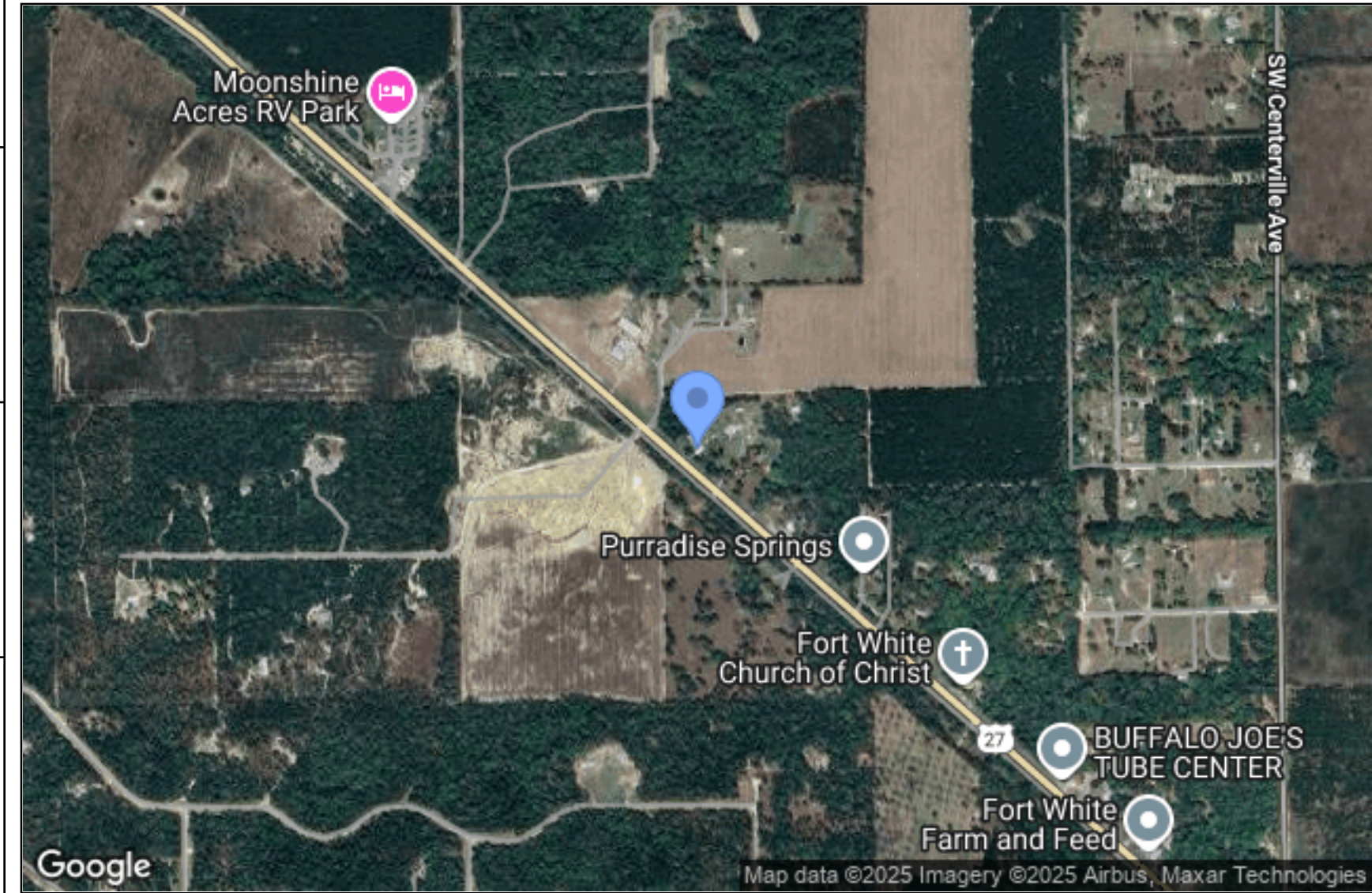


MOCK MELVIN E JR

9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES
29.9401404,-82.7381174

SYSTEM TIER (UTILITY): TIER 1 (11.06 KWDC*0.85 = 9.4 KWAC)
SCOPE OF WORK: INSTALLATION OF SOLAR PANELS AND ASSOCIATED ELECTRICAL EQUIPMENT.



01 VICINITY



02 AERIAL

PROJECT INFORMATION

DISTRICTS
COUNTY: COLUMBIA COUNTY
JURISDICTION: UN-INCORPORATED COLUMBIA

DESIGN SPECS
WIND EXPOSURE: B
RISK CATEGORY: II
WIND SPEED (MPH): 130
SNOW LOAD (PSF): 0

GOVERNING CODES
BUILDING: FBC 2023/ASCE 7-22
ELECTRICAL: NEC 2020
FIRE: FFPC, 8th ed. (2023)/NFPA 1 2021 ed.
GENERAL: UN-INCORPORATED COLUMBIA ORDINANCES

SYSTEM
SIZE (KWDC): 11.06
EST KWH/YR: 16569
PANELS: 28
PANEL: MSE395SX9R
INVERTER(S): IQ8PLUS-72-2-US
VOLTAGE (V): 240

SHEET INDEX

COVER	T1
GENERAL	G1
LAYOUT	S1
LOCATIONS PLAN	SL1
ATTACHMENT PLAN	SP1-SP3
ATTACHMENT DETAIL	SA1
ELECTRICAL DIAGRAM	E1
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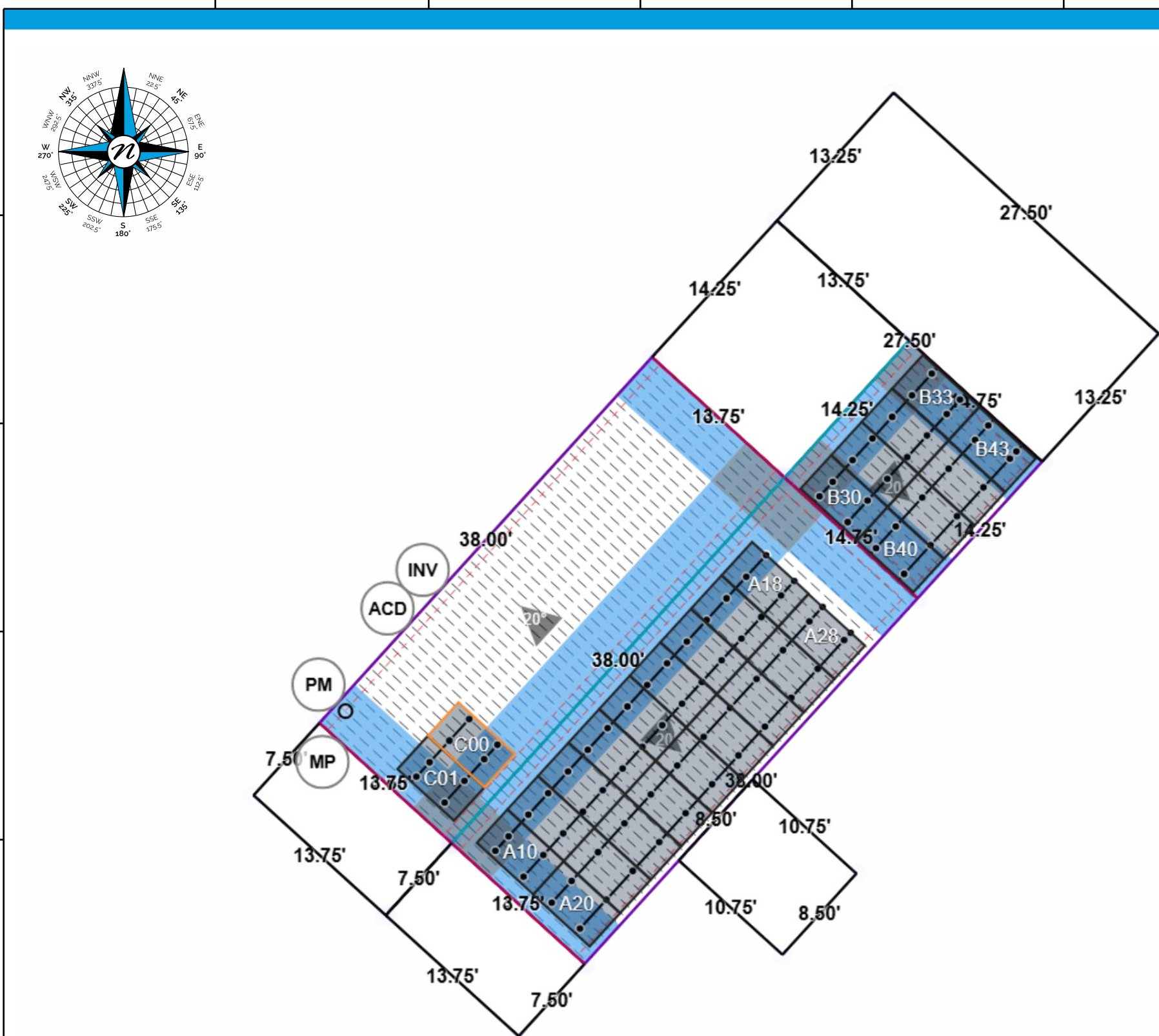
F	MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343	 Ryan S Gittens 2025.05.08 14:37:47 -04'00' RYAN S GITTENS PE90605	DATE	BY	VER	DESCRIPTION	T1
	9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	FLORIDA STATE ENERGY	 1646 W SNOW AVE 9 TAMPA, FL 33606		05.08.25	BF	1	INITIAL DESIGN	
	PROJECT ID: 4212025-9607	6901 TPC DRIVE STE 650, ORLANDO, FL 32822 (407) 718-9980							PAPER: ARCHB SCALE:

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

- | | | | | | | | | |
|---|--|---|--|----------|----|-----|----------------|--|
| MOCK MELVIN E JR | CONTRACTOR: - | ENGINEER: CA33343 |  <p>Ryan S Gittens
2025.05.08
14:37:47
-04'00'
RYAN S GITTENS
PE90605</p> | DATE | BY | VER | DESCRIPTION | G1

