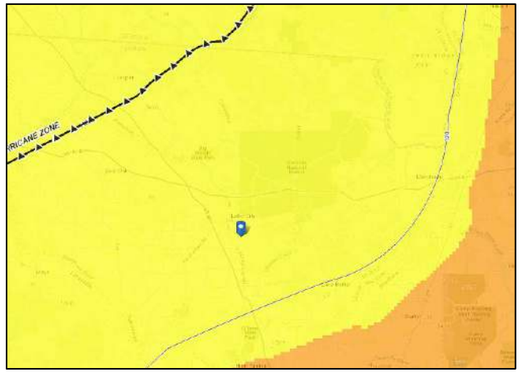
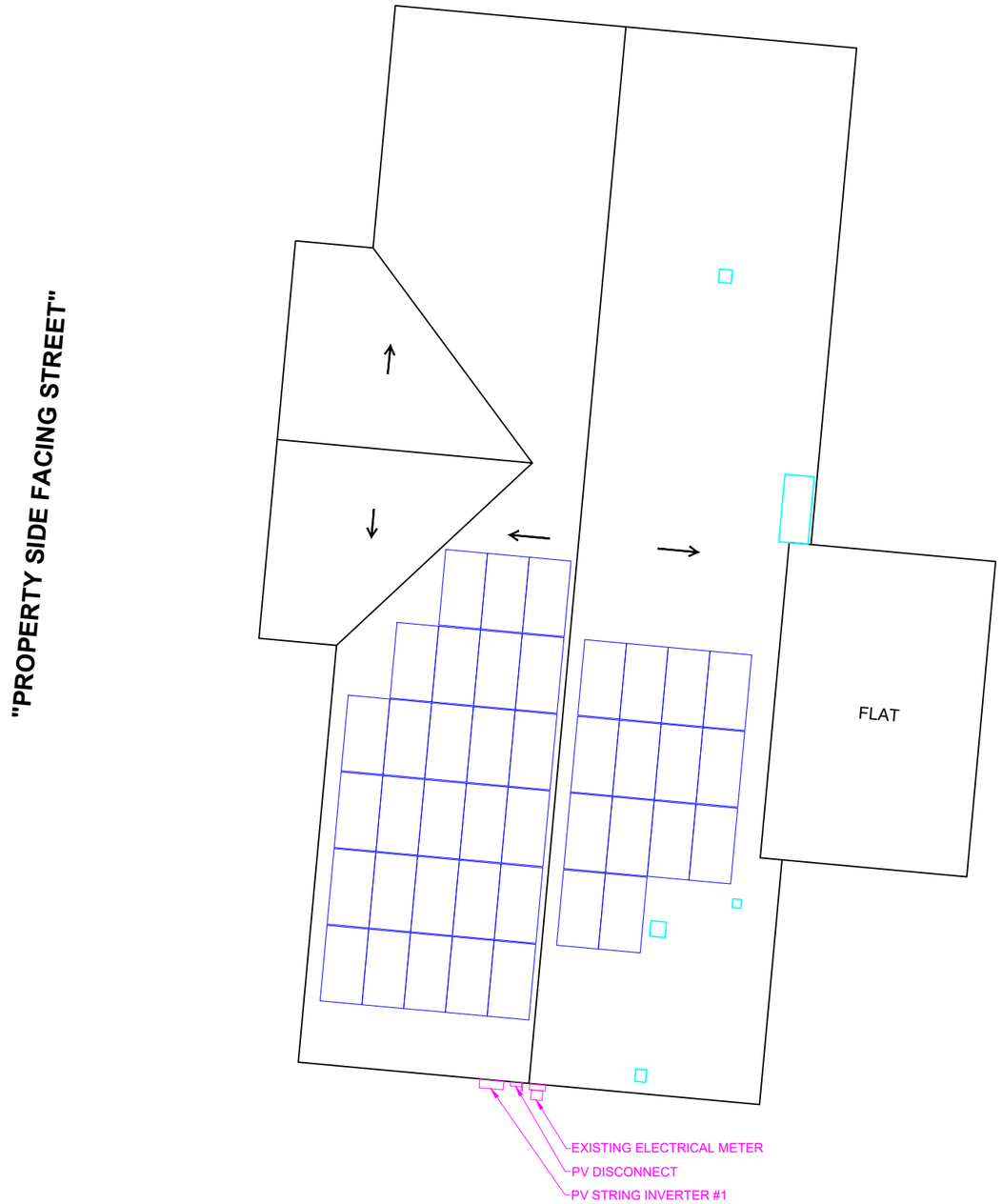


2 LOCATION MAP / WIND ZONES
N.T.S.

3 IRRADIANCE MAP
N.T.S.

4 3D RENDERING
N.T.S.

NORTH



1 ROOF PLAN VIEW / BOS LOCATION
N.T.S.

PROJECT DESCRIPTION

SYSTEM CAPACITY: 13.94 KW DC / 11.4 KW AC

PV PANELS: (41) SIL-340 NL (60 CELLS) BY SILFAB

OPTIMIZERS: (41) P340 BY SOLAREDGE

INVERTER: (1) SE11400H RGM BY SOLAREDGE

RACKING SYSTEM: CROSSRAIL SYSTEM 44-XL BY K-2

PROJECT INFORMATION

PROJECT LATITUDE	30.14536	MIN AMBIENT TEMP	1 ° C
PROJECT LONGITUDE	-82.60685	MAX AMBIENT TEMP	35 ° C
AHJ	COLUMBIA COUNTY	WIND EXPOSURE	C
		MAX WIND SPEED	118 MPH

DRAWINGS INDEX

GENERAL NOTES

PER FL. STATUTE 377.705 (REVISED 7/1/2017), I RAFAEL A. GONZALEZ SOTO, P.E. 83104 AN ENGINEER LICENSED PURSUANT TO CHAPTER 471, CERTIFY THAT THE PV ELECTRICAL SYSTEM AND ELECTRICAL COMPONENTS ARE DESIGNED AND APPROVED USING THE STANDARDS CONTAINED IN THE MOST RECENT VERSION OF THE FLORIDA BUILDING CODE.

APPLICABLE CODES: 2020 FLORIDA BUILDING CODE 7TH EDITION, ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES, NEW ELECTRICAL CODE, NFPA 70 AND NEC 2017.

ALL WIND DESIGN CRITERIA AND PARAMETERS ARE FOR HIP AND GABLE RESIDENTIAL ROOFS, CONSIDERING FROM A 7° TO A MAXIMUM 27° (2/12 TO A MAXIMUM 6/12 PITCH ROOF IN SCHEDULE. ALL RESIDENTIAL ROOFS SHALL NOT EXCEED 30'-0" MEAN ROOF HEIGHT. ROOF SEALANTS SHALL CONFORM TO ASTM C920 AND ASTM 6511, AND IT IS RESPONSIBILITY OF THE CONTRACTOR TO PILOT FILL ALL HOLES.

