

SHEET CATALOG

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SCOPE OF WORK

GENERAL SYSTEM INFORMATION:
 SYSTEM SIZE:
 12580W DC, 8880W AC
 MODULES:
 (37) TITAN SOLAR SIL-340NL
 INVERTER:
 (37)ENPHASE IQ 7-60-2-US(240V),
 BRANCH DETAILS:
 1X13, 1X12, 1X12 ENPHASE BRANCHES

APPLICABLE CODES

- ELECTRIC CODE:NEC 2017
- FIRE CODE:IFC 2018
- BUILDING CODE:IBC 2018
- RESIDENTIAL CODE:IRC 2018

GENERAL NOTES

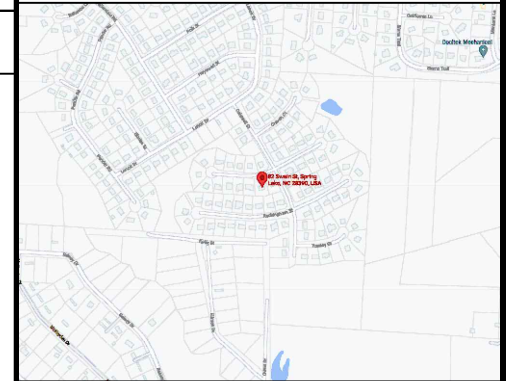
- 1.MODULES ARE LISTED UNDER UL 1703 AND CONFORM TO THE STANDARDS.
- 2.INVERTERS ARE LISTED UNDER UL 1741 AND CONFORM TO THE STANDARDS.
- 3.DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT OF THE PV SYSTEM AND THE ACTUAL SITE CONDITION MIGHT VARY.
- 4.WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26.
- 5.ALL GROUND WIRING CONNECTED TO THE MAIN SERVICE GROUNDING IN MAIN SERVICE PANEL/ SERVICE EQUIPMENT.
- 6.ALL CONDUCTORS SHALL BE 600V, 75°C STANDARD COPPER UNLESS OTHERWISE NOTED.
- 7.WHEN REQUIRED, A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- 8.THE SYSTEM WILL NOT BE INTERCONNECTED BY THE CONTRACTOR UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND/OR THE UTILITY.
- 9.ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREES, WIRES OR SIGNS.
- 10.PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING

JERELYN PILLER - 12.580kW DC, 8.880kW AC

SITE PLAN LAYOUT



VICINITY MAP



ADDRESS: 525W, BASELINE RD
 MESA AZ,85210

CUSTOMER INFORMATION

NAME: JERELYN PILLER

ADDRESS:82 SWAIN STREET, SPRING LAKE, NC 28390

35.2455709888, -78.9487576957
 APN:01051403 0006 14

AHJ:NC-COUNTY HARNETT

UTILITY:SOUTH RIVER EMC

PRN NUMBER:TPS-25515



COVER PAGE

DESIGNER /CHECKED BY: SK/PM

PAPER SIZE:17"X11"

SCALE:AS NOTED

REV:A

DATE:5/7/2021

T-1

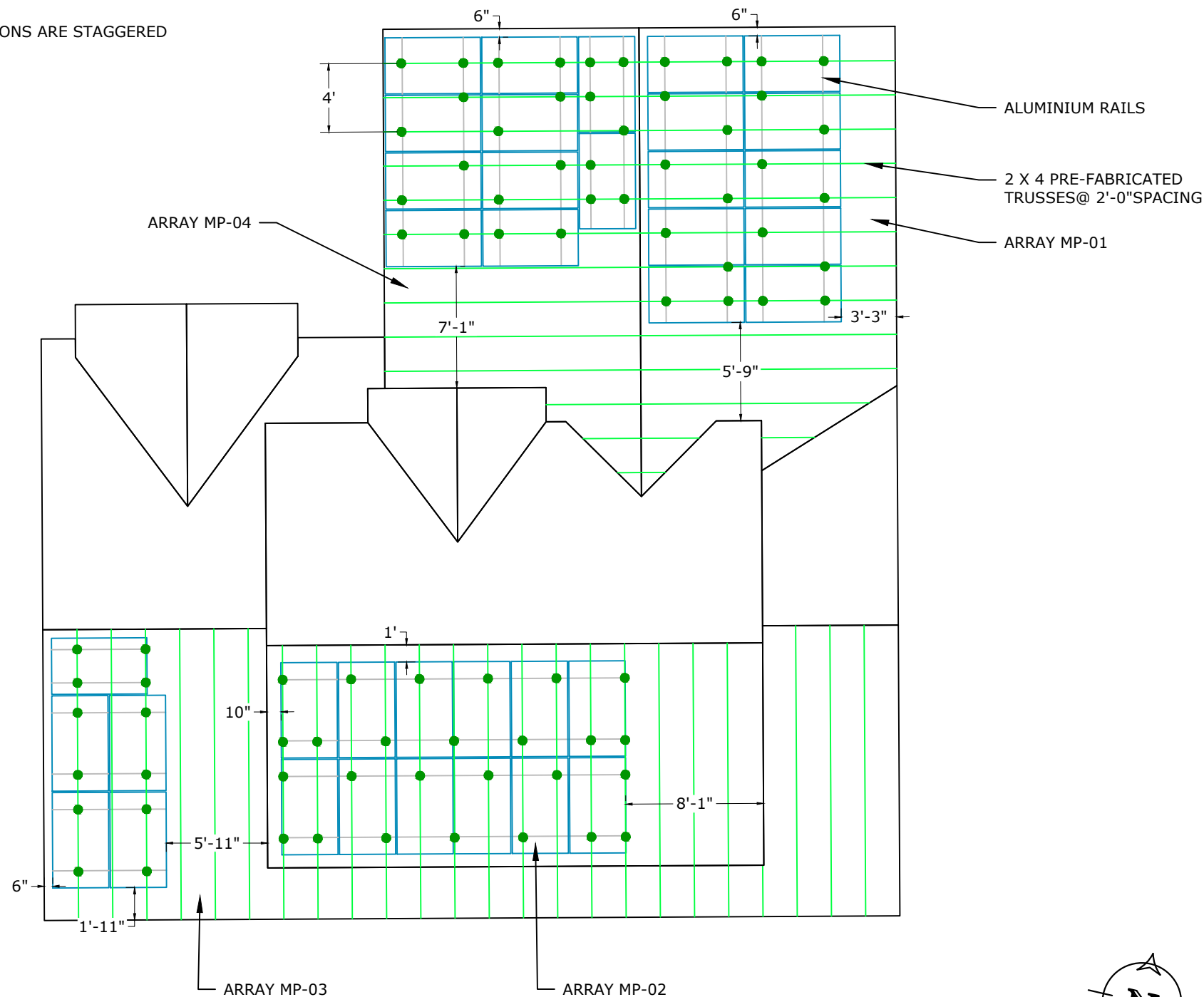
INSTALLATION NOTES

- 1.STRUCTURAL ROOF MEMBER LOCATIONS ARE ESTIMATED AND SHOULD BE LOCATED AND VERIFIED BY THE CONTRACTOR WHEN LAG BOLT PENETRATION OR MECHANICAL ATTACHMENT TO THE STRUCTURE IS REQUIRED.
- 2.ROOFTOP PENETRATIONS FOR SOLAR RACKING WILL BE COMPLETED AND SEALED WITH APPROVED SEALANT PER CODE BY A LICENSED CONTRACTOR.
- 3.LAGS MUST HAVE A MINIMUM 2.5" THREAD EMBEDMENT INTO THE STRUCTURAL MEMBER.
- 4.ALL PV RACKING ATTACHMENTS SHALL BE STAGGERED BY ROW BETWEEN THE ROOF FRAMING MEMBERS AS NECESSARY.
- 5.ROOF MOUNTED STANDARD RAIL REQUIRES ONE THERMAL EXPANSION GAP FOR EVERY RUN OF RAIL GREATER THAN 40'.
- 6.ALL CONDUCTORS AND CONDUITS ON THE ROOF SHALL BE MINIMUM 2.5" ABOVE THE ROOF SURFACE (INCLUDING CABLES UNDERNEATH MODULES AND RACKING).
- 7.THE PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL OR BUILDING ROOF VENTS.

