

ULTIMATE WIND SPEED	175	mph
NOMINAL WIND SPEED	118	mph
RISK CATEGORY	II	
EXPOSURE CATEGORY	B	
ROOF SLOPE (°)	20	
ROOF TYPE	GABLED	
PRESSURE ZONE:	1&2	
MEAN ROOF HEIGHT:	12.25	
PERIMETER WIDTH:	4.90	
K _D	0.85	
K _{ZT}	1.00	
K _H	0.575	
VELOCITY PRESSURE (q) = 0.60*0.00256* K _H K _{ZT} K _D V ²		
VELOCITY PRESSURE (ASD)	10.45	
EXTERNAL PRESSURE COEFFICIENT Z1	0.7	-2.0
EXTERNAL PRESSURE COEFFICIENT Z2e	0.7	-2.0
EXTERNAL PRESSURE COEFFICIENT Z2n	0.7	-3.0
EXTERNAL PRESSURE COEFFICIENT Z2r	0.7	-3.0
EXTERNAL PRESSURE COEFFICIENT Z3e	0.7	-3.0
EXTERNAL PRESSURE COEFFICIENT Z3r	0.7	-3.6
INTERNAL PRESSURE COEFFICIENT	0.18	

ZONES	PRESSURES (PSF)	MAX. SPAN (FT)	MAX. CANTILEVER (IN)
1	-22.78	6'	24"
2e	-22.78	6'	24"
2n	-33.22	6'	24"
2r	-33.22	6'	24"
3e	-33.22	4'	16"
3r	-39.49	4'	16"

TOTAL ROOF AREA	2,960.1 sq.-ft
TOTAL MODULES:	32
TOTAL PHOTOVOLTAIC AREA:	585.74 sq.-ft
WIND LOAD (PSF):	33.49
TOTAL WIND LOAD (LBS):	19,616.43
TOTAL ROOF MOUNTS:	194
TENSION FORCE PER MOUNT (LBS):	101.11