CONTRACTOR SHALL ENSURE ALL ROOF PENETRATIONS TO BE INSTALLED AND SEALED PER 2020 FLORIDA BUILDING CODE 7TH EDITION OR LOCAL GOVERNING CODE.

ALL WIRING METHODS AND INSTALLATION PRACTICES SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE (NEC) 2017, LOCAL STATE CODES, AND OTHER APPLICABLE LOCAL CODES. MEANS SHALL BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER CONDUCTORS IN THE BUILDING. CONNECTORS TO BE TORQUED PER DEVICE LISTING, OR MANUFACTURERS RECOMMENDATIONS. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER GROUNDING.

REQUIRED SAFETY SIGNS AND LABELS SHALL BE PERMANENTLY ATTACHED BY ADHESIVE, OR OTHER MECHANICAL MEANS, LABELS SHALL COMPLY WITH ARTICLE 690 VI OF THE NEC 2017 OR OTHER APPLICABLE STATE AND LOCAL CODES. SEE LABELS AND MARKING PAGE FOR MORE INFORMATION.

RACKING ROOF MOUNT SYSTEM SHALL BE INSTALLED FOLLOWING MANUFACTURERS INSTRUCTION SPEC'S, INCLUDING ALL GROUNDING WEEB CLIPS, GROUND LUGS, AND RAIL SPLICE KITS FOR ELECTRICAL CONTINUITY.

MECAWIND TOOL IS BASED ON THE C&C WIND LOADS FOR ENCLOSED BUILDINGS. DESIGN WIND PRESSURES ARE CALCULATED USING ASCE 7-16 EQUATION 30.6-1. ALL NOTES IN FIGURES ASCE 7-16 30.4-1 AND 30.4-2(A,B AND /67C) HAVE BEEN INCORPORATED. MEAN ROOF HEIGHT MUST BE LESS THAN 60 FEET.

DOCUMENT CONTROL	DATE	CAD	QC
ISSUED FOR PERMIT	03-18-2021	DP	JG

REV	DESCRIPTION	DATE	CAD	QC

ENGINEER CONTACT INFORMATION
ENGIPARTNERS LLC
C.A. 32661
255 GIRALDA AVE
CORAL GABLES, FL 33134
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833 - 888 - 3644

ENGINEERING STAMP
RAFAEL A. GONZALEZ SOTO LICENSE No. 83104 STATE OF FLORIDA PROFESSIONAL ENGINEER
Digitally signed by Rafael A Gonzalez Soto
Date: 2021.03.22 07:40:19 -04'00'

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

CONTRACTOR LOGO
TITAN SOLAR POWER

CUSTOMER: MOSES TOWN

PROJECT ADDRESS: 205 SE JONATHAN WAY, LAKE CITY FL 32025

PARCEL NUMBER: 15-4S-17-08360-184

SHEET NAME: COVER SHEET

PROJECT ID: TSP68549

ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE

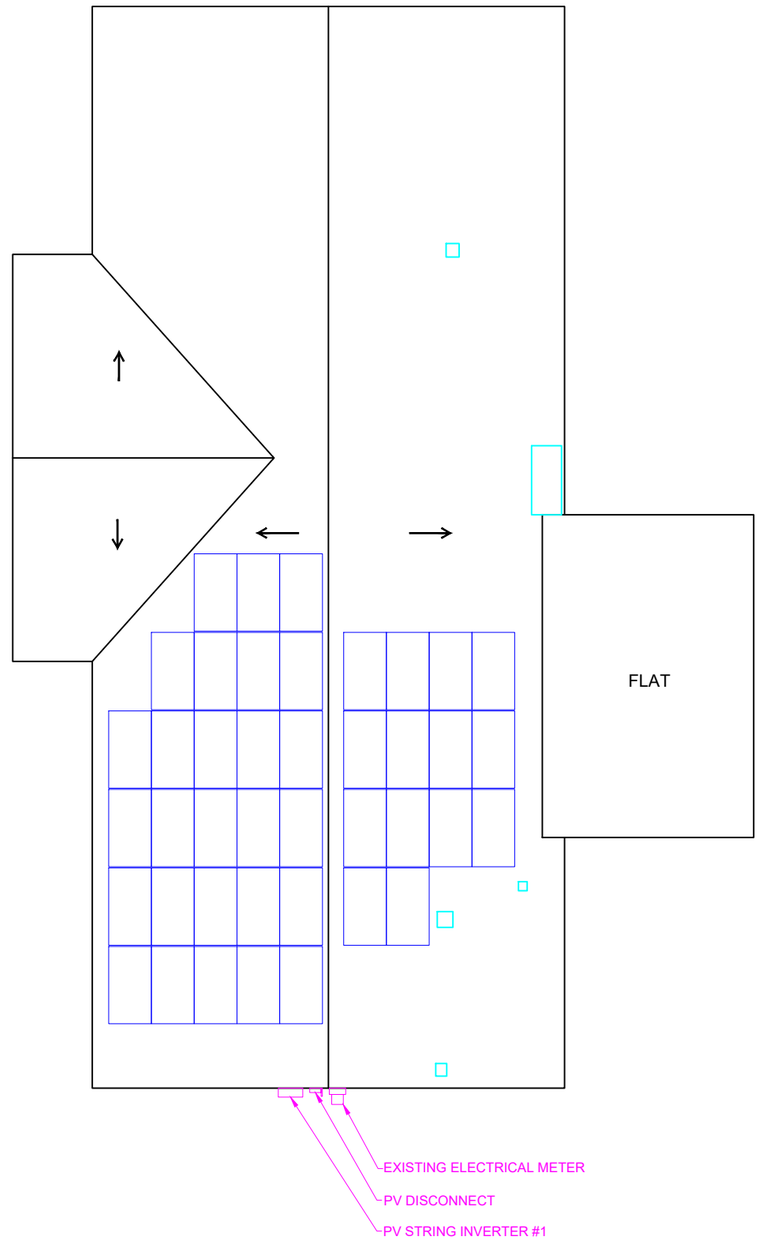
DATE: 03-16-2021

SHEET TITLE: C-1

SHEETS: 1 OF 9

NORTH

"PROPERTY SIDE FACING STREET"



1 SAFETY PLAN
N.T.S.

LOCATION OF NEAREST URGENT CARE FACILITY

NAME:

ADDRESS:

PHONE NUMBER:

NOTES:

1. INSTALLERS SHALL DRAW IN DESIGNATED SAFETY AREA AROUND HOME
2. INSTALLERS SHALL UPDATE NAME ADDRESS AND PHONE NUMBER OF NEAREST URGENT CAR FACILITY RELATIVE TO THE SITE BEFORE STARTING WORK

DOCUMENT CONTROL	DATE	CAD	QC
ISSUED FOR PERMIT	03-18-2021	DP	JG

REV	DESCRIPTION	DATE	CAD	QC

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#EC13008093

CONTRACTOR LOGO

TITAN SOLAR POWER

CUSTOMER: MOSES TOWN

PROJECT ADDRESS: 205 SE JONATHAN WAY
LAKE CITY FL 32025

PARCEL NUMBER: 15-4S-17-08360-184

SHEET NAME: SAFETY PLAN

PROJECT ID: TSP68549

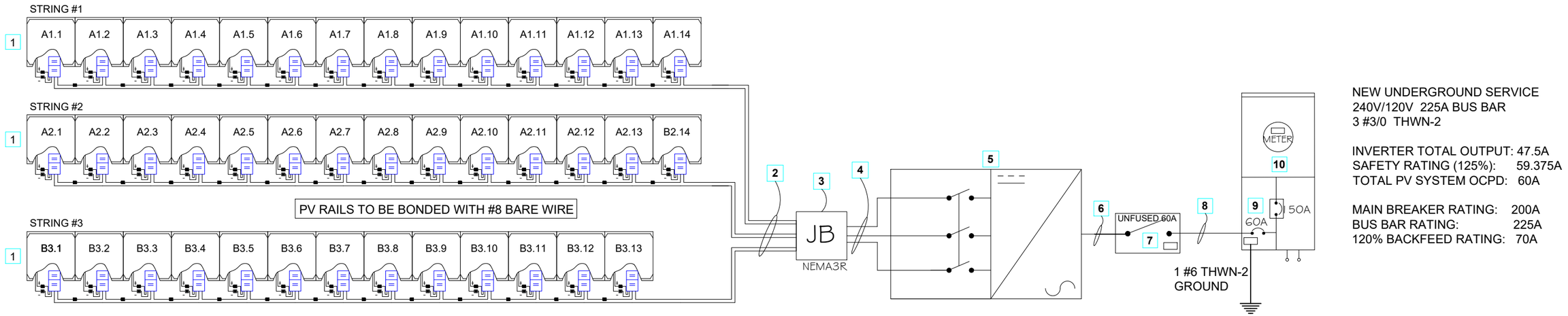
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE

DATE: 03-16-2021

SHEET TITLE: C-2

SHEETS: 2 OF 9

	WIRE SIZES, QUANTITY & TYPE			RACEWAY SIZE, TYPE, LOCATION & INFO.			WIRE AMPACITY CALCULATIONS							ADDITIONAL INFORMATION			
WIRE TAG	CONDUCTOR QTY. SIZE & TYPE	NEUTRAL QTY. SIZE & TYPE	GROUND QTY. SIZE & TYPE	RACEWAY SIZE & TYPE	RACEWAY LOCATION	RACEWAY HEIGHT ABOVE ROOF	OUTPUT CURRENT	125% OF OUTPUT CURRRENT	MIN OCPD	WIRE DE-RATED CALCULATION				DIST.	VOLTAGE	VOLTAGE DROP %	CONDUIT FILL %
										WIRE RATING	AMBIENT TEMP	# OF COND.	FINAL AMPACITY				
DC (BEFORE JB)	(6) #10 AWG PV WIRE	N/A	(1) #8 AWG BARE COPPER	NOT APPLICABLE	UNDER ARRAY	1/2" TO 3-1/2"	15A	18.8A	20A	40A X 0.76 X 1 = 30.4 A				10 FT.	350V	0.11%	6.4%
DC (AFTER JB)	(6) #10 AWG THWN-2	N/A	(1) #8 AWG THWN-2	3/4" EMT CONDUIT	ABOVE ROOF	1/2" TO 3-1/2"	15A	18.8A	20A	40A X 0.76 X 0.8 = 24.3 A				20 FT.	350V	0.21%	8.1%
AC (INVERTER TO METER)	(2) #6 AWG THWN-2	(1)#6AWG THWN-2	(1) #8 AWG THWN-2	3/4" EMT CONDUIT	EXTERIOR WALL	"N/A"	47.5A	59.375A	60A	75A X 0.76 X 1 = 57.0 A				5 FT.	240V	0.1%	7.7%



NEW UNDERGROUND SERVICE
240V/120V 225A BUS BAR
3 #3/0 THWN-2

INVERTER TOTAL OUTPUT: 47.5A
SAFETY RATING (125%): 59.375A
TOTAL PV SYSTEM OCPD: 60A

MAIN BREAKER RATING: 200A
BUS BAR RATING: 225A
120% BACKFEED RATING: 70A

1 ONE LINE RISER DIAGRAM

N.T.S.

LEGEND:

1	(41) SIL-340 NL (60 CELLS) BY SILFAB REFER TO D-1 SHEET	2	6 #10 PV WIRE 1 #8 BARE WIRE GROUND 3/4" EMT CONDUIT	3	NEMA3R JUNCTION BOX
4	6 #10 THWN-2 1 #8 THWN-2 GROUND 3/4" EMT CONDUIT	5	SE11400H-RGM BY SOLAREDGE REFER TO D-3 SHEET	6	2 #6 L1,L2 THWN-2 1 #8 THWN-2 GROUND 1 #6 THWN-2 NEUTRAL 3/4" EMT CONDUIT
7	PV SYSTEM DISCONNECT	8	2 #6 L1,L2 THWN-2 1 #8 THWN-2 GROUND 1 #6 THWN-2 NEUTRAL 3/4" EMT CONDUIT	9	PV INTERCONNECTION POINT
10	NEW ELECTRICAL SERVICE	11	NOT USED	12	NOT USED

DOCUMENT CONTROL	DATE	CAD	QC
ISSUED FOR PERMIT	03-18-2021	DP	JG

REV	DESCRIPTION	DATE	CAD	QC

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(813) 982 -9001
#EC13008093

CONTRACTOR LOGO
TITAN SOLAR POWER

CUSTOMER: MOSES TOWN
PROJECT ADDRESS: 205 SE JONATHAN WAY, LAKE CITY FL 32025
PARCEL NUMBER: 15-4S-17-08360-184

SHEET NAME: ONE LINE RISER DIAGRAM

PROJECT ID:	ENGINEER OF RECORD:	SHEET TITLE:
TSP68549	ENG. RAFAEL A. GONZALEZ SOTO, PE	E-1
	DATE: 03-16-2021	SHEETS: 3 OF 9