SITE INFORMATION - WIND SPEED: 118 MPH AND SNOW LOAD: 10 PSF

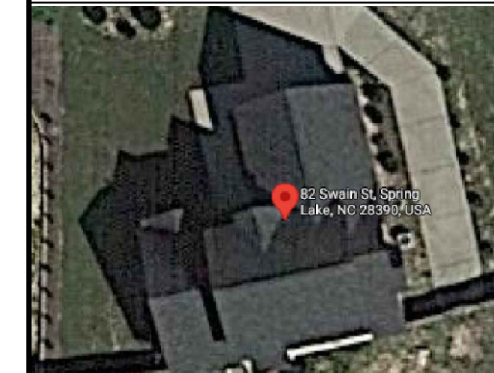
SR. NO	AZIMUTH	PITCH	NO. OF MODULES	ARRAY AREA (SQ. FT.)	ROOF TYPE	ATTACHMENT	ROOF EXPOSURE	FRAME TYPE	FRAME SIZE	FRAME SPACING	MAX RAIL SPAN	OVER HANG
MP-01	77°	33°	10	183.0	COMPOSITION SHINGLE	QUICK BOLT	ATTIC	PRE-FABRICATED TRUSSES	2 X 4	2'-0"	4'-0"	1'-6"
MP-02	167°	33°	12	219.7	COMPOSITION SHINGLE	QUICK BOLT	ATTIC	PRE-FABRICATED TRUSSES	2 X 4	2'-0"	4'-0"	1'-6"
MP-03	167°	33°	5	91.5	COMPOSITION SHINGLE	QUICK BOLT	ATTIC	PRE-FABRICATED TRUSSES	2 X 4	2'-0"	4'-0"	1'-6"
MP-04	257°	33°	10	183.0	COMPOSITION SHINGLE	QUICK BOLT	ATTIC	PRE-FABRICATED TRUSSES	2 X 4	2'-0"	4'-0"	1'-6"

NOTE: PENETRATIONS ARE STAGGERED



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

AERIAL VIEW



ADDRESS: 525W, BASELINE RD
MESA AZ, 85210

CUSTOMER INFORMATION

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35.2455709888, -78.9487576957
APN: 01051403 0006 14

AHJ: NC-COUNTY HARNETT

UTILITY: SOUTH RIVER EMC

PRN NUMBER: TPS-25515



MOUNTING DETAIL

DESIGNER /CHECKED BY: SK/PM

PAPER SIZE: 17"X11"

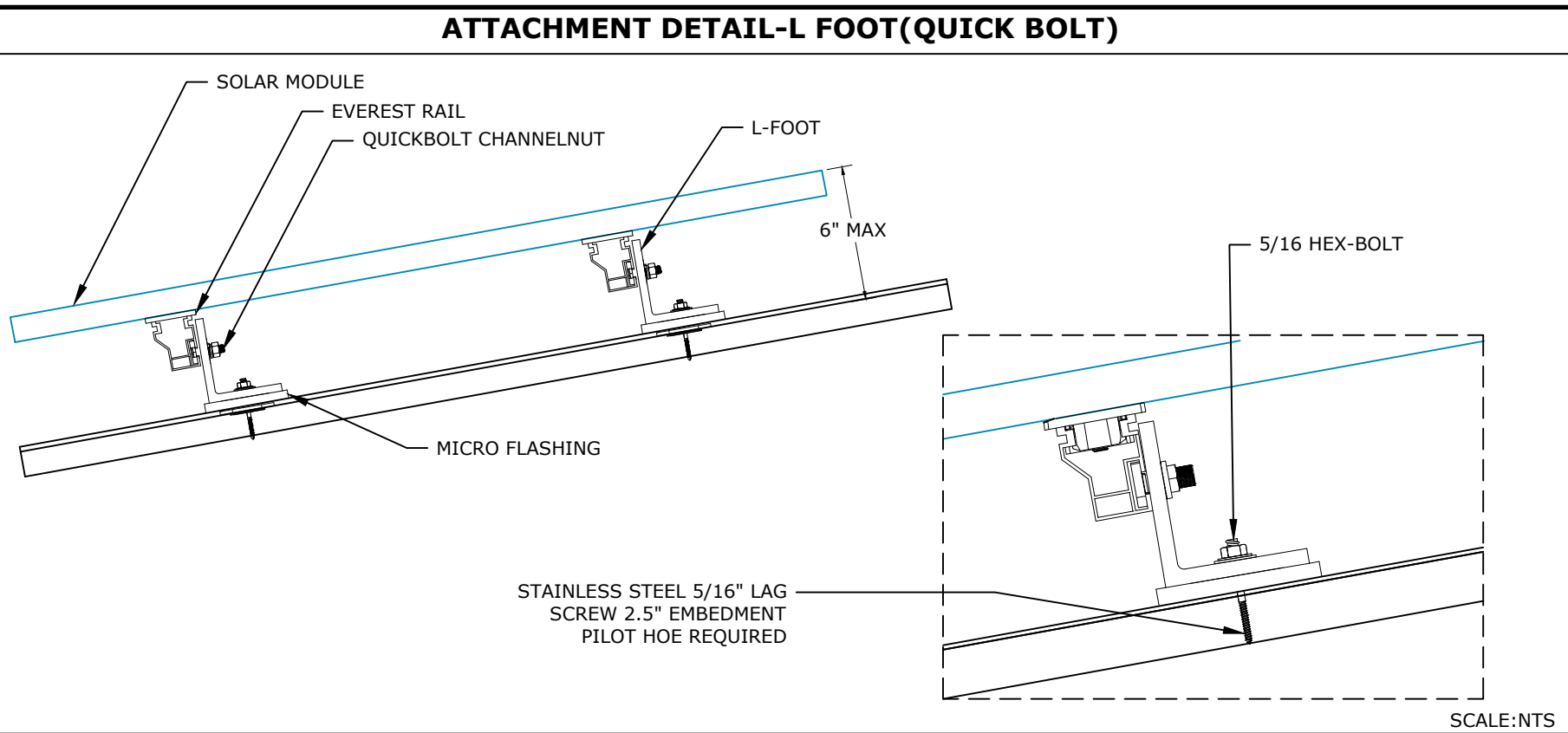
SCALE: AS NOTED

REV: A

DATE: 5/7/2021

M-1

DEAD LOAD CALCULATIONS			
BOM	QUANTITY	LBS/UNIT	TOTAL WEIGHT (LBS)
MODULES	37	41.4	1531.80
MID-CLAMP	54	0.300	16.20
END-CLAMP	40	0.310	12.40
RAIL LENGTH	258	0.560	144.48
SPLICE BAR	8	0.650	5.20
QUICK BOLT	81	1.04	84.24
MICRO-INVERTER	37	2.38	88.06
TOTAL WEIGHT OF THE SYSTEM (LBS)			1882.38
TOTAL ARRAY AREA ON THE ROOF (SQ. FT.)			677.27
WEIGHT PER SQ. FT.(LBS)			2.78
WEIGHT PER PENETRATION (LBS)			23.24