LEGEND & SYMBOLS

OBS ROOF OBSTRUCTIONS
XX.X ARRAY #
MODULE #
STRING #

PV MODULES

TRUSSES OR RAFTERS

ROOF MOUNTS & RAIL

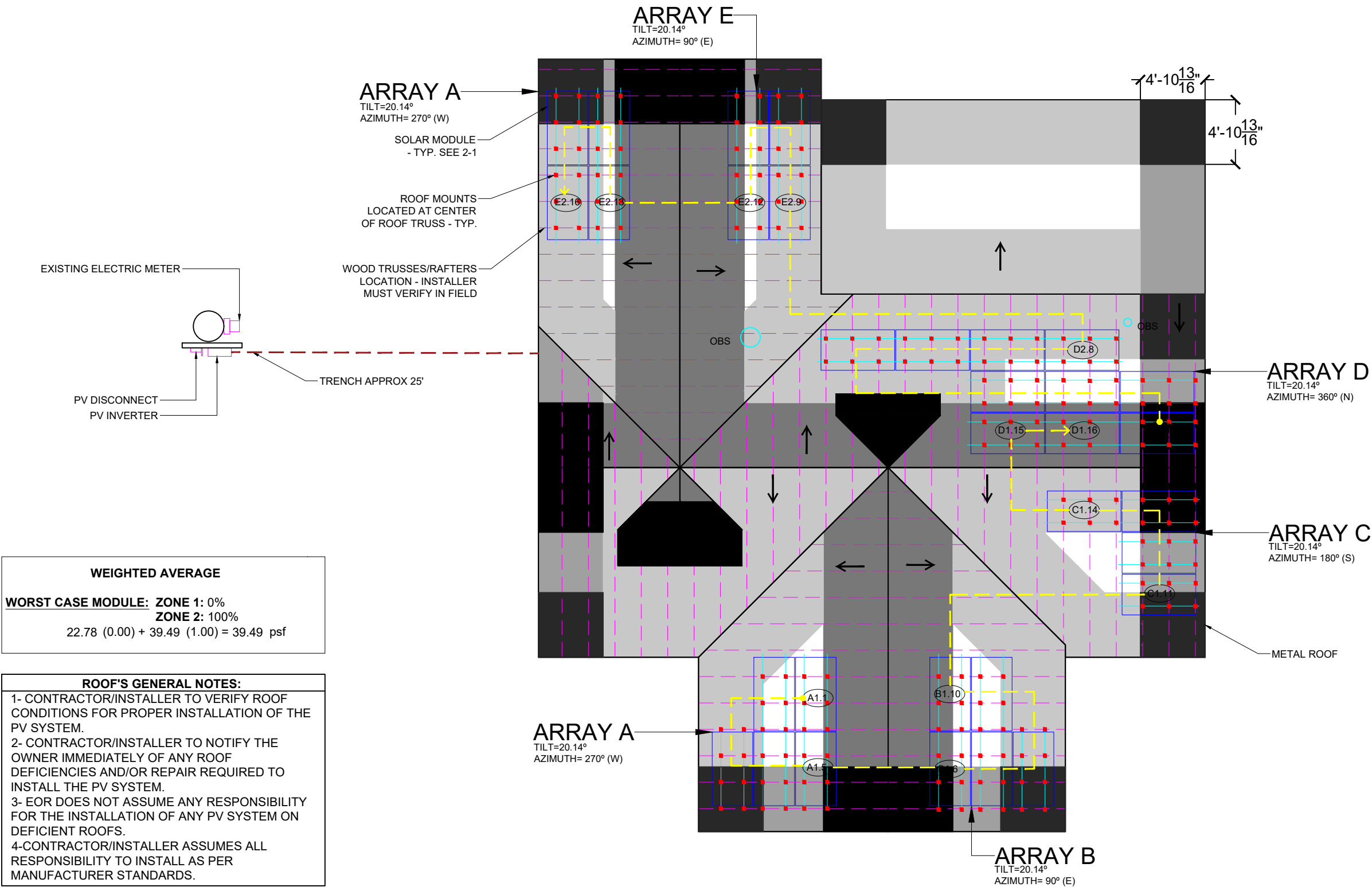
ROOF SLOPE

UL 1703 CERTIFIED
PORTRAIT MAX. SURFACE LOAD: 83.54 psf
LANDSCAPE MAX. SURFACE LOAD: 50.13 psf
APPLIED WIND LOAD : 33.49 psf

NOTES:
-INSTALL MID CLAMPS BETWEEN MODULES AND ENDS CLAMPS AT THE END OF EACH ROW OF MODULES.
-ALUMINUM RAILS SHOULD ALWAYS BE SUPPORTED BY MORE THAN ONE FOOTING ON BOTH SIDES OF THE SPLICE.

SIL-TITAN 340 NL (60 CELL) 66.9" 39.4"

2 SOLAR MODULE N.T.S.



1 STRUCTURAL ROOF PLAN & PV MODULES LAYOUT N.T.S.

DOCUMENT CONTROL				DATE		CAD	QC	ENGINEER CONTACT INFORMATION				ENGINEERING STAMP		CONTRACTOR CONTACT INFORMATION		CONTRACTOR LOGO		CUSTOMER:		SHEET NAME:	
ISSUED FOR PERMIT				01-28-21		JG	AF	ENGIPARTNERS LLC				Digitally signed by Rafael A Gonzalez Soto		TITAN SOLAR POWER FL		TITAN SOLAR POWER		JONATHAN MOSER		STRUCTURAL PLAN	
REV DESCRIPTION				DATE		CAD	QC	C.A. 32661 255 GIRALDA AVE CORAL GABLES, FL 33134				Date: 2021.01.31		12221 N US HIGHWAY 301		249 SE SECLUSION GLEN LAKE CITY, FL 32025		PROJECT ADDRESS:		PROJECT ID:	
								DESIGN@ENGIPARTNERS.COM				Date: 19:25:27 -05'00'		THONOTASASSA, FL 33592		10-4S-17-08305-003		PARCEL NUMBER:		TSP64089	
								833 - 888 - 3644						#EC13008093						ENGINEER OF RECORD:	
																				ENG. RAFAEL A. GONZALEZ SOTO, PE	
																				DATE:	
																				01-28-2021	
																				SHEET TITLE:	
																				S-1	
																				SHEETS:	
																				5 OF 9	

CrossRail 48-XL

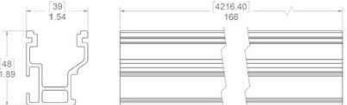


Mechanical Properties

CrossRail 48-XL	
Material	6000 Series Aluminum
Ultimate Tensile Strength	37.7 ksi (260 MPa)
Yield Strength	34.8 ksi (240 MPa)
Weight	0.76 lb/ft (1.13 kg/m)
Finish	Mill or Dark Anodized