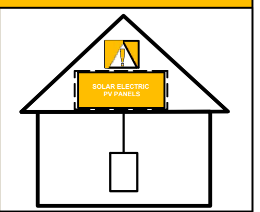
WARNING
ELECTRICAL SHOCK HAZARD
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
PER CODE: NEC 690.13 (B)

WARNING
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

LABEL LOCATION:
AC DISCONNECT, MAIN PANEL
PER CODE: NEC 110.27 (C)
OSHA 1910.145(f)(7)

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION, TO SHUTDOWN CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS WITHIN ARRAY REMAIN ENERGIZED IN SUNLIGHT



LABEL LOCATION:
AC DISCONNECT, MAIN PANEL
PER CODE: NEC 690.56(C)(3)

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SYSTEM SHUTDOWN

LABEL LOCATION:
AC DISCONNECT
POINT OF INTERCONNECTION
PER CODE: NEC 690.56(C)

INVERTER #1

NOMINAL OPERATING AC VOLTAGE	240 V
NOMINAL OPERATING AC FREQUENCY	60 HZ
MAXIMUM AC POWER	11.4KW
MAXIMUM AC CURRENT	47.5 AMPS
MAX OVERCURRENT DEVICE RATING FOR AC MODULE PROTECTION	N/A

LABEL LOCATION:
INVERTER
PER CODE: NEC 690.52

MAXIMUM VOLTAGE	480 VDC
MAXIMUM CIRCUIT CURRENT	30.5 A
MAX RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)	15 A

LABEL LOCATION:
INVERTER
PER CODE: NEC 690.53

PHOTOVOLTAIC AC DISCONNECT

RATED AC OUTPUT CURRENT:	47.5 A
NOMINAL OPERATING AC VOLTAGE:	240V

LABEL LOCATION:
AC DISCONNECT
PER CODE: NEC 690.54

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

LABEL LOCATION:
AC DISCONNECT
PER CODE: NEC 690.13 (B)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
MAIN SERVICES DISCONNECT, DC CONDUIT
PER CODE: NEC 690.31 (G) (3)

WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
POINT OF INTERCONNECTION
PER CODE: NEC 705.12 (B)(3)

WARNING
POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
POINT OF INTERCONNECTION
PER CODE: NEC 705.12(B)(2)(3)(b)

CAUTION
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LABEL LOCATION:
MAIN SERVICE PANEL
PER CODE: NEC 690.45(B)(5)

DO NOT DISCONNECT UNDER LOAD

LABEL LOCATION:
POINT OF INTERCONNECTION
PER CODE:
NEC 690.33(E)(2) & NEC 690.15 (C)

CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

LABEL LOCATION: POINT OF INTERCONNECTION
PER CODE: NEC 690.15, NEC 690.13(B)

1 PV SAFETY LABELS DATA
N.T.S.

DOCUMENT CONTROL	DATE	CAD	QC
ISSUED FOR PERMIT	03-18-2021	DP	JG
REV / DESCRIPTION	DATE	CAD	QC

ENGINEER CONTACT INFORMATION
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CONTRACTOR CONTACT INFORMATION
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12221 N US HIGHWAY 301
THONOTASASSA, FL 33592
(813) 982 -9001
#EC13008093

CONTRACTOR LOGO

CUSTOMER: MOSES TOWN
PROJECT ADDRESS: 205 SE JONATHAN WAY, LAKE CITY FL 32025
PARCEL NUMBER: 15-4S-17-08360-184

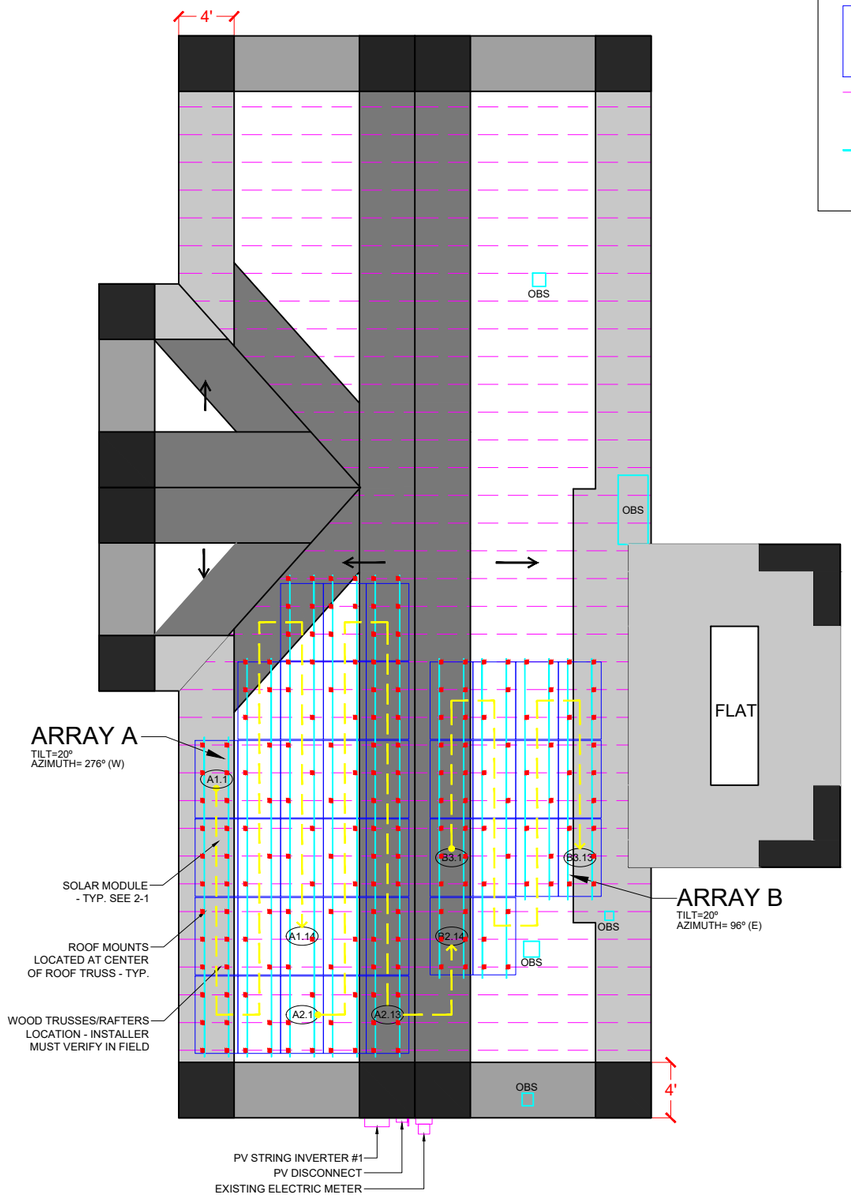
SHEET NAME: SAFETY LABELS
PROJECT ID: TSP68549
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE
DATE: 03-16-2021
SHEET TITLE: E-2
SHEETS: 4 OF 9

