

Permit Application for Photovoltaic Array System

Address: [REDACTED] Walnut Creek CA 94598
Owner: Morris Lee
Date: April 17, 2020

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Spec Sheets

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BUILDING PERMIT APPLICATION

Community & Economic Development Department,
Development Review Services Division
1666 N. Main Street
Walnut Creek, CA 94596
Voice: (925) 943-5834 Fax: (925) 256-3500
www.walnut-creek.org/developmentcenter

(For Staff Use Only)

Application #: _____
Received By: _____
Date Received: _____

Project Address: ##### Walnut Creek Suite/Unit # _____
Description of Work: Install grid-tie 2.4kW solar system on single family home
Cost of Construction (Valuation): \$ 5,500 (Valuation = Labor + Materials)

New Submittal Revision to Issued Permit Permit #: _____
 Additional Information Responses to Plan Check

New Construction Addition Alteration or Remodel Full Demolition
 Plumb, Elec, Mech ONLY Re-Roof Solar Partial Demolition
 Water Heater Furnace or A/C Pool / Spa After Hours
 Sign Awning

OWNER:
Name: Morris Lee
Address: #####
City & State: Walnut Creek, CA Zip: 94598
Phone #: ##### Fax #: N/A
E-mail: #####

CONTRACTOR:
Company: self-install by owner
Lic.#: _____ Class: _____
Address: _____
City & State: _____ Zip: _____
Phone #: _____ Fax #: _____
E-mail: _____

APPLICANT:
Name: Morris Lee Company: N/A
Lic. #: N/A ARCHITECT ENGINEER OTHER: homeowner
Address: ##### City & State: Walnut Creek Zip: 94598
Phone #: ##### Fax #: N/A E-mail: #####

As the Applicant of this project, I agree to the following:

- 1.) The Owner of the above mentioned property is aware and authorizes the submittal of this permit application.
- 2.) The information and statements given on this application, drawings and specifications are true and correct, to the best of my knowledge.

Morris Lee  April 8, 2020
Applicant's PRINTED Name Applicant's Signature Date

PLEASE ANSWER THE FOLLOWING QUESTIONS THAT PERTAIN TO YOUR PROJECT:

GENERAL INFO	<input checked="" type="checkbox"/> Single Family Residence <input type="checkbox"/> Duplex/Townhouse <input type="checkbox"/> Rossmoor <small>(Rossmoor approval letter required PRIOR to issuance of permit)</small>		
	<input type="checkbox"/> Multi-Family <input type="checkbox"/> Commercial/Tenant Improvement		
	Surface area of demolition:	<input type="text" value="0"/> sq. ft.	A Waste Management Plan (WMP) will be required if your project meets one of the following triggers: - Demolition surface area ≥ 300 sq. ft. - Construction area ≥ 1,000 sq. ft. - Valuation of project is ≥ \$50,000 - All non-residential projects, regardless of scope of work
	Construction floor area:	<input type="text" value="0"/> sq. ft.	
	Net new conditioned area:	<input type="text" value="0"/> sq. ft.	
	The City of Walnut Creek recommends each Waste Management Plan be submitted through Green Halo Systems. To find out more information, go to www.greenhalosystems.com or contact a Permit Technician at 925-943-5834.		
	Residential Care Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No OSHPD-3 Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
	Is this permit being issued as a result of an emergency? (i.e. earthquake) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Applicant requests expedited plan review? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>(if YES, an additional 50% of plan review fees will be assessed)</i> NOTE: EXPEDITE PLAN REVIEW ONLY APPLIES FOR BUILDING REVIEW.			
Who would you like comments sent to? <i>(Check all that apply)</i> <input checked="" type="checkbox"/> Owner <input type="checkbox"/> Design Professional <input type="checkbox"/> Contractor <input type="checkbox"/> Applicant or Agent			

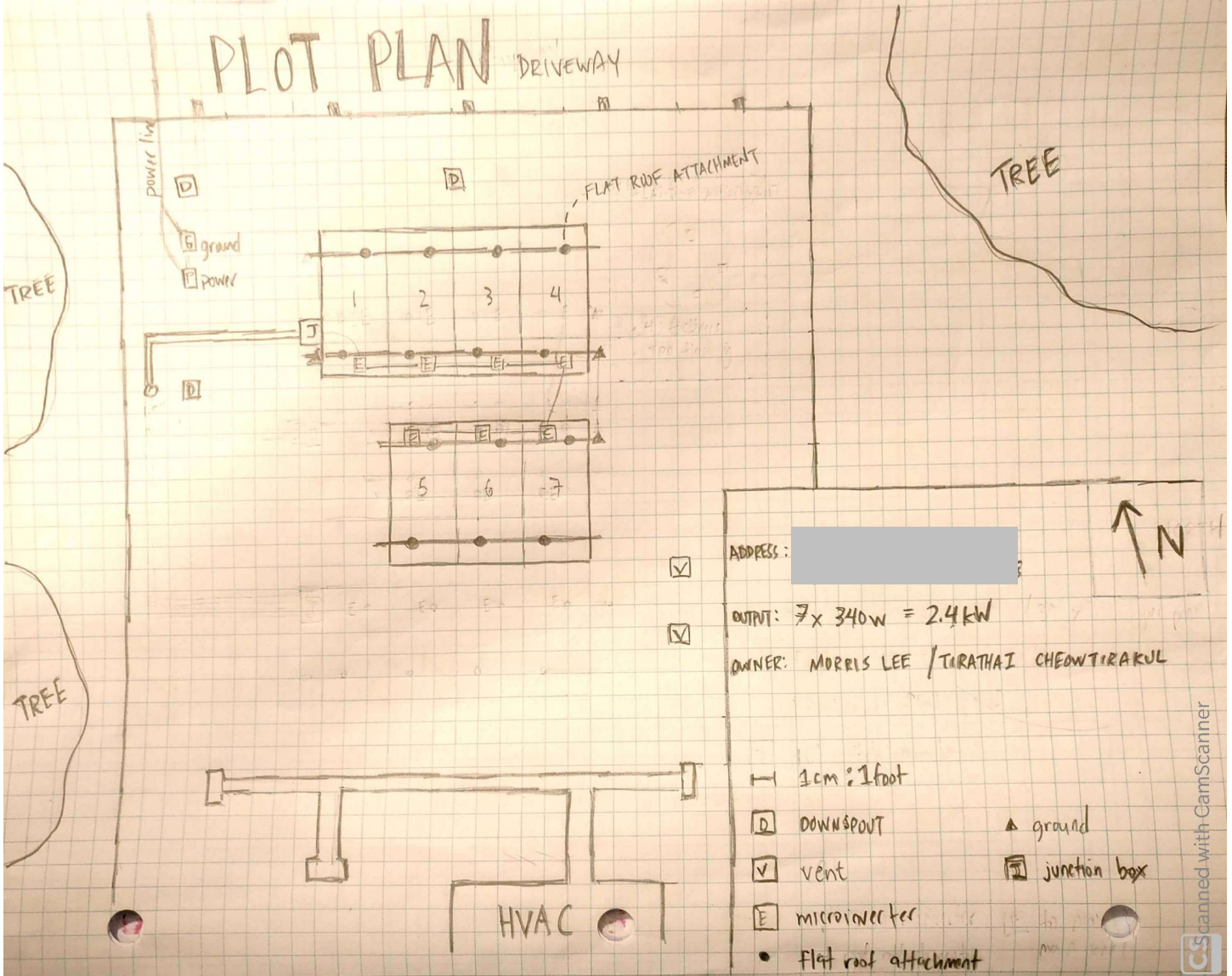
POOL & SPA	<input type="checkbox"/> Residential		<input type="checkbox"/> Multi-Family or Commercial		
	<input type="checkbox"/> New	<input type="checkbox"/> Remodel	<input type="checkbox"/> Demolition		
	<input type="checkbox"/> Pool	<input type="checkbox"/> Spa	<input type="checkbox"/> Pool & Spa	Is the Spa:	<input type="checkbox"/> Fixed in-place <input type="checkbox"/> Portable

