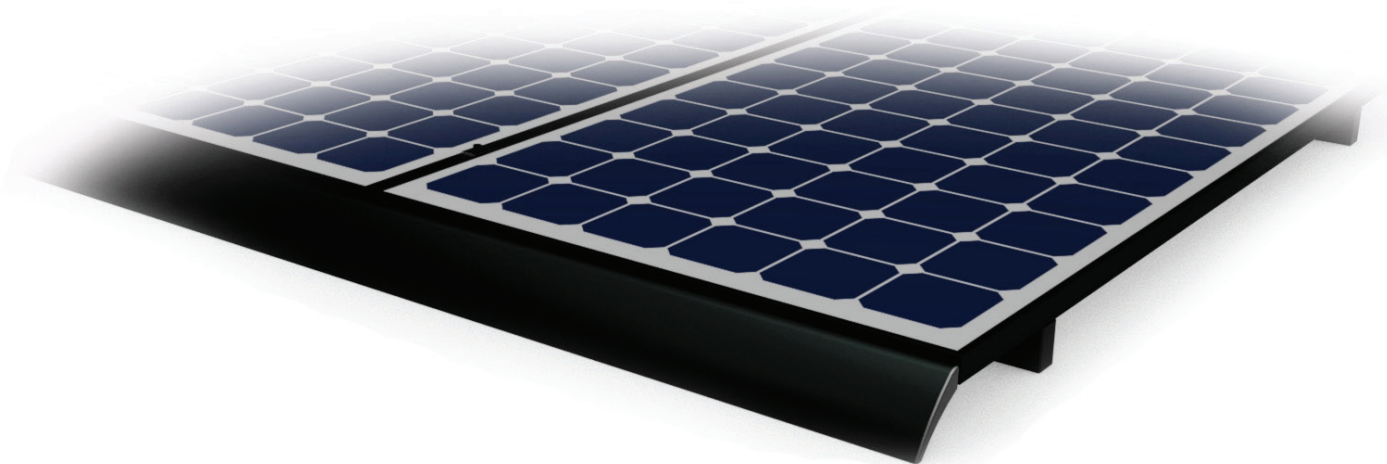
Certifications:

- UL Listed

Product compliance: No Data



Array Skirt



**Sleek Look. Attractive Design.
Easily Mounted.**



Skirt mounts attach to any standard module using single bolt with 1/2" socket



Splice provides snap-in attachment of skirt sections together



Skirt easily snaps onto mount providing a clean finished look



Can be installed at any time allowing easy retrofit of existing systems

Start Installing the Array Skirt Today

RESOURCES

snapnrack.com/resources

DESIGN

snapnrack.com/configurator

WHERE TO BUY

snapnrack.com/where-to-buy

The SnapNrack Array Skirt

is an enhanced aesthetic option with a sleek black finish providing a flush clean line homeowners love. When installed the Array Skirt provides a clean finish to the front of arrays covering any screws, bolts, wires, or mounting hardware. It mounts directly to standard module frames allowing it to attach to almost any array.

Skirt Mounts

- Hook onto the inside of module frame
- Secured in place with ½” fastener from front of module preventing any need for reaching under array

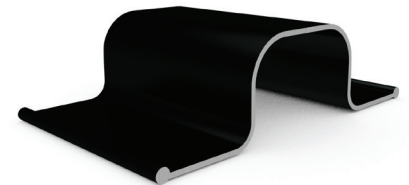


Skirt

- Snaps into place on the mount easily with no tools required
- Smooth curved profile provides an elegant finished look

Splice

- Attaching separate sections of skirt is easy with the snap-in splice
- Provides a seamless transition between skirt sections