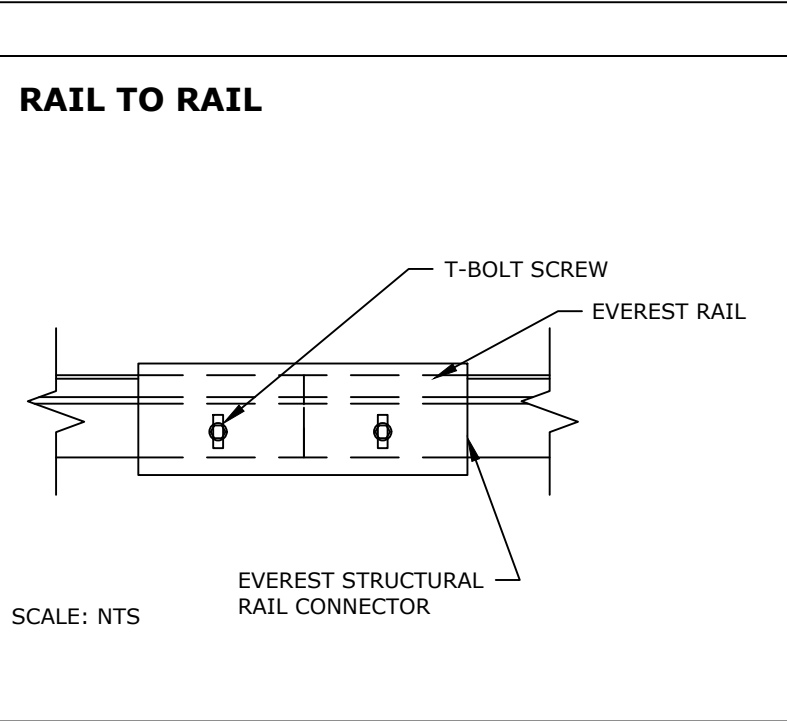
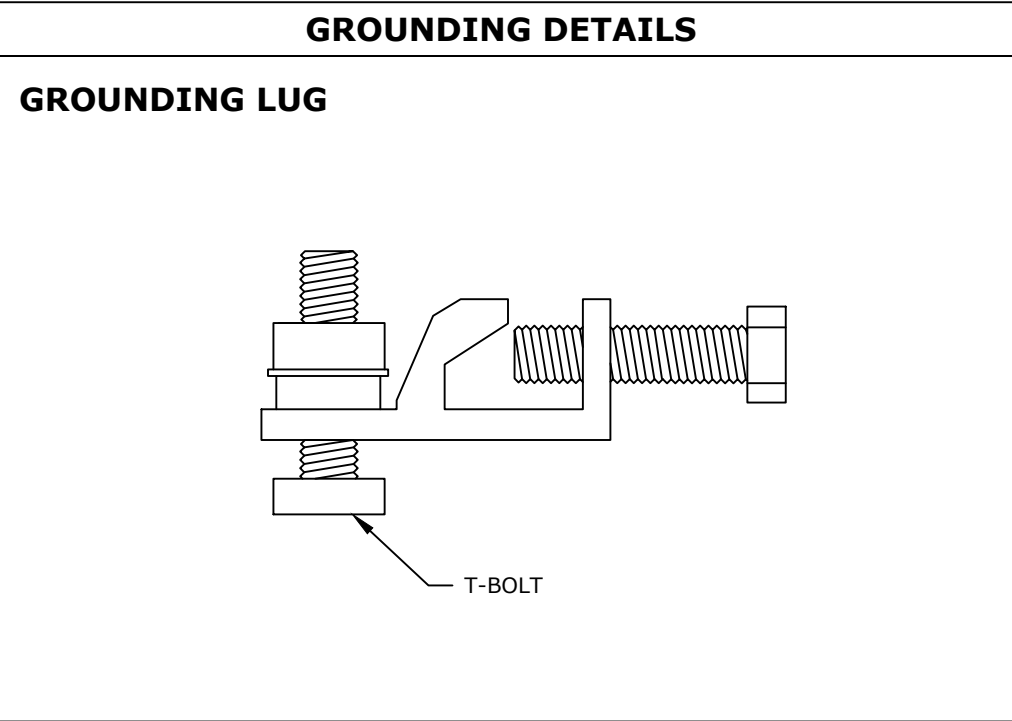
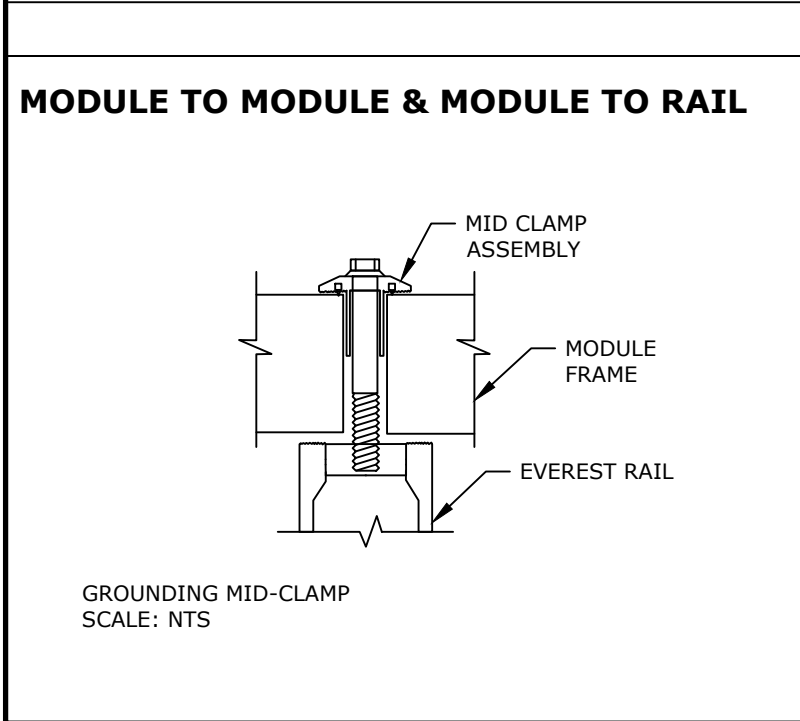
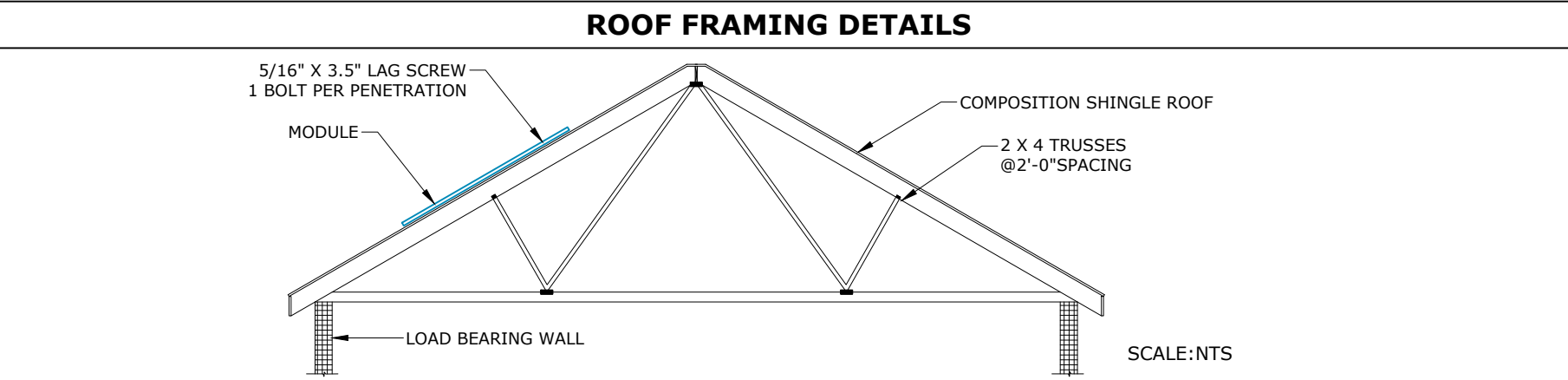
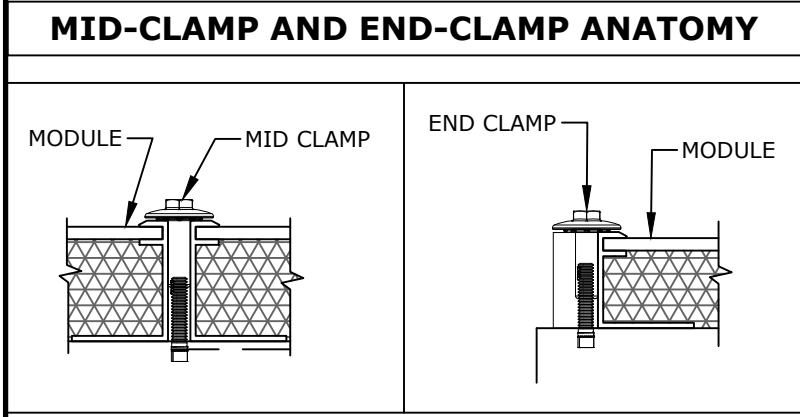