SOLAR	<input checked="" type="checkbox"/> Residential		<input type="checkbox"/> Multi-Family or Commercial		
	<input type="checkbox"/> Solar Collector	<input checked="" type="checkbox"/> Photovoltaic		Solar Panel Area:	<input type="text" value="105"/> sq. ft.
	Are the panels being placed on a new structure? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Size of system:	<input type="text" value="2.4"/> kw
	Are you replacing the roof at the same time? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				

RE-ROOF	Is this project: Tear-off or Overlay			
	Demolition area:	<input type="text" value=""/> sq. ft.	Old Material:	Weight:
	Re-Roof area:	<input type="text" value=""/> sq. ft.	New Material:	Weight:
	Is there mechanical on the roof? <input type="checkbox"/> Yes <input type="checkbox"/> No			
	Are there solar panels on roof? <input type="checkbox"/> Yes <input type="checkbox"/> No			
	How many stories is the building?			

PLOT PLAN

DRIVEWAY



ADDRESS: [REDACTED]

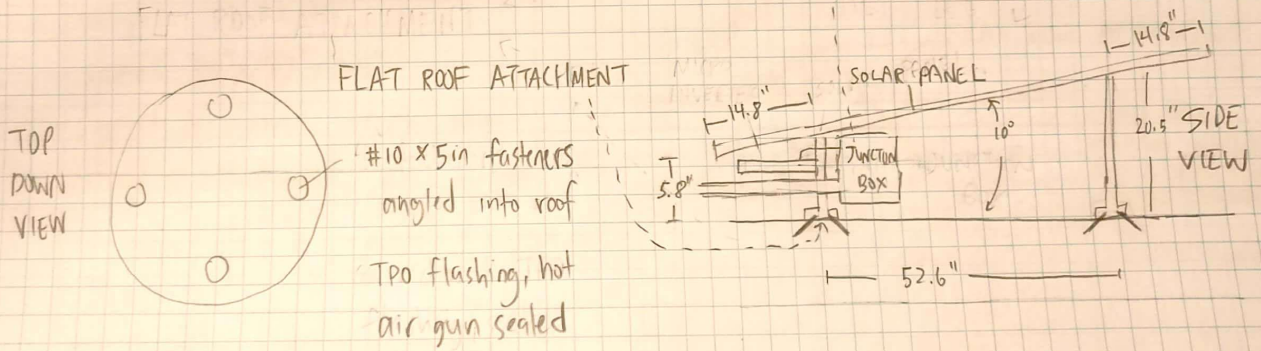
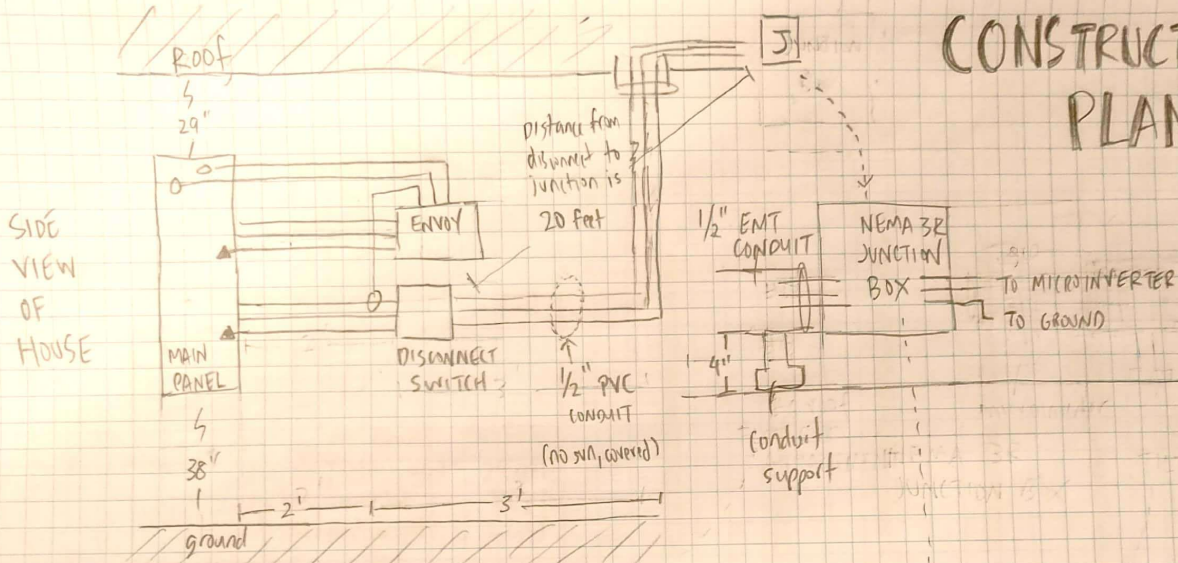
OUTPUT: 7 x 340W = 2.4 kW

OWNER: MORRIS LEE / TURATHAI CHEOWTIRAKUL

1cm : 1foot

- D DOWNSPOUT
- V vent
- E microinverter
- flat roof attachment
- ground
- J junction box

CONSTRUCTION PLAN



Battery Bank

Not applicable. No battery installation.

IMPORTANT: READ ALL MANUALS COMPLETELY PRIOR TO INSTALLATION OF SYSTEM COMPONENTS AND WIRING. FOR CRITICAL SAFETY INFORMATION, INSTALLATION SEQUENCES, COMPONENT SETTINGS, AND OPERATION PROCEDURES.

THIS DIAGRAM PICTS LAYOUT FOR WIRING ONLY. PHYSICAL LAYOUT MAY VARY. CONSULT RACKING REPORT FOR SPECIFIC DETAILS.

