

powered by

Q.ANTUM DUO Z

PRELIMINARY

Q.PEAK DUO BLK-G10+ 350-370

ENDURING HIGH
PERFORMANCE



Quality
Controlled PV

www.tuv.com
ID 1111232615



BREAKING THE 20% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.



THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY

Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.



INNOVATIVE ALL-WEATHER TECHNOLOGY

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.



ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti PID Technology¹, Hot-Spot Protect and Traceable Quality Tra.Q™.



EXTREME WEATHER RATING

High-tech aluminium alloy frame, certified for high snow (5400Pa) and wind loads (4000Pa).



A RELIABLE INVESTMENT

Inclusive 25-year product warranty and 25-year linear performance warranty².

¹ APT test conditions according to IEC / TS 62804-1:2015, method A (-1500 V, 96h)

² See data sheet on rear for further information.



THE IDEAL SOLUTION FOR:



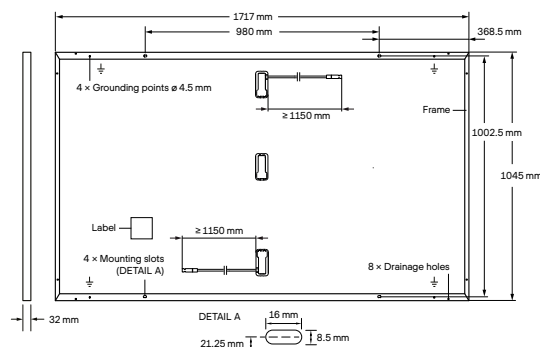
Rooftop arrays on
residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	1717 mm × 1045 mm × 32 mm (including frame)
Weight	19.9 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm × 32-60 mm × 15-18 mm Protection class IP67, with bypass diodes
Cable	4 mm ² Solar cable; (+) ≥ 1150 mm, (-) ≥ 1150 mm
Connector	Stäubli MC4; IP68

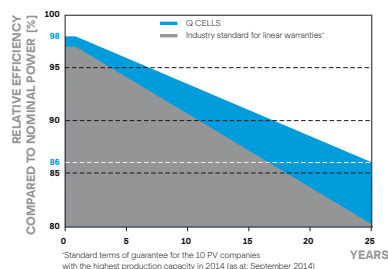


ELECTRICAL CHARACTERISTICS

POWER CLASS				350	355	360	365	370
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5 W / – 0 W)								
Minimum	Power at MPP ¹	P _{MPP}	[W]	350	355	360	365	370
	Short Circuit Current ¹	I _{SC}	[A]	10.97	11.00	11.04	11.07	11.10
	Open Circuit Voltage ¹	V _{OC}	[V]	41.11	41.14	41.18	41.21	41.24
	Current at MPP	I _{MPP}	[A]	10.37	10.43	10.49	10.56	10.62
	Voltage at MPP	V _{MPP}	[V]	33.76	34.03	34.31	34.58	34.84
	Efficiency ¹	η	[%]	≥19.5	≥19.8	≥20.1	≥20.3	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ²								
Minimum	Power at MPP	P _{MPP}	[W]	262.6	266.3	270.1	273.8	277.6
	Short Circuit Current	I _{SC}	[A]	8.84	8.87	8.89	8.92	8.95
	Open Circuit Voltage	V _{OC}	[V]	38.77	38.80	38.83	38.86	38.90
	Current at MPP	I _{MPP}	[A]	8.14	8.20	8.26	8.31	8.37
	Voltage at MPP	V _{MPP}	[V]	32.24	32.48	32.71	32.94	33.17

¹Measurement tolerances P_{MPP} ± 3%; I_{SC}; V_{OC} ± 5% at STC: 1000 W/m², 25 ± 2°C, AM 1.5 according to IEC 60904-3 • 2800 W/m², NMOT, spectrum AM 1.5

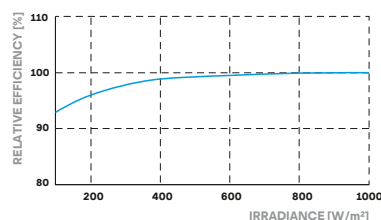
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25°C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I _{SC}	α	[%/K]	+0.04	Temperature Coefficient of V _{OC}	β	[%/K]	-0.27
Temperature Coefficient of P _{MPP}	γ	[%/K]	-0.34	Nominal Module Operating Temperature	NMOT	[°C]	43 ± 3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V _{SYS}	[V]	1000	PV module classification	Class II
Maximum Reverse Current	I _R	[A]	20	Fire Rating based on ANSI / UL 61730	C / TYPE 2
Max. Design Load, Push / Pull		[Pa]	3600 / 2660	Permitted Module Temperature on Continuous Duty	-40°C - +85°C
Max. Test Load, Push / Pull		[Pa]	5400 / 4000		

QUALIFICATIONS AND CERTIFICATES

Quality Controlled PV - TÜV Rheinland;
IEC 61215:2016; IEC 61730:2016.
This data sheet complies
with DIN EN 50380.
QCPV Certification ongoing.



Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH

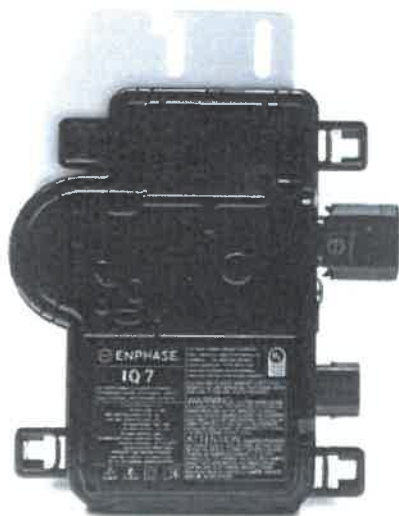
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | **TEL** +49 (0)3494 66 99-23444 | **FAX** +49 (0)3494 66 99-23000 | **EMAIL** sales@q-cells.com | **WEB** www.q-cells.com

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.



To learn more about Enphase offerings, visit enphase.com



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 pairings¹	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/range²	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 circuit³	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 5 / 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

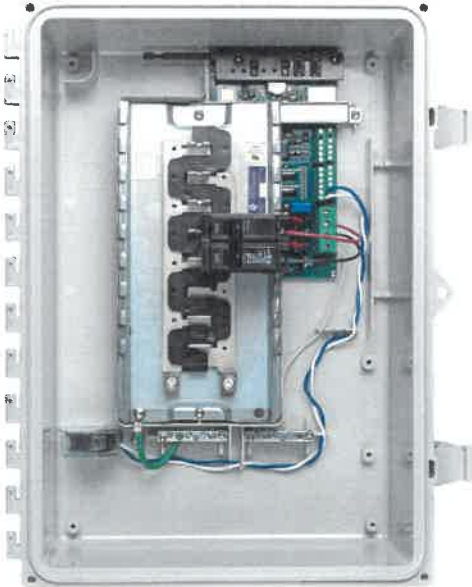
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2018-05-24



Enphase IQ Combiner 3

(X-IQ-AM1-240-3)

The **Enphase IQ Combiner 3™** 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
- Optional AC receptacle available for PLC bridge
- Provides production metering and optional consumption monitoring

Simple

- Reduced size from previous combiner
- Centered mounting brackets support single stud mounting
- Supports back and side conduit entry
- 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



LISTED

To learn more about Enphase offerings, visit enphase.com



Enphase IQ Combiner 3

MODEL NUMBER

IQ Combiner 3 X-IQ-AM1-240-3

IQ Combiner 3 with Enphase IQ Envoy™ printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).

ACCESSORIES and REPLACEMENT PARTS (not included, order separately)

Enphase Mobile Connect™

CELLMODEM-03 (4G / 12-year data plan)

CELLMODEM-01 (3G / 5-year data plan)

CELLMODEM-M1 (4G based LTE-M / 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-10A-2-240

BRK-15A-2-240

BRK-20A-2P-240

Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers.

Circuit breaker, 2 pole, 10A, Eaton BR210

Circuit breaker, 2 pole, 15A, Eaton BR215

Circuit breaker, 2 pole, 20A, Eaton BR220

EPLC-01

Power line carrier (communication bridge pair), quantity 2

XA-PLUG-120-3

Accessory receptacle for Power Line Carrier in IQ Combiner 3 (required for EPLC-01)

XA-ENV-PCBA-3

Replacement IQ Envoy printed circuit board (PCB) for Combiner 3

ELECTRICAL SPECIFICATIONS

Rating

Continuous duty

System voltage

120/240 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)

80A of distributed generation / 90A with IQ Envoy breaker included

Production Metering CT

200 A solid core pre-installed and wired to IQ Envoy

MECHANICAL DATA

Dimensions (WxHxD)

49.5 x 37.5 x 16.8 cm (19.5" x 14.75" x 6.63"). Height is 21.06" (53.5 cm with mounting brackets).

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

- 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors
 - 60 A breaker branch input: 4 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

Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)

Cellular

Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) or CELLMODEM-M1 (4G based LTE-M) (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 60601-1/CANCSA 22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

To learn more about Enphase offerings, visit enphase.com

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2018-09-13



RT-MINI

Self-flashing base for asphalt & metal roof-top PV mounting systems

RT-MINI is suitable for mounting any rail system with a conventional L-Foot.

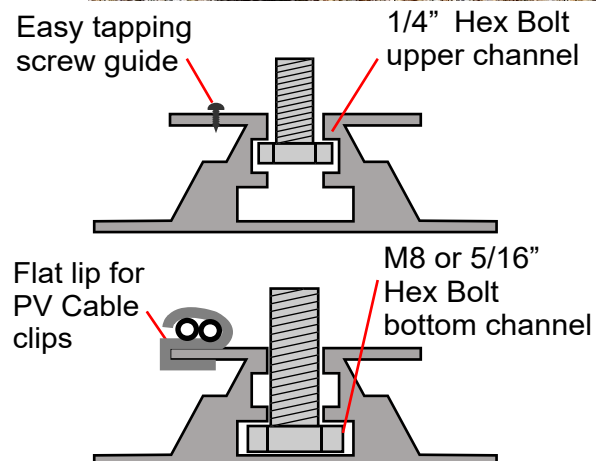


Dual bolt design: M8 or 5/16" for L-Foot & 1/4" for EMC



ICC ESR 3575

Call Now for more details
858-935-6064



Roof Tech

Smarter PV mounting solutions from top of roof to bottom line®
www.roof-tech.us info@roof-tech.us

RT-MINI

Flexible Flashing certified by the International Code Council (ICC)

Engineered to ASTM D 1761 (Standard Test Methods for Mechanical Fasteners in Wood)

Components

RT2-00-MINIBK

PAT : PENDING



MINI base : 20 ea.

Screw : 40 ea.

Extra RT-Butyl : 10 ea.

Optional item

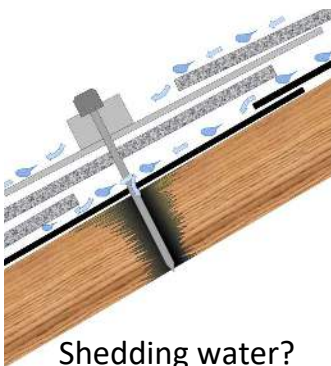
5 x 60mm Mounting screw (RT2-04-SD5-60) : 100 ea./Bag

5/16" Hex bolt, washer & nut set (RT-04-BN30SL-US) : 100 ea./Bag

RT-Butyl (RT2-04-BUTYLT) : 10 ea./Box

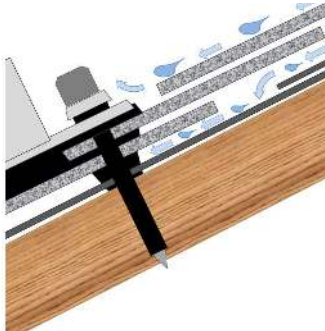
RT-Butyl is Roof Tech's flexible flashing used in 700,000 residential PV systems for the last 24 years. It is the first PV mounting system with Flexible Flashing certified by the ICC.

Metal Flashing Retrofit



Shedding water?

Flexible Flashing



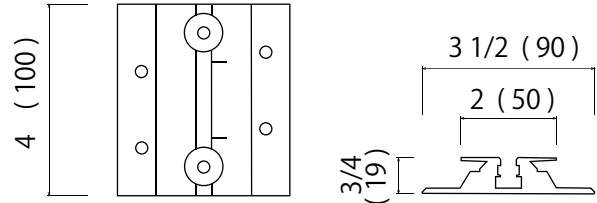
100% Waterproof

ICC ESR-3575

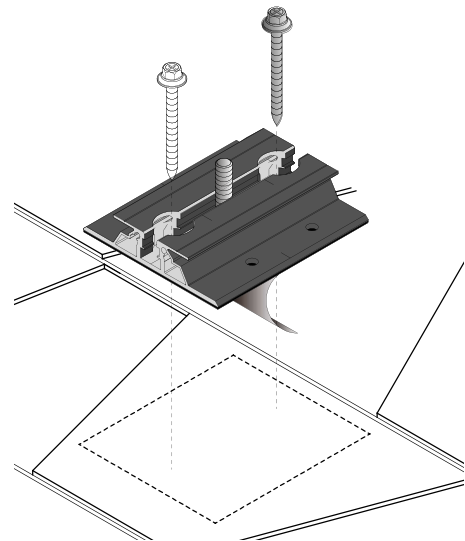
ASTM2140 testing UV testing (7500 hrs.)



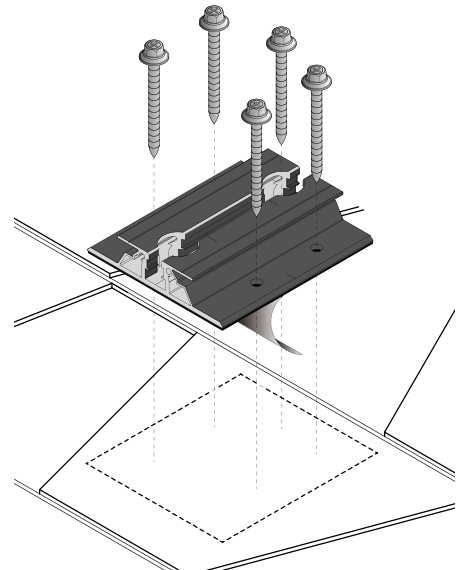
Dimensions in (mm)



Rafter installation



Deck installation



P.E. Stamped Letters available at www.roof-tech.us/support

Roof Tech Inc.

www.roof-tech.us

info@roof-tech.us

10620 Trenea Street, Suite 230, San Diego, CA 92131

858.935.6064



Rev. 03-2020



FLORIDA BUILDING CODE COMPLIANCE

FLORIDA BUILDING CODE 2020 REQUIREMENTS

Questions often arise in the solar industry as to the requirements for installing solar mounting systems in Dade and Broward counties and throughout the rest of the Florida. Outlined below are the four requirements to comply with the **2020 Florida Building Code**. The first three requirements are necessary for solar racking systems, while the fourth is specific to solar roof attachments. The fifth item, Florida-specific testing, is optional for installation.

1 - UL CERTIFICATIONS

- ▶ Racking UL 2703 (Supplied by EcoFasten)
- ▶ Modules UL 1703 or UL 61730 (See module manufacturer website)
- ▶ Inverters UL 1741 (See inverter manufacturer website)

2 - MODULE LOAD RATING

- ▶ UL 1703 / UL 61730 load rating to meet site conditions pressure for project (see module manufacturer installation manual or data sheet)
- ▶ Or alternately, Module Mechanical Load Test Report to show that the module meets or exceed the site conditions load rating

3 - RACKING STRUCTURAL CAPACITY

- ▶ Florida PE stamped system capacity and span tables that meet site conditions and roof zones for the project (Supplied by EcoFasten)

4 - ROOF ATTACHMENTS

- ▶ Structural Capacity certification letters that meets or exceeds site conditions (Supplied by EcoFasten)
- ▶ Waterproofing/Flashing per NRCA & FRSA/TRI (Florida) guidelines (Supplied by EcoFasten, when applicable)

5 - OPTIONAL FLORIDA SPECIFIC TESTING OR CERTIFICATIONS

- ▶ Florida Product Approval
- ▶ Miami Dade NOA
- ▶ Water Seal Testing: TAS100(A) (required for HVHZ Florida Product Approval or Miami Dade NOA)

ECOFASTEN ROOF ATTACHMENTS – FLORIDA COMPLIANT

EcoFasten offers two roof attachments that meet the specifications for installation in the State of Florida, which are GF-1® and QB-1 as shown below.