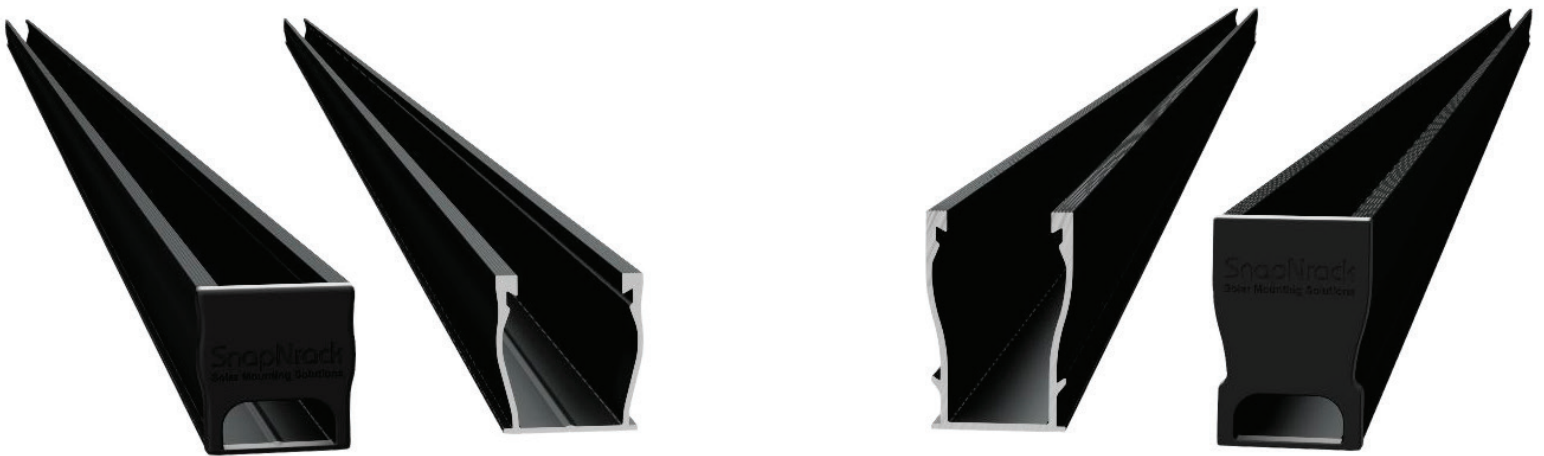
End Caps

- Cover end sections of skirt so no cuts are visible
- Easily snap end caps onto the ends of any skirt section

Quality. Innovative. Superior.

SnapNrack Solar Mounting Solutions are engineered to optimize material use and labor resources and improve overall installation quality and safety.

Ultra Rail



The Ultimate Value in Rooftop Solar



Industry leading Wire Management Solutions



Mounts available for all roof types



Single Tool Installation



All SnapNrack Module Clamps & Accessories are compatible with both rail profiles

Start Installing Ultra Rail Today

RESOURCES
DESIGN
WHERE TO BUY

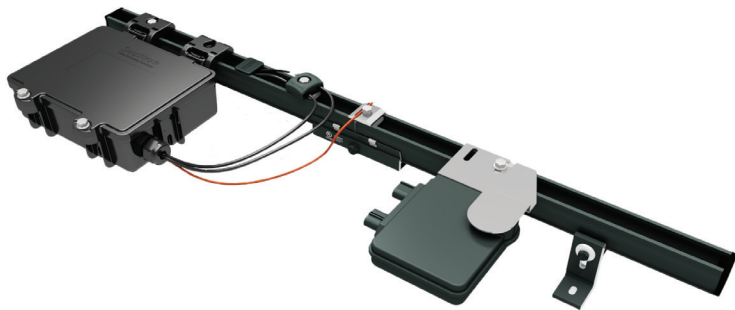
snapnrack.com/resources
snapnrack.com/configurator
snapnrack.com/where-to-buy

SnapNrack Ultra Rail System

A sleek, straightforward rail solution for mounting solar modules on all roof types. Ultra Rail features two rail profiles; UR-40 is a lightweight rail profile that is suitable for most geographic regions and maintains all the great features of SnapNrack rail, while UR-60 is a heavier duty rail profile that provides a larger rail channel and increased span capabilities. Both are compatible with all existing mounts, module clamps, and accessories for ease of install.

The Entire System is a Snap to Install

- New Ultra Rail Mounts include snap-in brackets for attaching rail
- Compatible with all the SnapNrack Mid Clamps and End Clamps customers love
- Universal End Clamps and snap-in End Caps provide a clean look to the array edge



Unparalleled Wire Management

- Open rail channel provides room for running wires resulting in a long-lasting quality install
- Industry best wire management offering includes Junction Boxes, Universal Wire Clamps, MLPE Attachment Kits, and Conduit Clamps
- System is fully bonded and listed to UL 2703 Standard

Heavy Duty UR-60 Rail

- UR-60 rail profile provides increased span capabilities for high wind speeds and snow loads
- Taller, stronger rail profile includes profile-specific rail splice and end cap
- All existing mounts, module clamps, and accessories are retained for the same great install experience



Quality. Innovative. Superior.