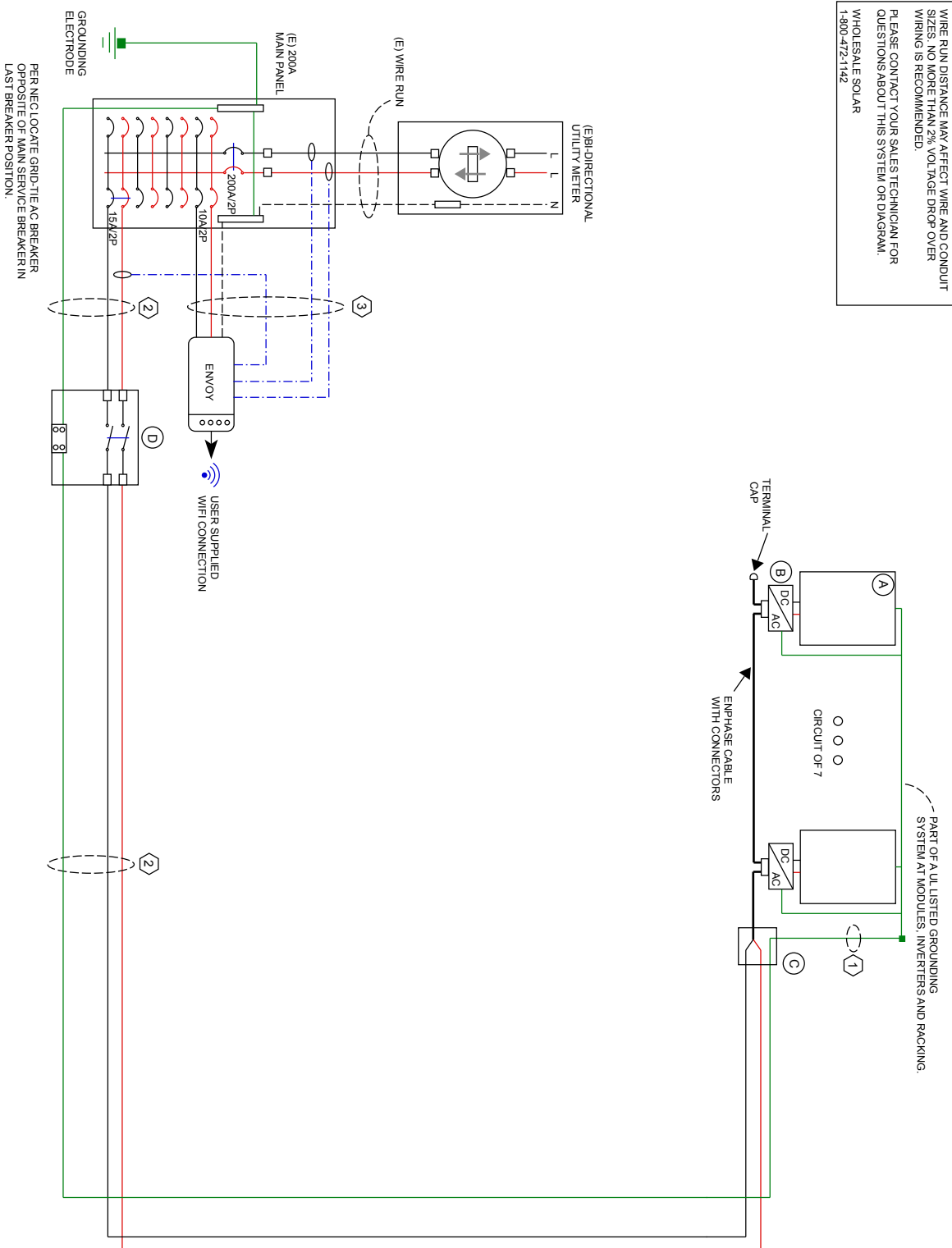
REFER TO MANUALS AND EQUIPMENT LABELS FOR WIRING TERMINATION LOCATIONS.

ON-SITE LOCATION OF EQUIPMENT MAY BE SUBJECT TO APPROVAL OF UTILITY PROVIDER.

WIRE RUN DISTANCE MAY AFFECT WIRE AND CONDUIT SIZES. NO MORE THAN 2% VOLTAGE DROP OVER WIRING IS RECOMMENDED.

PLEASE CONTACT YOUR SALES TECHNICIAN FOR QUESTIONS ABOUT THIS SYSTEM OR DIAGRAM.

WHOLESALE SOLAR
1-800-472-1142



A SOLAR PV MODULES
ASTRO ENERGY
CHR160120/14/5
P/MAX 345 WATTS
V/MPP 37.38 VDC
VOC 46.37 VDC
I/MPP 9.23 ADC
ISC 9.67 ADC

B ENPHASE ENERGY
MICRO INVERTERS
IC07PLUS-72-2-US
DC INPUT
P/MAX 440 WATTS
AC OUTPUT
P/MAX 290 WATTS
240 VAC / 60 HZ

C USER SUPPLIED
NEWARK BOX TO TRANSITION
TO CONDUIT WHERE REQUIRED
BY LOCAL AUTHORITY.

D USER SUPPLIED
MANUAL AC DISCONNECT MAY
BE REQUIRED BY LOCAL
AUTHORITY
15 AAC / 240 VAC MIN.

1 USER SUPPLIED
#6 CU GROUND

2 USER SUPPLIED
2 - #12 THWN-2 CU
1 - #6 CU GROUND
IN 1/2" CONDUIT MIN.
P/MAX 2,030 WATTS
VOC 240.00 VAC
I/MPP 848 AAC

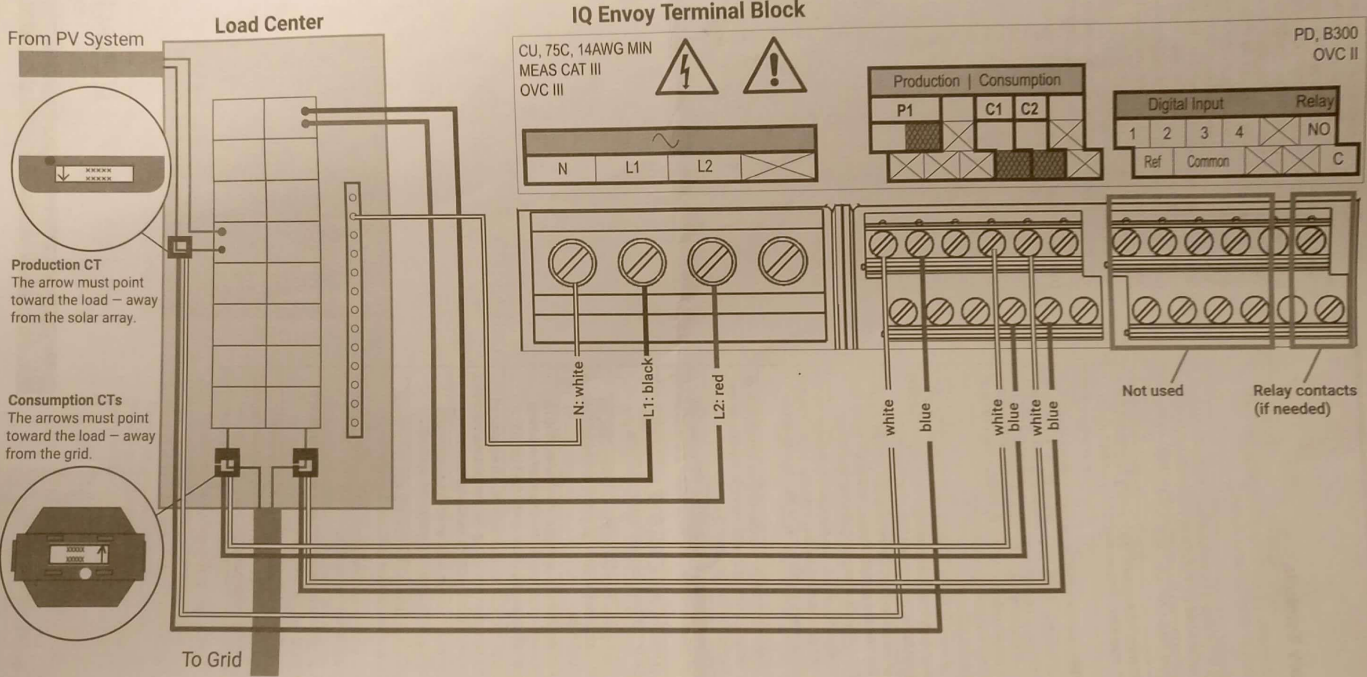
3 USER SUPPLIED
3 - #14 THHN-2 CU
IN 1/2" CONDUIT MIN.