PAPER:
ARCHB

SCALE: |
| 9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES | FLORIDA STATE ENERGY |  | | 05.08.25 | BF | 1 | INITIAL DESIGN | |
| | 6901 TPC DRIVE STE 650,
ORLANDO, FL 32822 | | | | | | | |
| | (407) 718-9980 | 1646 W SNOW AVE 9 TAMPA,
FL 33606 | | | | | | |
| PROJECT ID: 4212025-9607 | | | | | | | | |



01 PLAN VIEW

FLORIDA STATE ENERGY

EQUIPMENT LEGEND

- PM -POWER METER
- MP -MAIN PANEL
- ACD -AC DISCONNECT
- INV -INVERTER/COMBINER

ZONE WIDTHS

- PITCHED:
- < NA' > -1
 - < 4' > -2
 - < 4' > -3

ROOF TYPE 2

MATERIAL: METAL
ATTACHMENT: (88) S5I-PROTEA
RAIL: (195) PEGASUS

RELEVANT DIMS

LEAST HORIZ DIM: 36'
ROOF HEIGHT(S), h/EXPOSED DIST, d1: 15'/7.5'
ZONE WIDTH, a: 4'

ARRAY(S)

MODULES: (28) MSE395SX9R
ARRAY AREA: 606 SQFT

02 SYSTEM SUMMARY

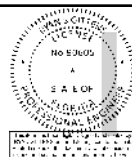
GENERAL

- EXISTING VENTS, SKYLIGHTS OR EXHAUST OUTLETS SHALL NOT BE COVERED BY THE SOLAR PV SYSTEM.
- MODULES SHALL NOT OVERHANG ANY RIDGE, HIP OR ROOF EDGE.
- CONTRACTOR SHALL NOTIFY ENGINEER/DESIGNER OF ANY CHANGES.
- PANELS SHALL BE A MINIMUM OF 10IN AWAY FROM ROOF EDGE.

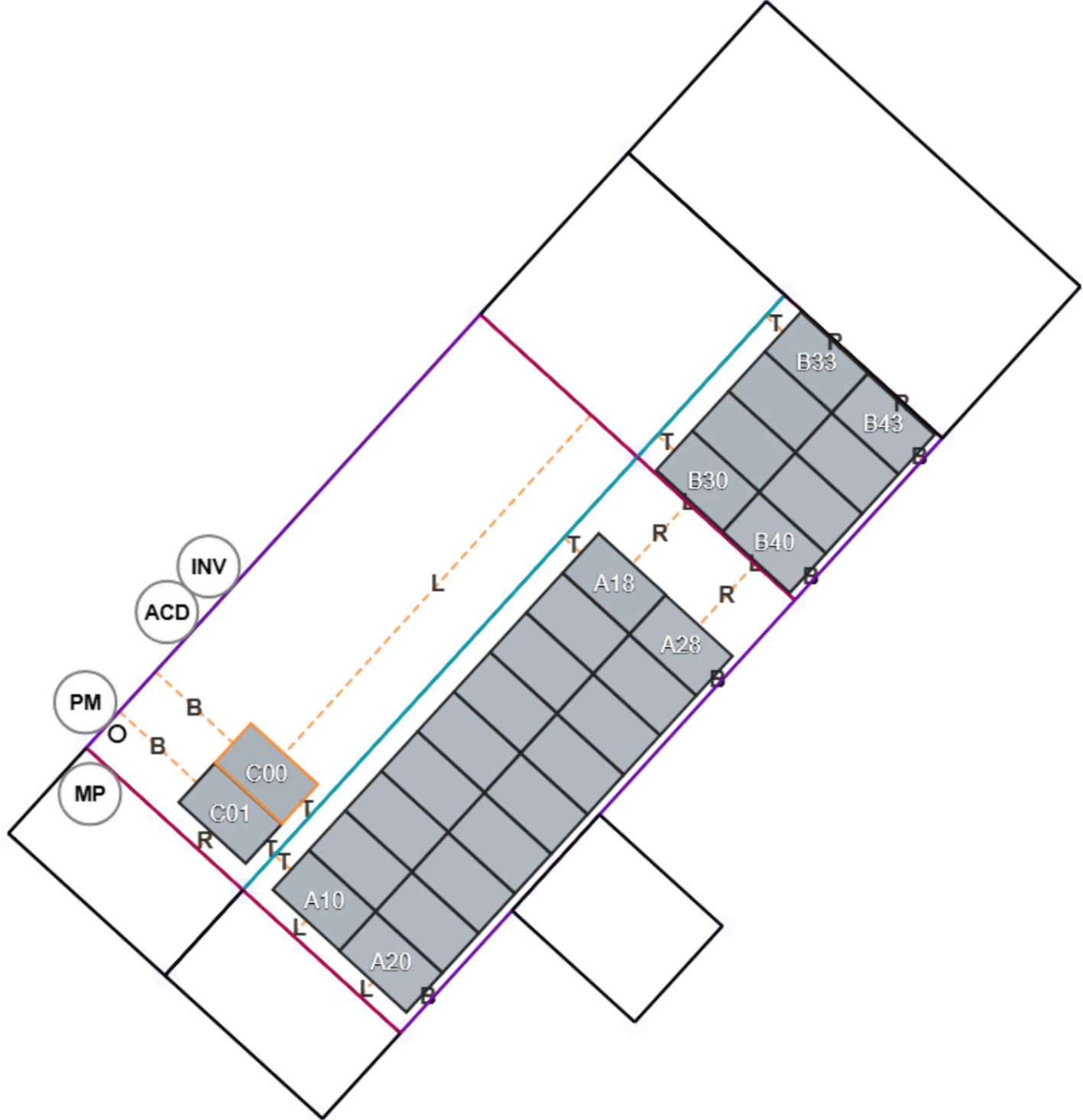
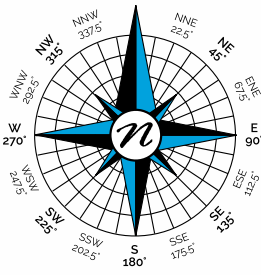
03 NOTES

BASED ON OUR REVIEW, THE EXISTING MEMBERS COMPLY WITH FBC 2023/ASCE 7-22 DESIGN SPAN RATINGS WITH SUFFICIENT CAPACITY TO SUPPORT THE NEW LOADS IMPOSED BY THE PROPOSED SOLAR ARRAY. THE SPECIFICATIONS SHOWN IN THIS CONSTRUCTION PLAN WERE DESIGNED PER FBC 2023/ASCE 7-22 FOR A WIND SPEED OF 130 MPH, EXPOSURE CATEGORY B FOR RISK CATEGORY II BUILDING WITH 0 PSF GROUND SNOW LOAD.

04 STRUC. EVALUATION/CERTIFICATION

MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343	 Ryan S Gittens 2025.05.08 14:37:47 -04'00' RYAN S GITTENS PE90605	DATE	BY	VER	DESCRIPTION	S1
	FLORIDA STATE ENERGY	 1646 W SNOW AVE 9 TAMPA, FL 33606		05.08.25	BF	1	INITIAL DESIGN	
9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	6901 TPC DRIVE STE 650, ORLANDO, FL 32822							
PROJECT ID: 4212025-9607	(407) 718-9980							SCALE: 1"=9.52'

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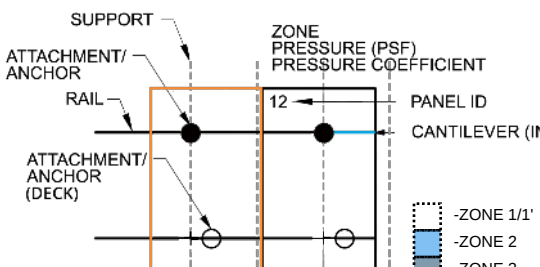
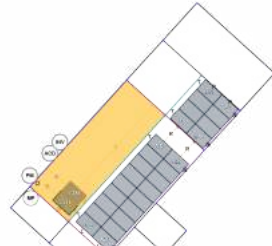
ARRAY OFFSETS

PANEL ID	SIDE	DIM (in)
C01	T	12.24
C01	R	16.8
C01	B	81.84
C00	T	12.24
C00	B	81.96
C00	L	355.8
A10	T	17.04
A10	L	15.84
A18	T	17.76
A18	R	64.32
A28	R	64.92
A28	B	6.6
A20	B	7.44
A20	L	15.24
B30	T	17.76
B30	L	2.16
B33	T	18.24
B33	R	1.44
B43	R	1.92
B43	B	6.24
B40	B	6.6
B40	L	1.68

01 LOCATIONS PLAN

MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343	 Ryan S Gittens 2025.05.08 14:37:47 -04'00' RYAN S GITTENS PE90605	DATE	BY	VER	DESCRIPTION	SL1
	FLORIDA STATE ENERGY			05.08.25	BF	1	INITIAL DESIGN	
9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	6901 TPC DRIVE STE 650, ORLANDO, FL 32822	1646 W SNOW AVE 9 TAMPA, FL 33606						PAPER: ARCHB
PROJECT ID: 4212025-9607	(407) 718-9980							SCALE: 1"=NaN'