SnapNrack Solar Mounting Solutions are engineered to optimize material use and labor resources and improve overall installation quality and safety.

877-732-2860

www.snapnrack.com

contact@snapnrack.com

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SnapRack SpeedSeal™ Foot

Patent Pending Lag Driven Sealant Solution for Ultra Rail



A New Generation of Roof Attachments

- Innovative design incorporates flashing reliability into a single roof attachment
- 100% waterproof solution
- Sealing cavity with compressible barrier secures sealant in place & fills voids

Maintain the Integrity of the Roof by Eliminating Disruption

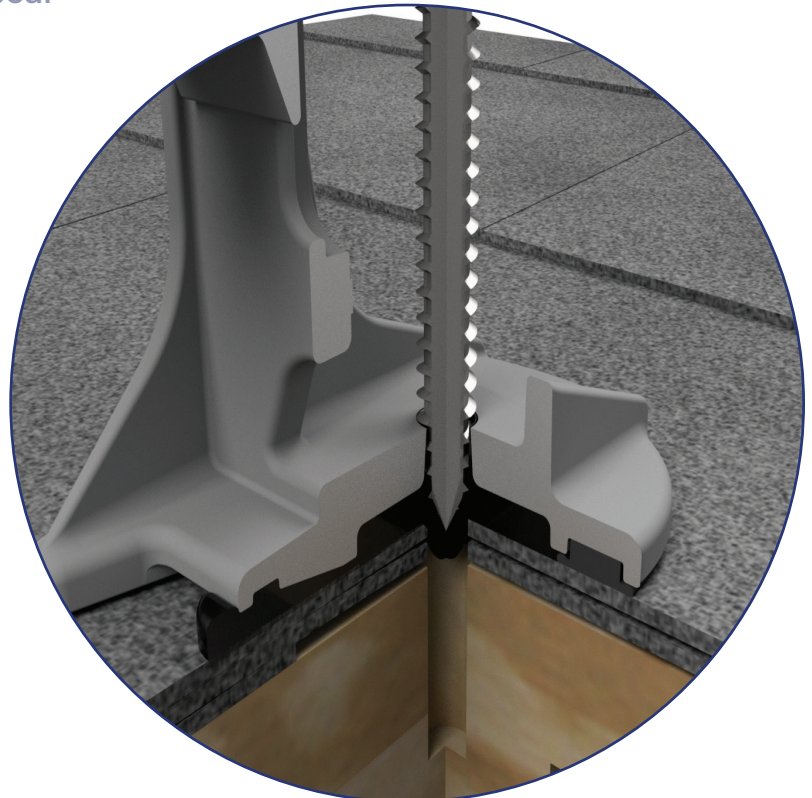
- Zero prying of shingles
- Zero removal of nails leaving holes in the roof
- Roof remains installed the way manufacturer meant it to be

Lag Driven Sealant Waterproofing

- Time Tested Roof Sealant provides lasting seal
- Sealant is compressed into cavity and lag hole as attachment is secured to rafter
- Active sealant solidifies bond if ever touched by liquid
- Technology passes UL 2582 Wind Driven Rain Test and ASTM E2140 Water Column Testing standards. Patent Pending.

Single Tool Installation

- SnapRack was the first in the industry to develop a complete system that only requires a single tool. That tradition is continued as a ½" socket is still the only tool necessary to secure the mount as well as all other parts of the system.



Note: Sealant shown in white for illustration purposes only.

SnapNrack SpeedSeal™ Foot

Fastest Roof Attachment in Solar

- Lag straight to a structural member, no in-between components such as flashings or bases.
- Simply locate rafter, fill sealant cavity & secure to roof.
It's that simple!

Integrated Flashings. No Questions.

- Sealant fills around lag screw keeping roof and structure sealed and intact
- No added holes from ripping up nails, staples and screws holding shingles on roof

Less Time. Less Parts. Less Tools.