ALL WIRING MUST COMPLY WITH NEC GUIDELINES AND LOCAL AUTHORITY HAVING JURISDICTION.

DIAGRAM NOTATIONS REFLECT BREAKER SIZES, AND MINIMUM WIRE AND CONDUIT SIZES FOR SIZE OF SYSTEM AS SHOWN AND ACCORDING TO 2017 NEC REGULATIONS FOR SAFETY.

ORDER # 190630
PREPARED BY: D.S.
CHECKED BY: JIR/J.C.
03/24/2020

PER NEC LOCATE GRID-TIE AC BREAKER OPPOSITE OF MAIN SERVICE BREAKER IN LAST BREAKER POSITION!



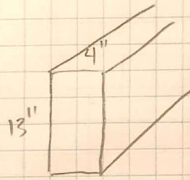
Production CT
The arrow must point toward the load – away from the solar array.

Consumption CTs
The arrows must point toward the load – away from the grid.

STRUCTURAL SUPPORT

* Type of Roof: TPO Membrane

* Beams



* Weight:

total system weight:	411.3 lbs
weight/attachment:	29.4 lbs
racking weight:	74.8 lbs
distributed weight:	2.8 psf

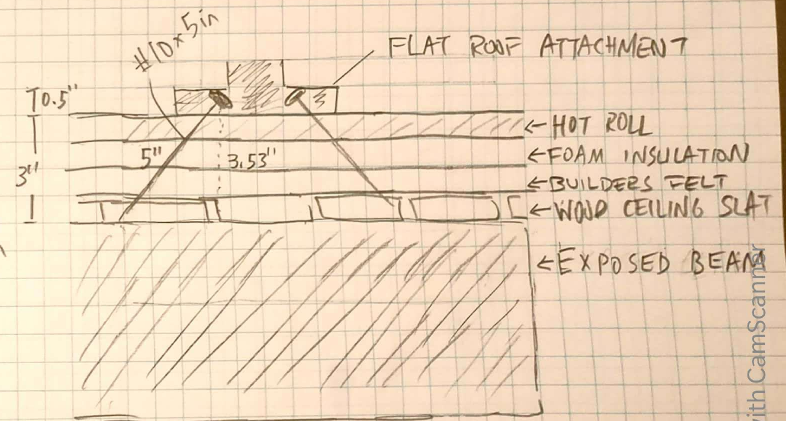
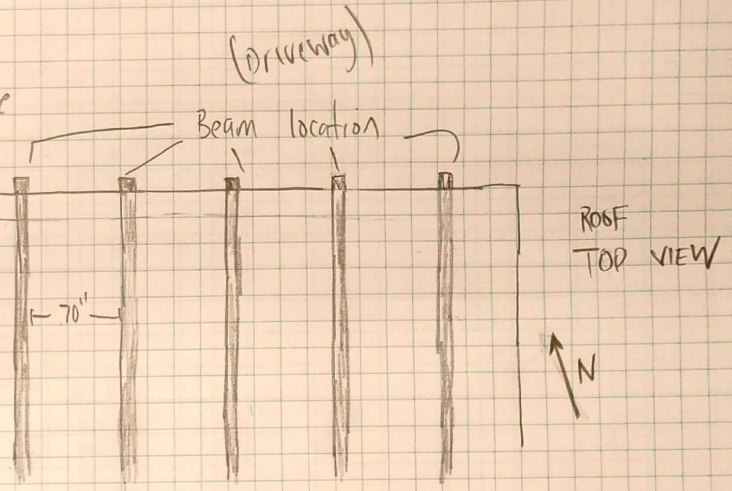
* SOLAR PANEL

- weight: 48.28 lbs

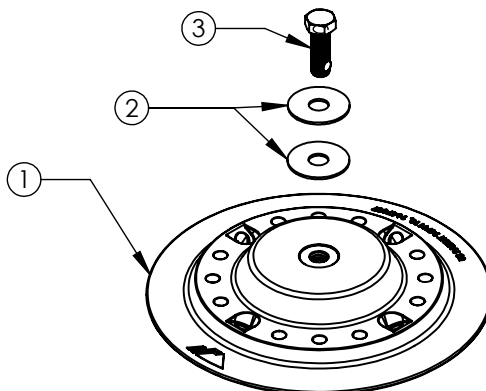
- size: 39" x 77" x 1.5"

- support locations: see plot plan

- method of attachments: see → and construction plan



* no strengthening work to be done

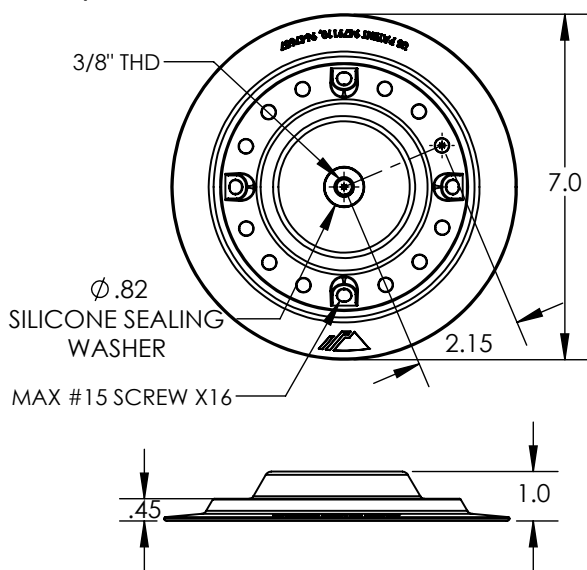


ITEM NO.	DESCRIPTION
1	FLAT ROOF ATTACH, BASE
2	WASHER, FLAT 3/8" X 1.25" OD SS
3	BOLT, 3/8-16 X 1.125" HEX, SS

FLAT ROOF ATTACHMENT (FRA)