GF-1®

GF-1® is a versatile solution for use on composition shingle roofs. The 8" x 12" flashing installs with a single fastener and when combined with an EcoFasten compression bracket, a watertight seal is created, maintaining the integrity of the roof.

Available GF-1® SKUs:

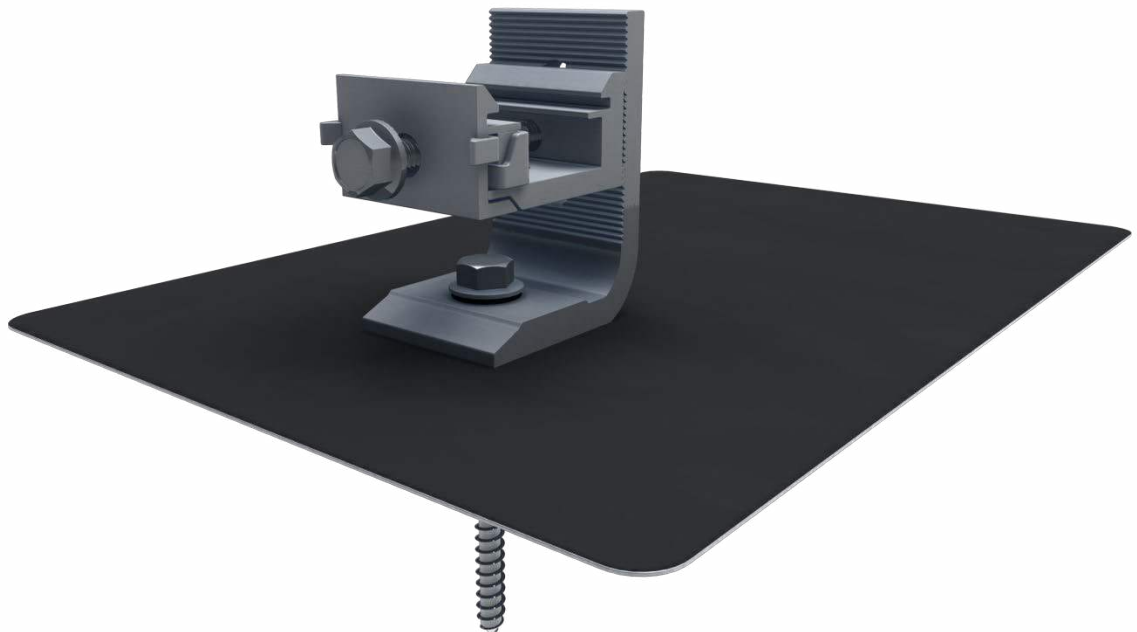
- 3012010 - GF-1 FLASHING GLV BLK 8x12"
- 3012011 - GF-1 FLASHING GLV MLL 8X12"

Available Compression Brackets:

- 2012022 - CF UNIV L-FOOT MLL 3"

GF-1® Structural Capacity Documentation for Permit Packets

- ▶ [ClickFit L-Foot Capacity Report 07.29.2021](#)
- ▶ [GF-1 Installation Manual Florida 08.11.2021 v2.0](#)



QB-1

QB-1 uses a super strong base that can be used on composition shingle, tile, shake, slate, metal shingle, and low slope rooftops. This is a rail-based solution is ideal for new residential construction projects. The base can be installed prior to the roofing material, allowing for the roof to be shingled or tiled around the posts.

Available QB-1 SKUs:

- 3017010 - QB-1 BASE AL
- 3017011 - QB-1 POST AL MLL 4.5"
- 3017012 - QB-1 POST AL MLL 6.5"
- 3017013 - QB-1 FLASHING AL MLL 12X12"
- 3017014 - QB-1 FLASHING AL MLL 18X18"
- 3017015 - QB-1 EPDM COLLAR BLK 1.25"

QB-1 Structural Capacity Documentation for Permit Packets

- ▶ [QB-1 State of Florida Certification Letter 07.29.2021](#)
- ▶ [QB-1 Installation Manual 04.09.2021 v1.0](#)



CLICKFIT®

ClickFit® is one of the fastest installing rail-based systems in the industry. With its click-in rail assembly, the rails can be connected to any of EcoFasten's composition shingle, tile, and metal roof mounts in seconds without the need for fasteners or tools. The ClickFit system is made of robust, anti-corrosive materials, such as aluminum and cold formed coated steel, to ensure the strength, corrosion resistance, and longevity.

Available ClickFit Rail SKUs:

- 2012021 - CF STD RAIL MLL AL 14FT
- 2012025 - CF STD RAIL AL MLL 171.5"

ClickFit UL 2703 Certification for Permit Packets

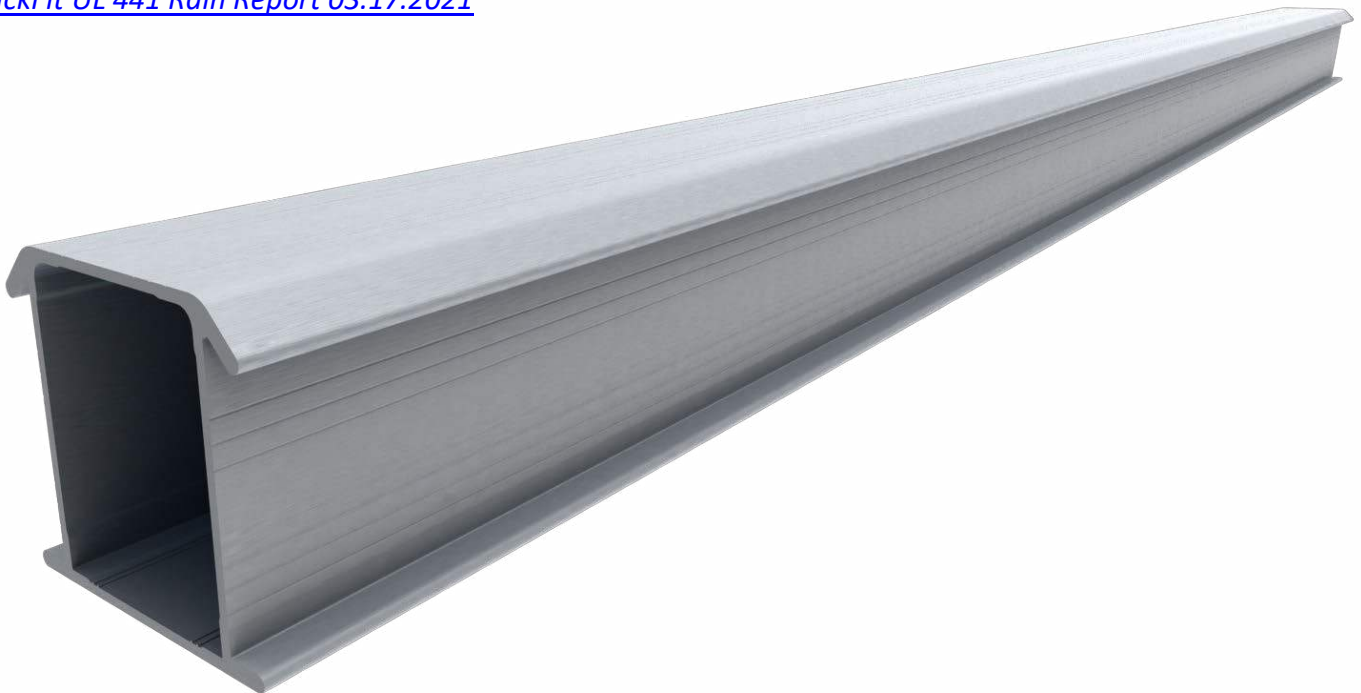
- ▶ [*ClickFit UL 2703 Approved Installation Manual Version 07.06.2021 v2.5*](#)
- ▶ [*ClickFit UL 2703 Approved Addendum 06.07.2021 v1.1*](#)

ClickFit Module Load Rating/Span Tables for Permit Packets

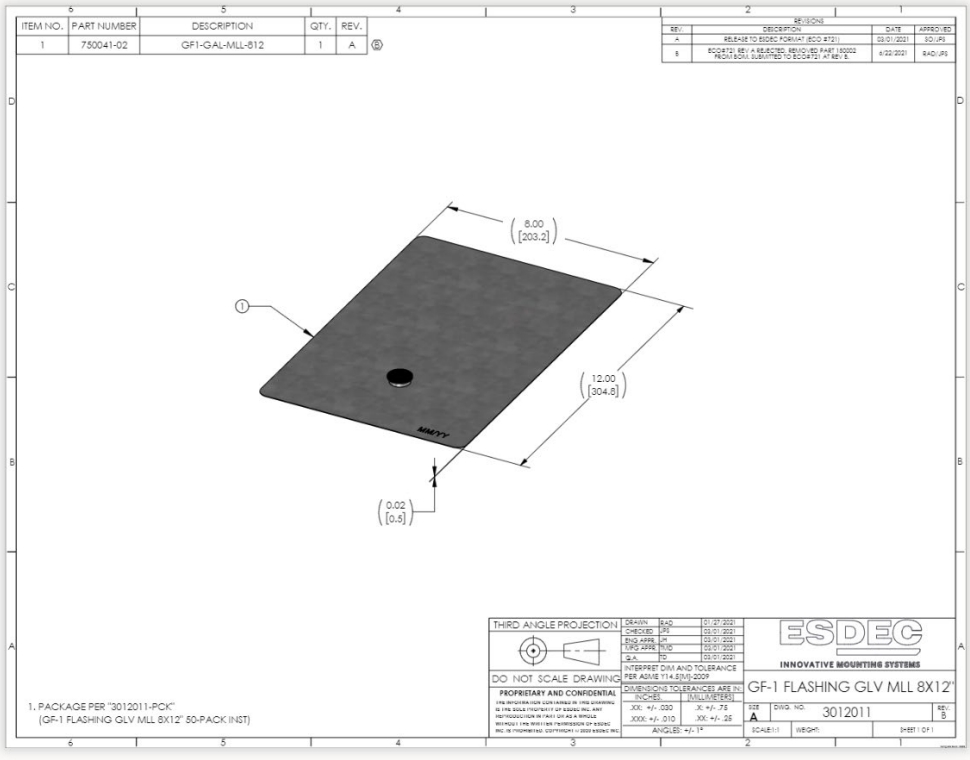
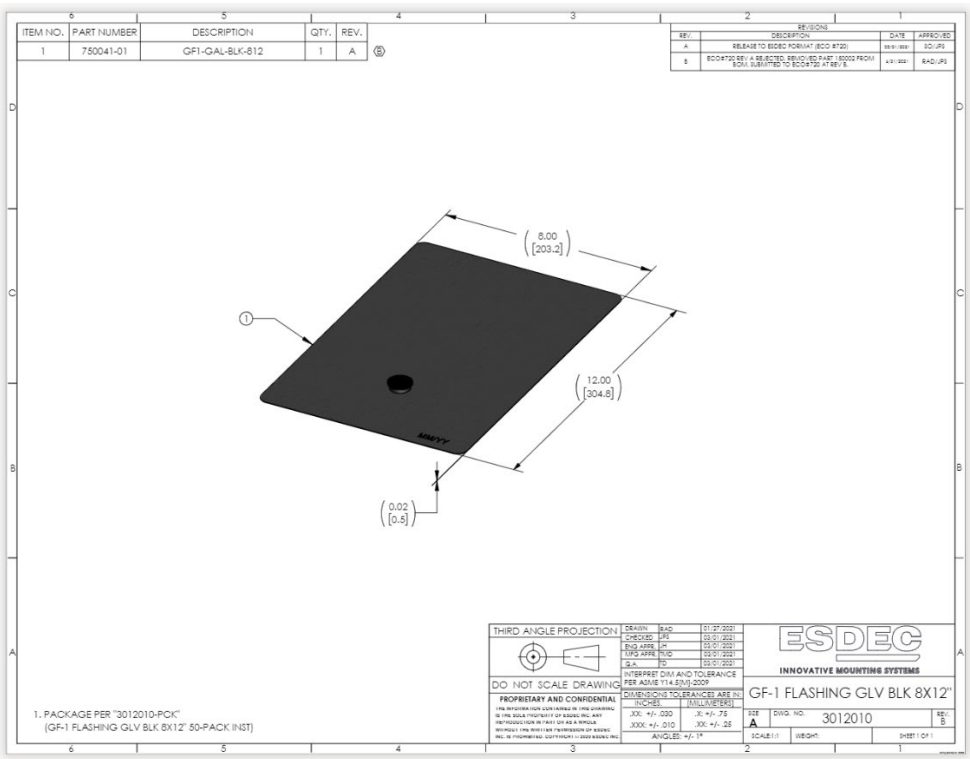
- ▶ [*ClickFit Master Letter Certification 04.15.2021*](#)

ClickFit Waterproofing for Permit Packets

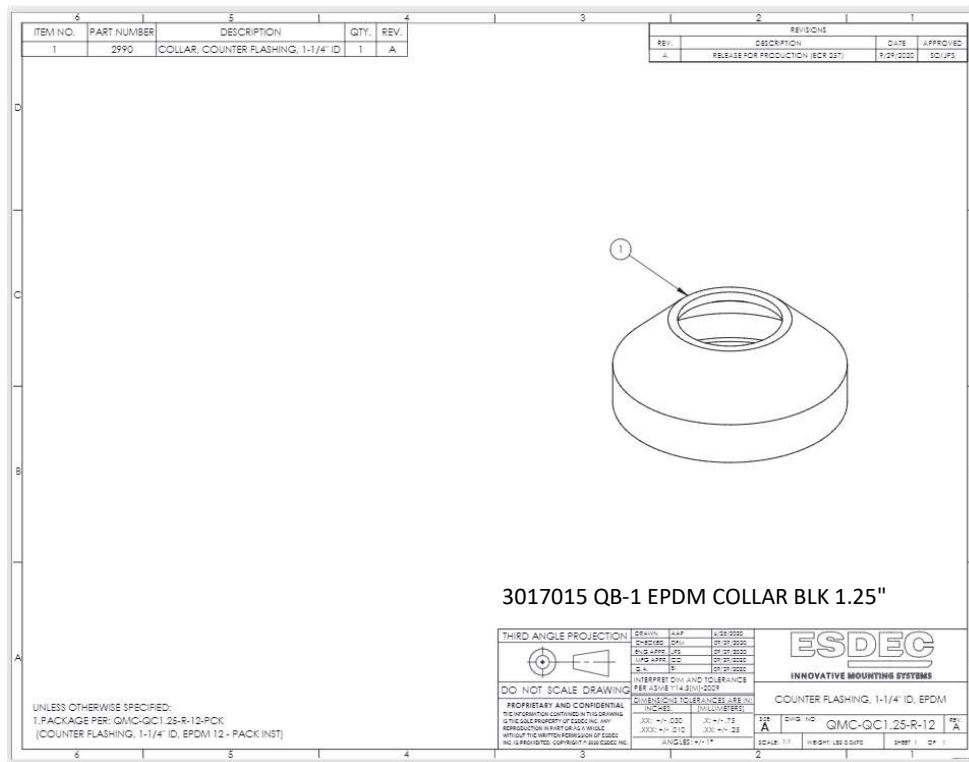
- ▶ [*ClickFit UL 441 Rain Report 03.17.2021*](#)