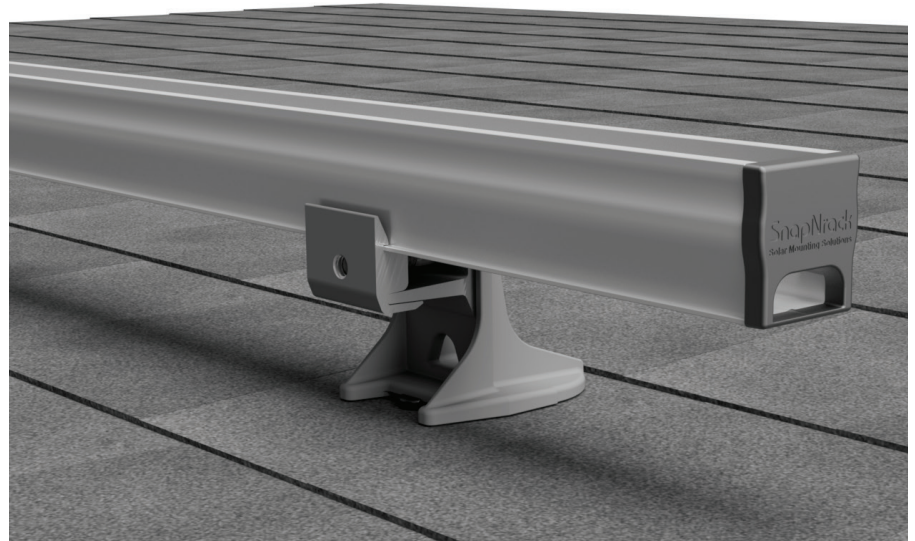
- No more need for a pry bar to rip up shingles
- No more proprietary lag screws
- Single Tool installation with ½" socket

Total System Solution One Tool. One Warranty.

- SnapNrack Ultra Rail is a straightforward intuitive install experience on the roof without compromising quality, aesthetics & safety, all supported by a 25 year warranty.
- Built-in Wire Management & Aesthetically pleasing features designed for Ultra Rail result in a long-lasting quality install that installers and homeowners love.

Certifications

SnapNrack Ultra Rail System has been evaluated by Underwriters Laboratories (UL) and Listed to UL/ANSI Standard 2703 for Mechanical Loading and Fire. Additionally it is listed to UL 2582 for wind-driven rain and ASTM 2140.



OVERVIEW OF THE SNAPNRACK ULTRA RAIL SYSTEM INSTALLED ON A TYPICAL ROOF

REFER TO SPECIFIC "ATTACHMENT DETAIL" FOR DETAILS ON ATTACHING AND WATERPROOFING THE VARIOUS SNAPNRACK ROOF ATTACHMENT PRODUCTS

REFER TO SPECIFIC "COMPONENT DETAIL" FOR DETAILS ON VARIOUS SNAPNRACK ACCESSARY AND COMPONENT PRODUCTS

BOTH THE SNAPNRACK, UNIVERSAL END CLAMP AND SNAPNRACK, ULTRA RAIL END CLAMP CAN BE USED ON END MODULES

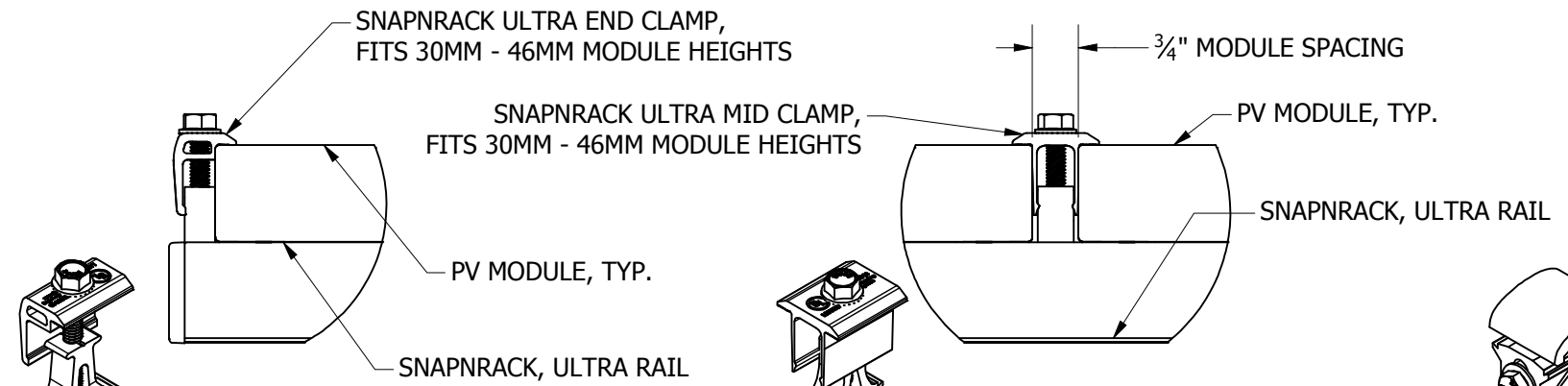
MODULES MAY BE CLAMPED ON SHORT OR LONG SIDE PER MODULE MANUFACTURER REQUIREMENTS