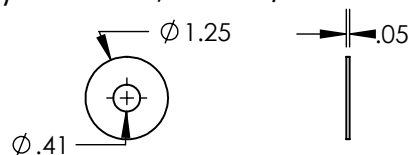
Part Number	Description
FRA-BASE-01-M1	Flat Roof Attachment, Mill

1) FLAT ROOF ATTACH, BASE



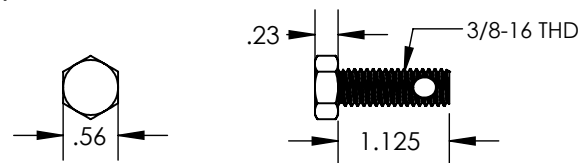
Property	Value
Material	Aluminum
Finish	Mill

2) WASHER, FLAT 3/8" X 1.25" OD SS

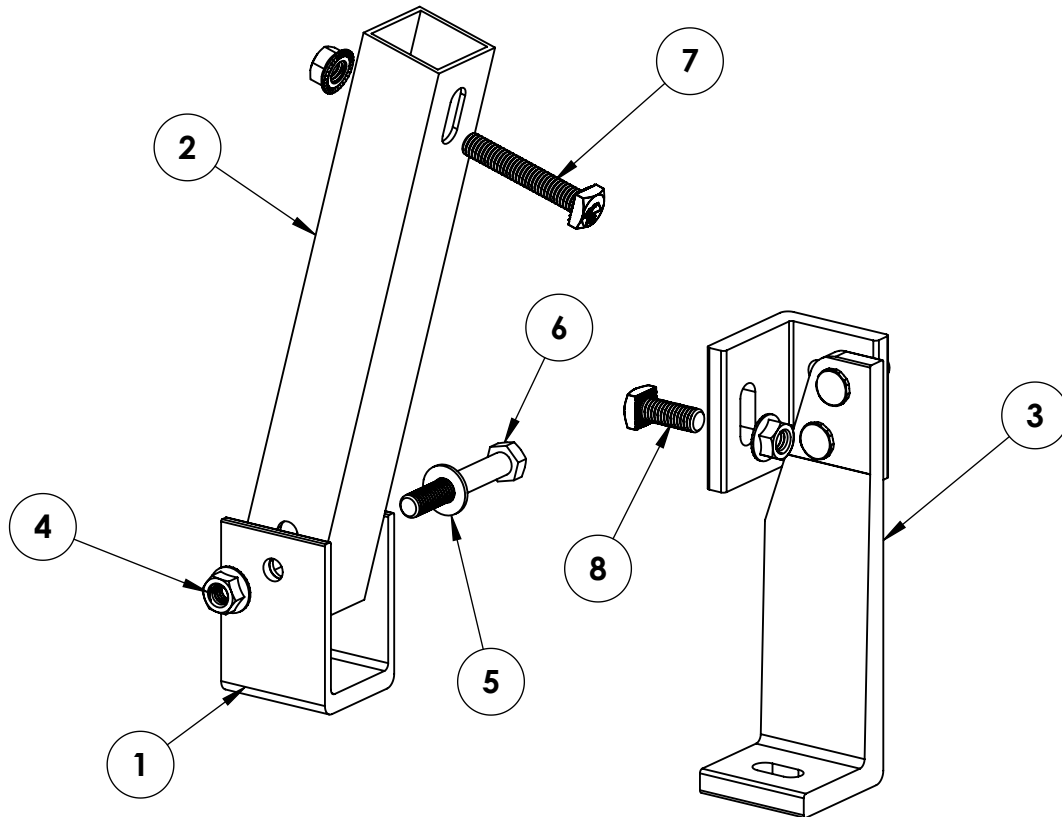


Property	Value
Material	300 Series Stainless Steel
Finish	Clear

3) BOLT, 3/8-16 X 1.125" HEX, SS



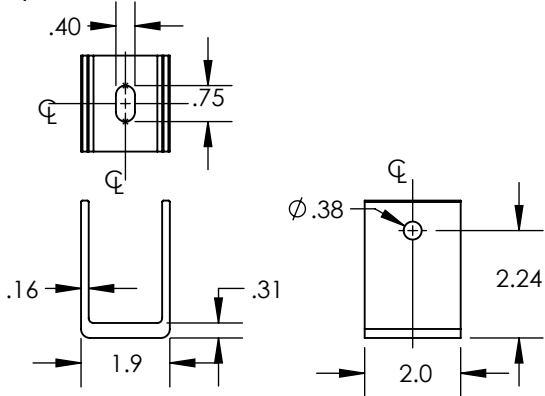
Property	Value
Material	300 Series Stainless Steel
Finish	Clear



ITEM NO.	DESCRIPTION	QTY.
1	U-FOOT	1
2	NORTH TILT LEG, 1.5" SQ, LENGTH VARIES	1
3	PRE-ASSEMBLED SOUTH TILT LEG	1
4	NUT, FLANGE HEX 3/8-16 SS	3
5	WASHER, FLAT 3/8 SS	1
6	BOLT, 3/8-16 X 2.5" CS SST	1
7	BOLT, BONDING 3/8-16 SQ HEAD, 2.25"	1
8	BOLT, BONDING 3/8-16 SQ HEAD, 1.0"	1

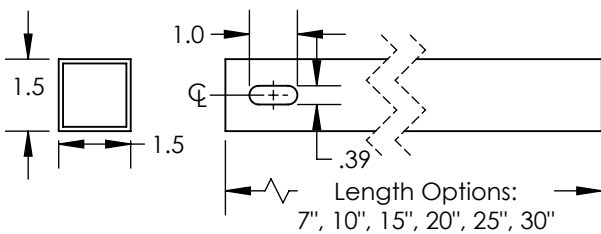
Part Number	Description	North Tilt Leg Length
TM-FTL-007	Kit, Fixed Tilt Leg, 7", Mill	7"
TM-FTL-010	Kit, Fixed Tilt Leg, 10", Mill	10"
TM-FTL-015	Kit, Fixed Tilt Leg, 15", Mill	15"
TM-FTL-020	Kit, Fixed Tilt Leg, 20", Mill	20"
TM-FTL-025	Kit, Fixed Tilt Leg, 25", Mill	25"
TM-FTL-030	Kit, Fixed Tilt Leg, 30", Mill	30"