ROOF'S GENERAL NOTES:

1- CONTRACTOR/INSTALLER TO VERIFY ROOF CONDITIONS FOR PROPER INSTALLATION OF THE PV SYSTEM.
2- CONTRACTOR/INSTALLER TO NOTIFY THE OWNER IMMEDIATELY OF ANY ROOF DEFICIENCIES AND/OR REPAIR REQUIRED TO INSTALL THE PV SYSTEM.
3- EOR DOES NOT ASSUME ANY RESPONSIBILITY FOR THE INSTALLATION OF ANY PV SYSTEM ON DEFICIENT ROOFS.
4-CONTRACTOR/INSTALLER ASSUMES ALL RESPONSIBILITY TO INSTALL AS PER MANUFACTURER STANDARDS.

NORTH

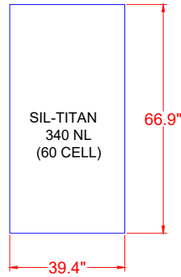
"PROPERTY SIDE FACING STREET"



LEGEND & SYMBOLS

OBS — ROOF OBSTRUCTIONS
XX.X — ARRAY # / MODULE # / STRING #
PV MODULES
TRUSSES OR RAFTERS
ROOF MOUNTS & RAIL
ROOF SLOPE

SOLAR MODULE



UL 1703 CERTIFIED
PORTRAIT MAX. SURFACE LOAD: 119 psf
LANDSCAPE MAX. SURFACE LOAD: 50.13 psf
APPLIED WIND LOAD : 49.07 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.

WEIGHTED AVERAGE

WORST CASE MODULE:
ZONE 1: 0%
ZONE 2r: 100%
49.07(1.0) + 33.64(0.0) =49.07psf

ULTIMATE WIND SPEED	175	mph
NOMINAL WIND SPEED	118	mph
RISK CATEGORY	II	
EXPOSURE CATEGORY	C	
ROOF SLOPE (°)	20	
ROOF TYPE	GABLED	
PRESSURE ZONE:	1&2	
MEAN ROOF HEIGHT:	12.93	
PERIMETER WIDTH:	4.0	
K_D	0.85	
K_{ZT}	1.0	
K_H	0.85	
VELOCITY PRESSURE (q) = 0.60*0.00256* $K_H K_{ZT} K_D V^2$		
VELOCITY PRESSURE (ASD)	15.43	
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	-33.64	4'	16"
2e	-33.64	2'	8"
2n	-49.07	2'	8"
2r	-49.07	2'	8"
3e	-49.07	2'	8"
3r	-58.33	2'	8"

TOTAL ROOF AREA	3136.06	sq.-ft
TOTAL MODULES:	41	
TOTAL PHOTOVOLTAIC AREA:	750.3	sq.-ft
WIND LOAD (PSF):	49.07	
TOTAL WIND LOAD (LBS):	-36,817.22	
TOTAL ROOF MOUNTS:	185	
TENSION FORCE PER MOUNT (LBS):	199.01	

1 STRUCTURAL ROOF PLAN & PV MODULES LAYOUT

N.T.S.

DOCUMENT CONTROL	DATE	CAD	QC
ISSUED FOR PERMIT	03-18-2021	DP	JG

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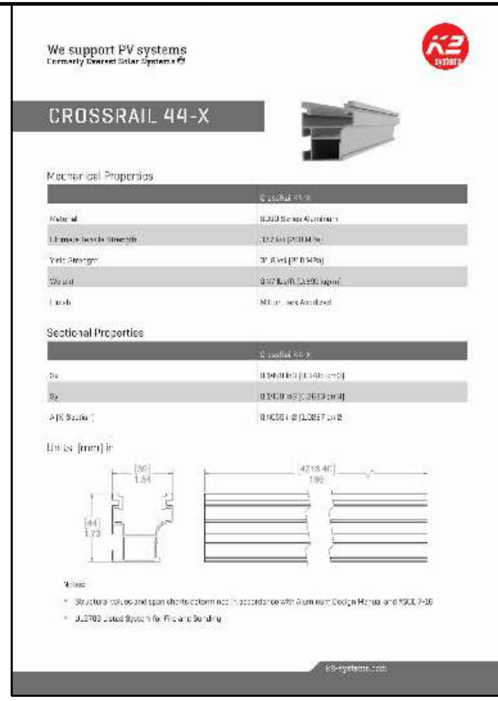
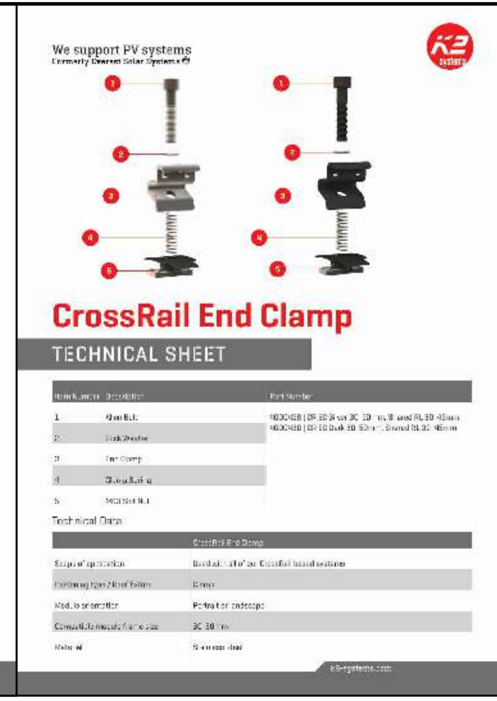
CONTRACTOR LOGO
TITAN SOLAR POWER