GF-1 CUT SHEETS

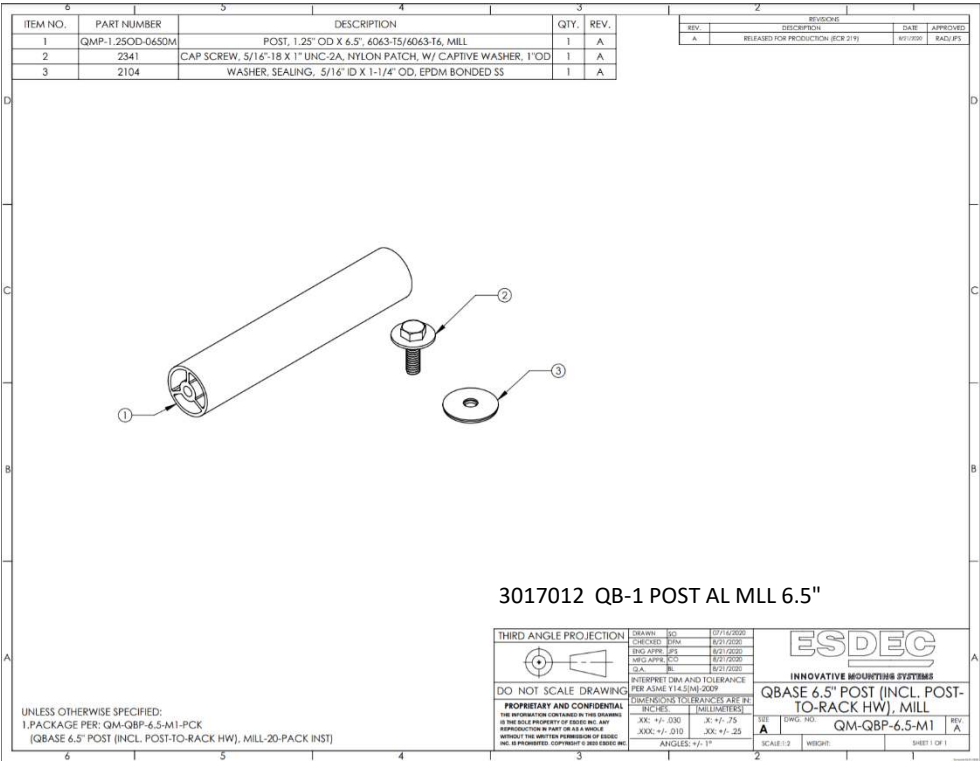
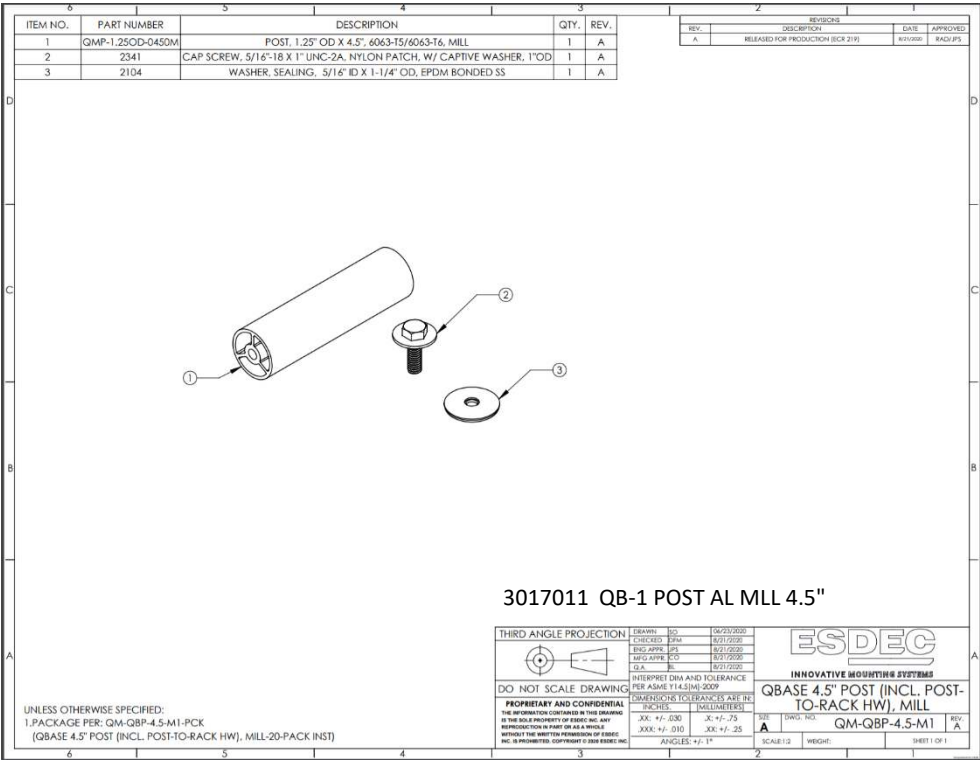


WATERPROOFING PER NRCA GUIDELINES
Designed and Certified for Compliance with the Florida Building Code & ASCE/SEI-7



Designed and Certified for Compliance with the Florida Building Code & ASCE/SEI-7

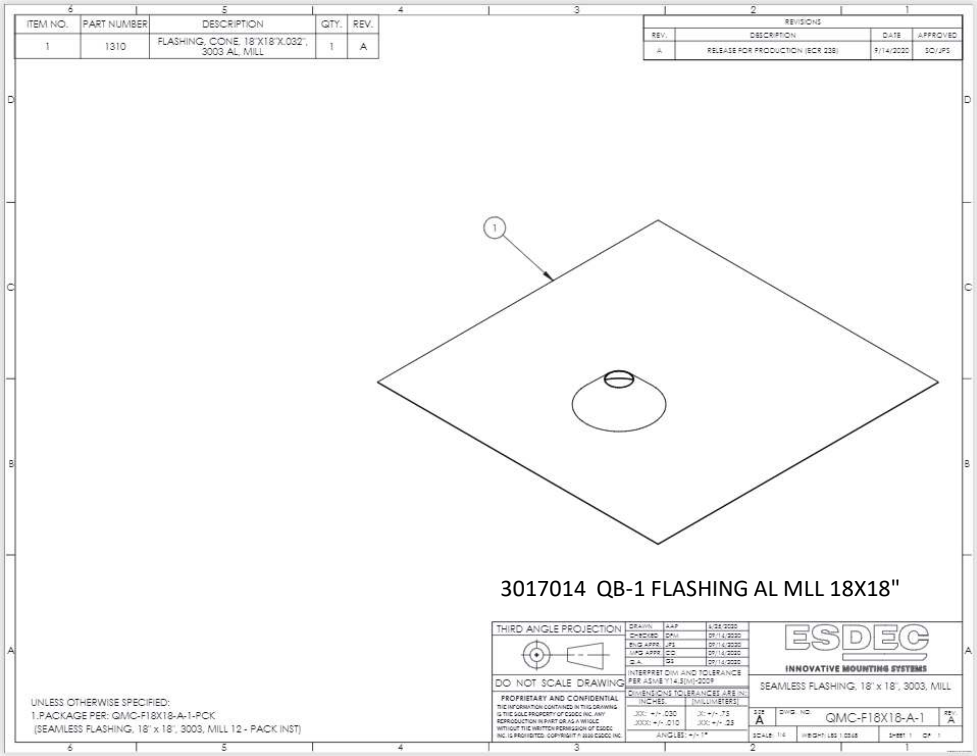
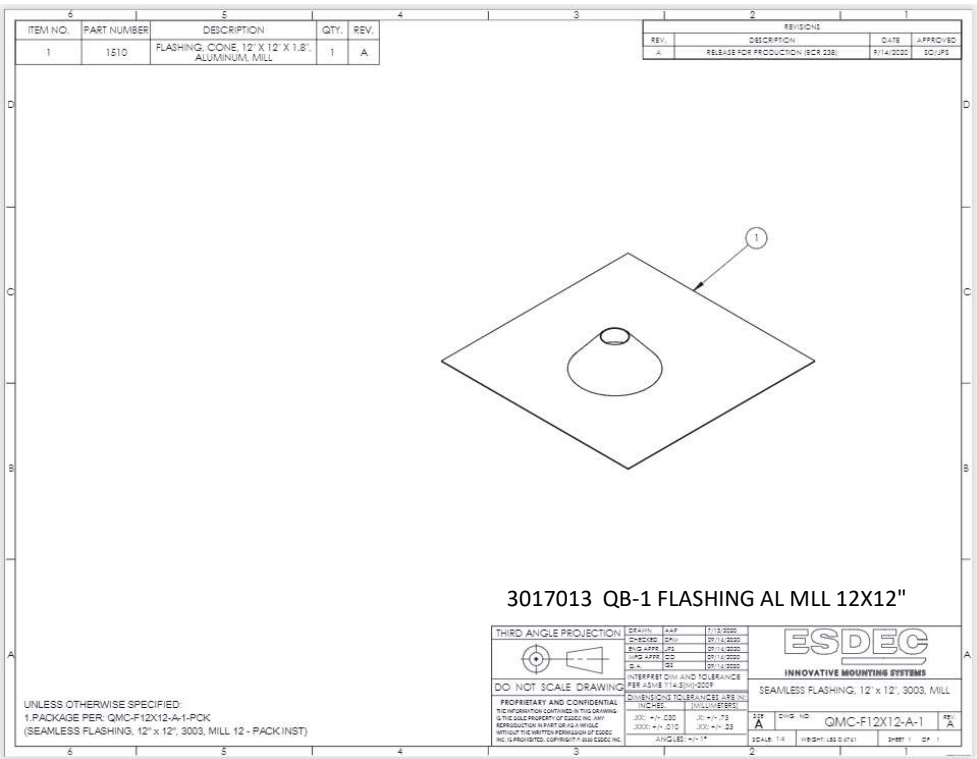
QB-1 CUT SHEETS



STRUCTURAL CERTIFICATION

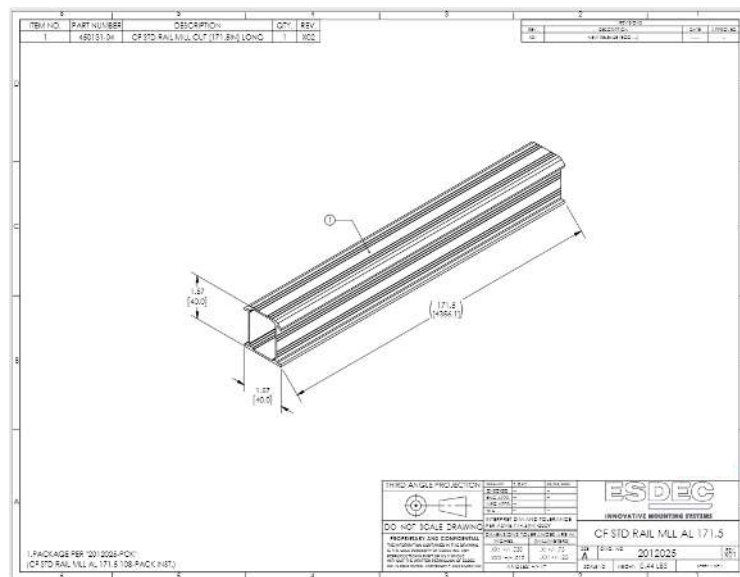
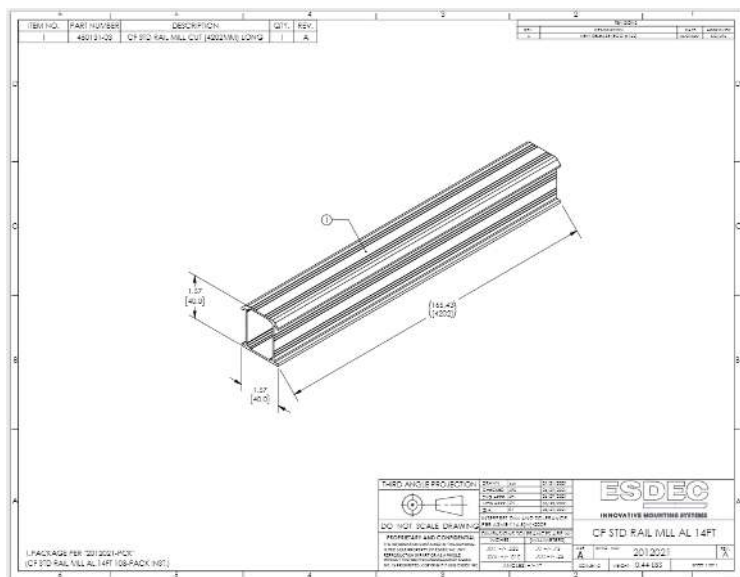
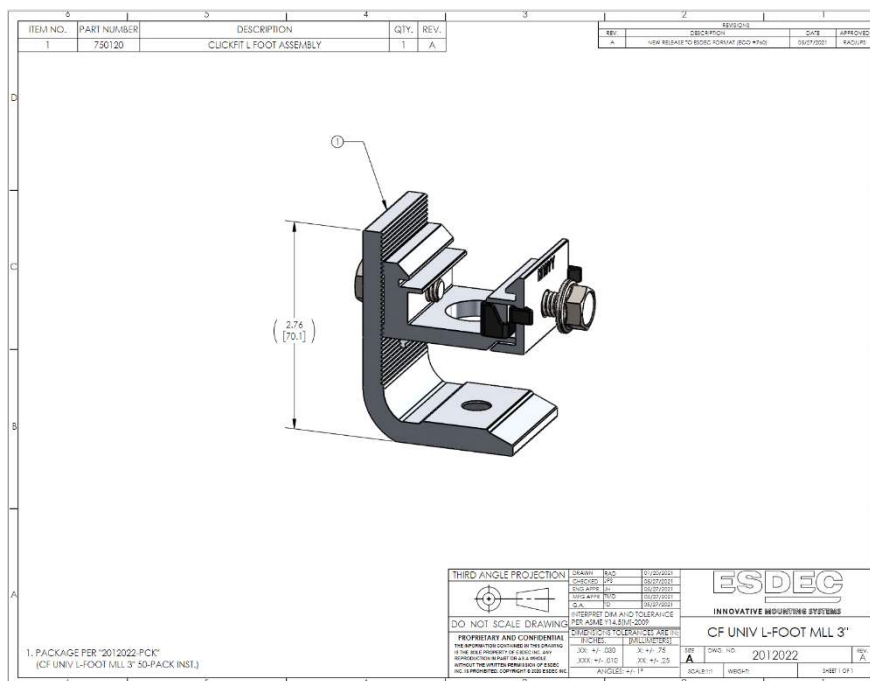
Designed and Certified for Compliance with the Florida Building Code & ASCE/SEI-7

QB-1 CUT SHEETS



WATERPROOFING PER NRCA GUIDELINES
Designed and Certified for Compliance with the Florida Building Code & ASCE/SEI-7

CLICKFIT CUT SHEETS



STRUCTURAL CERTIFICATION

Designed and Certified for Compliance with the Florida Building Code & ASCE/SEI-7

UL 2703

Conforms to UL 2703 Mechanical & Bonding requirements. See EcoFasten ClickFit Installation Manual for full ratings.

PERMITTING PACKETS

Listed below is the documentation you will need to provide to your AHJ for permitting approval. Click on the link to download file.