1) U-Foot



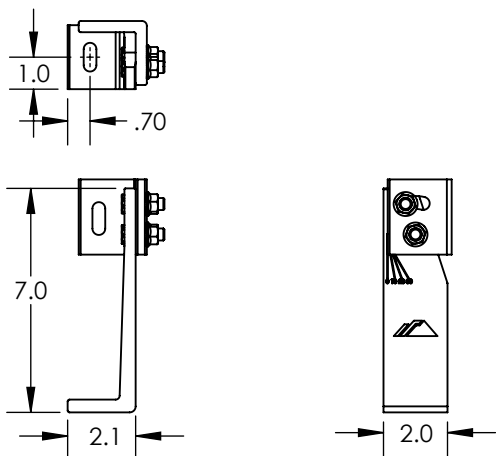
Property	Value
Material	Aluminum
Finish	Mill

2) North Tilt Leg



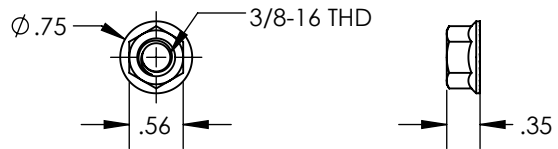
Property	Value
Material	Aluminum
Finish	Mill

3) Pre-assembled South Tilt Leg



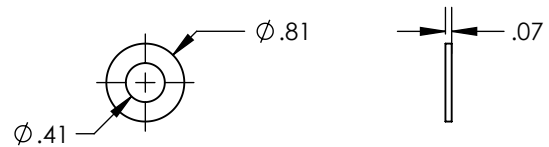
Property	Value
Material	Aluminum
Finish	Mill

4) Nut, Flange Hex 3/8-16 SS



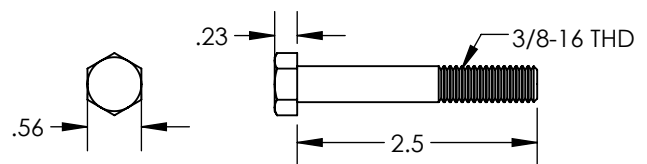
Property	Value
Material	Stainless Steel
Finish	Clear

5) Washer, Flat 3/8 SS



Property	Value
Material	Stainless Steel
Finish	Clear

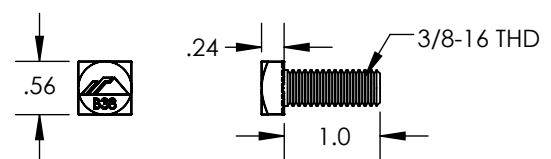
6) Bolt, 3/8-16 X 2.5" CS SS



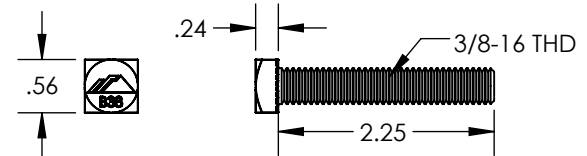
Property	Value
Material	Stainless Steel
Finish	Clear

7, 8) Bolt, Bonding 3/8-16 Sq Head

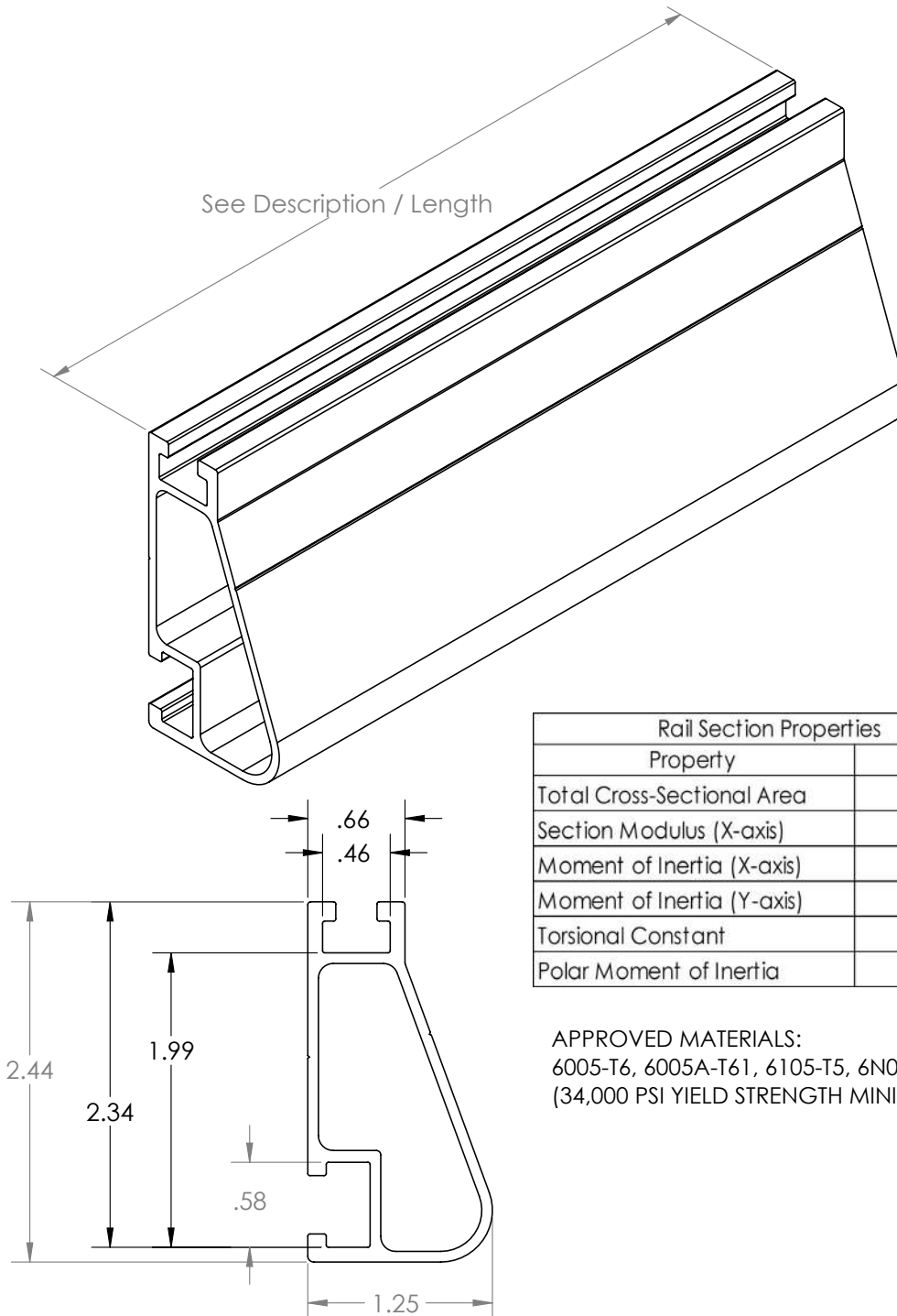
1.0"



2.25"