MODULES DATA	
TITAN SOLAR SIL-340NL	
MODULE DIMS	66.9"x39.4"x1.5"
LAG SCREWS	5/16"x3.5":2.5"MIN EMBEDMENT

UPLIFT CALCULATIONS		
UPLIFT	20318.1	LBS
PULL OUT STRENGTH	49815	LBS
POINT LOADING	19	LBS



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STRUCTURAL DETAIL	
DESIGNER /CHECKED BY: SK/PM	PAPER SIZE:17"X11"
SCALE:AS NOTED	REV:A
DATE:5/7/2021	M-2

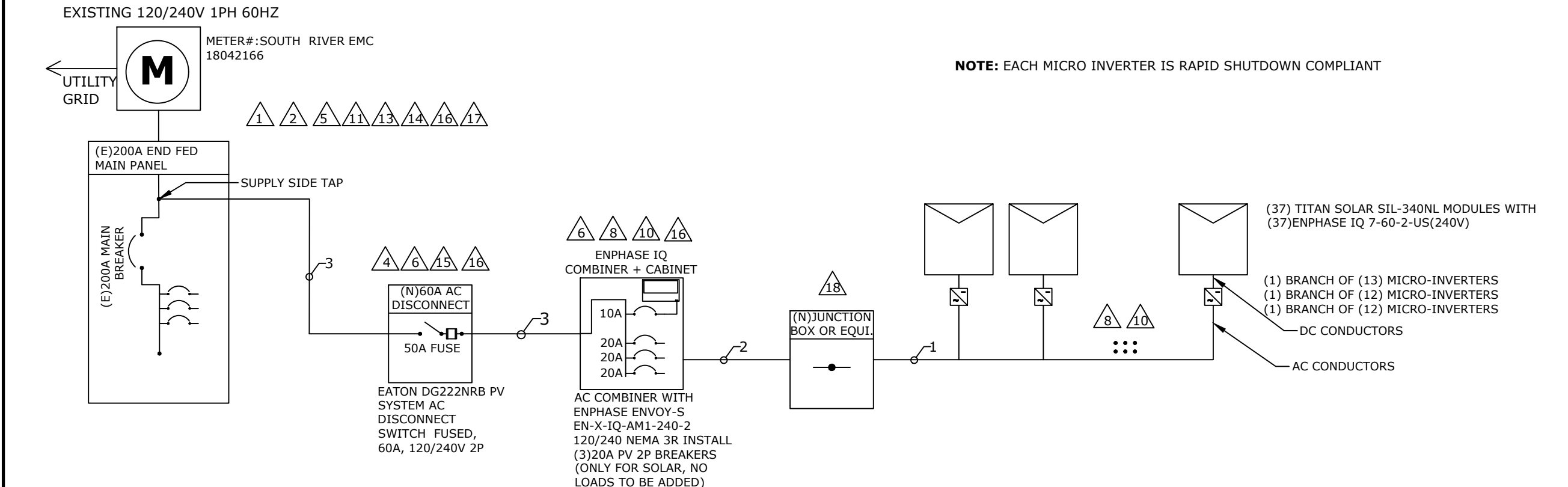
SINGLE LINE DIAGRAM: DC SYSTEM SIZE - 12580W, AC SYSTEM SIZE - 8880W

ELECTRICAL NOTES

MICRO INVERTER SPECIFICATIONS	
MODEL	ENPHASE IQ 7-60-2-US(240V)
POWER RATING	240W
MAX OUTPUT CURRENT	1A
CEC WEIGHTED EFFICIENCY	97%
MAX NO OF MICRO INVERTERS/BRANCH	16
MAX DC VOLTAGE	48V

MODULE SPECIFICATION	
MODEL	TITAN SOLAR SIL-340NL
MODULE POWER @ STC	340W
OPEN CIRCUIT VOLTAGE: Voc	40.9V
MAX POWER VOLTAGE: Vmp	33.7V
SHORT CIRCUIT VOLTAGE: Isc	10.5A
MAX POWER CURRENT: Imp	10.1A

- 1.CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.10(D).
- 2.CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.10(C).
- 3.MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%.
- 4.ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
- 5.BREAKER/FUSE SIZES CONFORMS TO NEC 240.6 CODE SECTION.
- 6.AC GROUNDING ELECTRODE CONDUCTOR SIZED PER NEC 250.66.
- 7.AMBIENT TEMPERATURE CORRECTION FACTOR IS BASED ON NEC 690.31(C).
- 8.AMBIENT TEMPERATURE ADJUSTMENT FACTOR IS BASED ON NEC 310.15(B)(2).
- 9.MAX. SYSTEM VOLTAGE CORRECTION IS PER NEC 690.7.
- 10.CONDUCTORS ARE SIZED PER WIRE AMPACITY TABLE NEC 310.15(B)(16).



TITAN
SOLAR POWER

ADDRESS: 525W, BASELINE RD
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35.2455709888, -78.9487576957
APN:01051403 0006 14

AHJ:NC-COUNTY HARNETT

UTILITY:SOUTH RIVER EMC

PRN NUMBER:TPS-25515

CONDUIT SCHEDULE				
TAG ID	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(2) 12AWG ENPHASE Q CABLE PER BRANCH CIRCUIT	NONE	(1) 10 AWG BARE COPPER
2	3/4"EMT OR EQUIV	(6) 10AWG THHN/THWN-2	NONE	(1) 10 AWG THHN/THWN-2
3	3/4"EMT OR EQUIV	(2) 6 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2	(1) 10 AWG THHN/THWN-2

NOTE:
MAIN PANEL RATING:200A, MAIN BREAKER RATING:200A
LINE SIDE TAP: 100% ALLOWABLE BACKFEED IS =200A

OC PD CALCULATIONS:
INVERTER OVERCURRENT PROTECTION= INVERTER O/P I X CONTINUOUS LOAD(1.25)
=1x1.25x37=46.25A=>PV BREAKER = 50A
TOTAL REQUIRED PV BREAKER SIZE / FUSE SIZE=>50A PV BREAKER

ELECTRICAL CALCULATIONS

AC WIRE SIZING CALCULATIONS BASED OF FOLLOWING EQUATIONS >>

- REQUIRED CONDUCTOR AMPACITY: INVERTER OUTPUT CURRENT X #OF INVERTERSXMAX CURRENT PER 690.8(A)(3)X125% PER 690.8(B)(2)(A)
- CORRECTED AMPACITY CALCULATIONS:AMPACITY X TEMPERATURE DERATE FACTOR X CONDUIT FILL DERATE = DERATED CONDUCTOR AMPACITY
- DERATED CONDUCTOR AMPACITY CHECK: MAX CURRENT PER 690.8(B)(2)(2) < DERATED CONDUCTOR AMPACITY

AC WIRE CALCULATIONS:- MATERIAL:COPPER & TEMPERATURE RATING:90°C																			
TAG ID	REQUIRED CONDUCTOR AMPACITY						CORRECTED AMPACITY CALCULATION						DERATED CONDUCTOR AMPACITY CHECK						
1	1	X	13	=	13.00	X	1.25	=	16.25A	30	X	0.87	X	1	=	26.10A	16.25A	<	26.10A
2	1	X	13	=	13.00	X	1.25	=	16.25A	40	X	0.87	X	1	=	34.80A	16.25A	<	34.80A
3	1	X	37	=	37.00	X	1.25	=	46.25A	75	X	0.87	X	1	=	65.25A	46.25A	<	65.25A



SINGLE LINE DIAGRAM

DESIGNER /CHECKED BY: SK/PM PAPER SIZE:17"X11"