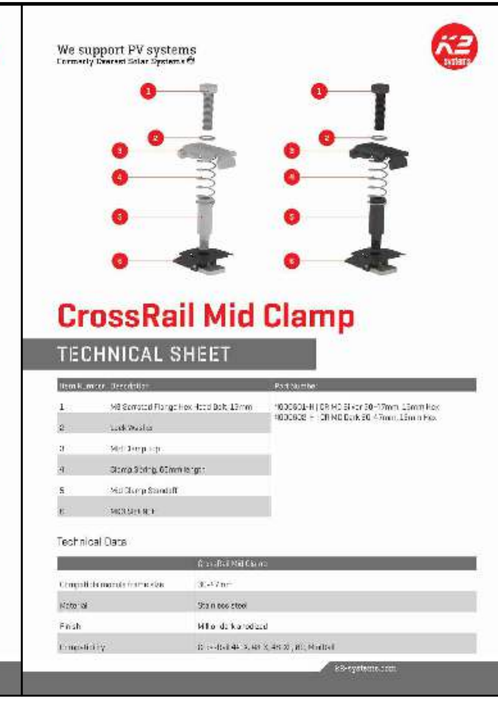
CUSTOMER: MOSES TOWN
PROJECT ADDRESS: 205 SE JONATHAN WAY, LAKE CITY FL 32025
PARCEL NUMBER: 15-4S-17-08360-184

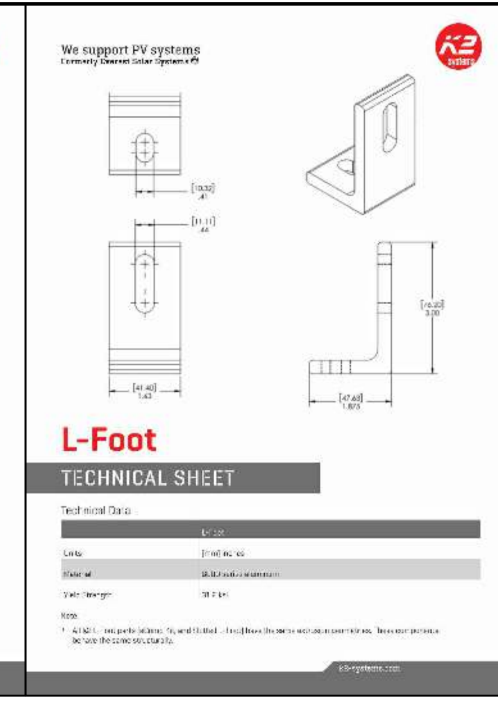
SHEET NAME: STRUCTURAL PLAN

PROJECT ID: TSP68549
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE
DATE: 03-16-2021
SHEET TITLE: S-1
SHEETS: 5 OF 9









LAG BOLT PULL OUT CALCULATIONS

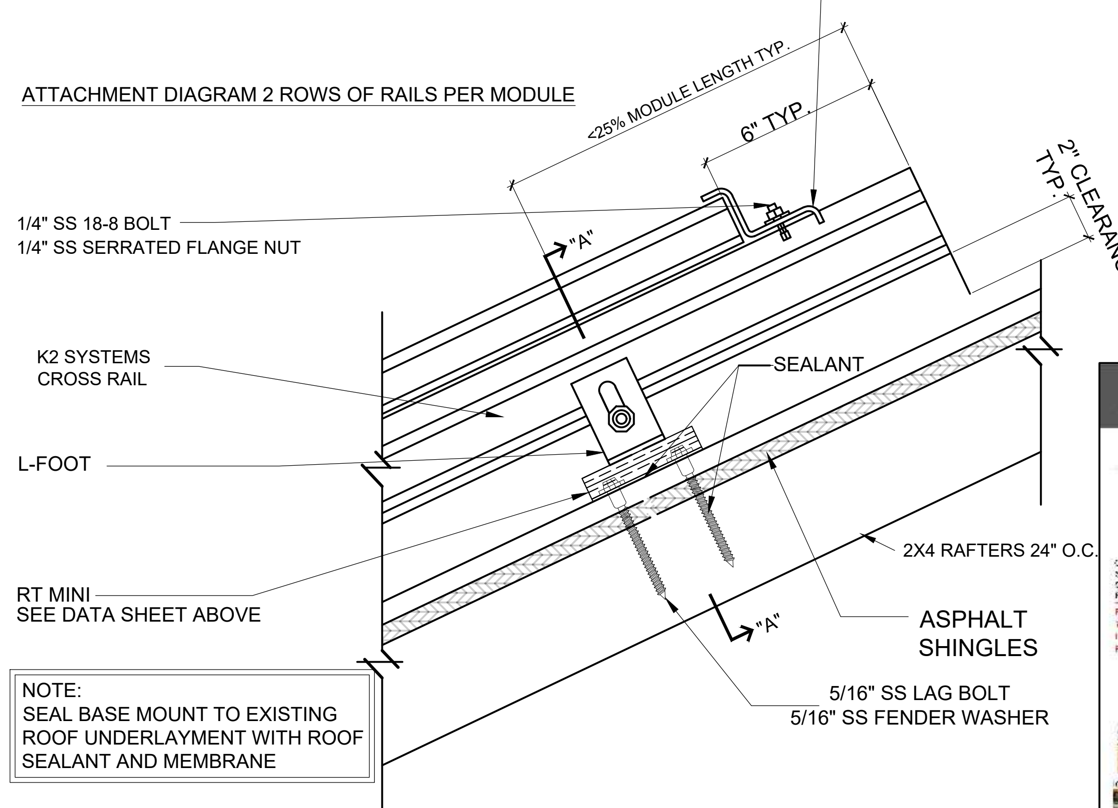
Spruce, Pine,	Per inch Thread Depth	266lbs
SS Lag Bolt 5/16" x 4"	Min. Thread Depth	0'-3"
Wood Strength x Thread Depth = Pull Out Strength		
266 lbs. x 3 in = 798 lbs.		
Allowable Pull Out Strength per Lag Bolt		798 lbs.
Max. Pull Out Strength Required per Lag Bolt		199.01
Lag Bolt Pull Out Strength Safety Factor		4.0