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS

	ARRAY MODULE: TOTAL AREA: 43.28 SQFT HARDWARE RAIL: ATTACHMENT: ANCHORAGE: FRAMING SIZE: SPACING: ROOF MEAN HEIGHT: MATERIAL: SHAPE:	DEAD LOAD CALC LOADS: Panel = 48.5lbs Anchors = ~2lbs Rail = 0.72lbs/ft Misc = 1.6lbs/panel DEADLOAD PER ROW, Fdr: Fdr = (lbs/panel*#panels/row) + (lbs/ft-rail*#rails/row)*2 + (lbs/anchor*#anchors/row) + (misc-lbs/panel*#panels/row) (lbf) DIST DEADLOAD, Fdd: Fdd = Fdr/(area/panel*#panels/row) (psf) DEADLOAD PER ANCHOR, Fda: Fda = Fdr/(#anchors/row) (lbs)	PANELS PARALLEL TO SURFACE, 29.4.4 CRITERIA: - Panels parallel to roof surface (within 2 deg) - Max height of panel above roof, h1 & h2 OF 10" - Min panel gap of 0.25" - Min edge distance 2*h2 - Max panel chord length of 6.7' UPLIFT ON ONE PANEL, Fup = P*A (lbf) Per ASCE 2.4, 26.10.2 & 29.4.4 P = pasd = 0.6*p = 0.6*qh*(GCp)*(YE)*(Ya), A = load area UPLIFT PER ROW, Fur = SUM(Fup(0):Fup(n)) (lbf) Where Fup(0):Fup(n) = loads from first to last panel in row UPLIFT PER ANCHOR, Fua = Fur/(#ANCHORS/ROW) (lbf) LOAD PER ANCHOR, Fa = 0.6*Fda + Fua (lbf) SAFETY FACTOR, SF = Ftest/Fa	FLORIDA STATE ENERGY VELOCITY PRESSURE qh = 0.00256*Kz*Kzt*Kd*Ke*V^2 = 25 (lb/sqft) Where Kz = 0.57, Kzt = 1, Kd = 0.85, Ke = 1, V = 130 EXT PRESSURE COEFFICIENT, GCp: GCp varies per roof & zone, 30.3-2A-1 to 30.3.7: Aeff = 21.64 sqft (1 panel) EXPOSURE FACTOR, YE: YE = 1.5 for uplift loads on panels that are exposed and within a distance 2*h2 from the end of a row at an exposed edge of the array; YE = 1.0 elsewhere for uplift loads and for all downward loads, as illustrated in Fig. 29.4-7. A panel is defined as exposed if d1 to the roof edge > 0.5h and one of the following applies: 1. d1 to the adjacent array > 2*h2 or 2. d2 to the next adjacent panel > 2*h2. PRESSURE EQUALIZATION FACTOR, Ya: Ya is given as 0.58 per 29.4.4, 29.4-8 with h2 = 5"+ & panel gap = 0.37"	ZONES f0: 1' (Flat) f1: 1 (Flat) f2: 2 (Flat) f3: 3 (Flat) g1: 1 (Gable) g2: 2 (Gable) g3: 3 (Gable) h1: 1 (Hip) h2: 2 (Hip) h3: 3 (Hip) 
LEGEND	PARAMETERS	LOAD CALCS PER FBC 2023/ASCE 7-22			PLANE C AZ: 312° P: 20° TOF: 77%

ROW: 0 (2 MODS)

DIST LOAD, Fdd: 2.77 psf

POINT LOAD, Fda: 14.98 lbs

ROOF PITCH: 07-20 deg

PANEL TILT: 0

AZIMUTH: 312 deg

UPLIFT/ROW, Fur: -1015 lbf

RAIL1

RAIL2

ANCHORS:

LOAD/ANCHOR, Fa: -118 lbf -118 lbf

TEST LOAD/ANCHOR: -550 lbf -550 lbf

SF: 4.67 4.67

NOM SPAN: 27" 27"

MAX SPAN: 32" 32"

MAX CANTILEVER: 9" 9"

Z: g2

P: -25 psf

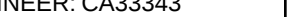
GCp: -2.26

Z: g3

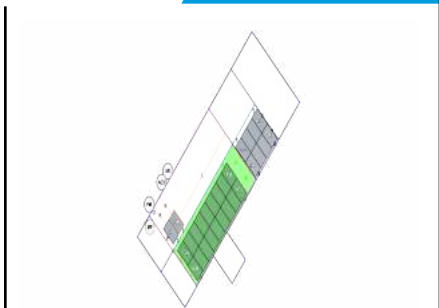
P: -22 psf

GCp: -3

01 ATTACHMENT PLAN

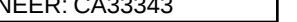
MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343	 Ryan S Gittens 2025.05.08 14:37:47 -04'00' RYAN S GITTENS PE90605	DATE	BY	VER	DESCRIPTION	SP1
	FLORIDA STATE ENERGY	 1646 W SNOW AVE 9 TAMPA, FL 33606		05.08.25	BF	1	INITIAL DESIGN	
9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	6901 TPC DRIVE STE 650, ORLANDO, FL 32822							PAPER: ARCHB
PROJECT ID: 4212025-9607	(407) 718-9980							SCALE:

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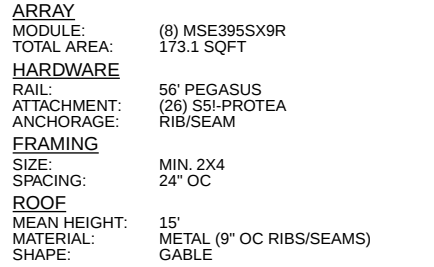


PLANE A | AZ: 132° | P: 20° | TOF: 95%

Z: g2 P: -17 psf GCp: -2.26	Z: g1 P: -16 psf GCp: -1.66	Z: g1 P: -16 psf GCp: -1.66	Z: g1 P: -16 psf GCp: -1.66	Z: g1 P: -16 psf GCp: -1.66	Z: g1 P: -16 psf GCp: -1.66	Z: g1 P: -16 psf GCp: -1.66	Z: g1 P: -16 psf GCp: -1.66	Z: g1 P: -17 psf GCp: -2.26
A20	A21	A22	A23	A24	A25	A26	A27	A28
								

MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343	 Ryan S Gittens 2025.05.08 14:37:47 -04'00' RYAN S GITTENS PE90605	DATE	BY	VER	DESCRIPTION	SP2 PAPER: ARCHB SCALE:
9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	FLORIDA STATE ENERGY			05.08.25	BF	1	INITIAL DESIGN	
PROJECT ID: 4212025-9607	6901 TPC DRIVE STE 650, ORLANDO, FL 32822	1646 W SNOW AVE 9 TAMPA, FL 33606						
	(407) 718-9980							

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS



DEAD LOAD CALC

LOADS:
 Panel = 48.5lbs
 Anchors = ~2lbs
 Rail = 0.72lbs/ft
 Misc = 1.6lbs/panel

DEADLOAD PER ROW, Fdr:

$$Fdr = (lbs/panel * \#panels/row) + (lbs/ft * rail * ft/rail/row) * 2 + (lbs/anchor * \#anchors/row) + (misc-lbs/panel * \#panels/row) (lbf)$$

DIST DEADLOAD, Fdd:

$$Fdd = Fdr / (area/panel * \#panels/row) (psf)$$

DEADLOAD PER ANCHOR, Fda:

$$Fda = Fdr / (\#anchors/row) (lbs)$$

PANELS PARALLEL TO SURFACE, 29.4.4

CRITERIA:

- Panels parallel to roof surface (within 2 deg)
- Max height of panel above roof, h1 & h2 OF 10"
- Min panel gap of 0.25"
- Min edge distance 2"x2"
- Max panel chord length of 6.7'

UPLIFT ON ONE PANEL, $F_{up} = P \cdot A$ (lbf)
 per ASCE 2.4, 26.10.2 & 29.4.4
 $P = \text{psfd} = 0.6 \cdot p = 0.6 \cdot q_h \cdot (GCp) \cdot (YE) \cdot (Ya)$, A = load area

UPLIFT PER ROW, $F_{up} = \text{SUM}(F_{up}) \cdot \text{Fup}(n)$ (lbf)
 Where $F_{up}(0) : F_{up}(n)$ = loads from first to last panel in row

UPLIFT PER ANCHOR, $F_{ua} = F_{up} / (\# \text{ANCHORS} / \text{ROW})$ (lbf)

LOAD PER ANCHOR, $F_a = 0.6 \cdot F_{ua} + F_{ua}$ (lbf)

SAFETY FACTOR, $SF = F_{test} / F_a$

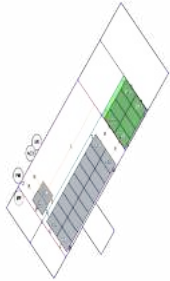
VELOCITY PRESSURE $q_h = 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 = 25 \text{ (lb/sqft)}$
Where $K_z = 0.57$, $K_{zt} = 1$, $K_d = 0.85$, $K_e = 1$, $V = 130$

EXT PRESSURE COEFFICIENT, GCP :
 GCP varies per roof & zone, 30.3-2A-1 to 30.3.7: $A_{eff} = 21.64 \text{ sqft (1 panel)}$

EXPOSURE FACTOR, YE :
 $YE = 1.5$ for uplift loads on panels that are exposed and within a distance $2 \cdot h_2$ from the end of a row at an exposed edge of the array; $YE = 1.0$ elsewhere for uplift loads and for all downward loads, as illustrated in Fig. 29-4.7. A panel is defined as exposed if d_1 to the roof edge $> 0.5h$ and one of the following applies: 1. d_1 to the adjacent array $> 2 \cdot h_2$ or 2. d_2 to the next adjacent panel $> 2 \cdot h_2$.

PRESSURE EQUALIZATION FACTOR, Ya :
 Ya is given as 0.58 per 29.4.4, 29.4.8 with $h = 5'$ & panel gap = 0.37"

ZONES
f0: 1' (Flat)
f1: 1 (Flat)
f2: 2 (Flat)
f3: 3 (Flat)
g1: 1 (Gable)
g2: 2 (Gable)
g3: 3 (Gable)
h1: 1 (Hip)
h2: 2 (Hip)
h3: 3 (Hip)