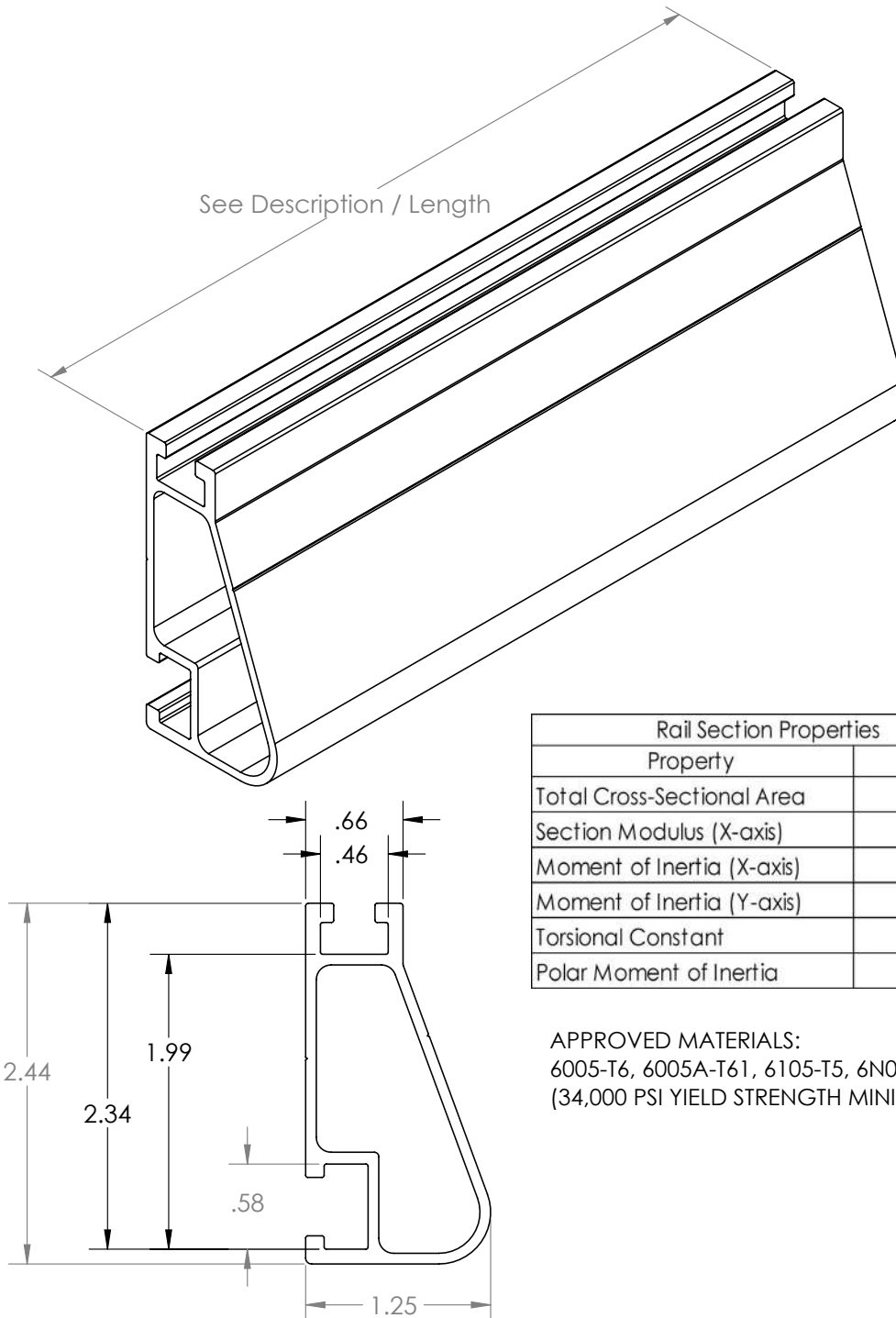
Property	Value
Material	Stainless Steel
Finish	Clear



Rail Section Properties	
Property	Value
Total Cross-Sectional Area	0.582 in ²
Section Modulus (X-axis)	0.297 in ³
Moment of Inertia (X-axis)	0.390 in ⁴
Moment of Inertia (Y-axis)	0.085 in ⁴
Torsional Constant	0.214 in ³
Polar Moment of Inertia	0.126 in ⁴

APPROVED MATERIALS:
 6005-T6, 6005A-T61, 6105-T5, 6N01-T6
 (34,000 PSI YIELD STRENGTH MINIMUM)

Clear Part Number	Black Part Number	Description / Length	Material	Weight
XR-100-132A	XR-100-132B	XR100, Rail 132" (11 Feet)	6000-Series Aluminum	7.50 lbs.
XR-100-168A	XR-100-168B	XR100, Rail 168" (14 Feet)		9.55 lbs.
XR-100-204A	XR-100-204B	XR100, Rail 204" (17 Feet)		11.60 lbs.



Rail Section Properties	
Property	Value
Total Cross-Sectional Area	0.582 in ²
Section Modulus (X-axis)	0.297 in ³
Moment of Inertia (X-axis)	0.390 in ⁴
Moment of Inertia (Y-axis)	0.085 in ⁴
Torsional Constant	0.214 in ³
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APPROVED MATERIALS:
 6005-T6, 6005A-T61, 6105-T5, 6N01-T6
 (34,000 PSI YIELD STRENGTH MINIMUM)

Clear Part Number	Black Part Number	Description / Length	Material	Weight
XR-100-132A	XR-100-132B	XR100, Rail 132" (11 Feet)	6000-Series Aluminum	7.50 lbs.
XR-100-168A	XR-100-168B	XR100, Rail 168" (14 Feet)		9.55 lbs.
XR-100-204A	XR-100-204B	XR100, Rail 204" (17 Feet)		11.60 lbs.

AstroHalo™

High Tech Leads Industry



340W~355W

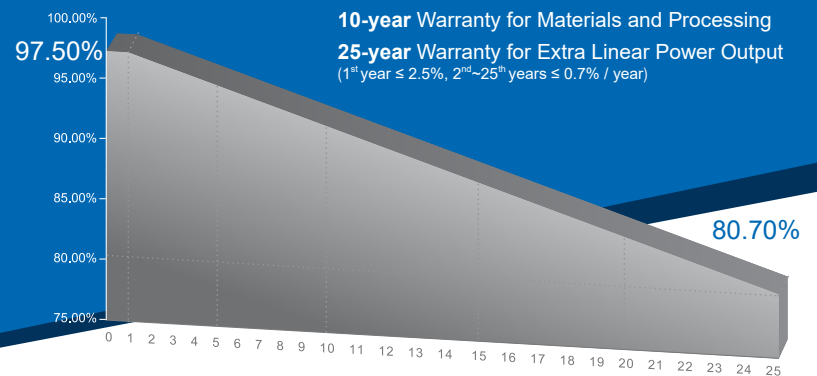
5BB-Polycrystalline PV Module

CHSM6612P Series

CHSM6612P/HV Series

CHSM6612P max system voltage 1000V standard

CHSM6612P/HV max system voltage 1500V standard



KEY FEATURES

- OUTPUT POSITIVE TOLERANCE**
 Guaranteed 0~+5W positive tolerance ensures power output reliability.
- INNOVATIVE PERC CELL TECHNOLOGY**
 Excellent cell efficiency and output.
- EXCELLENT STATIC MECHANICAL LOAD CAPABILITY**
 Certified to withstand: front load (6000 Pa) and back load (3600 Pa).
- HIGHER RELIABILITY AND DURABILITY**
 Effectively deals with harsh environments, such as sand, salt mist and ammonia resistance.
- PASSED HAIL TEST**
 Certified to hail resistance: ice ball size (d=45mm) and ice ball velocity (v=30.7m/s).
- PID RESISTANCE**
 Excellent PID resistance at 96 hours (@85°C /85%) test, and also can be improved to meet higher standards for the particularly harsh environment.