SCALE:AS NOTED REV:A

DATE:5/7/2021 E-1

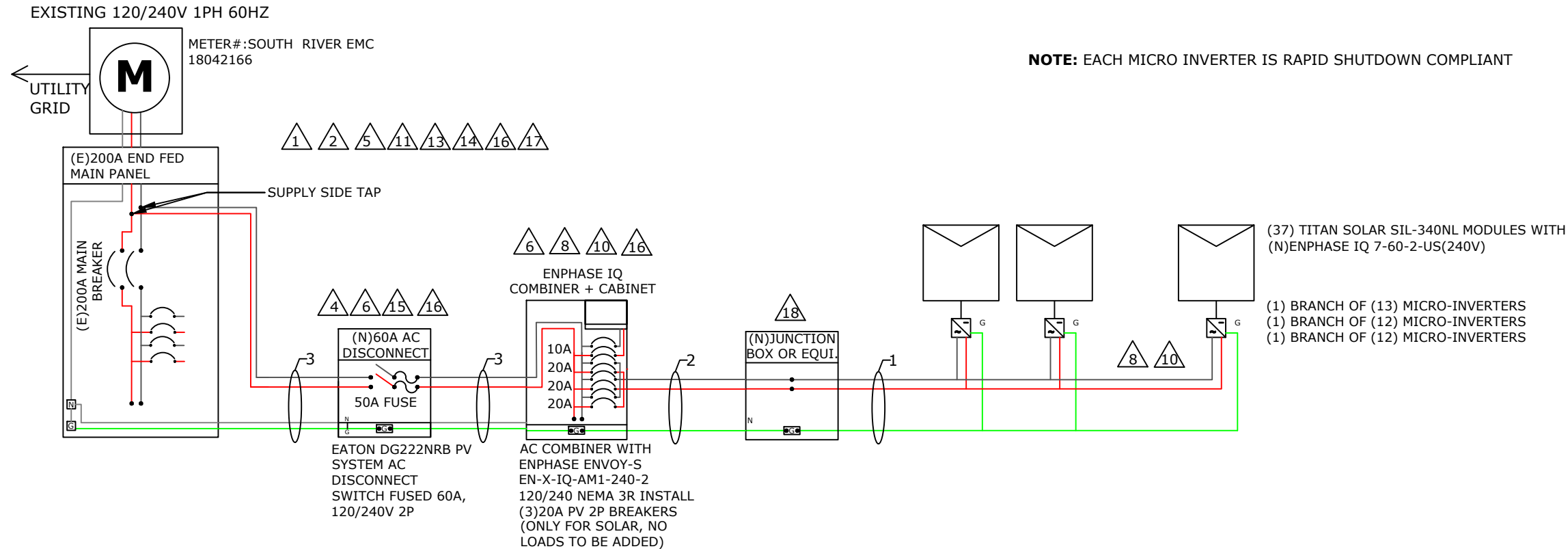
THREE LINE DIAGRAM: DC SYSTEM SIZE - 12580W, AC SYSTEM SIZE - 8880W

ELECTRICAL NOTES

MICRO INVERTER SPECIFICATIONS	
MODEL	ENPHASE IQ 7-60-2-US(240V)
POWER RATING	240W
MAX OUTPUT CURRENT	1A
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MAX NO OF MICRO INVERTERS/BRANCH	16
MAX DC VOLTAGE	48V

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MODEL	TITAN SOLAR SIL-340NL
MODULE POWER @ STC	340W
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- 4.ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
- 5.BREAKER/FUSE SIZES CONFORMS TO NEC 240.6 CODE SECTION.
- 6.AC GROUNDING ELECTRODE CONDUCTOR SIZED PER NEC 250.66.
- 7.AMBIENT TEMPERATURE CORRECTION FACTOR IS BASED ON NEC 690.31(C).
- 8.AMBIENT TEMPERATURE ADJUSTMENT FACTOR IS BASED ON NEC 310.15(B)(2).
- 9.MAX. SYSTEM VOLTAGE CORRECTION IS PER NEC 690.7.
- 10.CONDUCTORS ARE SIZED PER WIRE AMPACITY TABLE NEC 310.15(B)(16).



CONDUIT SCHEDULE				
TAG ID	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(2) 12AWG ENPHASE Q CABLE PER BRANCH CIRCUIT	NONE	(1) 10 AWG BARE COPPER
2	3/4"EMT OR EQUIV	(6) 10AWG THHN/THWN-2	NONE	(1) 10 AWG THHN/THWN-2
3	3/4"EMT OR EQUIV	(2) 6 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2	(1) 10 AWG THHN/THWN-2

NOTE:
MAIN PANEL RATING:200A, MAIN BREAKER RATING:200A
LINE SIDE TAP: 100% ALLOWABLE BACKFEED IS =200A

OCPD CALCULATIONS:
INVERTER OVERCURRENT PROTECTION= INVERTER O/P I X CONTINUOUS LOAD(1.25)
=1x1.25x37=46.25A=>PV BREAKER = 50A
TOTAL REQUIRED PV BREAKER SIZE / FUSE SIZE=>50A PV BREAKER

ELECTRICAL CALCULATIONS

AC WIRE SIZING CALCULATIONS BASED OF FOLLOWING EQUATIONS >>

- REQUIRED CONDUCTOR AMPACITY: INVERTER OUTPUT CURRENT X #OF INVERTERSXMAX CURRENT PER 690.8(A)(3)X125% PER 690.8(B)(2)(A)
- CORRECTED AMPACITY CALCULATIONS:AMPACITY X TEMPERATURE DERATE FACTOR X CONDUIT FILL DERATE = DERATED CONDUCTOR AMPACITY
- DERATED CONDUCTOR AMPACITY CHECK: MAX CURRENT PER 690.8(B)(2)(2) < DERATED CONDUCTOR AMPACITY

AC WIRE CALCULATIONS:- MATERIAL:COPPER & TEMPERATURE RATING:90°C																			
TAG ID	REQUIRED CONDUCTOR AMPACITY						CORRECTED AMPACITY CALCULATION						DERATED CONDUCTOR AMPACITY CHECK						
1	1	X	13	=	13.00	X	1.25	=	16.25A	30	X	0.87	X	1	=	26.10A	16.25A	<	26.10A
2	1	X	13	=	13.00	X	1.25	=	16.25A	40	X	0.87	X	1	=	34.80A	16.25A	<	34.80A
3	1	X	37	=	37.00	X	1.25	=	46.25A	75	X	0.87	X	1	=	65.25A	46.25A	<	65.25A



THREE LINE DIAGRAM

DESIGNER /CHECKED BY: SK/PM	PAPER SIZE:17"X11"
SCALE:AS NOTED	REV:A
DATE:5/7/2021	E-2

WARNING PLACARD

1 **CAUTION**
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED
LABEL LOCATION
BACKFED BREAKER [PER CODE: NEC 705.12(4)]

2 **WARNING**
INVERTER OUTPUT CONNECTION:
DO NOT RELOCATE THIS
OVERCURRENT DEVICE
LABEL LOCATION: BACKFED BREAKER
[PER CODE: 2017 NEC 705.12(2)(3)(b)]

3 **WARNING**
A GENERATION SOURCE IS CONNECTED TO THE SUPPLY
(UTILITY) SIDE OF THE MAIN SERVICE DISCONNECT. FOLLOW
THE PROPER LOCK-OUT/TAG-OUT PROCEDURES TO ENSURE
THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH IS
OPENED PRIOR TO PERFORMING WORK ON THIS DEVICE
LABEL LOCATION: (IF APPLICABLE) SUPPLY SIDE TAP LOAD PANEL
[PER CODE: UTILITY]

4 PHOTOVOLTAIC AC DISCONNECT
RATED AC OPERATING CURRENT 37.00 A
AC NOMINAL OPERATING VOLTAGE 240 VAC
LABEL LOCATION: MAIN PANEL AC DISCONNECT(S)
[PER CODE: NEC 690.54]

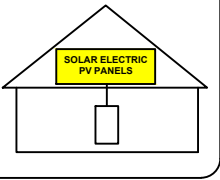
5 RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM
LABEL LOCATION: MAIN PANEL
[PER CODE: NEC 690.12,690.56(C)(3)]

6 **WARNING**
ELECTRIC SHOCK HAZARD
TERMINALS ON BOTH LINE AND LOAD SIDES MAY
BE ENERGIZED IN THE OPEN POSITION
LABEL LOCATION: COMBINER PANEL
AC DISCONNECT JUNCTION BOX INVERTER(S)
[PER CODE: NEC 690.13(B)]