RAILS MAY BE MOUNTED UP/DOWN OR ACROSS THE SLOPE OF THE ROOF

REFER TO SNAPNRACK INSTALLATION MANUAL FOR $\frac{5}{16}$ "Ø HARDWARE TORQUE SPECIFICATIONS

BIN: ALL

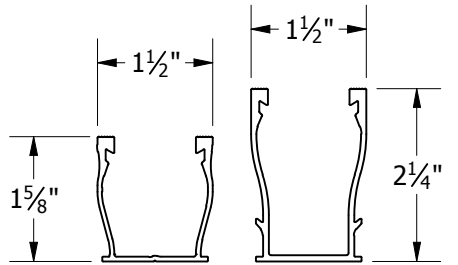
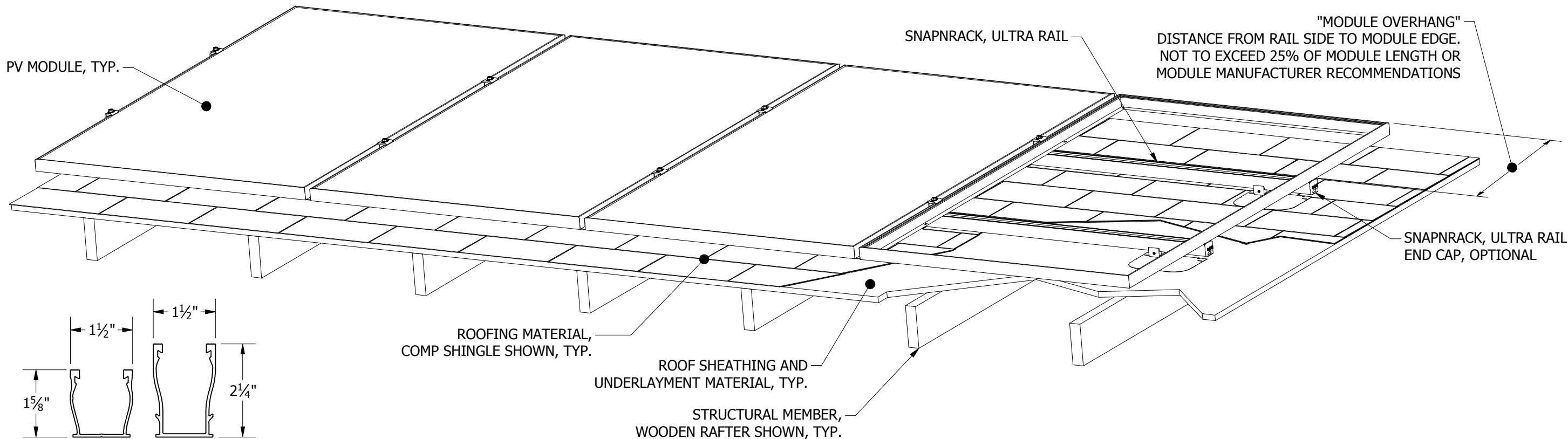
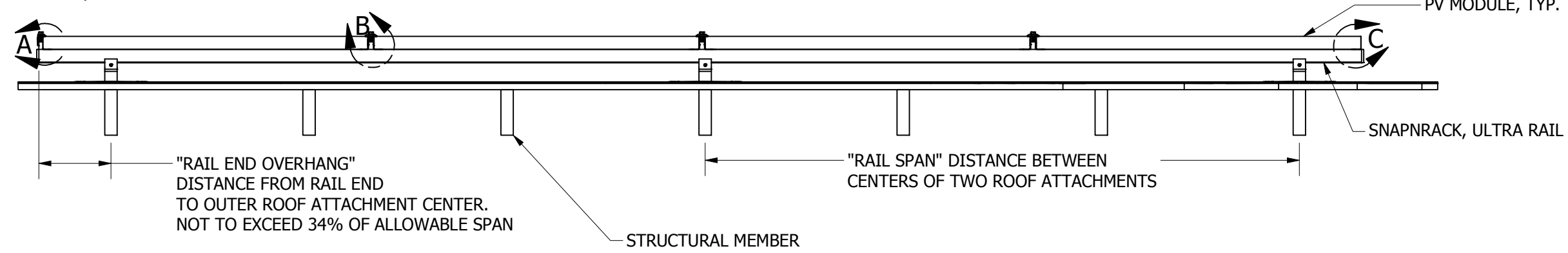
REVISION:			
1	5/7/2019	NEW DETAIL	MJA
2	1/3/2020	ULTRA CLAMPS	MJA