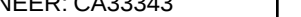


PLANE B | AZ: 132° | P: 20° | TOF: 95%

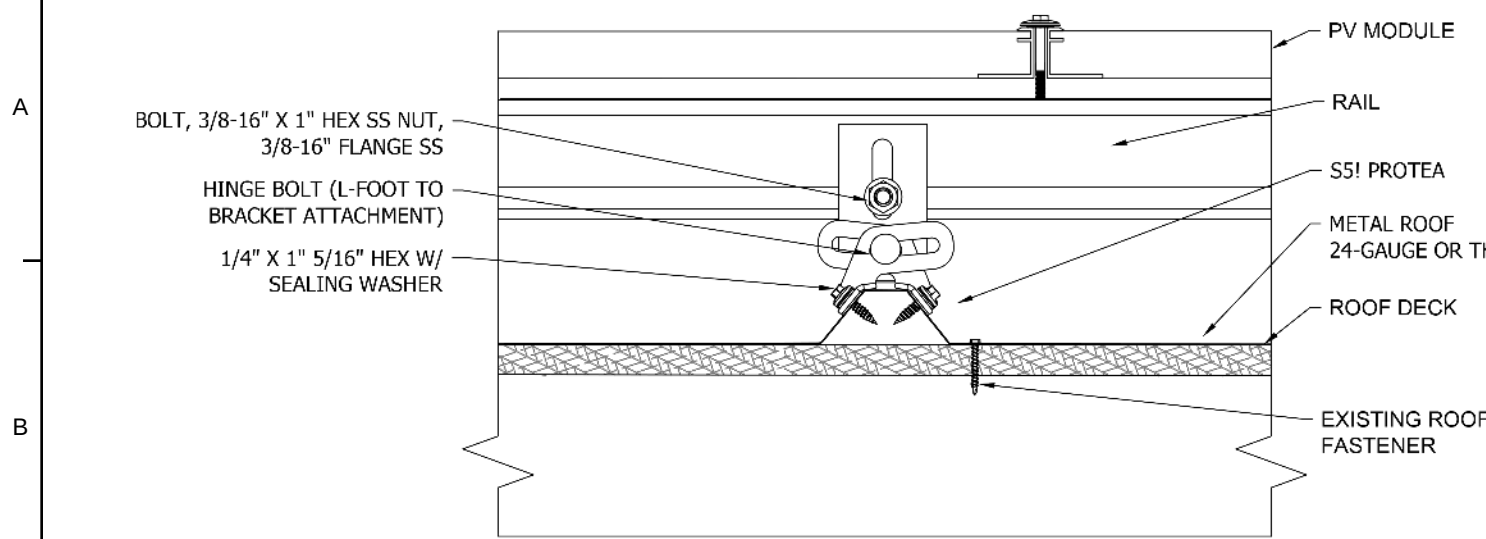
ANCHORS:	6	6
LOAD/ANCHOR, Fa:	-108 lbf	-108 lbf
TEST LOAD/ANCHOR:	-550 lbf	-550 lbf
SF:	5.09	5.09
NOM SPAN:	36"	36"
MAX SPAN:	36"	36"
MAX CANTILEVER:	10"	10"

ANCHORS:	7	7
LOAD/ANCHOR, Fa:	-124 lbf	-124 lbf
TEST LOAD/ANCHOR:	-550 lbf	-550 lbf
SF:	4.43	4.43
NOM SPAN:	27"	27"
MAX SPAN:	32"	32"
MAX CANTILEVER:	9"	9"

01 ATTACHMENT PLAN

MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343	 Ryan S Gittens 2025.05.08 14:37:47 -04'00' RYAN S GITTENS PE90605	DATE	BY	VER	DESCRIPTION	SP3 PAPER: ARCHB SCALE:
9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	FLORIDA STATE ENERGY			05.08.25	BF	1	INITIAL DESIGN	
PROJECT ID: 4212025-9607	6901 TPC DRIVE STE 650, ORLANDO, FL 32822	1646 W SNOW AVE 9 TAMPA, FL 33606						
	(407) 718-9980							

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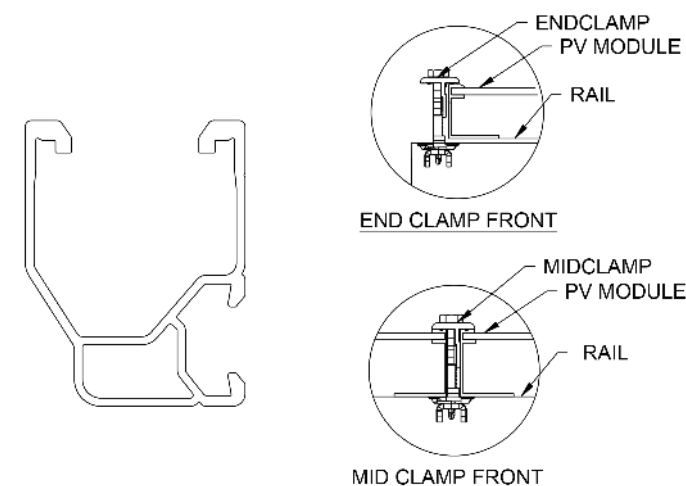
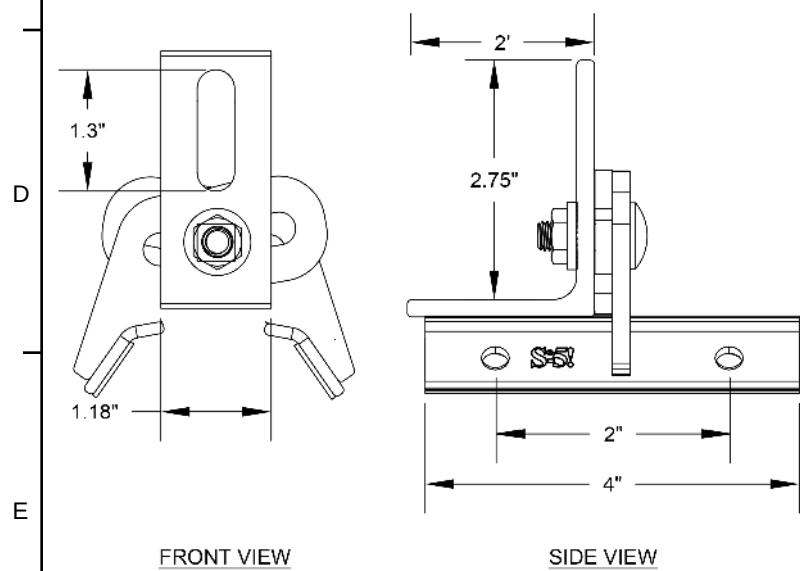


01 ANCHORAGE DETAIL

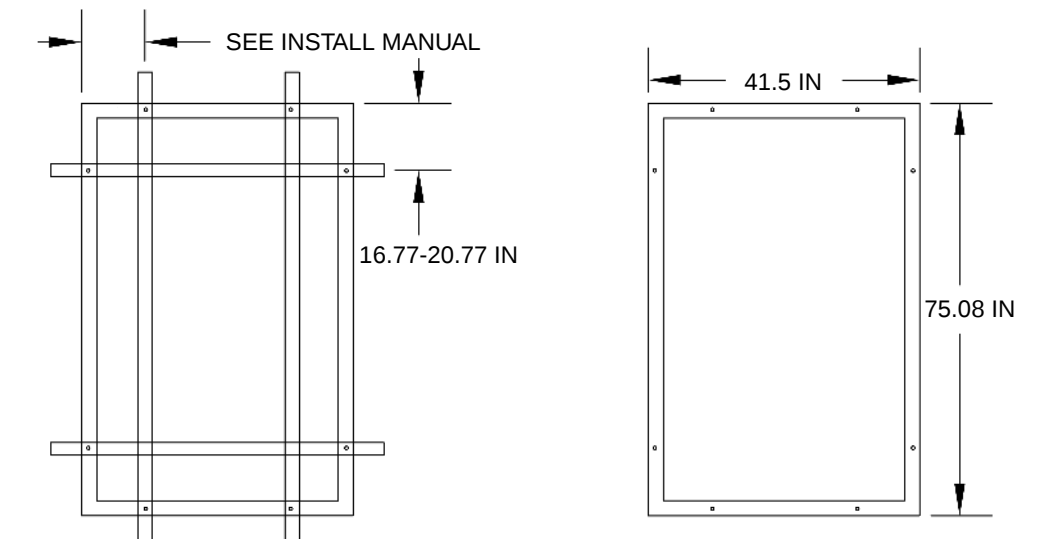
02 NOTES

GENERAL

- 1.1 DESIGNED PER FBC 2023/ASCE 7-22 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.
- 1.2 CONTRACTOR IS RESPONSIBLE FOR INSTALLING PV MODULES, RACKING & RACKING SUPPORTS IN ACCORDANCE WITH THE MANUFACTURER INSTALLATION INSTRUCTIONS NOT SHOWN IN THIS PLAN.
- 1.3 WITHDRAWAL VALUES GIVEN PER NDS BASED ON SG OF 0.5 WHERE APPLICABLE OR MANUFACTURER SUPPLIED 3RD PARTY UPLIFT TESTING REPORTS WITH APPLICABLE SAFETY FACTORS.
- 1.4 ALL PENETRATIONS SHALL BE FLASHED OR SEALED IN A MANNER THAT PREVENTS MOISTURE FROM ENTERING THE WALL AND ROOF USING ASTM C920 COMPLAINT SEALANT IN PILOT HOLES AND AROUND FASTENERS.
- 1.5 THE SUPPORTING ROOF STRUCTURE SHALL BE CONVENTIONAL WOOD FRAMED OR METAL CONSTRUCTION WITH PRE-ENGINEERED TRUSSES OR ROOF FRAMING MEMBERS.
- 1.6 EXISTING STRUCTURE IS ASSUMED TO BE IN COMPLIANCE WITH APPLICABLE BUILDING CODES AT THE TIME OF CONSTRUCTION.
- 1.7 IT IS THE CONTRACTOR RESPONSIBILITY TO INSTALL THE SYSTEM AND ITS SUPPORTS AS INDICATED IN THESE PLANS. THE CONTRACTOR SHALL CONTACT THE ENGINEER OF RECORD IF SITE CONDITIONS DIFFER FROM WHAT IS DEPICTED ON PLANS



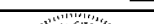
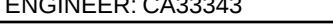
PEGASUS RAIL AND CLAMPS

MISSION SOLAR
MSE395SX9R

03 ANCHOR DETAIL

04 RACK & CLAMPS DETAIL

05 MODULE DETAILS

F	MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343	 Ryan S Gittens 2025.05.08 14:37:47 -04'00' RYAN S GITTENS PE90605	DATE	BY	VER	DESCRIPTION	SA1 PAPER: ARCHB SCALE:
	9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	FLORIDA STATE ENERGY			05.08.25	BF	1	INITIAL DESIGN	
		6901 TPC DRIVE STE 650, ORLANDO, FL 32822							
	PROJECT ID: 4212025-9607	(407) 718-9980	1646 W SNOW AVE 9 TAMPA, FL 33606						

GENERAL

- 1.1 CONTRACTOR SHALL COMPLY WITH FBC 2023/ASCE 7-22, NEC 2020 AND EQUIPMENT INSTALLATION INSTRUCTIONS NOT SHOWN IN THIS PLAN.
- 1.2 ALL EQUIPMENT SHALL BE LISTED PER NEC 690.4(B).
- 1.3 PV SOURCE CONDUCTORS ARE SIZED BE EXPOSED TO DIRECT SUNLIGHT WHEN INSTALLED IN RACEWAYS 7/8" OR LESS ABOVE ROOF. ADJUSTMENTS ARE BASED ON MAX CURRENT OF 16A, 35C AMBIENT TEMP, NEC 310.15(B)(2) AND T310.15(B)(1).
- 1.4 ALL EQUIPMENT SHALL BE RATED FOR INSTALL LOCATION. ROOF & OUTDOOR JUNCTION BOXES SHALL BE OUTDOOR RATED
- 1.5 INTERCONNECTION EQUIPMENT SHALL BE RATED FOR AVAILABLE FAULT CURRENT.
- 1.6 NEC 230.67(D) WHERE SERVICE EQUIPMENT IS REPLACED, A SURGE-PROTECTIVE DEVICE (SPD) SHALL BE PROVIDED.