8 **WARNING**
PHOTOVOLTAIC SYSTEM
COMBINER PANEL
DO NOT ADD LOADS
LABEL LOCATION: AC COMBINER PANEL
[PER CODE: NEC 690.13(B)]

10 **WARNING**
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND LOAD SIDES MAY
BE ENERGIZED IN THE OPEN POSITION
DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR
MODULES ARE EXPOSED TO SUNLIGHT
LABEL LOCATION
DC DISCONNECT INVERTER, COMBINE BOX
[PER CODE: NEC 690.13(B)]

11 **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
LABEL LOCATION: MAIN SERVICE
[PER CODE: NEC 690.12, NEC 690.56(C)(1)(a)]



18 **WARNING PHOTOVOLTAIC POWER SOURCE**
LABEL LOCATION
DC CONDUIT JUNCTION BOX NO MORE THAN 10FT
[PER CODE: NEC 690.13(G),NEC 690.31(G)(4)]

13 **CAUTION**
DUAL POWER SOURCE
SECOND SOURCE IS
PHOTOVOLTAIC
LABEL LOCATION :SERVICE METER MAIN PANEL
[PER CODE: UTILITY]

14 **WARNING**
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS
OVER-CURRENT DEVICE
LABEL LOCATION : (IF APPLICABLE) SERVICE PANEL
[PER CODE: NEC 705.12(D)(7)]

15 PHOTOVOLTAIC SYSTEM
UTILITY DISCONNECT SWITCH
LABEL LOCATION :AC DISCONNECT
[PER CODE: NEC 690.13(B)UTILITY]

16 **WARNING**
ELECTRIC SHOCK HAZARD
IF GROUND FAULT IS INDICATED ALL NORMALLY
GROUNDED CONDUCTORS MAY BE UNGROUNDED
AND ENERGIZED
LABEL LOCATION
AC DISCONNECT COMBINER BOX SERVICE METER
[PER CODE: NEC 690.5(C)]

17 PV SOLAR BREAKER
DO NOT RELOCATE THIS
OVERCURRENT DEVICE
LABEL LOCATION
MAIN PANEL DEAD FRONT
[PER CODE: NEC 705.12(B)(2)(3)(b)]

REFLECTIVE AND WEATHER RESISTANCE LABEL REQUIRES CAPITALIZED LETTERS WITH A MINIMUM HEIGHT OF 3/8INCH, WHITE LETTERS ON RED BACKGROUND LABELS SHALL BE PLACED ON INTERIOR AND EXTERIOR DCCONDUIT, RACEWAYS, ENCLOSURE, AND CABLE ASSEMBLIES EVERY 10 FEET, WITHIN 1 FOOT OF TURNS OR BENDSAND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/ CEILING ASSEMBLIES, WALLS OR BARRIERS.



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MESA AZ,85210

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WARNING PLACARDS

DESIGNER /CHECKED BY: SK/PM PAPER SIZE:17"X11"

SCALE:AS NOTED REV:A

DATE:5/7/2021 PL-1

SAFETY PLANS

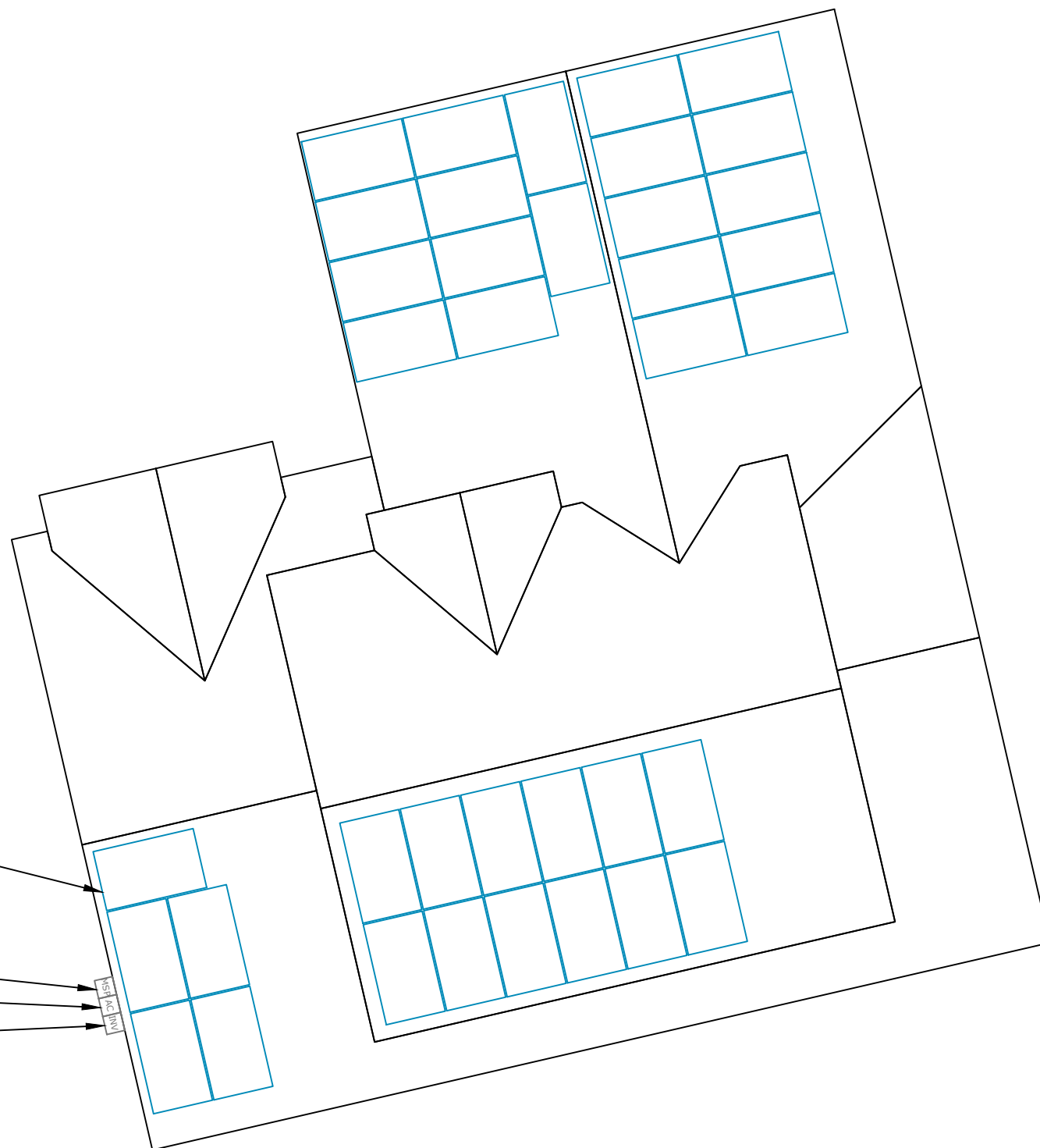
SAFETY PLANS

NOTES:

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

LOCATION OF NEAREST URGENT CARE FACILITY

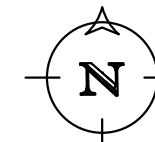
NAME:
ADDRESS:
PHONE NUMBER:



SOLAR PV ARRAY WITH MICRO INVERTER
ROOF MOUNTED

MAIN SERVICE PANEL WITH UTILITY METER
UTILITY DISCONNECT SWITCH
ENPHASE IQ COMBINER +CABINET

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SAFETY PLANS-1

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DATE:5/7/2021	PL-2
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SAFETY PLANS

SAFETY PLANS

NOTES:

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2. INSTALLERS SHALL UPDATE NAME ADDRESS AND PHONE NUMBER OF NEAREST.
3. URGENT CARE FACILITY RELATIVE TO THE SITE BEFORE STARTING WORK.

LOCATION OF NEAREST URGENT CARE FACILITY

NAME:
ADDRESS:
PHONE NUMBER:

PERSONS COVERED BY THIS JOB SAFETY PLAN

**INJURED AT WORK TODAY?
INITIAL YES OR NO**

PRINT NAME	INITIAL	YES	NO

UNDERGROUND DIG REQUIRED?