DETAIL A: SNAPNRACK, ULTRA RAIL END CLAMP

DETAIL B: SNAPNRACK, ULTRA RAIL MID CLAMP

DETAIL C: SNAPNRACK, UNIVERSAL END CLAMP



Sunrun South LLC
595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902

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DESIGNER: M.AFFENTRANGER
DRAFTER: M.AFFENTRANGER
APPROVED BY: B.PETERSON

SCALE: DNS
DATE: 1/3/2020

DRAWING NUMBER: SNR-DC-00329

DESCRIPTION: ULTRA RAIL, SYSTEM OVERVIEW, TYPICAL

REV 2

SNAPNRACK UR SPEEDSEAL FOOT FOR COMPOSTION ROOF MOUNTING

MODULE HEIGHT OFF ROOF, RANGE:

UR-40: 3³/₈" - 4³/₈"

UR-60: 4" - 5"

REFER TO SNAPNRACK ENGINEERING CHARTS FOR APPLICABLE RAIL SPANS.

5/16"Ø S.S. LAG SCREW MUST EMBED A MIN. OF 2 1/2" INTO STRUCTURAL MEMBER

REFER TO SNAPNRACK INSTALLATION MANUAL FOR 5/16"Ø HARDWARE TORQUE SPECIFICATIONS

STRUCTURAL MEMBER SPECIFICATIONS:
 MINIMUM WOOD GRADE = SPF #2
 MINIMUM SPECIFIC GRAVITY = 0.42

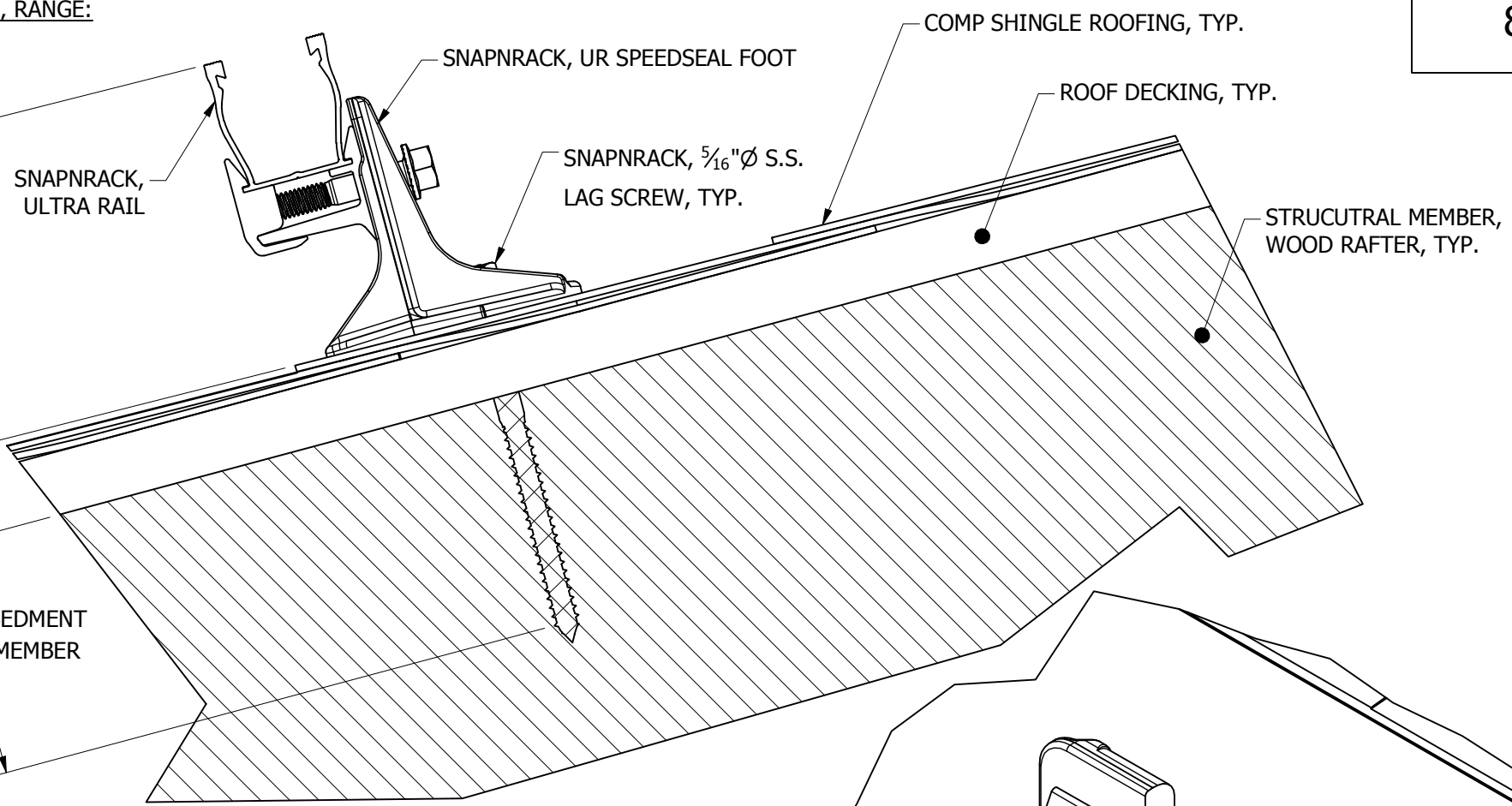
ALLOWABLE FASTENER UPLIFT = 820 LBS
 ALLOWABLE FASTENER LATERAL = 250 LBS

MINIMUM FASTENER EDGE DISTANCE = 0.5"
 MINIMUM FASTENER END DISTANCE = 2.2"