SYSTEM

- 2.1 THE ENPHASE SYSTEM IS NON-ISOLATED AND UNGROUNDED. NEITHER THE NEGATIVE NOR POSITIVE CONDUCTOR IS GROUNDED AND HAS A COMMON AC AND DC EQUIPMENT GROUNDING TERMINAL THEREFORE NO DC GEC IS REQUIRED.
- 2.2 ENPHASE IQ SERIES MICROINVERTERS REQUIRE NO GROUND OR GROUNDED CONDUCTOR BECAUSE THE DC CIRCUIT IS ISOLATED AND INSULATED FROM GROUND.
- 2.3 THE INVERTER IS EQUIPPED WITH A RAPID SHUTDOWN FEATURE WHICH CONFORMS TO NEC 690.12.
- 2.4 INTERCONNECTION SHALL BE MADE BY LINE-SIDE-TAP PER ARTICLE 705.11 USING CONNECTORS UL LISTED FOR THIS PURPOSE. TAP CONDUCTORS SHALL BE NO MORE THAN 10FT IF INSIDE BUILDING PER 705.11(C). TAP & ENCLOSURE SHALL COMPLY WITH NEC 312.8(A) (CROSS SECTIONAL AREA FILL).
- 2.5 NO MORE THAN 4 BRANCHES (OR 8 CONDUCTORS) SHALL BE RUN IN A SINGLE CONDUIT USING #10 WIRE. USE MULTIPLE CONDUITS/JBOX AS REQUIRED TO SATISFY THIS LIMIT.

GROUNDING

- 3.1 ALL EQUIPMENT SHALL BE PROPERLY GROUNDED PER THE REQUIREMENTS OF NEC ARTICLES 250 & 690.
- 3.2 FRAMED PV MODULES SHALL BE BONDED TOGETHER USING LUGS OR RACKING INTEGRATED GROUNDING CLAMPS.
- 3.3 EQUIPMENT GROUNDING SHALL BE INSTALLED PER NEC 250.120(C), SIZED PER 690.45 & BE A MINIMUM OF #6 WHEN EXPOSED TO DAMAGE.
- 3.4 INTERSYSTEM BONDING DEVICE REQUIRED AT SERVICE WHEN COMMUNICATION DEVICES ARE PRESENT PER 250.94.
- 3.5 EXISTING GROUNDING ELECTRODE SYSTEM (GES) SHALL COMPLY WITH 250.64, 250.53 & 250.62 & BE OF THE TYPES & SIZE LISTED IN 250.52.
- 3.6 EXISTING GROUNDING ELECTRODE SYSTEM (GES) SHALL BE SIZED PER 250.66 & T250.66: TYP. #4 GEC (FIELD VERIFY).
- 3.7 METAL WATER PIPES SHALL BE GROUNDED PER 250.104(A)

01 NOTES

ID	RUN	VOLTS(V)	CURRENT(A)	VD(%)	LEN(FT)	CONDUCTOR	SIZE	SETS	OHM/KFT	CONDUIT	MIN SIZE	#CCC	EGC	OCPD(A)	TERM(C)	TEMP FAC	FILL FAC	BASE AMP	ADJ AMP
A	BR-JBOX	240	15.73	1	38.53	Q-CABLE	#12	1	1.98	FREE AIR	3/4"	2	#10	20	75	1	1	25	25
B	JBOX-COMB	240	15.73	1	61.52	THHN/THWN-2	#10	1	1.24	PVC/EMT	3/4"	6	#10	20	75	1	0.8	35	32
C	COMB-DISC	240	33.88	1	45.53	THHN/THWN-2	#8	1	0.778	PVC/EMT/FMC/NMLT	3/4"	3	#10	45	75	1	1	50	50
D	DISC-PCC	240	33.88	1	72.14	THHN/THWN-2	#6	1	0.491	PVC/EMT/FMC/NMLT	3/4"	3	NA	NA	75	1	1	65	65

05 CONDUCTOR SCHEDULE

MAKE	MISSION SOLAR
MODEL	MSE395SX9R
RATED POWER (W)	395
MPP VOLTAGE (V)	36.99
MPP CURRENT (A)	10.68
OC VOLTAGE (V)	45.18
SC CURRENT (A)	11.24

02 MODULE RATINGS

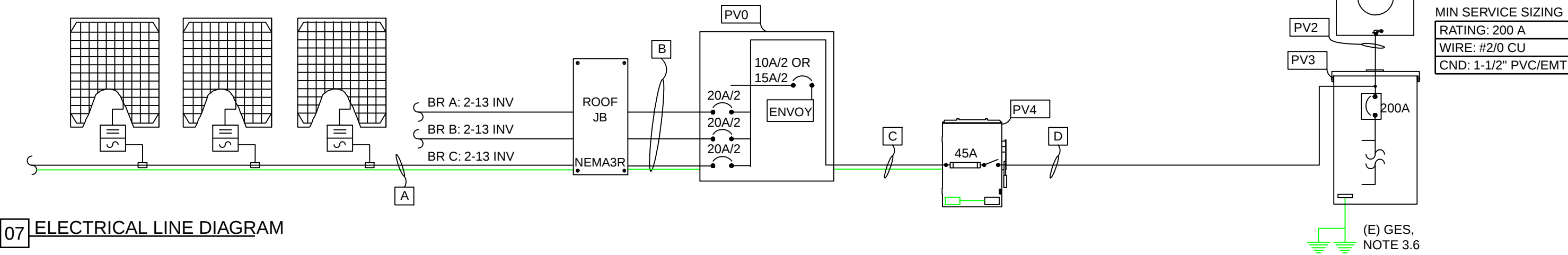
03 INVERTER RATINGS

# PV MODULES	28
# BRANCH CIRCUITS	3
# INVERTERS	28
MIN-MAX BR SIZE (INV)	2-13
STC DC RATING (KW)	11.06
AC OUTPUT RATING (KW)	8.12
DC/AC RATIO	1.36

04 SYSTEM

PV0	(N) ENPHASE IQ COMBINER
PV1	(E) MIN 200A METER OR CT CABINET
PV2	(E) 200A SERVICE CONDUCTORS
PV3	(E) 200A MAIN PNL W/ (E) 200A MAIN
PV4	(N) 60A, SERV RATED AC DISC, 45A FUSES

06 EQUIPMENT SCHEDULE



07 ELECTRICAL LINE DIAGRAM

MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343		DATE	BY	VER	DESCRIPTION	E1
9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	FLORIDA STATE ENERGY			05.08.25	BF	1	INITIAL DESIGN	
PROJECT ID: 4212025-9607	6901 TPC DRIVE STE 650, ORLANDO, FL 32822	1646 W SNOW AVE 9 TAMPA, FL 33606						
	(407) 718-9980							

1

2

3

4

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9

FLORIDA STATE ENERGY

! WARNING

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

NEC 706.15(C)(4), NEC 690.13(B)
LOCATION(S): 3
Combiner Box/Circuits/Enclosures

PHOTOVOLTAIC
AC DISCONNECT

NEC 690.13(B)
LOCATION(S): 4, 5
AC Disconnect/Breaker/POC

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

SOLAR ELECTRIC
PV PANELS

NFPA 1 11.12.2.1.1.1.1
LOCATION(S): 5

! WARNING

DUAL POWER SOURCE
SECOND POWER SOURCE IS PV SYSTEM

NEC 705.12(C), NEC 690.59
LOCATION(S): 6
Production/Net Meter

PHOTOVOLTAIC AC DISCONNECT

RATED AC OUTPUT CURRENT33.88

NOMINAL OPERATING AC VOLTAGE240

NEC 690.54
LOCATION(S): 3, 4
Inverter/POC/Breaker Panel/Pull Boxes

RAPID SHUTDOWN
SWITCH FOR SOLAR
PV SYSTEM

NFPA 1 11.12.2.1.1.8
LOCATION(S): 4
Rapid Shutdown Switch

PV SYSTEM
DISCONNECT

NEC 690.13(B)
LOCATION(S): 4, 5
Main Service Disconnect

EMERGENCY CONTACT

FLORIDA STATE ENERGY
(407) 718-9980

UTILITY REQ'D
LOCATION(S): 4, 6
Main Service Disconnect

01

LABELS

(1) J BOX

(2) CONDUIT/WIRING

(3) COMBINER/INVERTER

(4) AC DISC

(5) MAIN PNL

(6) METER

GENERAL

1.1 LABEL MATERIALS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT, NEC 110.21(B)(3).

1.2 EXACT MATERIALS USED ARE SUBJECT TO THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

1.3 LABELS SHALL BE A MINIMUM LETTER HEIGHT OF 3/8" AND PERMANENTLY AFFIXED.

1.4 LABELS WILL BE REFLECTIVE AND MEET THE REQUIREMENTS OF NFPA 1-11.12.2.1.1.2

02

NOTES

MOCK MELVIN E JR

9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES

PROJECT ID: 4212025-9607

CONTRACTOR: -

FLORIDA STATE ENERGY

6901 TPC DRIVE STE 650,
ORLANDO, FL 32822

(407) 718-9980

ENGINEER: CA33343

ECUIP
ENGINEERING

1646 W SNOW AVE 9 TAMPA,
FL 33606

RYAN S
Gittens

2025.05.08
14:37:47
-04'00'

RYAN S GITTENS
PE90605

DATE

05.08.25

BY

BF

VER

1

DESCRIPTION

INITIAL DESIGN

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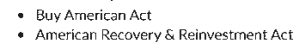
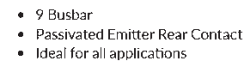
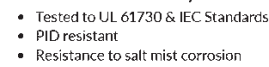
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Positive
Power
Tolerance

Demand the best. Demand Mission Solar Energy.