YES _____ PERMIT # _____



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MESA AZ,85210

CUSTOMER INFORMATION

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35.2455709888, -78.9487576957
APN:01051403 0006 14

AHJ:NC-COUNTY HARNETT

UTILITY:SOUTH RIVER EMC

PRN NUMBER:TPS-25515



SAFETY PLANS-2

DESIGNER /CHECKED BY: SK/PM

PAPER SIZE:17"X11"

SCALE:AS NOTED

REV:A

DATE:5/7/2021

PL-3

SPEC SHEET



TITAN

SOLAR PANEL

60 Cell
Monocrystalline
PV Module



CHUBB
* Chubb provides error and omission insurance to Silfab Solar Inc.

SIL-340 NL
POWERED BY
SILFAB SOLAR




INDUSTRY LEADING WARRANTY

The Titan Solar Panel is manufactured by Silfab Solar and includes an industry leading 25-year product workmanship and 30-year performance warranty.

MAXIMUM ENERGY OUTPUT

Leveraging over 35+ years of worldwide experience in the solar industry, Silfab is dedicated to superior manufacturing processes and innovations such as Bifacial and Back Contact technologies, to ensure our partners, such as Titan Solar have the latest in solar innovation.

NORTH AMERICAN QUALITY

Silfab is the leading automated solar module manufacturer in North America. Utilizing premium quality materials and strict quality control management to deliver the highest efficiency, premium quality PV modules 100% made in North America.



BAA / ARRA COMPLIANT

Panels are designed and manufactured to meet Buy American Act Compliance. The US State Department, US Military and FAA have all utilized Silfab panels in their solar installations.

LIGHT AND DURABLE

Engineered to accommodate high wind load conditions for test loads validated up to 4000Pa uplift. The light-weight frame is exclusively designed for wide-ranging racking compatibility and durability.

QUALITY MATTERS

Total automation ensures strict quality controls during the entire manufacturing process at ISO certified facilities.

DOMESTIC PRODUCTION

Silfab Solar manufactures PV modules in two automated locations within North America. Our 500+ North American team is ready to help Titan Solar win the hearts and minds of customers, providing customer service and product delivery that is direct, efficient and local.

AESTHETICALLY PLEASING

All black sleek design, ideal for high-profile residential or commercial applications.

PID RESISTANT

PID Resistant due to advanced cell technology and material selection. In accordance to IEC 62804-1.

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		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	

Certifications		SIL-340 NL mono PERC	
Product		ULC ORD C1703, UL1703, CEC listed***, UL 61215-1/-1/-2, UL 61730-1/-2, IEC 61215-1/-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.

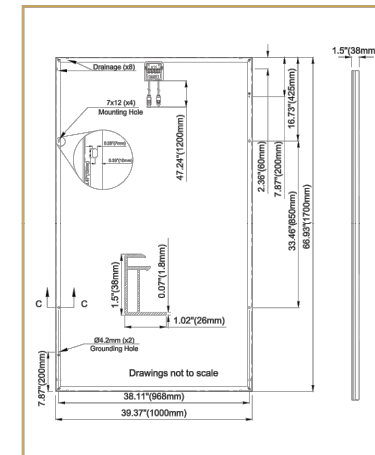
***September 2020 expected completion date.

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

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MODULE SPEC SHEET

DESIGNER /CHECKED BY: SK/PM PAPER SIZE:17"X11"

SCALE:AS NOTED REV:A

DATE:5/7/2021 SS-1

SPEC SHEET

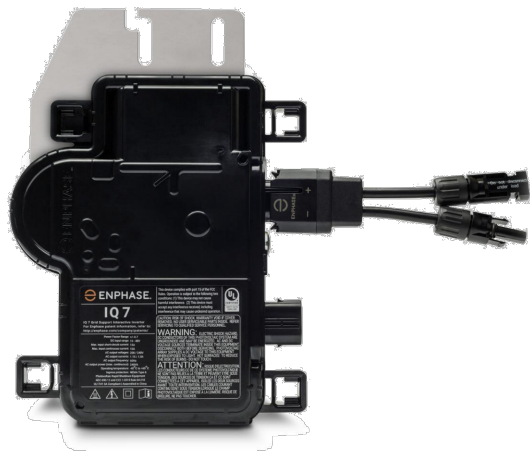
Data Sheet
Enphase Microinverters
 Region: AMERICAS

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell modules.

Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US	IQ7PLUS-72-2-US
Commonly used module pairings ¹	235 W - 350 W +	235 W - 440 W +
Module compatibility	60-cell PV modules only	60-cell and 72-cell PV modules
Maximum input DC voltage	48 V	60 V
Peak power tracking voltage	27 V - 37 V	27 V - 45 V
Operating range	16 V - 48 V	16 V - 60 V
Min/Max start voltage	22 V / 48 V	22 V / 60 V
Max DC short circuit current (module Isc)	15 A	15 A
Overvoltage class DC port	II	II
DC port backfeed current	0 A	0 A
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		295 VA	
Maximum continuous output power	240 VA		290 VA	
Nominal (L-L) voltage/range ²	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit ³	16 (240 VAC)	13 (208 VAC)	13 (240 VAC)	11 (208 VAC)
Overvoltage class AC port	III		III	
AC port backfeed current	0 A		0 A	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.85 leading ... 0.85 lagging		0.85 leading ... 0.85 lagging	
EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak efficiency	97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %

MECHANICAL DATA	
Ambient temperature range	-40°C to +65°C
Relative humidity range	4% to 100% (condensing)
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - No fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environmental category / UV exposure rating	NEMA Type 6 / outdoor

FEATURES	
Communication	Power Line Communication (PLC)
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.
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 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.
 2. Nominal voltage range can be extended beyond nominal if required by the utility.
 3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com

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INVERTER SPEC SHEET

DESIGNER /CHECKED BY: SK/PM

PAPER SIZE:17"X11"

SCALE:AS NOTED

REV:A

DATE:5/7/2021

SS-2



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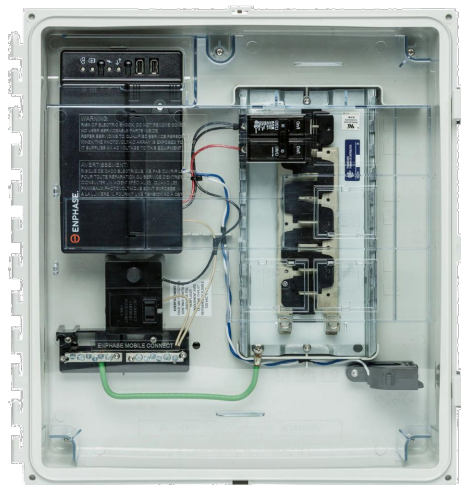


SPEC SHEET

Data Sheet
Enphase Networking

Enphase IQ Combiner+ (X-IQ-AM1-240-2)

The **Enphase IQ Combiner+**™ with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.



Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Provides production metering and optional consumption monitoring
- Supports installation of the Enphase Q Aggregator™

Simple

- Eaton BR series panelboard interior
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year warranty
- UL listed



To learn more about Enphase offerings, visit enphase.com



Enphase IQ Combiner+

MODEL NUMBER	
IQ Combiner+ X-IQ-AM1-240-2	IQ Combiner+ with Enphase IQ Envoy™ for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES (order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G / 12-year data plan) CELLMODEM-01 (3G / 5-year data plan) CELLMODEM-M1 (4G LTE CAT-M1 / 5-year data plan)	Plug and play industrial grade cellular modem with data plan for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.)
Consumption Monitoring CT CT-200-SPLIT	Split core current transformers enable whole home consumption metering* (+/- 2.5%).
Circuit Breakers BRK-15A-2-240 BRK-20A-2-240	Breaker, 2 pole, 15A, Eaton BR215 Breaker, 2 pole, 20A, Eaton BR220
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	240 VAC, 60 HZ
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80 A (any combination)
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy
MECHANICAL DATA	
Dimensions (WxHxD)	49.3 x 46.5 x 16.0 cm (19.4" x 18.3" x 6.3")
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	<ul style="list-style-type: none"> • 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 3 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	802.3, Cat5E (or Cat 6) UTP Ethernet cable - not included
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) (not included)
COMPLIANCE	
Compliance, Combiner	UL 1741 CAN/CSA C22.2 No. 107.1 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Compliance, IQ Envoy	UL 916 CAN/CSA C22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

To learn more about Enphase offerings, visit enphase.com

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2018-05-02



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COMBINER SPEC SHEET

DESIGNER /CHECKED BY: SK/PM

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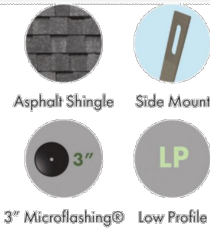
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SS-3

SPEC SHEET



LOW PROFILE QUICKBOLT
With 3" Microflashing® | Fixed Height



PN#	BOX QTY
17664	5.25" Bolts (10)
17666	Bolts + 3" Microflashing® (10ea.)
17667SS	Bolts + 3" Microflashing® + SS L-Foot + Nuts (25ea.)