UL 2703 CERTIFICATIONS:

- ▶ [ClickFit UL 2703 Approved Installation Manual Version 07.06.2021 v2.5](#)
- ▶ [ClickFit UL 2703 Approved Addendum 06.07.2021 v1.1](#)

STRUCTURAL CERTIFICATIONS:

- ▶ [ClickFit L-Foot Capacity Report 07.29.2021](#)
- ▶ [ClickFit Master Letter Certification 04.15.2021](#)
- ▶ [GF-1 Installation Manual Florida 08.11.2021 v2.0](#)
- ▶ [QB-1 State of Florida Certification Letter 07.29.2021](#)

WATERPROOFING:

- ▶ [ClickFit UL 441 Rain Report 03.17.2021](#)

INSTALLATION MANUALS:

- ▶ [GF-1 Installation Manual Florida 08.11.2021 v2.0](#)
- ▶ [QB-1 Installation Manual 04.09.2021 v1.0](#)

OPTIONAL CUT SHEETS:

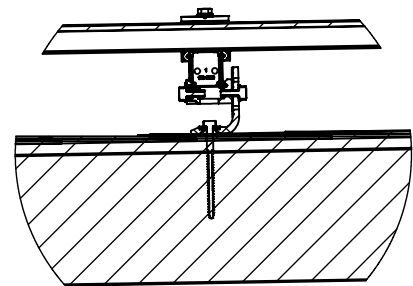
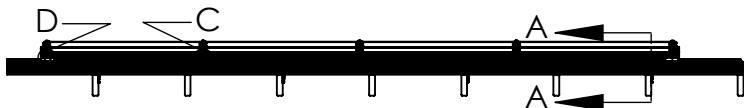
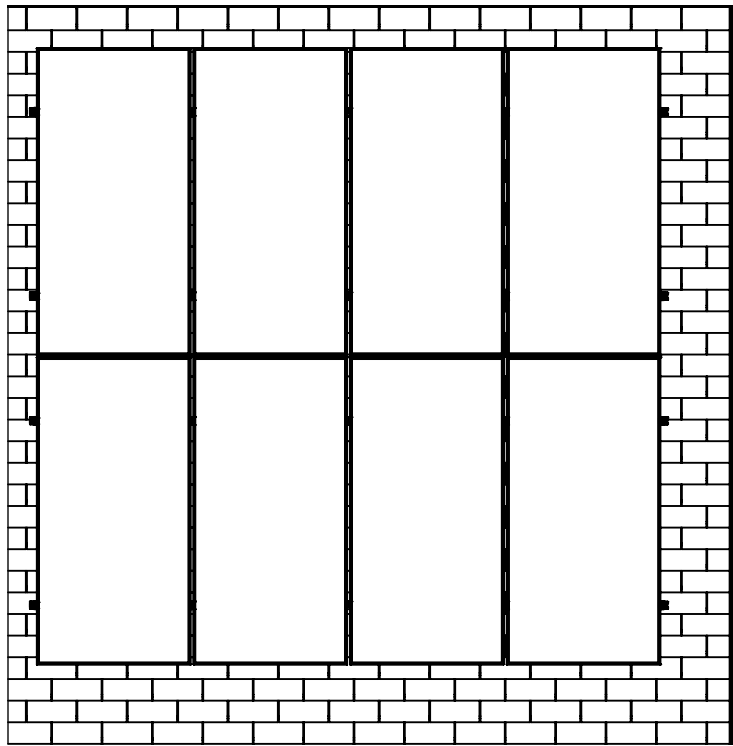
- ▶ [2012021 - CF STD RAIL MLL AL 14FT Cut Sheet](#)
- ▶ [2012022 - CF UNIV L-FOOT MLL 3" Cut Sheet](#)
- ▶ [2012025 - CF STD RAIL AL MLL 171.5" Cut Sheet](#)
- ▶ [3012010 - GF-1 FLASHING GLV BLK 8x12" Cut Sheet](#)
- ▶ [3012011 - GF-1 FLASHING GLV MLL 8X12" Cut Sheet](#)
- ▶ [3017010 - QB-1 BASE AL Cut Sheet](#)
- ▶ [3017011 - QB-1 POST AL MLL 4.5" Cut Sheet](#)
- ▶ [3017012 - QB-1 POST AL MLL 6.5" Cut Sheet](#)
- ▶ [3017013 - QB-1 FLASHING AL MLL 12X12" Cut Sheet](#)
- ▶ [3017014 - QB-1 FLASHING AL MLL 18X18" Cut Sheet](#)
- ▶ [3017015 - QB-1 EPDM COLLAR BLK 1.25" Cut Sheet](#)

CONTACT ECOFASTEN

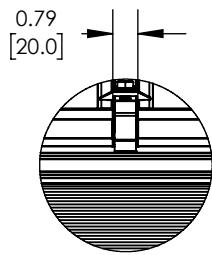
4141 W Van Buren Street, Suite 2, Phoenix, AZ 85009

877.859.3947 | ecofastensolar.com

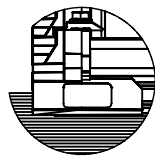




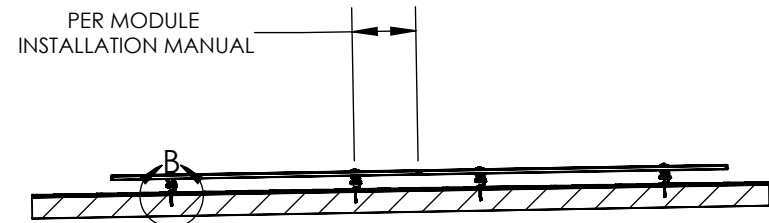
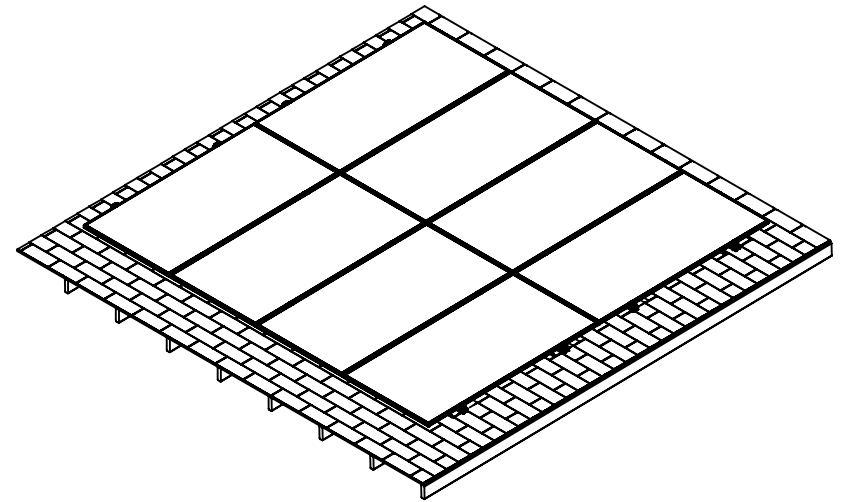
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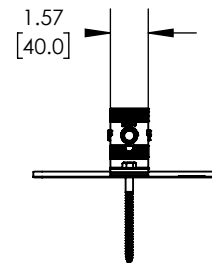
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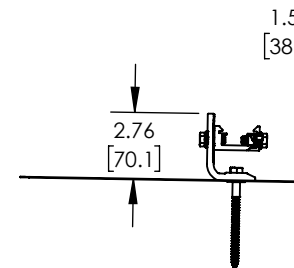
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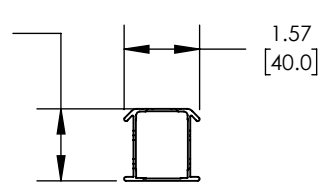
SECTION A-A



FRONT VIEW
L-FOOT

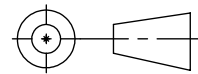


SIDE VIEW
L-FOOT



FRONT VIEW RAIL

THIRD ANGLE PROJECTION



DO NOT SCALE DRAWING

PROPRIETARY AND CONFIDENTIAL

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DRAWN	T. RAY	06/23/2021
CHECKED	-	-
ENG APPR.	-	-
MFG APPR.	-	-
Q.A.	-	-

INTERPRET DIM AND TOLERANCE PER ASME Y14.5[M]-2009

DIMENSIONS TOLERANCES ARE IN:

INCHES.	MILLIMETERS
.XX: +/- .030	.X: +/- .75
.XXX: +/- .010	.XX: +/- .25

ANGLES: +/- 1°

ESDEC

INNOVATIVE MOUNTING SYSTEMS

CLICKFIT COMP SHINGLE

SIZE A	DWG. NO. XX-XXXX-XXX	REV. X01
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SCALE: 1:50

WEIGHT:

SHEET 1 OF 2



April 22, 2021

EcoFasten Solar LLC
4141 W Van Buren St, Ste 2
Phoenix, AZ 85009
TEL: (877) 859-3947

Attn.: Eco Fasten Solar - Engineering Department

Re: Report # 2019-11325HG.05.01 – EcoFasten - ClickFit System for Gable and Hip Roofs
Subject: Engineering Certification for the State of Florida

PZSE, Inc. – Structural Engineers has provided engineering and span tables for the EcoFasten - ClickFit System, as presented in PZSE Report # 2019-11325HG.05.01, "Engineering Certification for the EcoFasten - ClickFit System for Gable and Hip Roofs". All information, data, and analysis therein are based on, and comply with, the following building codes and typical specifications:

- Building Codes:
1. 2020 Florida Building Code, by Florida Building Commission
 2. ASCE/SEI 7-16, Minimum Design Loads for Buildings and Other Structures, by American Society of Civil Engineers
 3. 2018 International Building Code, by International Code Council, Inc.
 4. 2018 International Residential Code, by International Code Council, Inc.
 5. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES
 6. Aluminum Design Manual 2015, by The Aluminum Association, Inc.
 7. ANSI/AWC NDS-2018, National Design Specification for Wood Construction, by the American Wood Council

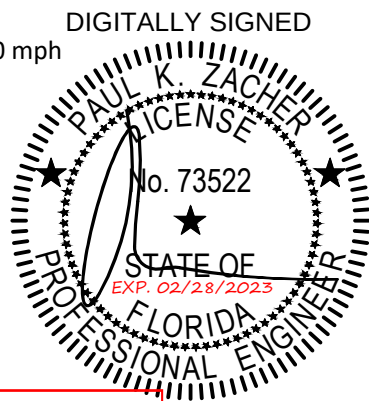
Design Criteria:

Risk Category II
Seismic Design Category = A - E
Exposure Category = B, C & D
Basic Wind Speed (ultimate) per ASCE 7-16 = 90 mph to 180 mph
Ground Snow Load = 0 to 60 (psf)

This letter certifies that the loading criteria and design basis for the EcoFasten - ClickFit System Span Tables are in compliance with the above codes.

If you have any questions on the above, do not hesitate to call.

Prepared by:
PZSE, Inc. – Structural Engineers
Roseville, CA



THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY PAUL K. ZACHER, PE ON 04/22/2021 USING A SHA-1 AUTHENTICATION CODE.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SHA-1 AUTHENTICATION CODE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.



April 15, 2021

EcoFasten Solar LLC
4141 W Van Buren St, Ste 2
Phoenix, AZ 85009
TEL: (877) 859-3947

Attn.: EcoFasten Solar LLC - Engineering Department

Re: Report # 2019-11325HG5.01 Engineering Certification for the EcoFasten Solar LLC ClickFit - Rail System for Gable and Hip Roof.

PZSE, Inc. - Structural Engineers have reviewed EcoFasten Solar LLC ClickFit System. All information, data, and analysis contained within the EcoFasten Solar LLC ClickFit System Rail span tables are based on and comply with the following codes:

1. Minimum Design Loads for Buildings and Other Structures, ASCE/SEI 7-16
2. 2018 International Building Code, by the International Code Council, Inc.
3. 2018 International Residential Code, by the International Code Council, Inc.
4. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012, by ICC-ES
5. Aluminum Design Manual 2015, by The Aluminum Association, Inc.

Following are typical specifications to meet the above code requirements:

Design Criteria:	Ground Snow Load = 0 - 60 (psf) Basic Wind Speed = 90 - 180 (mph) Roof Mean Height = 0 - 30 (ft) Enclosed and Partially Enclosed Gable and Hip Roof Pitch = 0° - 60° (degrees) Exposure Category = B, C & D
Attachment Devices:	The evaluation of the ClickFit System considers the ClickFit L-Foot.
Rail:	The evaluation of the ClickFit System Rail p/n 2012021 (450124, REV X03), made with an aluminum alloy, 6000 series, with a minimum yield strength of 35 ksi.
Cantilever:	Maximum cantilever length is L/3, where "L" is the span noted in the Span Tables, provided at least 1 module length between maximum cantilevers.

- Clearance:** 2" to 10" clear from the top of the roof to the top of the PV panel.
- Tolerance(s):** 1.0" tolerance for any specified dimension in this report is allowed for installation.
- PV Module Size:** 60-Cell PV Panel max dimension is 68.5".
72-Cell PV Panel max dimension is 80.4".
- Installation Orientation:** Landscape (L) - PV Panel long dimension is parallel to the ridge/eave line of the roof, and the PV panel is mounted on the short side.
Portrait (P) - PV Panel short dimension is parallel to the ridge/eave line of the roof, and the PV panel is mounted on the long side.

Components and Cladding Roof Zones:

Roof Zones – Enclosed and Partially Enclosed Gable Roofs, $\theta \leq 7^\circ$:

The zones shall be determined using figure 30.3-2A of ASCE 7-16. See Figure 1.

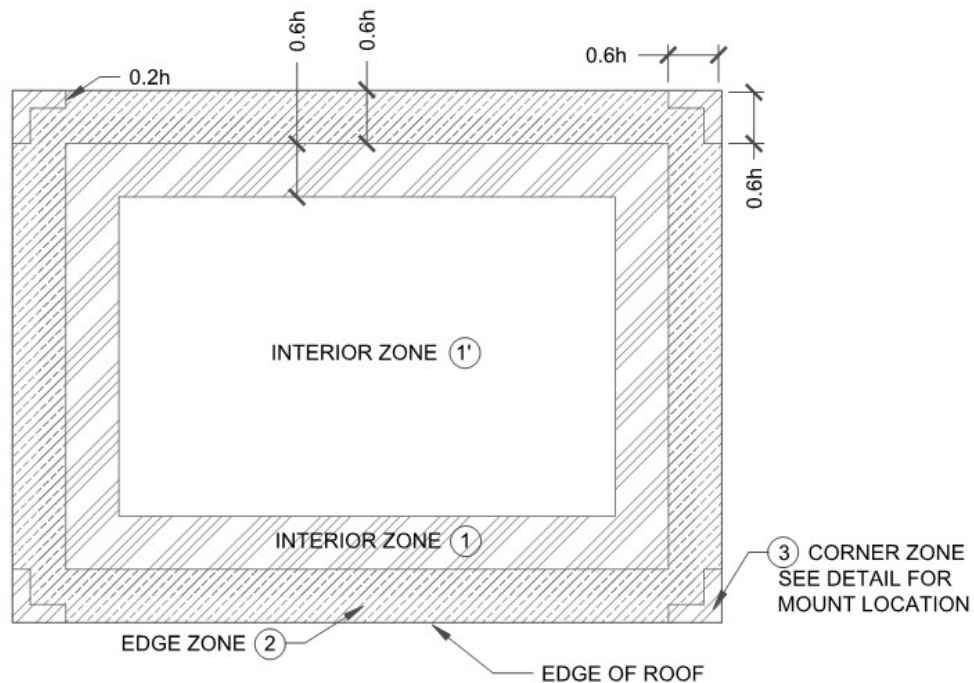


Figure 1: Roof Edge and Corner Zones, Gable Roofs, $\theta \leq 7^\circ$

Roof Zones – Enclosed and Partially Enclosed Gable and Hip Roofs, $7^\circ < \theta \leq 60^\circ$:

The Edge Zone, “a,” shall be determined using figure 30.3-2B to figure 30.3-2D of ASCE 7-16, for Gable roofs. The Edge Zone, “a,” shall be determined using figure 30.3-2E to figure 30.3-2I of ASCE 7-16, for Hip roofs. Interior Zone 1 span shall be the minimum of 1 and 1’ (See ClickFit System Rail Span Chart). Corner Zone 3 spans shall be the shortest of 3e and 3r (See ClickFit System Rail Span Chart). See Figure 2.

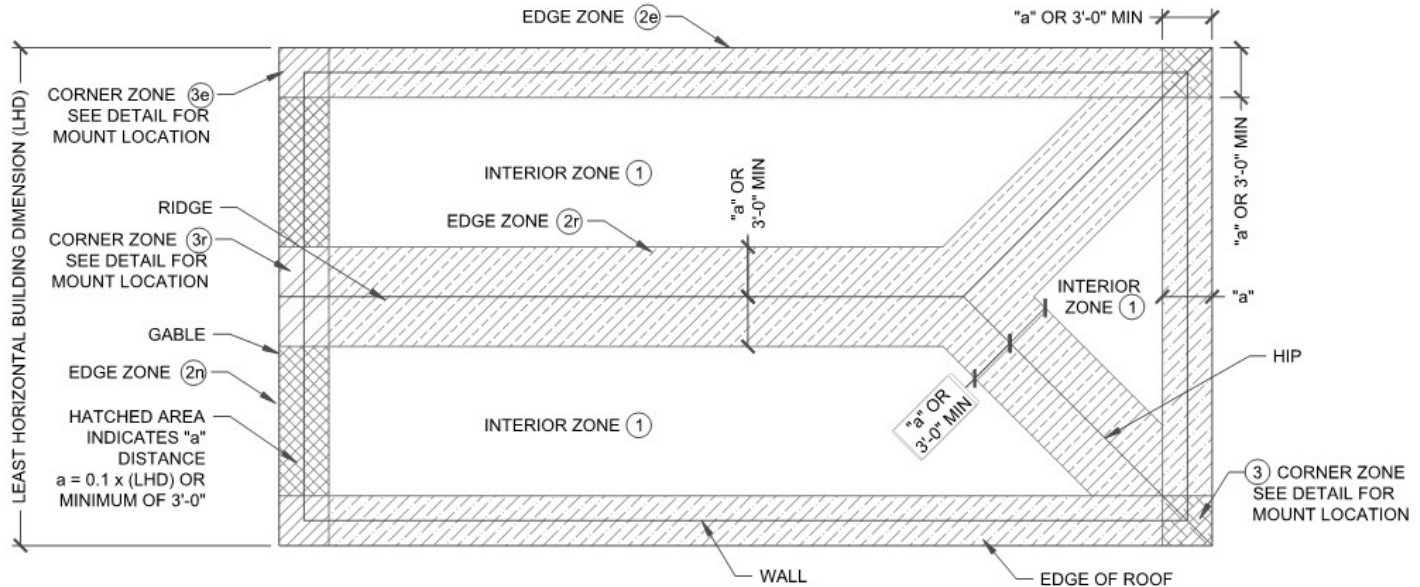


Figure 2: Roof Zones, Gable and Hip Roofs, $7^\circ < \theta \leq 45^\circ$

Panel with Support Mounts in Multiple Roof Zones:

Edge and Corner Zone spacings (Zone 2 & 3, respectively) apply only to mounts located in those Zones, not to all the mounts supporting the module.