Degradation guaranteed not to exceed 2% in year one and 0.58% annually from years two to 30 with 84.08% capacity guaranteed in year 25.
For more information, visit www.missionsolar.com/warranty

UL 61730 / IEC 61215 / IEC 61730 / IEC 61701

If you have questions or concerns about certification of our products in your area, please contact Mission Solar Energy.



Technical drawing of a mechanical part with dimensions in inches (red) and millimeters (black). The drawing includes a top view, a side view, and a cross-section view.

Top View Dimensions:

- Overall width: 1064.0 (red) / 27.0 (black)
- Overall height: 40.0 (red) / 1.575 (black)
- Distance from left edge to center of mounting holes: 1054.0 (red) / 41.5 (black)
- Distance from left edge to center of grounding holes: 1907.0 (red) / 75.08 (black)
- Distance from left edge to center of mounting holes (alternative): 1049.0 (red) / 41.299 (black)
- Distance from left edge to center of grounding holes (alternative): 1907.0 (red) / 75.08 (black)
- Distance from left edge to center of mounting holes (alternative): 1049.0 (red) / 41.299 (black)

Side View Dimensions:

- Overall height: 429.0 (red) / 16.89 (black)
- Distance from top edge to center of mounting holes: 77.0 (red) / 3.03 (black)
- Distance from top edge to center of grounding holes: 77.0 (red) / 3.03 (black)

Cross-section View Dimensions:

- Overall width: 1004.0 (red) / 39.53 (black)
- Overall height: 15 (black)

Labels:

- 4x Mounting Holes
- 2x Grounding Holes
- Mounting Holes

Cells Temp. = 25°C

Incident Irrd. = 1000 W/m²

Incident Irrd. = 800 W/m²

Incident Irrd. = 600 W/m²

Incident Irrd. = 400 W/m²

Incident Irrd. = 200 W/m²

CURRENT [A]

VOLTAGE [V]

IEC	61215, 61730, 61701
UL	61730

Product Type	MSE _{XXX} SX9R (XXX = P _{max})				
Power Output	P _{max}	W _p	390	395	400
Module Efficiency		%	19.4	19.7	19.9
Tolerance		%	0/+3	0/+3	0/+3
Short Circuit Current	I _{sc}	A	11.19	11.24	11.31
Open Circuit Voltage	V _{oc}	V	45.04	45.18	45.33
Rated Current	I _{mp}	A	10.63	10.68	10.79
Rated Voltage	V _{mp}	V	36.68	36.99	37.07
Fuse Rating		A	20	20	20
System Voltage		V	1,000	1,000	1,000

Normal Operating Cell Temperature (NOCT)	43.75°C (±3.7%)
Temperature Coefficient of Pmax	-0.367%/°C
Temperature Coefficient of Voc	-0.259%/°C
Temperature Coefficient of Isc	0.033%/°C

Maximum System Voltage	1,000Vdc
Operating Temperature Range	-40°F to 185°F (-40°C to +85°C)
Maximum Series Fuse Rating	20A
Fire Safety Classification	Type 1*
Front & Back Load (UL Standard)	Up to 5,400 Pa front and 3,600 Pa back load, Tested to UL 61730
Hail Safety Impact Velocity	25mm at 23 m/s

*Mission Solar Energy uses quality sourced materials that result in a Type I fire rating. Please note, the 'Fire Class' Rating is designated for the fully-installed PV system, which includes, but is not limited to, the module, the type of mounting used, pitch and roof composition.

Solar Cells	P-type mono-crystalline silicon
Cell Orientation	66 cells (6x11)
Module Dimension	1,907mm x 1,054mm x 40mm
Weight	48.5 lbs. (22 kg)
Front Glass	3.2mm tempered, low-iron, anti-reflective
Frame	40mm Anodized
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP67 with 3 bypass-diodes
Cable	1.2m, Wire 4mm2 (12AWG)
Connector	Staubli PV-KBT4/6II-UR and PV-KST4/6II-UR MC4, Renhe 05-8

Container Feet	Ship To	Pallet	Panels	390W Bin
53'	Most States	30	780	304.20 kW
Double Stack	CA	26	676	263.64 kW

Weight	Height	Width	Length
1,300 lbs.	47.56 in	46 in	77 in
(572 kg)	(120.80 cm)	(116.84 cm)	(195.58 cm)

www.missionsolar.com | info@missionsolar.com

PROJECT ID: 4212025-9607

123456789

FLORIDA STATE ENERGY

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)

IOB-60-2-US

IOBPLUS-72-2-US

Commonly used module pairings ¹	W	235 – 350	235 – 440
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell and 72-cell/144 half-cell
MPPT voltage range	V	27 – 37	29 – 45
Operating range	V	25 – 48	25 – 58
Min/max start voltage	V	30 / 48	30 / 58
Max input DC voltage	V	50	60
Max DC current ² [module Isc]	A		15
Overvoltage class DC port			II
DC port backfeed current	mA		0
PV array configuration	1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit		

OUTPUT DATA (AC)

IOB-60-2-US

IOBPLUS-72-2-US

Peak output power	VA	245	300
Max continuous output power	VA	240	290
Nominal (L-L) voltage/range ³	V	240 / 211 – 264	
Max continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 – 68	
Max units per 20 A (L-L) branch circuit ⁴		16	13
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.5	97.6
CEC weighted efficiency	%	97	97
Night-time power consumption	mW	60	

MECHANICAL DATA

Ambient temperature range	–40°C to +60°C (–40°F to +140°F)
Relative humidity range	4% to 100% (condensing)
DC Connector type	MC4
Dimensions (HxWxD)	212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection – no fans
Approved for wet locations	Yes
Acoustic noise at 1 m	<60 dBA
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environ. category / UV exposure rating	NEMA Type 6 / outdoor

COMPLIANCE

	CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01
Certifications	This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64–218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.

(1) No enforced DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility> (2) Maximum continuous input DC current is 10.6A (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-D6-0002-01-EN-US-2021-10-19

MOCK MELVIN E JR

9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES

PROJECT ID: 4212025-9607

CONTRACTOR: -

FLORIDA STATE ENERGY

6901 TPC DRIVE STE 650,
ORLANDO, FL 32822

(407) 718-9980

ENGINEER: CA33343

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1646 W SNOW AVE 9 TAMPA,
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RYAN S GITTENS

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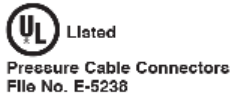
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INSULATION-PIERCING TAP CONNECTORS | CONECTORES DE DERIVACIÓN QUE PERFORAN EL AISLAMIENTO

Suitable for use on the line side of service equipment. Adecuado para uso en el lado de la línea del equipo de servicio.

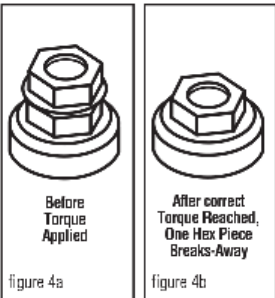
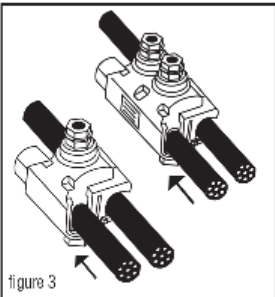
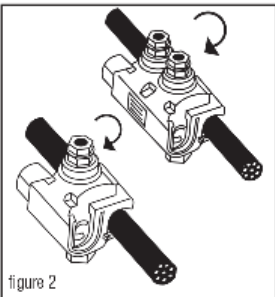
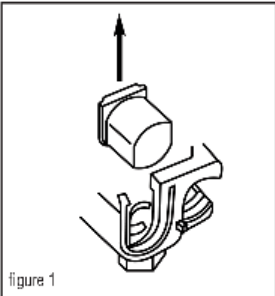
Installation Instructions:

Warning

Improperly installed electrical wiring can be dangerous and cause electrical fires. The connector chosen must be sized to the wires being used. Consult local building code before doing any electrical work. For assistance, refer to an instructional book or consult a qualified electrician.

Warning

Contact with electricity can cause serious injury or death. Use on insulated cable only. [RHH, RHW(-2), THHN, THHW, THW, THWN, USE, XHHW(-2)]. Consult factory for other insulation types. If the installation is to be made on an energized run, the tap conductor must be under no load and must not be grounded. Use electrically insulated gloves. De-energize the run cable if there are any questions of these conditions being met.



- Determine the direction for the tap conductor to exit and discard one end cap. **See figure 1.**
- Position the main (or feeder) side of the connector around the run cable and tighten the bolt finger tight. **See figure 2.** If required, loosen the bolt slightly to allow the connector to open completely. **DISASSEMBLY NOT RECOMMENDED.** The plastic "Turbo" spacer holds the connector open which eases installation and ensures proper connections.
- Cut the end of the tap cable squarely. **DO NOT STRIP CABLE INSULATION.**
- Insert the tap cable into the tap side of the connector until it is seated in the remaining end cap. **See figure 3.**
- Continue tightening the torque regulating bolt with a standard box or socket wrench until the torque regulating piece breaks away. If the connector has two (2) assembly bolts, alternately tighten until the hexagonal torque devices break away. **See figures 4a & 4b.** Note that the plastic "turbo" spacer on the side will also break. To make the installation even easier and to relieve torque from the cables, a second wrench can be used on the hexagonal piece on the bottom of the connector.

DO NOT use gripping type pliers, pipe, open ended or adjustable wrenches as these may damage the hexagonal torque regulating device. A torque wrench is not required.

MAKE SURE ONLY THE TOP HEXAGONAL TORQUE DEVICE OF THE BOLT HEAD IS USED FOR ASSEMBLY. THE SECOND HEX PIECE (CLOSER TO THE BODY OF THE CONNECTOR) IS USED FOR DISASSEMBLY.