First & only Microflashing® in the industry
Stainless Steel L-Foot
Fastest installation in the industry
UL Certified

Patent #8448407



LOW PROFILE QUICKBOLT
With 4" Microflashing® | Fixed Height



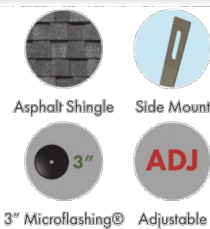
PN#	BOX QTY
17664	5.25" Bolts (10)
17720	Bolts + 4" Microflashing® (10ea.)
17721 SS	Bolts + 4" Microflashing® + SS L-Foot + Nuts (20ea.)

First & only Microflashing® in the industry
Stainless Steel L-Foot
4" Microflashing® provides more coverage
Fastest installation in the industry
UL Certified

Patent #8448407



7" QUICKBOLT
With 3" Microflashing® | Adjustable



PN#	BOX QTY
17670	7" Bolts (10)
17671	Bolts + 3" Microflashing® (10ea.)
17672SS	Bolts (20) + 3" Microflashing® (20) + SS L-Foot (20) + Nuts (40)

First & only Microflashing® in the industry
Stainless Steel L-Foot
UL Certified

Patent #8448407



7" QUICKBOLT
With 4" Microflashing® | Adjustable



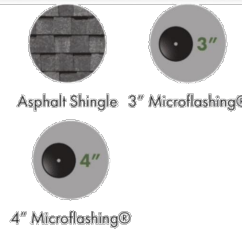
PN#	BOX QTY
17670	7" Bolts (10)
17723	Bolts + 4" Microflashing® (10ea.)
17724SS	Bolts (15) + 4" Microflashing® (15) + SS L-Foot (15) + Nuts (30)

First & only Microflashing® in the industry
Stainless Steel L-Foot
4" Microflashing® provides more coverage
UL Certified

Patent #8448407



3" & 4" MICROFLASHING®
For QuickBOLT



PN#	BOX QTY
17669	3" Microflashing® (10)
17659	4" Microflashing® (40)

First & only Microflashing® in the industry
Original Microflashing® design
EPDM on bottom, Stainless Steel on top
Compresses to composite shingle roof
Leak-proof seal
UL Certified

Patent #8448407



LOW PROFILE & OFFSET L-FOOT
For QuickBOLT



PN#	BOX QTY
15891SS	SS L-Foot (10)
15894SS	SS L-Foot (10)

Stainless Steel
Rail slot for adjustability when connecting T-Bolts



QUICK RATCHET CONDUIT CLAMP
For QuickBOLT Mounting Kits

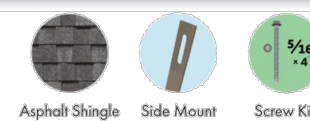


PN#	BOX QTY	SCREW SIZE
16255	10 Clamps	N/A

For running conduit
Attaches directly to any QuickBOLT Mounting Kit
Offers flexibility in bundling cables/wires



L-FOOT MOUNTING KIT
Fixed Height | Black Galva Flashing



PN#	BOX QTY	SCREW SIZE
17713	20 Flashing + L-Foot	5/16" x 4"

Stainless Steel L-Foot mounting system
Stronger than Aluminum Flashing



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MOUNT SPEC SHEET

DESIGNER /CHECKED BY: SK/PM

PAPER SIZE:17"X11"

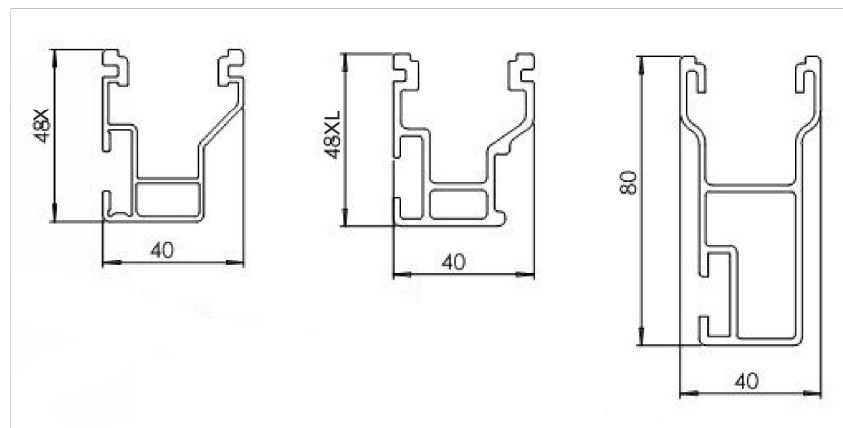
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SS-4

SPEC SHEET

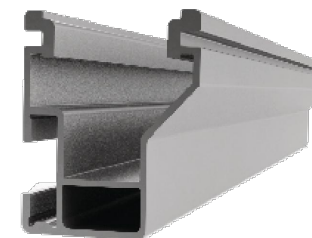


Technical data

	CrossRail System
Roof Type	Composition shingle, tile, standing seam
Material	High corrosion resistance stainless steel and high grade aluminum
Flexibility	Modular construction, suitable for any system size, height adjustable
PV Modules	For all common module types
Module Orientation	Portrait and landscape
Roof Attachment	Screw connection into rafter
Structural Validity	IBC compliant, stamped engineering letters available for all solar states
Warranty	25 years



CrossRail 48-X

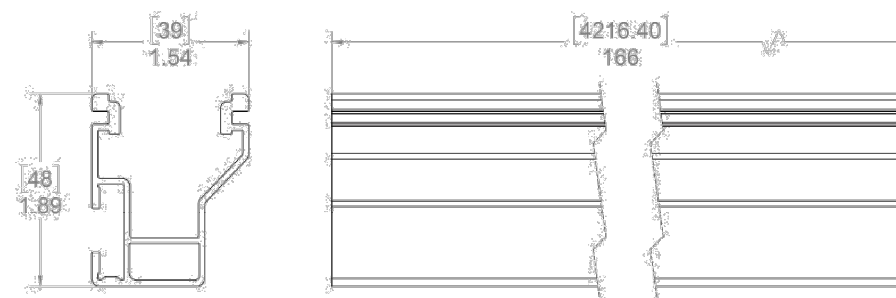


Mechanical Properties

	CrossRail 48-X
Material	6000 Series Aluminum
Ultimate Tensile Strength	37.7 ksi (260 MPa)
Yield Strength	34.8 ksi (240 MPa)
Weight	0.56 lbs/ft (0.833 kg/m)
Finish	Mill or Dark Anodized

Section Properties

	CrossRail 48-X
Sx	0.1980 in ³ (3.261 cm ³)
Sy	0.1510 in ³ (2.507 cm ³)
A (X-Section)	0.4650 in ² (3.013 cm ²)



Dimensions in [mm] Inches

Notes:

- ▶ Structural values and span charts determined in accordance with Aluminum Design Manual and ASCE 7-10
- ▶ UL2703 Listed System for Fire and Bonding

www.everest-solarsystems.com

www.everest-solarsystems.com



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RAIL SPEC SHEET

DESIGNER /CHECKED BY: SK/PM PAPER SIZE:17"X11"

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