SPAN TABLE FOR RT MINI ANCHORAGE SYSTEM

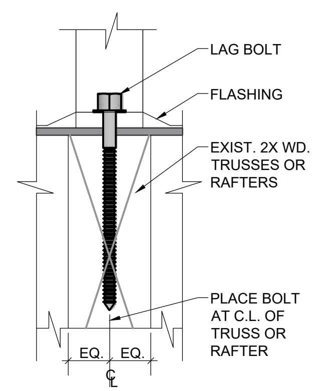
	Exposure Category	Roof Angle	Roof Area	95	100	105	110	115	120	130	140	150	160	170	180
				Basic Wind Speed, V (mph)											
PORTRAIT 60-CELLS	C	0 to 6 Degrees	1	96	96	96	87	79	72	61	52	45	39	34	30
			2	86	77	69	63	57	52	44	37	32	28	25	22
			3	60	54	49	44	40	37	31	26	23	20	18	15
		7 to 27 Degrees	1	96	87	78	71	64	59	50	43	37	32	28	25
			2	63	56	51	46	42	39	33	28	24	21	19	17
			3	51	46	42	38	34	32	27	23	20	17	15	14
		28 to 45 Degrees	1	96	89	81	74	67	62	53	46	40	35	31	27
			2	89	80	73	66	61	56	48	41	36	31	28	25
			3	56	50	46	41	38	35	30	26	22	19	17	15
PORTRAIT 72-CELLS	C	0 to 6 Degrees	1	96	95	85	76	69	63	51	45	39	34	30	27
			2	76	68	61	55	50	46	38	33	28	25	22	19
			3	53	47	43	39	35	32	27	23	20	17	15	14
		7 to 27 Degrees	1	85	76	68	62	56	52	44	37	32	28	25	22
			2	55	49	45	40	37	34	29	24	21	19	16	14
			3	45	40	36	33	30	28	23	20	17	15	13	12
		28 to 45 Degrees	1	86	78	71	65	59	54	46	40	35	31	27	24
			2	78	70	64	58	53	49	42	36	31	27	24	22
			3	49	44	40	36	33	31	25	22	19	17	15	13
LANDSCAPE	C	0 to 6 Degrees	1	96	96	96	96	96	96	95	88	76	67	59	52
			2	96	96	96	96	96	89	75	64	55	48	43	38
			3	96	92	83	75	68	63	53	45	39	34	30	27
		7 to 27 Degrees	1	96	96	96	96	96	96	85	73	63	55	49	43
			2	96	96	87	79	72	66	56	48	42	36	32	29
			3	87	79	71	65	59	54	46	39	34	30	27	24
		28 to 45 Degrees	1	96	96	96	96	96	96	92	78	68	60	53	47
			2	96	96	96	96	96	95	81	70	61	54	47	42
			3	95	86	78	71	65	60	51	44	38	33	30	26

K2 System 44-X Landscape 60-Cell

[illegible]



NOTE:
SEAL BASE MOUNT TO EXISTING ROOF UNDERLAYMENT WITH ROOF SEALANT AND MEMBRANE



SECTION "A-A"
N.T.S.

1 SHINGLE ROOF MOUNT DETAIL & DATA

N.T.S.

DISTRIBUTED LOAD CALCULATIONS

PV MODULES & RACKING WEIGHT = (INDIVIDUAL MODULE WEIGHT + 3.5 LBS) * (MODULE QTY) = (44.5 LBS) * (41) = 1,824.5 LBS

PER SQUARE FEET (PSF) ARRAY LOAD = PV MODULES & RACKING WEIGHT / TOTAL ARRAY AREA =1,824.5 LBS /750.3 SQFT =2.43 PSF

HENCE, ROOF WILL CARRY THE ADDITIONAL SOLAR SYSTEM LOAD

Notes: (1) Thread must be embedded in the side grain of a Trusses or other structural member integral with the building structure.
(2) Lag Bolts must be located in the middle third of the structural member.
(3) These values are not valid for wet services.
(4) This table does not include shear capacities. If necessary, contact a local engineer to specify lag bolt size with regard to shear forces.
(5) Install lag bolts with head ad washer flush to surface (no gap). Do nor over-torque.
(6) Withdrawal design values for lag screw connections shall be multiplied by applicable adjustment factors if necessary. See table 10.3.1 in the American Wood Council NDS for Wood Construction.

Lag Screw Installation Guidelines

1. Determine location for the Mount on roof by drilling through the center of truss from bottom with 5/32" drill bit.
2. Mark mounting holes for Mount on underlayment. Mounting holes should be centered on the trusses.
3. Drill 15/64" pilot hole.
4. Apply sealant to bottom of Mount.
5. Place Mount over roof underlayment with holes in roof.
6. Apply sealant to bottom of Mount, apply sealant to lag screws and fasten Mount securely to trusses.
7. Apply additional sealant to top assembly to be sure all penetrations are sealed.

ASCE 7-16 Velocity Pressure

qz10 = 0.00256Kz Kzt Kd V2

Where:

qz10 = ASCE 7-16 velocity pressure evaluated at mean roof height (psf)
Kz = velocity pressure exposure coefficient
Kzt = topographic factor
Kd = wind directionality factor
V = basic wind speed (mph) from ASCE 7-16 maps referred to as ultimate wind speed maps in 2020 FBC.

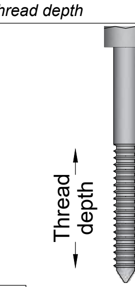
As an example, for an array having an area of 158.04 sq.-ft., the total uplifting (resultant) force acting on the array would be -39.1 psf x 158.04 sq. ft. = -6,179.364 lb. Knowing this resultant force, the design engineer can now determine the number of attachment points and the size of the mounting hardware necessary to safely carry this load.

Live Loads:

Live loads associated with photovoltaic systems are usually assumed to be distributed uniformly and are small, on the order of 4 psf or less.

Uni-Rac Specs. Lag pull-out (withdrawal) capacities (lbs) in typical roof lumber (ASD)

		STAINLESS STEEL Lag screw specifications
	Specific gravity	5/16" shaft, * per inch thread depth
Douglas Fir, Larch	0.50	266
Douglas Fir, South	0.46	235
Engelman Spruce, Lodgepole Pine (MSR 1650 f & higher)	0.46	235
Hem, Fir, Redwood (close grain)	0.43	212
Hem, Fir (North)	0.46	235
Southern Pine	0.55	307
Spruce, Pine, Fir	0.42	205
Spruce, Pine, Fir (E of 2 million psi and higher grades of MSR and MEL)	0.50	266



Sources: American Wood Council, NDS 2005, Table 11.2A, 11.3A.

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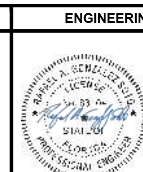

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CONTRACTOR LOGO

TITAN SOLAR POWER

CUSTOMER: MOSES TOWN

PROJECT ADDRESS: 205 SE JONATHAN WAY, LAKE CITY FL 32025

PARCEL NUMBER: 15-4S-17-08360-184

SHEET NAME: RACKING PLAN

PROJECT ID: TSP68549

ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE

DATE: 03-16-2021

SHEET TITLE: S-2

Silfab Solar Inc.
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Tel: +1-905-255-2501
Fax: +1-905-696-0267
Web: www.silfabsolar.com
Email: info@silfabsolar.com

February 10th, 2021

Subject: Update to Silfab's UL 1703 Mechanical Load Test Ratings

To whom it may concern,

Thank you for your choice of employing Silfab PV Modules in your PV rooftop projects, some of which can be located in areas with above normal windload design requirements.