COMPREHENSIVE CERTIFICATES



First solar company which passed the TUV Nord IEC/TS 62941 certification audit.

For Global Market



ASTROENERGY
A CHNT COMPANY

ELECTRICAL SPECIFICATIONS

STC rated output (P_{mpp})*	340 Wp	345 Wp	350 Wp	355 Wp
Rated voltage (V_{mpp}) at STC	37.33 V	37.38 V	37.48 V	37.55 V
Rated current (I_{mpp}) at STC	9.11 A	9.23 A	9.34 A	9.46 A
Open circuit voltage (V_{oc}) at STC	46.16 V	46.37 V	46.57 V	46.70 V
Short circuit current (I_{sc}) at STC	9.62 A	9.67 A	9.72 A	9.78 A
Module efficiency	17.5%	17.7%	18.0%	18.3%
Rated output (P_{mpp}) at NOCT	237.4 Wp	240.9 Wp	244.4 Wp	247.9 Wp
Rated voltage (V_{mpp}) at NOCT	34.10 V	34.15 V	34.24 V	34.29 V
Rated current (I_{mpp}) at NOCT	6.96 A	7.05 A	7.14 A	7.23 A
Open circuit voltage (V_{oc}) at NOCT	42.36 V	42.55 V	42.73 V	42.85 V
Short circuit current (I_{sc}) at NOCT	7.44 A	7.48 A	7.52 A	7.56 A
Temperature coefficient (P_{mpp})	- 0.408%/°C			
Temperature coefficient (I_{sc})	+0.050%/°C			
Temperature coefficient (V_{oc})	- 0.311%/°C			
Normal operating cell temperature (NOCT)	46±2°C			
Maximum system voltage (IEC/UL)	1000V _{DC} or 1500V _{DC}			
Number of diodes	3			
Junction box IP rating	IP 67			
Maximum series fuse rating	20 A			

* Measurement tolerance +/- 3%

STC: Irradiance 1000W/m², Cell Temperature 25°C, AM=1.5

NOCT: Irradiance 800W/m², Ambient Temperature 20°C, AM=1.5, Wind Speed 1m/s

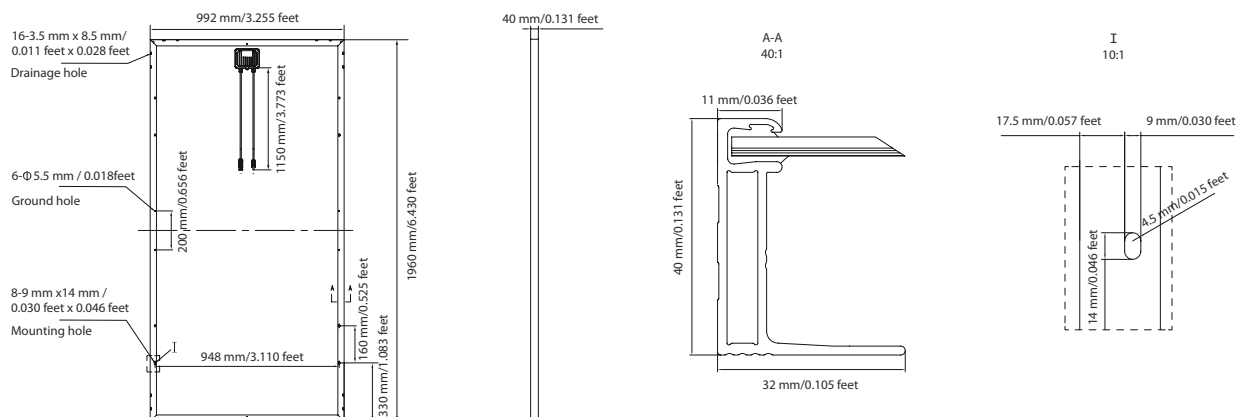
MECHANICAL SPECIFICATIONS

Outer dimensions (L x W x H)	1960 x 992 x 40 mm 77.17 x 39.06 x 1.57 in
Frame technology	Aluminum, silver anodized
Module composition	Glass / EVA / Backsheet (white)
Front glass thickness	3.2 mm / 0.13 in
① Cable length (IEC/UL)	1150 mm / 45.28 in
Cable diameter (IEC/UL)	4 mm ² / 12 AWG
② Maximum mechanical test load	6000 Pa (front) / 3600 Pa (back)
Fire performance (IEC/UL)	Class C (IEC) or Type 1 (UL)
Connector type (IEC/UL)	MC4 compatible

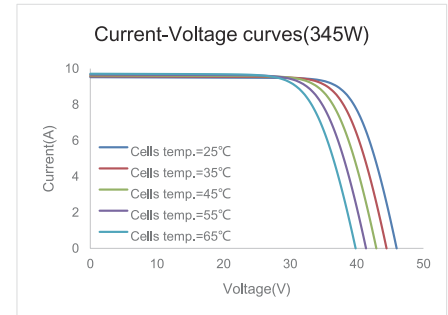
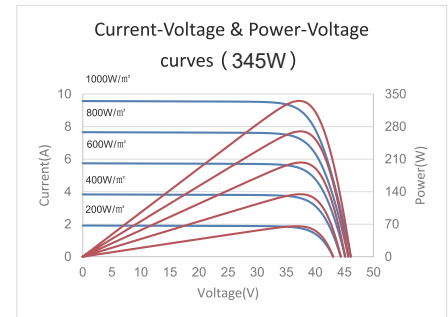
① Option: 900(+)/600(-) mm for defined projects in advance.

② Refer to Astronergy Crystalline Silicon PV Module Installation Manual or contact technical department.
Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

MODULE DIMENSION DETAILS



CURVE



PACKING SPECIFICATIONS

① Weight (module only)	21.9 kg / 48.28 lbs
② Packing unit	27 pcs / box
Weight of packing unit (for 40'HQ container)	636 kg / 1402 lbs
Number of modules per 40'HQ container	648 pcs

① Tolerance +/- 1.0kg
② Subject to sales contract

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 / IQ7-60-B-US		IQ7PLUS-72-2-US / IQ7PLUS-72-B-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 I _{sc})	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)	0.7 leading ... 0.7 lagging		0.7 leading ... 0.7 lagging	
EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak CEC 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)			
Connector type (IQ7-60-B-US & IQ7PLUS-72-B-US)	Friends PV2 (MC4 intermateable). Adaptors for modules with MC4 or UTX connectors: - PV2 to MC4: order ECA-S20-S22 - PV2 to UTX: order ECA-S20-S25			
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.

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