Section Properties

CrossRail 48-XL	
Sx	0.2420 in ³ (3.966 cm ³)
Sy	0.2140 in ³ (3.507 cm ³)
A (X-Section)	0.6520 in ² (4.206 cm ²)



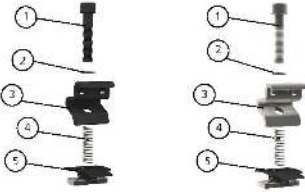
Dimensions in [mm] Inches

Notes:

- Structural values and span charts determined in accordance with Aluminum Design Manual I and ASCE 7-16
- UL703 Listed System for fire and bonding

www.everest-solar.com

CrossRail End Clamp



Item No.	Description	Part No.
1	Allen Bolt	400009 CR MC Silver, 30-50mm, Shaded BL, 30-42mm
2	Lock Washer	400003 CR MC Dark, 30-42mm, Shaded BL, 30-42mm
3	End Clamp	
4	Clamp Spring	
5	NK3 Slot Nut	

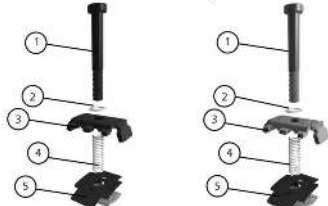
Technical data

Scope of application	Used with all of our CrossRail based systems
Fastening type / roof fixture	Clamp
Module orientation	Vertical or horizontal
Material	Stainless steel
Compatible module frame size	30-50mm
Warranty	25 years

www.everest-solar.com

End Clamp Technical Sheet 0032-1119- Subject to change. Product illustrations are exemplary and may differ from the original.

CrossRail Mid Clamp



Item No.	Description	Part No.
1	Allen Bolt	400009 CR MC Silver, 30-47mm, Shaded BL, 30-42mm
2	Lock Washer	400003 CR MC Dark, 30-42mm, Shaded BL, 30-42mm
3	Mid Clamp	
4	Clamp Spring	
5	NK3 Slot Nut	

Technical data

Scope of application	Used with all of our CrossRail based systems
Fastening type / roof fixture	Clamp
Module orientation	Vertical or horizontal
Material	Stainless steel
Compatible module frame size	30-47mm
Warranty	25 years

www.everest-solar.com

Mid Clamp Technical Sheet 0032-1119- Subject to change. Product illustrations are exemplary and may differ from the original.

S-5!®
The Right Way!

ProteaBracket™

The right way to attach almost anything to metal roofs!

ProteaBracket™ is the most versatile mounting system for solar panels and other equipment on metal roofs. It features a unique design that allows it to be installed on a wide variety of metal roof profiles, including standing seam, corrugated, and built-up roofs. The system is made of high-strength aluminum and is designed to last for 25 years or more. It is also easy to install and maintain, making it a great choice for both residential and commercial applications.

S-5!® ProteaBracket™ is a versatile bracket that adjusts easily to most trapezoidal roof profiles.

ProteaBracket™

S-5!®
The Right Way!

Installation Instructions

S-5!® Warning: Please read these instructions carefully before attempting to install the ProteaBracket™ system. Failure to follow these instructions may result in injury or property damage. The ProteaBracket™ system is designed to be installed on metal roofs. It is not intended for use on other types of roofs. The system is made of high-strength aluminum and is designed to last for 25 years or more. It is also easy to install and maintain, making it a great choice for both residential and commercial applications.