Silfab Solar Inc. has made recent targeted efforts to extend the mechanical test load ratings under the UL 1703 PV module standard for Silfab's residential PV module product offerings with regards to extreme uplift design load needs, namely the PV modules identified as follows: SIL-xxxNL, SIL-xxxHL, SIL-xxxBK, and SIL-xxxNX.

This letter serves to clarify the achieved maximum test load ratings, and the associated design load ratings, according to the following modifications to the design of the module's mounting locations under a 2-rail configuration which must be followed in order to ensure compliance:

(i) **SIL-xxxNL and SIL-xxxHL**: the mounting/clamping locations must be made along the long edge of the module frame and be spaced apart 1100mm +/- 25mm in a symmetric/centered fashion.

(ii) **SIL-xxxBK and SIL-xxxNX**: the mounting/clamping locations must be made along the long edge of the module frame and be spaced apart 1200mm +/- 25mm in a symmetric/centered fashion.

As long as the design and installation of the aforementioned PV module types follows the guidelines above, the maximum test load ratings in both downward and upward orientations have been confirmed as 119psf (5700Pa) which corresponds to a maximum design load rating of 79.3psf (3800Pa).

Sincerely,

Itai Suez, PhD – Vice President of Product Development
Silfab Solar Inc.

Electrical Specifications		SIL-340 NL mono PERC	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	340	241
Maximum power voltage (Vpmax)	V	33.7	30.4
Maximum power current (Ipmax)	A	10.1	7.9
Open circuit voltage (Voc)	V	40.9	37.1
Short circuit current (Isc)	A	10.5	8.3
Module efficiency	%	20.0	17.7
Maximum system voltage (VDC)	V	1000	
Series fuse rating	A	20	
Power Tolerance	Wp	+/-3%	

Measurement conditions: STC 1000 W/m2 • AM 1.5 • Temperature 25°C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ≤ 3%
• Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by +/-3%.

Temperature Ratings	SIL-340 NL mono PERC
Temperature Coefficient Isc	0.064 %/°C
Temperature Coefficient Voc	-0.28 %/°C
Temperature Coefficient Pmax	-0.36 %/°C
NOCT (± 2°C)	46 °C
Operating temperature	-40/+85 °C

Mechanical Properties and Components	SIL-340 NL mono PERC
Module weight	41 ±0.4 lbs
Dimensions (H x L x D)	66.9 in x 39.4 in x 1.5 in
Maximum surface load (wind/snow)*	83.5/112.8 lb/ft^2
Hail impact resistance	ø 1 in at 51.6 mph
Cells	60 - Si mono PERC - 5 busbar, 6.25 x 6.25 Inch
Glass	0.126 in high transmittance, tempered, DSM anti-reflective coating
Cables and connectors (refer to installation manual)	47.2 in, ø 0.22 in, MC4 from Staubli
Backsheet	High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet
Frame	Anodized Aluminum (Black)
Bypass diodes	3 diodes-30SQ045T (45V max DC blocking voltage, 30A max forward rectified current)
Junction Box	UL 3730 Certified, IEC 62790 Certified, IP67 rated

Warranties	SIL-340 NL mono PERC			
Module product workmanship warranty	25 years**			
Linear power performance guarantee	30 years			
	≥ 97.1% end 1st year	≥ 91.6% end 12th year	≥ 85.1% end 25th year	≥ 82.6% end 30th year

Certifications	SIL-340 NL mono PERC
Product	ULC ORD C1703, UL1703, CEC listed***, UL 61215-1/-1-1/-2, UL 61730-1/-2, IEC 61215-1/-1-1/-2***, IEC 61730-1/-2***, CSA C22.2#61730-1/-2***, IEC 62716 Ammonia Corrosion; IEC61701:2011 Salt Mist Corrosion Certified, UL Fire Rating: Type 2
Factory	ISO9001:2015

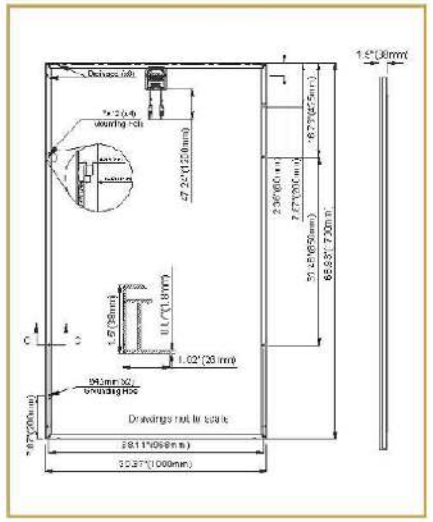
Modules Per Pallet: 26
Pallets Per Truck: 36
Modules Per Truck: 936

* ⚠ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.

** 12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at www.silfabsolar.com.

*** September 2020 expected completion date.

PAN files generated from 3rd party performance data are available for download at: www.silfabsolar.com/downloads



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CUSTOMER: MOSES TOWN
PROJECT ADDRESS: 205 SE JONATHAN WAY, LAKE CITY FL 32025
PARCEL NUMBER: 15-4S-17-08360-184

SHEET NAME: PV MODULES DATASHEET
PROJECT ID: TSP68549
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE
DATE: 03-16-2021
SHEET TITLE: D-1
SHEETS: 7 OF 9

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

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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	340	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			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	%
Overvoltage Category	II								
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)									
Maximum Output Current	15								Adc
Maximum Output Voltage	60					85			Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE 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								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[5]	-40 - +85 / -40 - +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) 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[6][7]		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[8]	
Maximum Power per String		5700 (6000 with SE7600-US - SE11400-US)	5250	6000[9]	12750[10]	W
Parallel Strings of Different Lengths or Orientations		Yes				

(6) For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf
(7) It is not allowed to mix P405/P485/P505 with P320/P340/P370/P400/P401 in one string
(8) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement
(9) 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
(10) 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

c ETL us Intertek RoHS

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PARCEL NUMBER: 15-4S-17-08360-184

SHEET NAME: SMART MONITORING DATASHEET

PROJECT ID:	ENGINEER OF RECORD:	SHEET TITLE:
TSP68549	ENG. RAFAEL A. GONZALEZ SOTO, PE	D-2
	DATE: 03-16-2021	SHEETS: 8 OF 9

Single Phase Inverter with HD-Wave Technology

for North America

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

INVERTERS

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted 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, NEC 2017 and NEC 2020 per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

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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	600ka 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

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SHEET NAME: INVERTER DATASHEET
PROJECT ID: TSP68549
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE
DATE: 03-16-2021
SHEET TITLE: D-3
SHEETS: 9 OF 9