Note: The torque regulating bolt ensures the correct torque is applied to the conductors without using a torque wrench. Important information such as run and tap ranges, voltage ratings and material/temperature ratings is marked on the connector.

Instalación Instrucciones:

Advertencia

Los cables eléctricos mal instalados pueden ser peligrosos y provocar incendios. El conector escogido debe ser de un tamaño adecuado para los cables que se utilicen. Consulte los códigos de construcción locales antes de efectuar trabajos eléctricos. Si necesita ayuda, consulte un libro de instrucciones o consulte con un electricista capacitado.

Advertencia

Use sólo en cable aislado. [RHH, RHW(-2), THHN, THHW, THW, THWN, USE, XHHW(-2)]. Consulte con la fábrica para obtener información sobre otros tipos de aislamiento. Si se va a hacer la instalación sobre un cable con corriente el conductor derivado debe estar libre de carga y no debe estar aterado. Use guantes con aislamiento eléctrico. Quite la corriente al cable del cual se hace la derivación si no se pueden cumplir estas condiciones. El contacto con electricidad puede producir lesiones graves o mortales.

- Determine la dirección en la que el conductor derivado saldrá y deseche la tapa terminal sobrante. **Vea la ilustración 1.**
- Coloque el lado principal (o de alimentación) del conector alrededor del cual se hace la derivación y apriete firmemente el dedo del perno. **Vea la ilustración 2.** Si hace falta, afloje el perno ligeramente para permitir que el conector se abra completamente. **NO ES RECOMENDABLE DESARMAR EL CONECTOR.** El espaciador "turbo" de plástico mantiene al conector abierto, lo cual facilita la instalación y asegura que las conexiones se hagan correctamente.
- Corte el extremo del cable de derivación perpendicularmente a su eje. **NO PELE EL AISLAMIENTO DEL CABLE.**
- Inserte el cable de derivación en el lado de derivación del conector hasta que tope contra la tapa terminal que queda. **Vea la ilustración 3.**
- Continúe apretando este perno que regula la torsión con una llave estándar o de cubo hasta que la pieza que regula la torsión se parta y se separe. Si el conector tiene dos (2) pernos de ensamble, apriételes alternativamente hasta que el dispositivo de regulación de torsión se parta. **Vea la ilustración 4a y 4b.** Observe que el espaciador "turbo" de plástico en el costado también se fracturará. Para hacer esta instalación aún más fácil y para aliviar la torsión de los cables, se puede usar una segunda llave sobre la pieza hexagonal al fondo del conector.

NO USE alicates de presión, llaves de turbo, llaves comunes o ajustables ya que éstas pueden dañar el dispositivo hexagonal que regula la torsión. No se requiere una llave de torsión.

ASEGÚRESE QUE SE USE, PARA EL ENSAMBLADO, SÓLO EL DISPOSITIVO SUPERIOR DE REGULACIÓN DE TORSIÓN DE LA CABEZA DEL PERNO. LA SEGUNDA PIEZA HEXAGONAL (LA MÁS CERCANA AL CUERPO DEL CONECTOR) SE USA SÓLO PARA DESARMAR EL CONECTOR.

Nota: El perno regulador de torsión garantiza la aplicación de la torsión correcta a los conductores sin usar una llave de torsión. La información importante de longitud de cable pelado y de toma, las clasificaciones de materiales y temperatura está marcada en el conector.

B-TAP® INSULATION PIERCING TAP CONNECTORS TORQUE AND CURRENT RATINGS

(Solid and/or Stranded)

CATALOG#	MAIN	TAP	NOMINAL TORQUE	TAP CURRENT RATING (IN AMPS)*
BTC2/0-14	2/0-4	10-14+	80 IN. LBS.	40
BTC1/0-10	1/0-8	2-10++	80 IN. LBS.	130
BTC4/0-10	4/0-3	2-10+++	125 IN. LBS.	130
BTC4/0-6	4/0-2	1/0-6	160 IN. LBS.	170
BTC4/0-2	4/0-2	4/0-2	160 IN. LBS.	260
BTC250-6	250-4	4/0-6	160 IN. LBS.	260
BTC250-4	250-1	3/0-4	160 IN. LBS.	225
BTC250-2	250-1/0	4/0-2	160 IN. LBS.	260
BTC350-1/0	350-1/0	350-1/0	330 IN. LBS.	350
BTC500-4	500-2/0	4/0-4	330 IN. LBS.	260
BTC500-1/0	500-4/0	350-1/0	330 IN. LBS.	350
BTC500-14	750-3/0	10-14 +++	80 IN. LBS.	40
BTC750-250	750-250	500-250	330 IN. LBS.	430

+10-14 Cu SOLID/STRANDED; 10-12 Al SOLID/STRANDED
++2-10 Cu SOLID/STRANDED; 2-10 Al STRANDED
+++2-10 Cu SOLID/STRANDED; 2-8 Al STRANDED
++++10-14 Cu SOLID/STRANDED; 10-12 Al STRANDED

Full line is 600V dual-rated, 194°F(90°C)

* Based on NEC Table 310-16 1996 (Not more than 3 insulated conductors in a raceway at ambient temperature of 30° C) for the largest tap wire size.



WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.



ADVERTENCIA: Cáncer y Daño Reproductivo - www.P65Warnings.ca.gov.

One year limited warranty. See [idealind.com](http://www.idealind.com) for more information.

Garantía limitada de un año. Visite www.idealind.com para obtener detalles de la garantía.



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Sycamore, IL, U.S.A.
800-435-0705 • www.idealind.com

PA-0304-1

F	MOCK MELVIN E JR	CONTRACTOR: -	ENGINEER: CA33343	 Ryan S Gittens 2025.05.08 14:37:47 -04'00' RYAN S GITTENS PE90605	DATE	BY	VER	DESCRIPTION	D4 PAPER: ARCHB SCALE:
	9607 U.S. 27 FORT WHITE FLORIDA 32038 UNITED STATES	FLORIDA STATE ENERGY	 1646 W SNOW AVE 9 TAMPA, FL 33606		05.08.25	BF	1	INITIAL DESIGN	
		6901 TPC DRIVE STE 650, ORLANDO, FL 32822							
	PROJECT ID: 4212025-9607	(407) 718-9980							

NEW

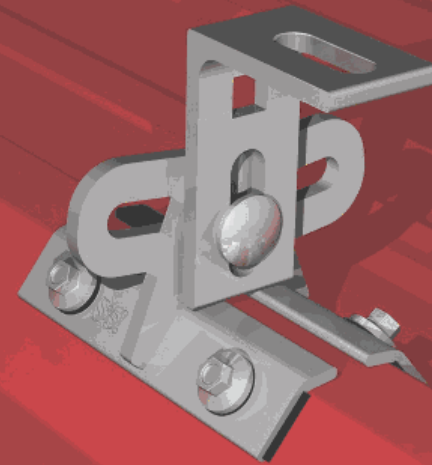
ProteaBracket™

A versatile bracket for mounting solar PV to trapezoidal roof profiles

Our pre-applied EPDM gasket with peel and stick adhesive makes installation a snap, ensuring accurate and secure placement the first time.

With no messy sealants, faster installation, and a weather-proof fit, ProteaBracket offers you the most versatile solar attachment solution available.

**ProteaBracket* can be used for
rail mounting or "direct-attach"
with S-5! PVKIT™**



- **34% lighter - saves on shipping**
- **Stronger L-Foot™**
- **Load-tested for engineered application**
- **Corrosion-resistant materials**
- **Adjustable - Fits rib profiles up to 3"**
- **Peel-and-Stick prevents accidental shifting during installation**
- **Fully pre-assembled**
- **25-year warranty***

*See www.S-5.com for details.

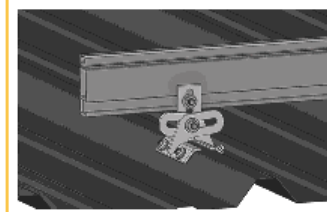
888-825-3432 | www.S-5.com

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal rib, exposed-fastened metal roof profiles!

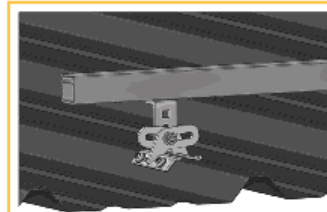
For design assistance, ask your distributor, or visit **www.S-5.com** for the independent lab test data that can be used for load-critical designs and applications. Also, please visit our website for more information including metallurgical compatibilities and specifications.

S-51® holding strength is unmatched in the industry.

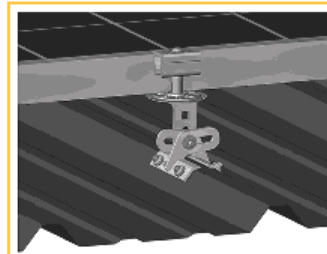
Side Mount Rail



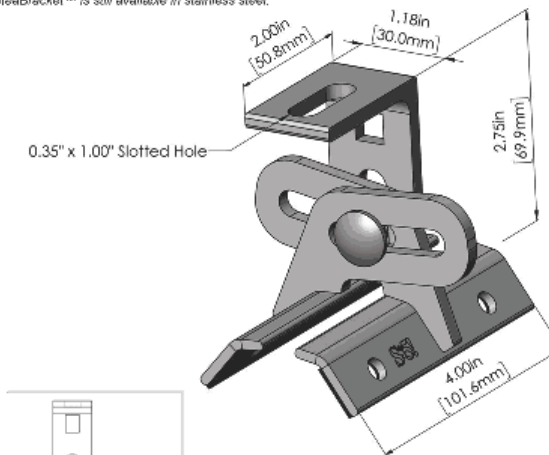
**Bottom
Mount Rail**



w/S-5!
PVKIT™
(rail-less)



ProteaBracket™ is still available in stainless steel



**ProteaBracket fits profiles
up to 3 inches**

INSTALLATION:

No surface preparation needed. (1) Wipe away excess oil and debris. (2) Peel off adhesive release paper. (3) Align and mount bracket directly onto crown of panel. (4) Cure ProteaBracket through pre-punched holes, using point 5-51 screws.