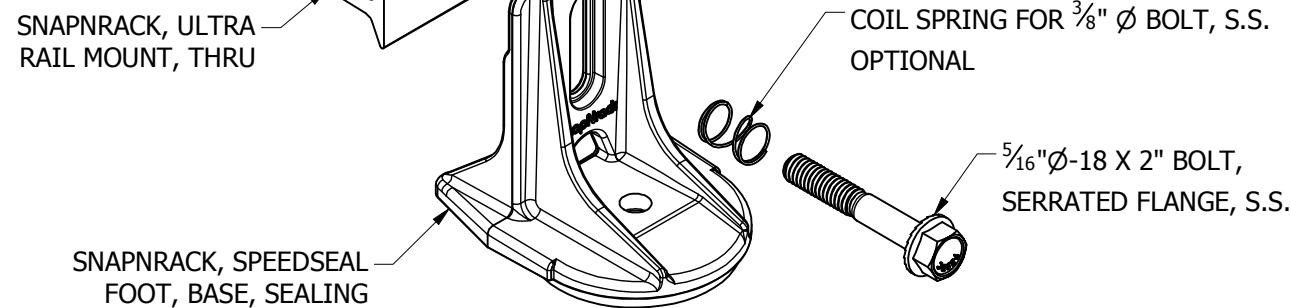
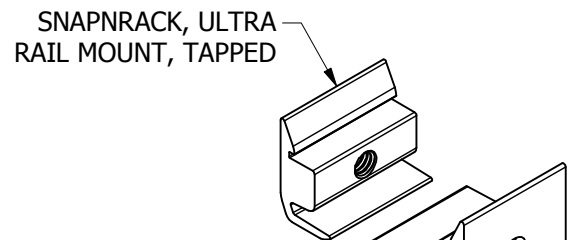
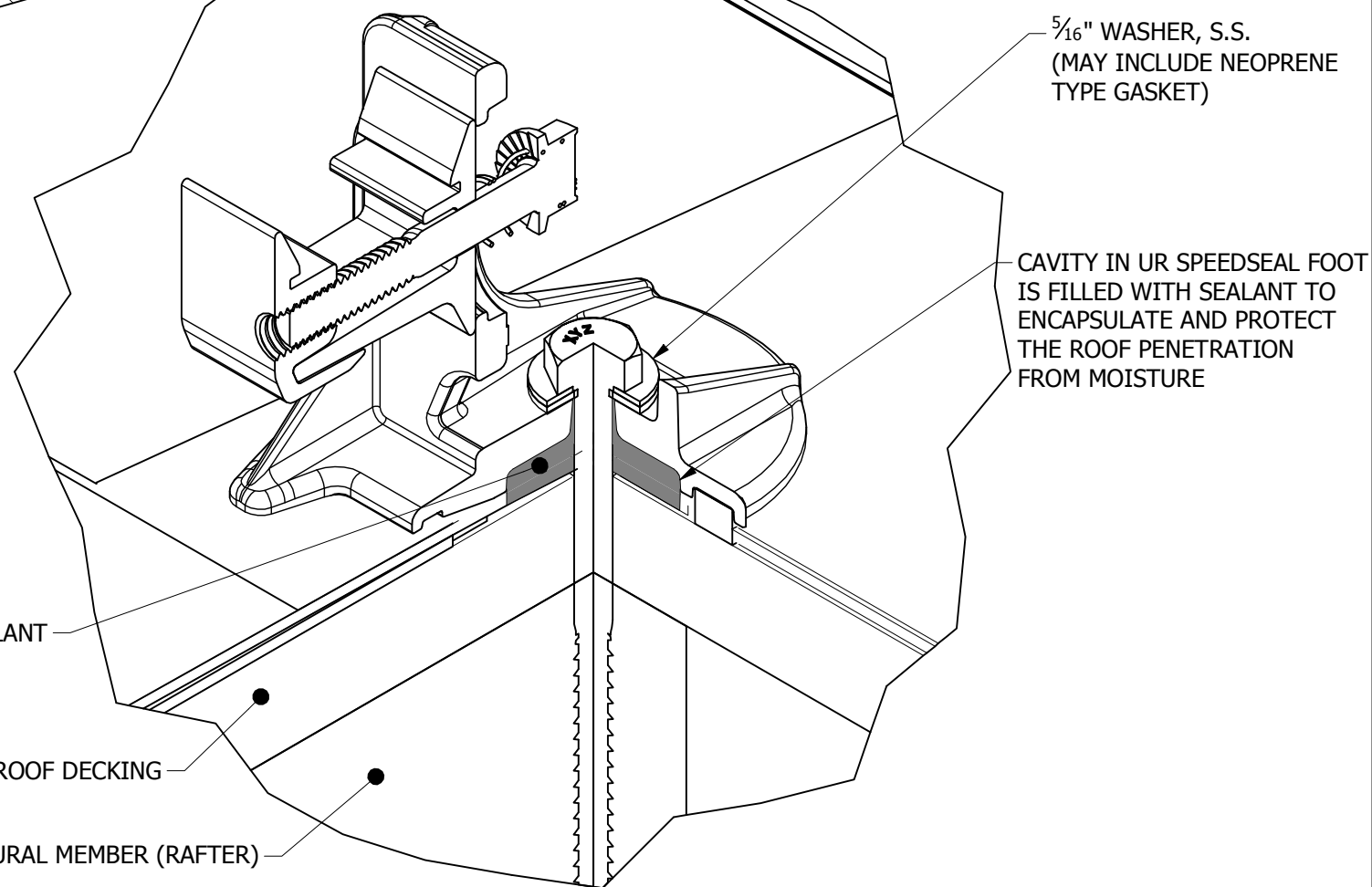
2 1/2" MIN. EMBEDMENT INTO WOOD MEMBER

BIN: **8**

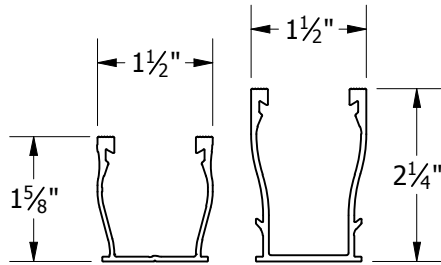
REVISION:			
1	3/10/2020	NEW DETAIL	MJA
2	6/5/2020	DIE CAST	BDP
3	7/22/2020	NAME UPDATE	MJA
4	10/2/2020	MIAMI-DADE	MJA



PENETRATION DETAIL



EXPLODED



UR-40 RAIL | UR-60 RAIL
 FOR USE WITH SNAPNRACK ULTRA SERIES RAILS



Sunrun South LLC
 595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
 PHONE (415) 580-6900 • FAX (415) 580-6902
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DESIGNER: M.AFFENTRANGER
 DRAFTER: M.AFFENTRANGER
 APPROVED BY: B.PETERSON

SCALE: DNS
 DATE: 10/2/2020

DRAWING NUMBER: SNR-DC-00438

DESCRIPTION: ULTRA RAIL, ATTACHMENT DETAIL, UR SPEEDSEAL FOOT TO RAFTER

REV: **4**