Tools Needed

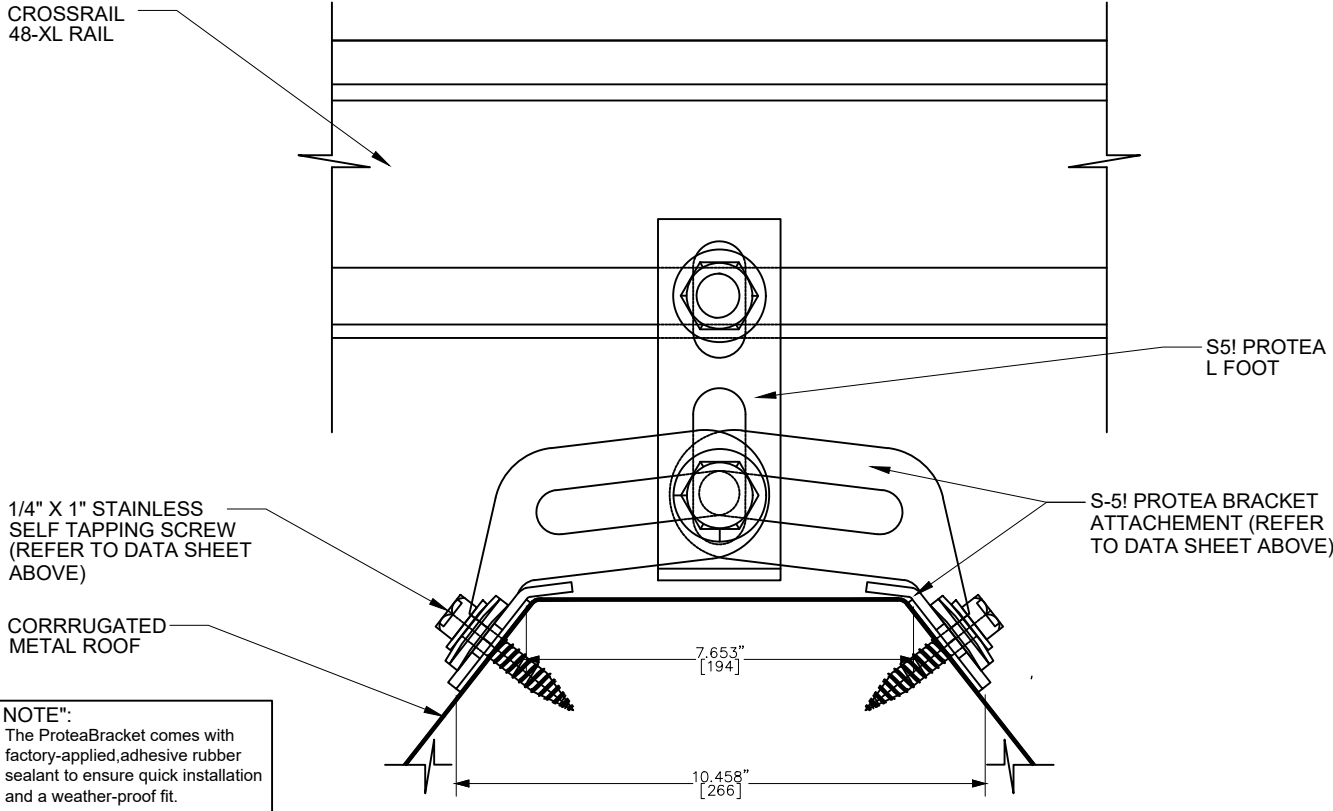
- Screwdriver
- Wrench
- Level
- String Line
- Drill
- 1/4" x 1" Screws
- 1/4" x 1" Nuts
- 1/4" x 1" Washers
- 1/4" x 1" Spacers

Use Proper Hardware

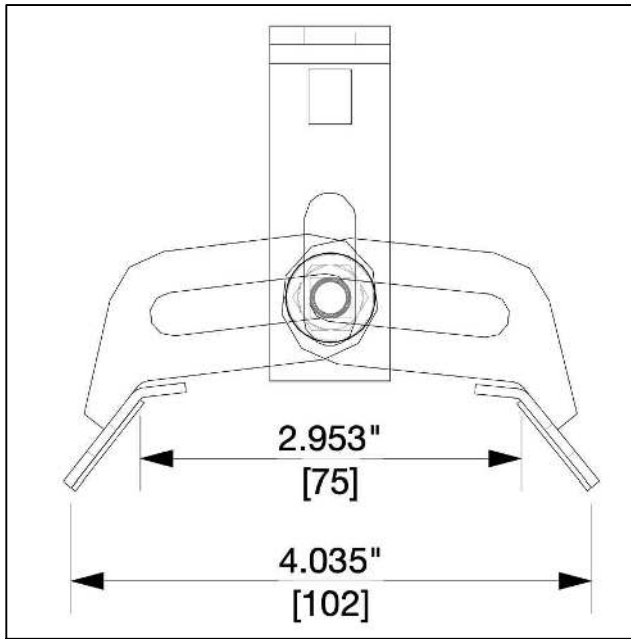
ProteaBracket™ is designed to be used with the following hardware: 1/4" x 1" Screws, 1/4" x 1" Nuts, 1/4" x 1" Washers, 1/4" x 1" Spacers. Please use the correct hardware to ensure proper installation and performance.