*ProteaBracket™ and the S-5! PVKIT™ 2.0
mounted on a trapezoidal roof profile*

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Distributed by

Ryan S
Gittens
2025.05.08
14:37:47
-04'00'
S GITTENS
E90605

DAVID A. SMITH
STATE OF TEXAS
LICENSE NO. 58605
MECHANICAL ENGINEERING

ENGINEER: CA33343

 ECUIP
ENGINEERING

1646 W SNOW AVE 9 TAMPA,
FL 33606

PROJECT ID: 4212025-9607

CONTRACTOR:	-
	FLORIDA STATE ENERGY
	6901 TPC DRIVE STE 650, ORLANDO, FL 32822
	(407) 718-9980

ENGINEER: CA33343

DATE	BY	VER	DESCRIPTION
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05.08.25	BF	1	INITIAL DESIGN
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D5

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5.2.4.1 Load Duration Factor (C_D)

Lumber strength is affected by the cumulative duration of maximum variable loads experienced during the life of the structure. In other words, strength is affected by both the load intensity and its duration (i.e., the load history). Because of its natural composition, wood is better able to resist higher short-term loads (i.e., transient live loads or impact loads) than long-term loads (i.e., dead loads and sustained live loads). Under impact loading, wood can resist about twice as much stress as the standard 10-year load duration (i.e., "normal duration") to which wood bending stress properties are normalized in the NDS.

When other loads with different duration characteristics are considered, it is necessary to modify certain tabulated stresses by a load duration factor (C_D) as shown in Table 5.3. Values of the load duration factor, C_D , for various load types are based on the total accumulated time effects of a given type of load during the useful life of a structure. C_D increases with decreasing load duration.

Where more than one load type is specified in a design analysis, the load duration factor associated with the shortest duration load is applied to the entire combination of loads. For example, for the load combination, *Dead Load + Snow Load + Wind Load*, the load duration factor, C_D , is equal to 1.6.

TABLE 5.3 Recommended Load Duration Factors for ASD

Load Type	Load Duration	Recommended C_D Value
Permanent (dead load)	Lifetime	0.9
Normal	Ten years	1.0
Occupancy (live load) ¹	Ten years to seven days	1.0 to 1.25
Snow ²	One month to seven days	1.15 to 1.25
Temporary construction	Seven days	1.25
Wind and seismic ³	Ten minutes to one minute	1.6 to 1.8
Impact	One second	2.0

Source: Based on NDS•2.3.2 and NDS•Appendix B (AF&PA, 1997).

Notes:

¹The NDS uses a live load duration of ten years ($C_D = 1.0$). The factor of 1.25 is consistent with the time effect factor for live load used in the new wood LRFD provisions (AF&PA, 1996a).

²The NDS uses a snow load duration of one month ($C_D = 1.15$). The factor of 1.25 is consistent with the time effect factor for snow load used in the new wood LRFD provisions (AF&PA, 1996a).

³The NDS uses a wind and seismic load duration of ten minutes ($C_D = 1.6$). The factor may be as high as 1.8 for earthquake loads which generally have a duration of less than 1 minute with a much shorter duration for ground motions in the design level range.

Fastener Loads for Plywood – Screws

Withdrawal:

Tables 3 and 4 present average ultimate withdrawal loads for wood and sheet metal screws in plywood-and-metal joints, based on analysis of test results. Wood screws are threaded for only 2/3 of their length. Sheet metal screws typically have higher ultimate load than wood screws in the smaller gages because of their full-length thread.

Values shown in Table 3 for wood screws are based on 1/4-inch protrusion of the wood screw from the back of the panel. This was to assure measurable length of thread embedment in the wood, since the tip of the tapered wood screw may be smaller than the pilot hole. This was not a factor for sheet metal screws due to their uniform shank diameters.

TABLE 3 WOOD AND SHEET METAL SCREWS: METAL-TO-PLYWOOD CONNECTIONS^(a,b)

Depth of Threaded Penetration (inch)	Average Ultimate Withdrawal Load (lbf)					
	Screw Size					
	#6	#8	#10	#12	#14	#16
3/8	150	180	205	—	—	—
1/2	200	240	275	315	350	—
5/8	250	295	345	390	440	—
3/4	300	355	415	470	525	—
1	—	—	—	625	700	775
1-1/8	—	—	—	705	790	875
2-1/4	—	—	—	—	1580	—

(a) Plywood was C-D grade with exterior glue (all plies Group 1).

(b) Values are not design values.

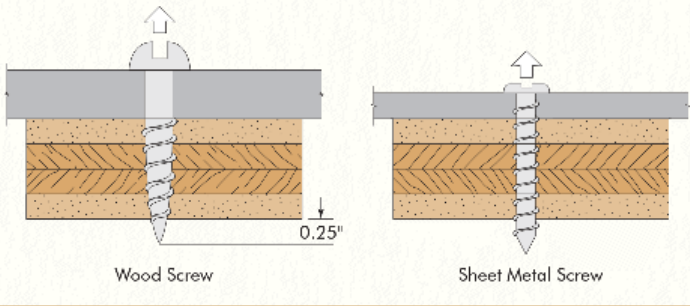
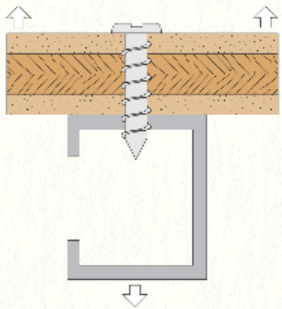


TABLE 4 SHEET METAL SCREWS: PLYWOOD-TO-METAL CONNECTIONS^(a,b)

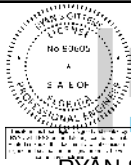
Framing	Plywood Performance Category	Average Ultimate Withdrawal Load (lbf) ^(a)				
		#8	#10	#12	#14	1/4"-20 Self Tapping Screw
0.080-inch Aluminum	1/4	130	150	170	180	220
	1/2	350	470	500	520	500
	3/4	660	680	790	850*	790*
0.078-inch Galvanized Steel (14 gage)	1/4	130	150	170	180	220
	1/2	350	470	500	520	500
	3/4	660	680	800	900	850

(a) Plywood was A-C EXT (all plies Group 1).

(b) Values are not design values. Loads denoted by an asterisk(*) were limited by screw-to-metal-framing strength; others were limited by plywood strength.



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RAIL SYSTEM

Instant Bonding

The N-S Bonding Jumper bonds row to row with no tools.

One Clamp Anywhere

The Multi-Clamp works as mid- or end-clamp, and fits standard 30-40mm frames.

Lifetime Wire Management

Open rail channel holds and protects wires. Clamps won't pinch wires after tightening.

Bonding Structural Splice

Connect rails instantly, without tools, interference or limitations.

Next-Level Solar Mounting

A complete system for hassle-free rooftop installation, from watertight mounts to lifetime wire management.



Simplicity

1/2" socket for everything. One clamp for mid or end. No tool splicing and bonding. Easy wire management.



Code Compliant

UL 2703 listed
LTR-AE-001-2012 listed
Class A fire rating for any slope
ASCE 7-16 PE Certified



Premium Aesthetics

The narrowest panel gap available. Optional Hidden End Clamps and End Caps provide a flush look on the edge of the array.



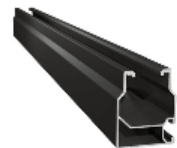
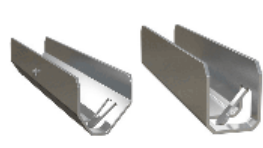
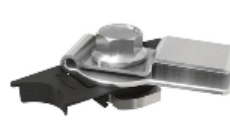
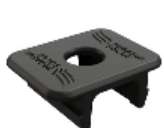
Watertight for Life

Secured on industry-leading Pegasus Mounts, for composite shingle and tile roofs. Backed by a 25-year warranty.

Pegasus Solar Inc | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | www.pegasussolar.com



RAIL SYSTEM

 Pegasus Rail Available in 14' and 7' lengths for easy layout and shipping. Open-channel design holds MC4 connectors, PV wire and trunk cables. Black and Mill finish.	 Pegasus Max Rail Maximum-strength design. Meets specifications for high snow-load and hurricane zones. Black and Mill finish.	 Splice and Max Splice Installs by hand. Works over mounts. Structurally connects and bonds rails automatically; UL2703 listed as reusable.	 Dovetail T-bolt Dovetail shape for extra strength. Uses 1/2" socket.
 Multi-Clamp Fits 30-40mm PV frames, as mid- or end-clamp. Twist-locks into position; doesn't pinch wires in rail. Bonds modules to rail; UL2703 listed as reusable.	 Hidden End Clamp Offers premium edge appearance. Preinstalled pull-tab grips rail edge, allowing easy, one-hand installation. Tucks away for reuse.	 Ground Lug Holds 6 or 8 AWG wire. Mounts on top or side of rail. Assembled on MLPE Mount. UL2703 listed as reusable.	 N-S Bonding Jumper Installs by hand, eliminates row-to-row copper wire. UL2703 listed as reusable only with Pegasus Rail.
 MLPE Mount Secures and bonds most micro-inverters and optimizers to rail. Connectors and wires easily route underneath after installation. UL2703 listed as reusable.	 Cable Grip Secures four PV wires or two trunk cables. Stainless-steel backing provides durable grip. Eliminates sagging wires.	 Wire Clip Hand operable. Holds wires in channel. Won't slip.	 End Cap and Max End Cap Fits flush to PV module and hides row or angled cuts. Hidden drain quickly clears water from rail.

- Certifications:**
- UL 2703, Edition 1
 - LTR-AE-001-2012
 - ASCE 7-16 PE certified
 - Class A fire rating for any slope roof





FREE PEGASUS SOLAR Design Tool

Quickly calculate the most efficient layout, spans and materials needed to suit your job. Visit the Pegasus Customer Portal: pegasussolar.com/portal

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LOAD		SPAN			
SNOW (PSF)	WIND (MPH)	32"	4'	6'	8'
0	120				
	160				
	190				
15	140				
	160				
	190				
30	160				
	190				
	190				
45	190				
	190				
	190				
70	190				
	190				
	190				
110	190				
	190				
	190				

For reference only. Spans above are calculated using ASCE 7-16 for a Gable Roof, Exposure Category B, 7-20deg roof angle, 30ft mean roof height with non-exposed modules. For PE certified span tables, visit www.pegasussolar.com/spans.

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