To Install ProteaBracket™

- Locate the center of the roof panel. The ProteaBracket™ should be installed in the center of the panel, perpendicular to the roof ridge.
- Mark the location of the ProteaBracket™ on the roof panel. Use a level to ensure the bracket is installed straight.
- Drill a hole through the roof panel at the marked location. Use a drill bit that is the same size as the hole in the ProteaBracket™.
- Insert the ProteaBracket™ into the hole. Push it down until it is flush with the roof panel.
- Secure the ProteaBracket™ with the 1/4" x 1" screws and nuts. Tighten the screws and nuts until they are snug, but do not over-tighten.



EVEREST CROSSRAIL 48-XL		FLUSH MOUNT SYSTEM SPAN TABLE (inches) 60 CELLS PORTRAIT OR LANDSCAPE EXPOSURE B		
ROOF SLOPE (degs.)	WIND SPEED (mph)	GROUND SNOW: 0 psf		
		ZONE 1 (inches)	ZONE 2 (inches)	ZONE 3 (inches)
7°-27°	110	96	89	77
	115	96	86	74
	120	96	84	70
	130	94	80	65
	140	91	73	60
	150	87	68	56
	160	93	64	53
	170	80	60	49
	180	75	57	48



S-5 BRACKET PULL OUT CALCULATIONS

(4) Self Tapping (1/4" D. x 1" L.) Screws per Bracket

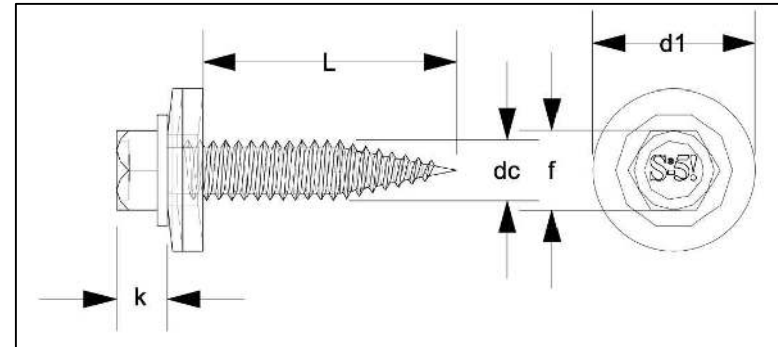
Allowable Pull Out Strength Per Bracket	633 lbs.
Max. Pull Out Strength Required per Bracket	101.11
Lag Bolt Pull Out Strength Safety Factor	6.26

DISTRIBUTED LOAD CALCULATIONS

PV MODULES & RACKING WEIGHT = (INDIVIDUAL MODULE WEIGHT + 3.5 LBS) * (MODULE QTY) = (44.5 LBS) * (32) = 1,424 LBS

PER SQUARE FEET (PSF) ARRAY LOAD = PV MODULES & RACKING WEIGHT / TOTAL ARRAY AREA = 1,424 LBS / 585.74 SQFT = 2.43 PSF

HENCE, ROOF WILL CARRY THE ADDITIONAL SOLAR SYSTEM LOAD



	k	dc	L	d1	f
MM	3.9	6.10-6.25	25.4	14.7	7.8
INCH	.15	.24-.246	1	.58	.31

6mm X 25mm (8mm Hex W/16mm Washer)

DOCUMENT CONTROL		DATE	CAD	QC
ISSUED FOR PERMIT		01-28-21	JG	AF
REV	DESCRIPTION	DATE	CAD	QC

ENGINEER CONTACT INFORMATION		ENGINEERING STAMP
ENGIPARTNERS LLC		Digitally signed by Rafael A Gonzalez Soto
C.A. 32661 255 GIRALDA AVE CORAL GABLES, FL 33134		Date: 2021.01.31 19:25:38 -05'00'
DESIGN@ENGIPARTNERS.COM		
833 - 888 - 3644		

CONTRACTOR CONTACT INFORMATION	
TITAN SOLAR POWER FL	
12221 N US HIGHWAY 301	
THONOTASSA, FL 33592	
(813) 982 - 9001	
#EC13008093	

CONTRACTOR LOGO	

CUSTOMER:	
JONATHAN MOSER	
PROJECT ADDRESS:	
249 SE SECLUSION GLEN LAKE CITY, FL 32025	
PARCEL NUMBER:	
10-4S-17-08305-003	

SHEET NAME:	
RACKING PLAN	
PROJECT ID:	
TSP64089	
ENGINEER OF RECORD:	
ENG. RAFAEL A. GONZALEZ SOTO, PE	
DATE:	
01-28-2021	
SHEET TITLE:	
S-2	
SHEETS:	
6 OF 9	