- Notes:
- 1) Tables are determined for Rail and L-foot only and does not include roof capacity check.
 - 2) Risk Category II per ASCE 7-16.
 - 3) Topographic factor, k_{zt} is 1.0.
 - 4) Average parapet height is 0.0 ft.
 - 5) Wind speeds are LRFD values.
 - 6) Attachment spacing(s) apply to a seismic design category E or less.

Panel Array Edge:

Panels exposed at array edge shall use figure 29.4-7 of ASCE 7-16 to determine “ d_1 ” and “ d_2 ” to apply “Array Edge” spans that apply to an array layout. See figure 3.

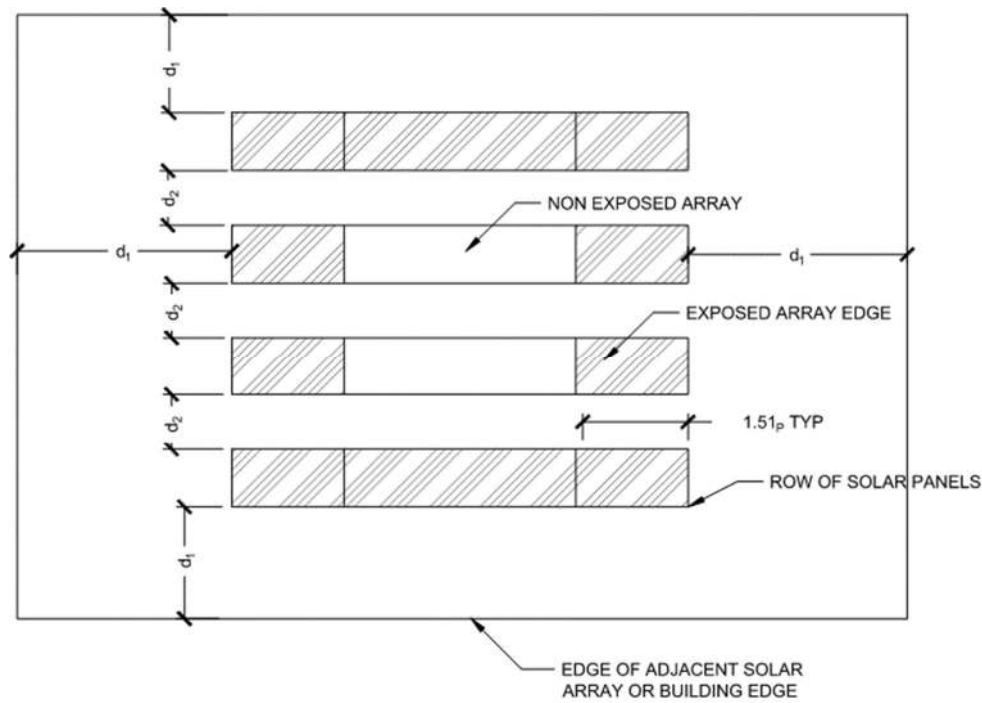


Figure 3: Array Edge

Design Responsibility:

These tables are intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, these tables should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether these tables apply to the project, and
- Understand and determine the appropriate values for all input parameters of these tables.

This letter certifies that the EcoFasten Solar LLC ClickFit Railed System, when installed according to the limitations of this letter and the attached span tables, complies with the above codes and loading criteria. This certification excludes evaluation of the building structure to support the loads imposed on the building by the array; including, but not limited to strength and deflection of structural framing members, fastening and/or strength of roofing materials, and/or the effects of snow accumulation on the roof. Structures will require additional knowledge of the building and are outside the scope of the certification of this racking system.

If you have any questions on the above, do not hesitate to call.

Prepared by:

PZSE, Inc. – Structural Engineers
Roseville



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Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- 60-Cell																																																			
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed-> Roof Zone->	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph																					
				1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r										
0 psf	B	0 to 7	Array Interior	86	79	70	70	70	63	63	86	74	67	67	67	59	59	86	71	63	63	63	55	55	85	68	61	61	61	51	51	82	65	57	57	57	48	48	78	62	54	54	54	45	45	45	45	45	45	45	45	45	45		
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45 to 60	Array Interior	75	75	69	69	69	69	69	71	71	66	66	66	66	66	68	68	63	63	63	63	63	65	65	60	60	60	60	60	63	63	56	56	56	56	56	60	60	53	53	53	53	53	53	53	53	53	53	53	53	53				

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Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- 60-Cell																																																
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed-> Roof Zone->	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph																		
				1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r							
B	0 to 7	Array Interior	72	72	70	70	70	63	63	72	72	67	67	67	59	59	72	71	63	63	63	55	55	72	68	61	61	61	51	51	72	65	57	57	57	48	48	72	62	54	54	54	45	45	45	45	45	45				
		Array Edge	72	68	61	61	61	52	52	72	64	57	57	57	48	48	72	61	53	53	53	44	44	72	58	49	49	49	42	42	70	54	46	46	46	39	39	67	51	44	44	44	37	37	37	37	37	37				
		7 to 20	Array Interior	74	74	74	64	64	64	60	70	70	70	61	61	61	56	67	67	67	57	57	57	52	64	64	53	53	53	48	61	61	61	50	50	50	45	58	58	47	47	47	47	47	47	47	47	47	47			
		Array Edge	64	64	64	53	53	53	49	61	61	61	49	49	49	45	57	57	57	46	46	46	42	53	53	53	43	43	43	39	50	50	50	40	40	37	47	47	47	38	38	38	34	34	34	34						
		20 to 27	Array Interior	79	79	79	68	68	68	66	78	78	78	65	65	63	74	74	74	62	62	62	60	70	70	58	58	58	56	67	67	67	55	55	55	53	65	65	65	52	52	52	50	50	50	42	42	42	42	42	42	
		Array Edge	71	71	71	59	59	59	56	67	67	67	54	54	54	52	64	64	64	51	51	51	49	61	61	61	47	47	47	45	58	58	58	44	44	44	40	40	37	45	45	45	42	42	42	42	42	42	42			
	27 to 45	Array Interior	76	76	76	76	73	68	73	72	72	72	70	64	70	69	69	69	66	61	66	66	66	66	66	66	66	63	58	63	63	63	61	55	61	61	61	61	61	51	51	51	48	48	48	47	47	47	47	47	47	47
		Array Edge	66	66	66	66	64	58	64	63	63	63	63	60	54	60	60	60	60	57	50	57	50	57	56	56	56	53	47	53	52	52	52	50	44	50	49	49	49	47	47	47	42	42	42	42	42	42	42	42		
		45 to 60	Array Interior	87	87	83	83	83	83	83	83	83	78	78	78	78	78	80	80	75	75	75	75	75	77	77	71	71	71	71	74	74	69	69	69	69	69	71	71	66	66	66	66	66	66	66	66	66	66	66		
		Array Edge	77	77	72	72	72	72	73	73	68	68	68	68	68	70	70	65	65	65	65	65	65	67	67	62	62	62	62	63	65	65	59	59	59	59	59	62	62	56	56	56	56	56	56	56	56	56	56			
		15 psf	0 to 7	Array Interior	72	69	62	62	62	54	54	72	72	66	59	59	50	50	72	63	55	55	55	46	46	72	60	51	51	51	43	43	72	56	48	48	48	41	41	69	53	45	45	45	38	38	38	34	34	34	34	
			Array Edge	72	60	51	51	51	43	43	72	56	48	48	48	40	40	72	58	44	44	44	37	37	65	49	41	41	41	34	34	62	46	39	39	39	30	30	60	43	37	37	37	37	37	37	37	37	37			
7 to 20	Array Interior		65	65	65	55	55	55	50	62	62	62	51	51	51	47	59	59	59	48	48	48	43	55	55	55	45	45	45	52	52	52	42	42	42	38	38	38	33	33	33	33	33	33	33	33	33	33				
Array Edge	55		55	55	45	45	45	41	41	51	51	51	41	41	41	38	48	48	48	39	39	39	35	45	45	45	36	36	36	42	42	42	32	32	32	27	27	27	27	27	27	27	27	27	27	27						
20 to 27	Array Interior		72	72	72	60	60	60	58	69	69	69	56	56	56	54	65	65	65	52	52	52	50	63	63	63	49	49	49	60	60	60	46	46	46	44	57	57	57	43	43	43	43	43	43	43	43					
Array Edge	63		63	63	49	49	49	47	59	59	59	46	46	46	44	55	55	55	42	42	42	41	52	52	52	40	40	40	48	48	48	37	37	37	36	46	46	46	35	35	35	35	35	35	35	35						
20 psf	0 to 7	Array Interior	69	69	69	69	63	63	69	69	67	67	67	59	59	69	69	63	63	63	55	55	69	68	61	61	61	51	51	69	65	57	57	57	48	48	69	62	54	54	54	45	45	45	45	45	45					
	Array Edge	69	68	61	61	61	52	52	69	64	57	57	57	48	48	69	61	53	53	53	44	44	69	58	49	49	49	42	42	69	54	46	46	46	39	39	67	51	44	44	44	37	37	37	37	37	37					
	7 to 20	Array Interior	74	74	74	64	64	64	60	70	70	70	61	61	61	56	67	67	67	57	57	57	52	64	64	53	53	53	48	61	61	61	50	50	50	45	58	58	47	47	47	47	47	47	47	47	47	47				
	Array Edge	64	64	64	53	53	53	49	61	61	61	49	49	49	45	57	57	57	46	46	46	42	53	53	53	43	43	43	39	50	50	50	40	40	37	47	47	47	38	38	38	34	34	34	34							
	20 to 27	Array Interior	76	76	76	68	68	68	66	76	76	76	65	65	63	74	74	74	62	62	62	60	70	70	58	58	58	56	67	67	67	55	55	55	53	65	65	65	52	52	52	50	50	50	42	42	42	42	42	42		
	Array Edge	71	71	71	59	59	59	56	67	67	67	54	54	54	52	64	64	64	51	51	51	49	61	61	61	47	47	47	45	58	58	58	44	44	44	40	40	37	45	45	45	42	42	42	42	42	42	42				
27 to 45	Array Interior	76	76	76	76	73	68	73	72	72	72	70	64	70	69	69	69	66	61	66	66	66	66	66	66	66	63	58	63	63	63	61	55	61	61	61	61	61	51	51	51	48	48	48	47	47	47	47	47	47		
	Array Edge	66	66	66	66	64	58	64	63	63	63	63	60	54	60	60	60	60	57	50	57	50	57	56	56	56	53	47	53	52	52	52	50	44	50	49	49	49	47	47	47	42	42	42	42	42	42	42	42			
	45 to 60	Array Interior	87	87	83	83	83	83	83	83	83	78	78	78	78	78	80	80	75	75	75	75	75	77	77	71	71	71	71	74	74	69	69	69	69	69	71	71	66	66	66	66	66	66	66	66	66	66	66			
	Array Edge	77	77	72	72	72	72	73	73	68	68	68	68	68	70	70	65	65	65	65	65	65	67	67	62	62	62	62	63	65	65	59	59	59	59	59	62	62	56	56	56	56	56	56	56	56	56	56				
	20 psf	0 to 7	Array Interior	69	69	62	62	62	54	54	69	66	59	59	59	50	50	69	63	55	55	55	46	46	69	60	51	51	51	43	43	69	56	48	48	48	41	41	69	53	45	45	45	38	38	38	34	34	34	34		
		Array Edge	69	60	51	51	51	43	43	69	56	48	48	48	40	40	69	58	44	44	44	37	37	65	49	41	41	41	34	34	62	46	39	39	39	30	30	60	43	37	37	37	37	37	37	37	37	37				
7 to 20		Array Interior	65	65	65	55	55	55	50	62	62	62	51	51	51	47	59	59	59	48	48	48	43	55	55	55	45	45	45	52	52	52	42	42	42	38	38	38	33	33	33	33	33	33	33	33	33	33	33			
Array Edge		55	55	55	45	45	45	41	41	51	51	51	41	41	41	38	48	48	48	39	39	39	35	45	45	45	36	36	36	42	42	42	32	32	32	27	27	27	27	27	27	27	27	27	27	27						
20 to 27		Array Interior	72	72	72	60	60	60	58	69	69	69	56	56	56	54	65	65	65	52	52	52	50	63	63	63	49	49	49	60	60	60	46	46	46	44	57	57	57	43	43	43	43	43	43	43	43					
Array Edge		63	63	63	49	49	49	47	59	59	59	46	46	46	44	55	55	55	42	42	42	41	52	52	52	40	40	40	48	48	48	37	37	37	36	46	46	46	35	35	35	35	35	35	35	35						
27 to 45	Array Interior	68	68	68	68	65	60	65	64	64	64	64	62	56	62	61	61	61	61	59	52	52	50	59	58	58	58	55	49	55	54	54	54	51	46	51	51	51	48	48	48	47	47	47	47	47	47	47				
	Array Edge	58	58	58	58	55	49	55	54	54	54	54	51	45	51	50	50	50	50	47	42	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47						
	45 to 60	Array Interior	79	79	73	73	73	73	73	75	75	70	70	70	70	70	72	72	66	66	66	66	66	69	69	64	64	64	64	66	66	61	61	61	61	61</																

[illegible]

Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- 60-Cell																																																	
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed -> Roof Zone ->	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph																			
				1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r								
30 psf	B	0 to 7	Array Interior	68	68	68	68	68	63	63	68	67	67	67	59	59	68	68	63	63	63	55	55	68	68	61	61	61	51	51	68	65	57	57	57	48	48	68	62	54	54	54	45	45	68	62	54	54	54	45	45		
			Array Edge	68	68	61	61	61	52	52	68	64	57	57	57	48	48	68	61	53	53	53	44	44	68	58	49	49	49	42	42	68	54	46	46	46	39	39	67	51	44	44	44	37	37	67	51	44	44	44	37	37	
		7 to 20	Array Interior	70	70	70	64	64	64	60	70	70	70	61	61	61	56	67	67	67	57	57	57	52	52	64	64	53	53	53	49	61	61	61	50	50	50	45	58	58	58	47	47	47	47	47	47	47	47	47	47	47	47
			Array Edge	64	64	64	53	53	53	49	61	61	61	49	49	49	45	57	57	57	46	46	46	42	42	53	53	53	43	43	43	39	50	50	50	40	40	37	47	47	47	38	38	38	34	34	38	34	38	34	38	34	
		20 to 27	Array Interior	71	71	71	68	68	68	66	71	71	71	65	65	65	63	71	71	71	62	62	62	60	70	70	70	58	58	58	56	67	67	55	55	55	53	65	65	65	52	52	52	52	52	52	52	52	52	52	52	52	
			Array Edge	71	71	71	59	59	59	56	67	67	67	54	54	54	52	64	64	64	51	51	51	49	49	61	61	61	47	47	47	45	58	58	58	44	44	44	43	55	55	55	42	42	42	42	42	42	42	42	42	42	
		27 to 45	Array Interior	76	76	76	76	73	68	73	72	72	72	70	70	70	64	70	69	69	69	66	66	66	66	66	69	69	69	66	66	63	58	63	63	61	55	61	61	61	61	61	61	58	51	58	51	58	51	58			
			Array Edge	66	66	66	66	64	58	64	63	63	63	63	60	54	60	69	69	60	60	57	50	57	56	56	56	56	56	53	47	53	52	52	52	50	44	50	49	49	49	49	49	49	49	47	42	47	42	47			
		45 to 60	Array Interior	87	87	83	83	83	83	83	83	83	78	78	78	78	78	80	80	75	75	75	75	75	77	77	71	71	71	71	71	74	74	69	69	69	69	69	71	71	66	66	66	66	66	66	66	66	66				
			Array Edge	77	77	72	72	72	72	72	73	73	68	68	68	68	68	70	70	65	65	65	65	65	67	67	62	62	62	62	62	65	65	59	59	59	59	62	62	56	56	56	56	56	56	56	56	56	56	56	56		
	C	0 to 7	Array Interior	68	68	62	62	62	54	54	68	66	59	59	59	50	50	68	63	55	55	55	46	46	68	60	51	51	51	43	43	68	56	48	48	48	41	68	53	45	45	45	38	38	60	43	45	45	38	38			
			Array Edge	68	60	51	51	51	43	43	68	56	48	48	48	40	40	68	52	44	44	44	37	37	65	49	41	41	41	34	34	62	46	39	39	39	30	60	43	37	37	37	27	27	27	27	27	27	27	27			
		7 to 20	Array Interior	65	65	65	55	55	55	50	62	62	62	51	51	51	47	59	59	59	48	48	48	43	43	55	55	55	45	45	45	52	52	52	42	42	42	38	49	49	49	39	39	39	29	29	39	29	39	29	36		
			Array Edge	55	55	55	45	45	45	41	51	51	51	41	41	41	38	48	48	48	39	39	39	35	35	45	45	45	36	36	36	42	42	42	32	32	32	27	39	39	39	29	29	29	24	24	39	29	24	24			
		20 to 27	Array Interior	71	71	71	60	60	60	58	69	69	69	56	56	56	54	65	65	65	52	52	52	50	63	63	63	49	49	49	60	60	60	46	46	46	44	57	57	57	43	43	43	43	43	42	43	43	42	43			
			Array Edge	63	63	63	49	49	49	47	59	59	59	46	46	46	44	55	55	55	42	42	42	41	52	52	52	40	40	40	38	49	49	49	37	37	37	36	46	46	46	35	35	35	32	32	36	32	32				
		27 to 45	Array Interior	68	68	68	65	60	65	64	64	64	64	62	56	62	61	61	61	61	59	52	59	58	58	58	55	49	55	54	54	54	51	46	51	51	51	51	51	48	43	48	43	48	43	48	43	48					
			Array Edge	58	58	58	58	55	49	55	54	54	54	54	51	45	51	50	50	50	50	47	42	47	47	47	47	44	40	44	44	44	44	42	37	42	42	42	42	42	39	34	42	39	34	39	34						
		45 to 60	Array Interior	79	79	73	73	73	73	73	75	75	70	70	70	70	70	72	72	66	66	66	66	66	69	69	64	64	64	64	66	66	61	61	61	61	61	64	64	58	58	58	58	58	58	58	58	58	58	58	58		
			Array Edge	69	69	64	64	64	64	64	66	66	61	61	61	61	61	63	63	57	57	57	57	57	60	60	53	53	53	53	57	57	50	50	50	50	50	53	53	47	47	47	47	47	47	47	47	47	47	47			
	D	0 to 7	Array Interior	69	65	58	58	58	49	49	69	62	54	54	54	45	45	69	59	50	50	50	42	42	69	55	47	47	47	40	68	52	44	44	44	37	65	49	42	42	42	42	42	42	42	42	42	42	42	42			
			Array Edge	67	55	47	47	47	40	40	67	51	44	44	44	44	44	64	48	41	41	41	33	33	61	44	38	38	38	29	58	42	36	36	36	25	55	39	32	32	32	23	23	23	23	23	23	23	23				
		7 to 20	Array Interior	62	62	62	51	51	51	46	58	58	58	47	47	47	43	54	54	54	44	44	44	40	50	50	50	41	41	41	37	47	47	47	38	38	38	34	45	45	45	36	36	36	36	36	36	36	36	36			
			Array Edge	51	51	51	41	41	41	37	47	47	47	38	38	38	34	44	44	44	35	35	35	29	41	41	41	31	31	31	25	38	38	38	27	27	27	22	36	36	36	24	24	24	24	24	24	24	24				
		20 to 27	Array Interior	68	68	68	56	56	56	53	65	65	65	52	52	52	50	62	62	62	48	48	48	46	49	59	59	45	45	45	55	55	55	42	42	42	40	52	52	52	40	40	40	40	40	40	38	38					
			Array Edge	59	59	59	45	45	45	43	54	54	54	42	42	42	40	51	51	51	39	39	39	37	47	47	47	36	36	36	34	44	44	44	33	33	33	30	42	42	42	29	29	29	29	29	29	29	29				
		27 to 45	Array Interior	64	64	64	61	55	61	61	61	61	61	58	51	58	57	57	57	57	54	48	54	53	53	53	50	45	50	50	50	50	50	47	42	47	47	47	47	47	47	47	47	47	47	47	47	47					
			Array Edge	53	53	53	50	45	50	49	49	49	49	49	47	42	47	46	46	46	46	44	39	44	43	43	43	40	40	40	40	40	40	40	38	33	38	38	38	36	29	36	36	29	36	29	36						
		B	0 to 7	Array Interior	75	75	69	69	69	69	69	71	71	66	66	66	66	66	68	68	63	63	63	63	63	65	65	60	60	60	60	63	63	56	56	56	56	56	60	60	53	53	53	53	53	53	53	53	53	53	53		
				Array Edge	64	64	61	61	61	52	52	64	64	57	57	57	48	48	64	61	53	53	53	44	44	64	58	49	49	49	42	42	64	54	46	46	46	39	39	64	51	44	44	44	37	37	64	51	44	44	44	37	37
7 to 20	Array Interior	66	66	66	64	64	64	60	66	66	66	61	61	61	56	66	66	66	57	57	57	52	52	64	64	53	53	53	49	61	61	61	50	50	50	45	58	58	58	47	47	47	47	47	47								

[illegible]

[illegible]

Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- 72-Cell (P)																																											
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed --> Roof Zone -->	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph													
				1'	1'	2e	2r	2n	3e	3r	1'	1'	2e	2r	2n	3e	3r	1'	1'	2e	2r	2n	3e	3r	1'	1'	2e	2r	2n	3e	3r	1'	1'	2e	2r	2n	3e	3r	1'	1'	2e	2r	2n	3e	3r		
0 psf	B	0 to 7	Array Interior	82	74	67	67	67	59	59	82	71	63	63	63	55	55	82	67	60	60	60	51	51	81	64	56	56	56	47	47	77	61	53	53	53	44	44	74	58	50	50	50	42	42		
			Array Edge	81	64	57	57	57	48	48	77	61	52	52	52	44	44	73	57	49	49	49	41	41	70	53	46	46	46	38	38	67	50	43	43	43	36	36	64	47	40	40	40	32	32		
		7 to 20	Array Interior	70	70	70	61	61	61	55	66	66	66	56	56	56	51	51	63	63	52	52	52	48	48	60	60	49	49	49	45	57	57	57	46	46	46	42	54	54	54	43	43	39			
			Array Edge	61	61	61	49	49	49	45	56	56	56	46	46	46	41	41	52	52	42	42	42	39	49	49	49	40	40	40	36	46	46	46	37	37	32	43	43	43	35	35	35	29			
		20 to 27	Array Interior	78	78	78	65	65	65	63	74	74	74	61	61	61	59	70	70	58	58	58	45	45	67	67	57	57	54	54	52	64	64	64	51	51	51	49	61	61	61	48	48	46			
			Array Edge	67	67	67	54	54	54	52	64	64	64	50	50	50	48	61	61	61	47	47	47	45	57	57	57	44	44	44	42	53	53	53	41	41	41	39	50	50	50	39	39	37			
		27 to 45	Array Interior	72	72	72	72	70	64	70	68	68	68	66	61	66	65	65	65	63	57	63	62	62	62	60	54	60	60	60	57	50	57	56	56	56	53	47	56	56	56	53	47	53			
			Array Edge	63	63	63	63	60	54	60	59	59	59	56	50	56	55	55	55	55	52	46	52	51	51	51	51	49	48	48	48	46	41	46	46	46	46	46	46	46	46	43	38	43			
		45 to 60	Array Interior	82	82	78	78	78	78	78	79	79	74	74	74	74	76	76	73	71	71	71	71	73	73	68	68	68	68	68	70	70	65	65	65	65	65	68	68	62	62	62	62	62			
			Array Edge	73	73	68	68	68	68	68	70	70	65	65	65	65	65	67	67	62	62	62	62	64	64	58	58	58	58	58	61	61	55	55	55	55	55	59	59	52	52	52	52	52			
	C	0 to 7	Array Interior	82	66	59	59	59	49	49	79	62	54	54	54	46	46	75	59	51	51	51	43	43	71	55	47	47	47	40	68	52	44	44	44	37	37	65	49	42	42	42	35	35			
			Array Edge	72	56	47	47	47	40	40	68	51	44	44	44	37	37	65	48	41	41	41	33	33	62	45	38	38	38	29	59	42	36	36	36	26	26	55	40	32	32	32	23	23			
		7 to 20	Array Interior	62	62	62	51	51	51	46	58	58	58	47	47	47	43	54	54	54	44	44	40	51	51	51	41	41	41	37	48	48	48	39	39	39	35	45	45	45	36	36	36	31	31		
			Array Edge	51	51	51	41	41	41	38	47	47	47	38	38	38	34	44	44	44	36	36	29	41	41	41	31	31	31	26	39	39	39	27	27	27	23	36	36	36	24	24	24	20			
		20 to 27	Array Interior	69	69	69	56	56	56	54	65	65	65	52	52	52	50	62	62	62	48	48	46	59	59	59	45	45	45	43	55	55	55	42	42	42	41	52	52	52	40	40	40	38			
			Array Edge	59	59	59	45	45	45	44	55	55	55	42	42	42	40	51	51	51	39	39	38	48	48	48	37	37	37	35	45	45	45	33	33	33	31	42	42	42	29	29	29	27			
		27 to 45	Array Interior	64	64	64	64	62	56	62	61	61	61	61	58	52	58	57	57	57	57	54	48	54	53	53	53	51	45	51	50	50	50	47	42	47	47	47	47	45	40	45					
			Array Edge	54	54	54	54	51	45	51	50	50	50	47	42	47	46	46	46	46	44	39	44	43	43	43	41	37	41	41	41	41	41	38	33	38	38	38	38	36	36	29					
		45 to 60	Array Interior	74	74	70	70	70	70	70	71	71	66	66	66	66	66	68	68	63	63	63	63	65	65	60	60	60	60	60	63	63	57	57	57	57	57	60	60	54	54	54	54	54			
			Array Edge	66	66	60	60	60	60	60	62	62	56	56	56	56	56	59	59	52	52	52	52	56	56	49	49	49	49	49	52	52	46	46	46	46	46	46	49	49	43	43	43	43			
	D	0 to 7	Array Interior	78	62	54	54	54	45	45	74	58	50	50	50	42	42	70	54	46	46	46	39	39	67	51	43	43	43	36	64	48	41	41	41	33	62	45	38	38	38	29	29				
			Array Edge	67	51	43	43	43	37	37	64	47	40	40	40	32	32	61	44	37	37	37	28	28	57	41	34	34	34	24	54	38	30	30	30	22	51	36	27	27	27	19	19				
		7 to 20	Array Interior	58	58	58	47	47	47	42	53	53	53	43	43	43	39	50	50	50	40	40	37	46	46	46	38	38	38	33	44	44	44	35	35	29	41	41	41	31	31	31	26				
			Array Edge	47	47	47	38	38	38	33	43	43	43	34	34	34	29	40	40	40	30	30	25	38	38	38	26	26	26	22	35	35	23	23	23	19	31	31	31	20	20	20	17				
		20 to 27	Array Interior	65	65	65	51	51	51	49	61	61	61	48	48	48	46	58	58	58	44	44	42	54	54	54	41	41	41	40	51	51	51	39	39	39	37	48	48	48	37	37	37	35			
			Array Edge	54	54	54	42	42	42	40	50	50	50	39	39	39	37	47	47	47	36	36	33	44	44	44	32	32	32	29	41	41	41	28	28	28	26	39	39	39	25	25	25	23			
		27 to 45	Array Interior	60	60	60	57	51	57	56	56	56	56	53	47	53	52	52	52	50	44	50	49	49	49	49	46	46	46	41	46	46	46	43	39	43	43	43	43	41	37	41	41	37			
			Array Edge	49	49	49	47	41	47	46	46	46	46	43	38	43	42	42	42	40	36	40	40	40	40	38	31	38	33	33	37	37	37	37	35	28	35	35	35	35	31	26	31				
		45 to 60	Array Interior	71	71	66	66	66	66	66	67	67	62	62	62	62	62	65	65	59	59	59	59	62	62	55	55	55	55	59	59	52	52	52	52	56	56	49	49	49	49	49	49				
			Array Edge	62	62	56	56	56	56	56	58	58	52	52	52	52	52	54	54	48	48	48	48	48	51	51	45	45	45	45	48	48	42	42	42	42	42	45	45	40	40	40	40				
B	0 to 7	Array Interior	73	73	67	67	67	59	59	73	71	63	63	63	55	55	73	67	60	60	60	51	51	73	64	56	56	56	47	77	61	53	53	53	44	74	58	50	50	50	42	42					
		Array Edge	73	64	57	57	57	48	48	73	61	52	52	52	44	44	73	57	49	49	49	41	41	70	53	46	46	46	38	38	67	50	43	43	43	36	64	47	40	40	40	32	32				
	7 to 20	Array Interior	70	70	70	61	61	61	55	66	66	66	56	56	56	51	63	63	52	52	52	48	48	60	60	49	49	49	45	57	57	57	46	46	46	42	54	54	54	43	43	39					
		Array Edge	61	61	61	49	49	49	45	56	56	56	46	46	46	41	52	52	42	42	42	39	49	49	49	40	40	40	36	46	46	46	37	37	32	43	43	43	35	35	35	29					
	20 to 27	Array Interior	78	78	78	65	65	65	63	74	74	74	61	61	61	59	70	70	58	58	58	45	45	67	67	57	57	54	54	52	64	64	64	51	51	51	49	61	61	61	48	48	46				
		Array Edge	67	67	67	54	54	54	52	64	64	64	50	50	50	48	61	61	61	47	47	47	45																								

[illegible]

Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- 72-Cell (P)																																															
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed >> Roof Zone >>	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph																	
				1'	2'	2n	3e	3r	1'	2'	2n	3e	3r	1'	2'	2n	3e	3r	1'	2'	2n	3e	3r	1'	1'	2'	2n	3e	3r	1'	1'	2'	2n	3e	3r	1'	1'	2'	2n	3e	3r										
15 psf	B	0 to 7	Array Interior	69	69	67	67	67	59	59	69	69	63	63	63	55	55	69	67	60	60	60	51	51	69	64	56	56	56	47	47	69	61	53	53	53	44	44	69	58	50	50	50	42	42						
			Array Edge	69	64	57	57	57	48	48	69	61	52	52	52	44	44	69	57	49	49	49	41	41	69	60	56	46	46	48	38	38	67	50	43	43	43	36	36	64	47	40	40	40	32	32					
		7 to 20	Array Interior	70	70	70	61	61	61	55	56	66	66	56	56	56	51	51	63	63	52	52	52	48	48	60	60	60	49	49	49	57	57	57	46	46	46	46	46	54	54	54	43	43	43	39	39				
			Array Edge	61	61	61	49	49	49	45	45	56	56	56	46	46	46	41	41	52	52	52	42	42	42	39	49	49	49	40	40	40	36	36	46	46	46	37	37	37	32	43	43	35	35	35	29	29			
		20 to 27	Array Interior	75	75	75	65	65	65	63	74	74	74	61	61	61	59	70	70	58	58	58	55	55	67	67	57	54	54	54	52	64	64	64	51	51	51	49	61	61	61	48	48	48	38	38	46	46			
			Array Edge	67	67	67	54	54	54	52	64	64	64	50	50	50	48	61	61	61	47	47	47	45	57	57	57	44	44	44	42	53	53	53	41	41	41	39	50	50	50	39	39	39	37	37					
		27 to 45	Array Interior	72	72	72	72	72	64	70	68	68	68	66	61	66	65	65	65	65	63	57	63	57	63	62	62	62	60	54	60	60	60	60	60	57	50	56	56	56	53	47	53	43	43	43	39	39			
			Array Edge	63	63	63	63	60	54	60	59	59	59	56	50	56	55	55	55	55	52	46	52	46	52	51	51	51	49	43	49	48	48	48	46	41	46	46	46	46	46	46	46	43	38	43	38	43			
	C	45 to 60	Array Interior	82	82	78	78	78	78	79	79	74	74	74	74	74	76	76	71	71	71	71	71	71	73	73	68	68	68	68	70	70	65	65	65	65	65	68	68	62	62	62	62	62	62	62	62				
			Array Edge	73	73	68	68	68	68	68	70	70	65	65	65	65	65	67	67	62	62	62	62	62	62	64	64	58	58	58	58	61	61	55	55	55	55	55	59	59	52	52	52	52	52	52	52				
		0 to 7	Array Interior	69	66	59	59	59	49	49	69	62	54	54	54	46	46	69	59	51	51	51	43	43	64	65	47	47	47	40	40	68	52	44	44	44	37	37	65	49	42	42	42	35	35	39	39				
			Array Edge	69	66	47	47	47	40	40	68	51	44	44	44	37	37	65	48	41	41	41	33	33	62	45	38	38	38	29	29	59	42	36	36	36	26	26	55	40	32	32	32	23	23						
		7 to 20	Array Interior	62	62	62	51	51	51	46	58	58	47	47	47	43	54	54	54	44	44	44	40	40	51	51	51	41	41	41	37	48	48	48	39	39	39	35	45	45	45	36	36	36	31	31					
			Array Edge	51	51	51	41	41	41	38	47	47	47	38	38	34	44	44	44	36	36	36	29	29	41	41	41	31	31	31	26	39	39	39	27	27	27	23	36	36	36	24	24	24	20	20					
		D	20 to 27	Array Interior	69	69	69	56	56	56	54	65	65	65	52	52	52	50	62	62	62	48	48	48	48	48	59	59	59	45	45	45	43	55	55	55	42	42	42	42	42	42	42	42	42	42	42	42			
				Array Edge	59	59	59	45	45	45	44	55	55	55	42	42	42	40	51	51	51	39	39	39	38	48	48	48	37	37	37	35	45	45	45	33	33	33	31	42	42	42	29	29	29	27	27				
27 to 45	Array Interior		64	64	64	64	62	56	62	61	61	61	61	58	52	58	57	57	57	57	54	48	54	53	53	53	53	51	45	51	50	50	50	47	42	47	47	47	47	47	47	45	45	45	40	40					
	Array Edge		54	54	54	54	51	45	51	50	50	50	47	42	47	46	46	46	46	44	39	44	43	43	43	43	41	37	41	41	41	41	41	38	33	38	38	38	38	36	36	29	29	29	26	26					
45 to 60	Array Interior		74	74	70	70	70	70	70	71	71	66	66	66	66	66	68	68	63	63	63	63	63	65	65	60	60	60	60	60	63	63	67	57	57	57	57	60	60	54	54	54	54	54	54						
	Array Edge		66	66	60	60	60	60	60	62	62	56	56	56	56	56	59	59	52	52	52	52	52	56	56	49	49	49	49	49	62	52	46	46	46	46	46	49	49	43	43	43	43	43							
20 psf	B		0 to 7	Array Interior	65	65	65	65	65	59	59	65	65	63	63	63	55	55	65	65	60	60	60	51	51	65	64	56	56	56	47	47	65	61	53	53	53	44	44	65	58	50	50	50	42	42					
				Array Edge	65	64	57	57	57	48	48	65	61	52	52	52	44	44	65	57	49	49	49	41	41	65	60	56	46	46	48	38	38	67	50	43	43	43	36	36	64	47	40	40	40	32	32				
		7 to 20	Array Interior	70	70	70	61	61	61	55	56	66	66	56	56	56	51	51	63	63	52	52	52	48	48	60	60	60	49	49	49	57	57	57	46	46	46	46	46	54	54	54	43	43	43	39	39				
			Array Edge	61	61	61	49	49	49	45	45	56	56	56	46	46	46	41	41	52	52	52	42	42	42	39	49	49	49	40	40	40	36	36	46	46	46	37	37	37	32	43	43	35	35	35	29	29			
		20 to 27	Array Interior	72	72	72	65	65	65	63	72	72	72	61	61	61	59	70	70	58	58	58	55	55	67	67	57	54	54	54	52	64	64	64	51	51	51	49	61	61	61	48	48	48	38	38	46	46			
			Array Edge	67	67	67	54	54	54	52	64	64	64	50	50	50	48	61	61	61	47	47	47	45	57	57	57	44	44	44	42	53	53	53	41	41	41	39	50	50	50	39	39	39	37	37					
		27 to 45	Array Interior	72	72	72	72	72	64	70	68	68	68	66	61	66	65	65	65	65	63	57	63	57	63	62	62	62	60	54	60	60	60	60	60	57	50	56	56	56	53	47	53	43	43	43	39	39			
			Array Edge	63	63	63	63	60	54	60	59	59	59	56	50	56	55	55	55	55	52	46	52	46	52	51	51	51	49	43	49	48	48	48	46	41	46	46	46	46	46	46	46	46	46	43	38	43	38	43	
	C	45 to 60	Array Interior	82	82	78	78	78	78	79	79	74	74	74	74	74	76	76	71	71	71	71	71	73	73	68	68	68	68	70	70	65	65	65	65	65	68	68	62	62	62	62	62	62	62	62					
			Array Edge	73	73	68	68	68	68	68	70	70	65	65	65	65	65	67	67	62	62	62	62	62	64	64	58	58	58	58	61	61	55	55	55	55	55	59	59	52	52	52	52	52	52	52	52				
		0 to 7	Array Interior	65	65	59	59	59	49	49	65	62	54	54	54	46	46	65	59	51	51	51	43	43	65	55	47	47	47	40	40	65	52	44	44	44	37	37	65	49	42	42	42	35	35	39	39				
			Array Edge	65	66	47	47	47	40	40	65	51	44	44	44	37	37	65	48	41	41	41	33	33	62	45	38	38	38	29	29	59	42	36	36	36	26	26	55	40	32	32	32	23	23						
		7 to 20	Array Interior	62	62	62	51	51	51	46	58	58	47	47	47	43	54	54	54	44	44	44	40	40	51	51	51	41	41	41	37	48	48	48	39	39	39	35	45	45	45	36	36	36	31	31					
			Array Edge	51	51	51	41	41	41	38	47	47	47	38	38	34	44	44	44	36	36	36	29	29	41	41	41	31	31	31	26	39	39	39	27	27	27	23	36	36	36	24	24	24	20	20					
		D	20 to 27	Array Interior	69	69	69	56	56	56	54	65	65	65	52	52	52	50	62	62	62	48	48	48	48	48	59	59	59	45	45	45	43	55	55	55	42	42	42	42	42	42	42	42	42	42	42	42			
				Array Edge	59	59	59	45	45	45	44	55	55	55	42	42	42	40	51	51	51	39	39	39	38	48	48	48	37	37	37	35	45	45	45	33	33	33	31	42	42	42	29	29	29	27	27				
27 to 45	Array Interior		64	64	64	64	62	56	62	61	61	61	61	58	52	58	57	57	57	57	54	48	54	53	53	53	51	45	51																						

[illegible]

Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- 72-Cell (P)																																																																																																			
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed-->	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph																																																																					
				1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r	1'	2'	2e	2r	2n	3e	3r																																																										
B																																																						0 to 7		Array Interior	64	64	64	64	64	59	59	64	64	63	63	63	63	55	55	64	64	60	60	60	51	51	64	64	56	56	56	47	47	64	61	53	53	53	44	44	64	58	50	50	50	42	42				
																																																								Array Edge	64	64	57	57	57	48	48	64	61	52	52	52	44	44	64	57	49	49	49	41	41	64	53	46	46	46	38	38	64	50	43	43	43	36	36	64	47	40	40	40	32	32					
																																																						7 to 20		Array Interior	66	66	66	61	61	61	55	55	66	66	66	56	56	56	51	51	63	63	52	52	52	48	48	60	60	49	49	49	49	49	57	57	57	46	46	46	46	46	54	54	43	43	43	39	39		
																																																								Array Edge	61	61	61	49	49	49	45	45	56	56	46	46	46	41	41	52	52	42	42	42	39	39	49	49	40	40	40	40	36	46	46	46	37	37	37	32	43	43	35	35	35	29	29				
																																																						20 to 27		Array Interior	67	67	67	65	65	65	63	63	67	67	66	61	61	61	59	59	67	67	67	58	58	58	55	55	67	67	57	54	54	54	52	64	64	53	53	53	41	41	41	39	61	61	48	48	48	46	46
																																																								Array Edge	67	67	67	54	54	54	52	52	64	64	50	50	50	48	48	61	61	47	47	47	47	47	45	45	57	57	44	44	44	44	42	53	53	53	41	41	41	39	50	50	50	39	39	37	37		
																																																						27 to 45		Array Interior	72	72	72	72	70	70	64	70	68	68	68	66	61	66	65	65	65	65	63	57	63	62	62	62	60	54	60	60	60	57	50	60	60	60	57	50	57	56	56	56	53	47	53	43	43	43	
																																																								Array Edge	63	63	63	63	60	54	60	59	59	59	59	56	50	56	55	55	55	55	52	46	52	51	51	51	49	43	49	48	48	48	46	41	46	48	48	48	46	41	46	46	46	46	43	38	43		
																																																						45 to 60		Array Interior	82	82	78	78	78	78	78	79	79	74	74	74	74	74	74	75	76	71	71	71	71	71	71	73	73	68	68	68	68	68	70	70	65	65	65	65	65	68	68	62	62	62	62	62			
																																																								Array Edge	73	73	68	68	68	68	68	70	70	65	65	65	65	65	65	67	67	62	62	62	62	62	62	64	64	58	58	58	58	58	61	61	55	55	55	55	55	59	59	52	52	52	52	52			
30 psf																																																						0 to 7		Array Interior	64	64	59	59	59	49	49	64	62	54	54	54	46	46	64	59	51	51	51	43	43	64	55	47	47	47	40	40	64	52	44	44	44	37	37	64	49	42	42	42	35	35					
																																																								Array Edge	64	56	47	47	47	40	40	64	51	44	44	44	37	37	64	48	41	41	41	33	33	62	45	38	38	38	29	29	64	42	36	36	36	26	26	55	40	32	32	23	23						
																																																						7 to 20		Array Interior	62	62	62	51	51	51	46	58	58	47	47	47	43	54	54	44	44	44	44	40	51	51	51	41	41	41	37	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48			
																																																								Array Edge	51	51	51	41	41	41	38	47	47	47	38	38	34	44	44	44	44	36	36	29	41	41	41	31	31	31	26	39	39	39	37	37	35	45	45	45	45	45	45	45	45	45	45				
																																																						20 to 27		Array Interior	67	67	67	56	56	56	54	65	65	65	52	52	52	50	62	62	62	62	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48			
																																																								Array Edge	59	59	59	45	45	45	44	55	55	55	42	42	42	40	51	51	51	39	39	39	38	38	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48			
																																																						27 to 45		Array Interior	64	64	64	64	62	56	62	61	61	61	58	52	58	57	57	57	57	54	48	54	53	53	53	51	45	51	50	50	50	47	42	47	47	47	47	47	47	47	47	47	47	47	47	47			
																																																								Array Edge	54	54	54	54	51	45	51	50	50	50	50	47	42	47	46	46	46	46	39	44	43	43	43	41	37	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41			
																																																						45 to 60		Array Interior	74	74	70	70	70	70	70	71	71	66	66	66	66	66	66	68	68	63	63	63	63	63	65	65	60	60	60	60	60	63	63	57	57	57	57	57	60	60	54	54	54	54	54				
																																																								Array Edge	66	66	62	60	60	60	60	62	62	56	56	56	56	56	59	59	52	52	52	52	52	56	56	49	49	49	49	49	52	52	46	46	46	46	46	49	49	43	43	43	43	43					
35 psf																																																						0 to 7		Array Interior	66	66	64	61	61	61	55	55	66	66	64	56	56	56	51	51	63	63	52	52	52	48	48	60	60	49	49	49	49	49	57	57	57	46	46	46	46	46	54	54	43	43	43	39	39		
																																																								Array Edge	61	61	61	49	49	49	45	45	56	56	46	46	46	41	41	52	52	42	42	42	39	39	49	49	40	40	40	40	36	46	46	46	37	37	37	32	43	43	35	35	35	29	29				
																																																						7 to 20		Array Interior	64	64	64	61	61	61	55	55	64	64	64	56	56	56	51	51	63	63	52	52	52	48	48	60	60	49	49	49	49	49	57	57	57	46	46	46	46	46	54	54	43	43	43	39	39		
																																																								Array Edge	61	61	61	49	49	49	45	45	56	56	46	46	46	41	41	52	52	42	42	42	39	39	49	49	40	40	40	40	36	46	46	46	37	37	37	32	43	43	35	35	35	29	29				
																																																						20 to 27		Array Interior	66	66	66	65	65	65	63	63	66	66	66	61	61	61	59	59	66	66	66	58	58	58	55	55	66	66	56	54	54	54	52	64	64	53	53	53	41	41	41	39	61	61	48	48	48	46	46
																																																								Array Edge	66	66	66	54	54	54	52	52	64	64	50	50	50	48	48	61	61	47	47	47	47	47	45	45	57	57	44	44	44	44	42	53	53	53	41	41	41	39	50	50	50	39	39	37	37		
																																																						27 to 45		Array Interior	72	72	72	72	70	70	64	70	68	68	68	66	61	66	65	65	65	65	63	57	63	62	62	62	60	54	60	60	60	57	50	60	60	60	57	50	57	56	56	56	53	47	53	43	43	43	
																																																								Array Edge	63	63	63	63	60	54	60	59	59	59	59	56	50	56	55	55	55	55	52	46	52	51	51	51	49	43	49	48	48	48	46	41	46	48	48	48	46	41	46	46	46	46	43	38	43		
																																																						45 to 60		Array Interior	82	82	78	78	78	78	78	79	79	74	74	74	74	74	74	75	76	71	71	71	71	71	73	73	68	68	68	68	68	70	70	65	65	65	65	65	68	68	62	62	62	62	62				
																																																								Array Edge	73	73	68	68	68	68	68	70	70	65	65	65	65	65	67	67	62	62	62	62	62	62	64	64	58	58	58	58	58	61	61	55	55	55	55	55	59	59	52	52	52	52	52				
40 psf																																																						0 to 7		Array Interior	62	62	59	59	59	49	49	62	62	54	54	54	46	46	62	59	51	51	51	43	43	62	55	47	47	47	40	40	62	52	44	44	44	37	37	62	49	42	42	42	35	35					
																																																								Array Edge	62	56	47	47	47	40	40	62	51	44	44	44	37	37	62	48	41	41	41	33	33	62	45	38	38	38	29	29	62	42	36	36	36	26	26	55	40	32	32	23	23						
																																																						7 to 20		Array Interior	62	62	62	51	51	51	46	58	58	47	47	47	43	54	54	44	44	44	44	40	51	51	51	41	41	41	37	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48			
																																																								Array Edge	51	51	51	41	41	41	38	47	47	47	38	38	34	44	44	44	44	36	36	29	41	41	41	31	31	31	26	39	39	39	37	37	35	45	45	45	45	45	45	45	45	45	45				
																																																						20 to 27		Array Interior	66	66	66	56	56	56	54	65	65	65	52	52	52	50	62	62	62	62	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48			
																																																								Array Edge	59	59	59	45	45	45	44	55	55	55	42	42	42	40	51	51	51	39	39	39	38	38	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48			
																																																						27 to 45		Array Interior	64	64	64	64	62	56	62	61																																							

[illegible]

[illegible]

[illegible]

Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- Landscape																																																																							
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed-->	130 mph												140 mph												150 mph												160 mph												170 mph												180 mph											
				Roof Zone-->			1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r																				
0 psf	B	0 to 7	Array Interior	103	89	80	80	80	71	71	103	85	76	76	76	68	68	102	80	72	72	72	64	64	97	77	69	69	69	62	62	93	74	66	66	66	58	58	89	71	64	64	64	55	55																														
			Array Edge	97	77	69	69	69	62	62	92	73	66	66	66	58	58	87	70	63	63	63	54	54	83	67	60	60	60	51	51	80	64	56	56	56	48	48	77	61	53	53	53	45	45																														
		7 to 20	Array Interior	84	84	84	73	73	73	68	80	80	80	69	69	69	65	65	76	76	76	66	66	66	62	62	72	72	72	63	63	63	59	59	69	69	69	60	60	55	55	67	67	67	57	57	57	52	52																										
			Array Edge	73	73	73	63	63	63	59	69	69	69	60	60	60	55	55	66	66	66	56	56	56	51	51	63	63	63	52	52	52	48	48	60	60	60	49	49	45	45	57	57	57	46	46	46	42	42																										
		20 to 27	Array Interior	93	93	93	77	77	77	77	75	75	88	88	88	74	74	74	84	84	84	70	70	70	68	68	80	80	80	67	67	67	65	65	77	77	77	64	64	64	63	63	74	74	74	62	62	62	60	60																									
			Array Edge	80	80	80	67	67	67	65	65	76	76	76	64	64	64	62	62	73	73	73	61	61	61	59	59	69	69	69	57	57	57	55	55	67	67	67	54	54	54	52	52	64	64	64	51	51	51	49	49																								
		27 to 45	Array Interior	87	87	87	87	83	77	77	77	83	82	82	82	79	79	79	78	78	78	75	75	75	70	70	75	75	75	75	72	67	67	72	72	72	72	69	64	69	69	69	69	67	62	67	62	67	62	67																									
			Array Edge	75	75	75	75	72	67	67	67	71	71	71	71	69	64	69	68	68	68	66	66	66	61	61	65	65	65	65	63	57	57	62	62	62	62	60	54	60	60	60	57	51	57	51	57	51	57																										
	45 to 60	Array Interior	100	100	94	94	94	94	94	94	95	95	95	89	89	89	89	89	91	91	85	85	85	85	85	88	88	81	81	81	81	81	84	84	78	78	78	78	78	81	81	75	75	75	75	75	75	75	75	75																									
		Array Edge	88	88	82	82	82	82	82	84	84	84	78	78	78	78	78	80	80	74	74	74	74	74	77	77	71	71	71	71	71	74	74	68	68	68	68	68	71	71	65	65	65	65	65	65	65	65	65																										
	C	0 to 7	Array Interior	100	79	71	71	71	71	63	63	94	75	67	67	67	60	60	90	71	64	64	64	56	56	86	68	61	61	61	61	61	82	65	58	58	58	49	49	79	63	55	55	55	47	47																													
			Array Edge	86	68	62	62	62	53	53	81	65	58	58	58	49	49	77	62	54	54	54	46	46	74	59	50	50	50	43	43	71	55	47	47	47	40	40	68	52	45	45	45	38	38																														
		7 to 20	Array Interior	74	74	74	65	65	65	61	71	71	71	61	61	61	57	57	67	67	67	58	58	58	53	53	64	64	64	54	54	54	49	49	62	62	62	51	51	51	46	46	59	59	59	48	48	44	44																										
			Array Edge	65	65	65	55	55	55	50	61	61	61	51	51	51	46	46	58	58	58	47	47	47	42	42	54	54	54	44	44	44	40	40	51	51	51	41	41	41	38	38	48	48	48	39	39	35																											
		20 to 27	Array Interior	82	82	82	69	69	69	67	78	78	78	65	65	65	64	74	74	74	62	62	62	60	70	70	70	58	58	58	56	55	52	64	64	64	51	51	51	49	62	62	62	48	48	48	44	44																											
			Array Edge	71	71	71	60	60	60	58	68	68	68	55	55	55	53	65	65	65	52	52	52	50	62	62	62	62	62	62	62	48	48	48	46	59	59	59	45	45	44	44	56	56	56	43	43	43	41	41																									
27 to 45		Array Interior	77	77	77	77	74	69	74	73	73	73	70	65	70	70	70	70	70	70	67	62	67	67	67	67	67	67	67	67	64	59	64	64	64	59	64	64	64	62	56	62	61	61	61	59	53	59																											
		Array Edge	67	67	67	67	64	60	64	64	64	64	64	61	55	61	61	61	61	61	58	52	58	57	57	57	57	57	57	54	48	54	54	54	48	54	54	54	51	51	51	48	43	48	43	43	41	41																											
45 to 60	Array Interior	90	90	84	84	84	84	84	84	86	86	79	79	79	79	79	82	82	76	76	76	76	76	79	79	72	72	72	72	72	72	75	75	69	69	69	69	69	73	73	67	67	67	67	67	67																													
	Array Edge	79	79	73	73	73	73	73	75	75	69	69	69	69	69	72	72	66	66	66	66	66	66	68	68	63	63	63	63	63	66	66	60	60	60	60	60	63	63	57	57	57	57	57	57																														
D	0 to 7	Array Interior	94	74	67	67	67	60	89	71	64	64	64	55	55	84	67	61	61	61	51	51	80	64	57	57	57	48	48	74	59	51	51	51	44	44	74	59	51	51	51	41	41	41	34	34																													
		Array Edge	81	65	57	57	57	48	48	77	61	53	53	53	45	45	73	58	49	49	49	42	42	70	54	46	46	46	39	39	62	54	44	44	44	37	37	64	48	41	41	41	34	34																															
	7 to 20	Array Interior	70	70	70	61	61	61	56	67	67	67	57	57	52	64	64	64	53	53	53	48	48	61	61	61	50	50	50	45	58	58	58	47	47	47	43	54	54	54	44	44	44	44	44	44	44																												
		Array Edge	61	61	61	50	50	50	46	57	57	57	46	46	46	42	53	53	53	43	43	43	39	50	50	50	40	40	40	37	47	47	47	38	38	38	33	44	44	44	36	36	36	30	30																														
	20 to 27	Array Interior	78	78	78	65	65	65	63	74	74	74	62	62	62	60	70	70	70	58	58	58	56	57	67	67	67	55	55	52	64	64	64	51	51	51	49	62	62	62	48	48	48	44	44																														
		Array Edge	67	67	67	55	55	55	53	64	64	64	51	51	51	49	61	61	61	47	47	47	46	58	58	58	44	44	44	43	54	54	54	42	42	42	40	51	51	51	39	39	39	38	38																														
	27 to 45	Array Interior	73	73	73	73	70	65	70	69	69	69	66	62	66	66	66	66	66	66	63	58	63	58	63	63	63	63	61	54	61	60	60	60	57	51	57	57	57	57	54	54	54	48	48																														
		Array Edge	63	63	63	61	55	61	60	60	60	60	57	51	57	56	56	56	56	53	47	53	52	52	52	52	52	52	50	44	50	49	49	49	47	42	47	46	46	46	46	44	39	44	39	44																													
45 to 60	Array Interior	85	85	79	79	79	79	79	81	81	75	75	75	75	75	78	78	71	71	71	71	71	71	74	74	68	68	68	68	68	71	71	66	66	66	66	66	68	68	63	63	63	63	63	63																														
	Array Edge	75	75	69	69	69	69	69	71	71	65	65	65	65	65	68	68	62	62	62	62	62	65	65	65	65	65	63	57	63	62	62	62	62	62	60	60	60	53	53	53	53	53	53																															
5 psf	B	0 to 7	Array Interior	100	89	80	80	80	71	71	100	85	76	76	76	68	68	100	80	72	72	72	64	64	97	77	69	69	69	62	62	93	74	66	66	66	59	59	89	71	64	64	64	55	55																														
			Array Edge	97	77	69	69	69	62	62	92	73	66	66	66	58	58	87	70	63	63	63	54	54	83	67	60	60	60	51	51	80	64	56	56	56	48	48	77	61	53	53	53	45	45																														
		7 to 20	Array Interior	84	84	84	73	73	73	68	80	80	80	69	69	69	65	65	76	76	76	66	66	66	62	62	72	72	72	63	63	63	59	59	69	69	69	60	60	55	55	67	67	67	57	57	57	52	52																										
			Array Edge	73	73	73	63	63	63	59	69	69	69	60	60	60	55	55	66	66	66	56	56	56	51	51	63	63	63	52	52	52	48	48	60	60	60	49	49	45	45	57	57	57	46	46	46	42	42																										
		20 to 27	Array Interior	93	93	93	77	77	77	77	75	75	88	88	88	74	74	74	84	84	84	70	70	70	68	68	80	80	80	67	67	67	65	65	77	77	77	64	64	64	63	63	74	74	74	62	62	62	60	60																									
			Array Edge	80	80	80	67	67	67	65	65	76	76	76	64	64	64	62	62	73	73	73	61	61	61	59	59	69	69	69																																													

[illegible]

Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- Landscape																																																		
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed-> Roof Zone->	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph																				
				1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r	1'	1	2e	2r	2n	3e	3r									
15 psf	B	0 to 7	Array Interior	86	86	80	80	80	71	71	86	85	76	76	76	68	68	86	80	72	72	72	64	64	86	77	69	69	69	62	62	86	74	66	66	66	59	59	86	71	64	64	64	55	55	86	71	64	64	64	55	55		
			Array Edge	86	77	69	69	69	62	62	86	73	66	66	66	58	58	86	70	63	63	63	54	54	83	67	60	60	60	51	51	80	64	56	56	56	48	48	77	61	53	53	53	45	45	77	61	53	53	45	45			
		7 to 20	Array Interior	84	84	84	73	73	73	68	80	80	80	69	69	69	65	76	76	76	66	66	66	62	72	72	72	63	63	59	69	69	69	60	60	55	67	67	67	57	57	57	57	57	57	57	57	57	57	57	57	57	57	
			Array Edge	73	73	73	63	63	63	59	69	69	69	60	60	60	55	66	66	66	56	56	56	51	63	63	63	52	52	48	60	60	60	49	49	49	45	57	57	57	46	46	46	46	46	46	46	46	46	46	46	46		
		20 to 27	Array Interior	93	93	93	77	77	77	77	75	88	88	88	74	74	74	72	84	84	84	70	70	70	68	80	80	80	67	67	67	65	77	77	77	64	64	64	63	74	74	74	62	62	62	62	62	62	62	62	62	62	62	
			Array Edge	80	80	80	67	67	67	67	65	76	76	76	64	64	64	62	73	73	73	61	61	61	59	69	69	69	57	57	57	67	67	67	54	54	54	52	64	64	64	51	51	51	51	51	51	51	51	51	51	51	51	
		27 to 45	Array Interior	87	87	87	83	77	83	82	82	82	73	73	73	79	79	78	78	78	75	70	75	75	75	75	75	75	75	72	67	72	72	72	72	69	64	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69		
			Array Edge	75	75	75	75	72	67	72	71	71	71	71	69	64	69	68	68	68	66	61	66	65	65	65	65	65	65	65	63	67	62	62	62	60	54	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60		
		C	45 to 60	Array Interior	100	100	94	94	94	94	94	95	95	89	89	89	89	89	91	91	85	85	85	85	85	88	88	81	81	81	81	84	84	78	78	78	78	81	81	75	75	75	75	75	75	75	75	75	75	75	75	75		
				Array Edge	88	88	82	82	82	82	82	84	84	78	78	78	78	78	80	80	74	74	74	74	74	77	77	71	71	71	71	74	74	68	68	68	68	68	71	71	65	65	65	65	65	65	65	65	65	65	65	65	65	
	0 to 7		Array Interior	86	79	71	71	71	63	63	86	75	67	67	67	60	60	86	71	64	64	64	56	56	86	68	61	61	61	52	82	65	58	58	58	49	49	79	63	55	55	55	47	47	47	47	47	47	47	47	47	47	47	47
			Array Edge	86	68	62	62	62	53	53	81	65	58	58	58	49	49	77	62	54	54	54	46	46	74	59	50	50	50	43	71	55	47	47	47	40	40	68	52	45	45	45	38	38	38	38	38	38	38	38	38	38		
	7 to 20		Array Interior	74	74	74	65	65	65	61	71	71	71	61	61	61	57	67	67	67	58	58	58	53	64	64	64	54	54	49	62	62	62	51	51	51	46	59	59	59	48	48	48	48	48	48	48	48	48	48	48	48		
			Array Edge	65	65	65	55	55	55	50	61	61	61	51	51	51	46	58	58	58	47	47	47	43	54	54	54	44	44	40	51	51	51	41	41	41	38	48	48	48	39	39	39	39	39	39	39	39	39	39	39	39		
	D		20 to 27	Array Interior	82	82	82	69	69	69	67	78	78	78	65	65	65	64	74	74	74	62	62	62	61	71	71	71	60	60	57	68	68	68	56	56	56	54	66	66	66	53	53	53	43	43	43	43	43	43	43	43		
				Array Edge	71	71	71	60	60	60	58	68	68	68	55	55	55	53	65	65	65	52	52	52	50	62	62	62	48	48	46	59	59	59	45	45	45	44	56	56	56	43	43	43	43	43	43	43	43	43	43	43		
		27 to 45	Array Interior	77	77	77	77	74	69	74	73	73	73	70	65	70	73	70	70	70	67	62	67	67	67	67	67	67	67	64	64	64	62	56	62	61	61	61	61	59	53	59	53	59	53	59	53	59	53	59	53	59		
			Array Edge	67	67	67	67	64	60	64	64	64	64	61	55	61	61	61	61	61	58	52	58	57	57	57	57	57	54	54	54	51	45	51	51	51	51	51	51	48	48	48	48	48	48	48	48	48	48	48	48	48		
		45 to 60	Array Interior	90	90	84	84	84	84	84	86	86	79	79	79	79	79	82	82	76	76	76	76	76	79	79	72	72	72	72	75	75	69	69	69	69	73	73	67	67	67	67	67	67	67	67	67	67	67	67	67			
			Array Edge	79	79	73	73	73	73	73	75	75	69	69	69	69	69	72	72	66	66	66	66	66	68	68	63	63	63	63	66	66	60	60	60	60	63	63	57	57	57	57	57	57	57	57	57	57	57	57	57			
		B	0 to 7	Array Interior	82	82	80	80	80	71	71	82	82	76	76	76	68	68	82	80	72	72	72	64	64	82	77	69	69	69	62	62	82	74	66	66	66	59	59	82	71	64	64	64	55	55	82	71	64	64	64	55	55	
				Array Edge	82	77	69	69	69	62	62	82	73	66	66	66	58	58	82	70	63	63	63	54	54	82	67	60	60	60	51	51	80	64	56	56	56	48	48	77	61	53	53	53	45	45	77	61	53	53	45	45		
	7 to 20		Array Interior	84	84	84	73	73	73	68	80	80	80	69	69	69	65	76	76	76	66	66	66	62	72	72	72	63	63	59	69	69	69	60	60	55	67	67	67	57	57	57	57	57	57	57	57	57	57	57	57	57	57	
			Array Edge	73	73	73	63	63	63	59	69	69	69	60	60	60	55	66	66	66	56	56	56	51	63	63	63	52	52	48	60	60	60	49	49	49	45	57	57	57	46	46	46	46	46	46	46	46	46	46	46	46		
	20 to 27		Array Interior	91	91	91	77	77	77	77	75	88	88	88	74	74	74	72	84	84	84	70	70	70	68	80	80	80	67	67	67	65	77	77	77	64	64	64	63	74	74	74	62	62	62	62	62	62	62	62	62	62	62	
			Array Edge	80	80	80	67	67	67	65	76	76	76	64	64	64	62	73	73	73	61	61	61	59	69	69	69	57	57	55	67	67	67	54	54	54	52	64	64	64	51	51	51	51	51	51	51	51	51	51	51	51		
	27 to 45		Array Interior	87	87	87	83	77	83	82	82	82	73	73	73	79	79	78	78	78	75	70	75	75	75	75	75	75	75	72	67	72	72	72	72	69	64	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69		
			Array Edge	75	75	75	75	72	67	72	71	71	71	71	69	64	69	68	68	68	66	61	66	65	65	65	65	65	65	65	63	67	62	62	62	60	54	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60		
	C	45 to 60	Array Interior	100	100	94	94	94	94	94	95	95	89	89	89	89	89	91	91	85	85	85	85	85	88	88	81	81	81	81	84	84	78	78	78	78	81	81	75	75	75	75	75	75	75	75	75	75	75	75	75			
Array Edge			88	88	82	82	82	82	82	84	84	78	78	78	78	78	80	80	74	74	74	74	74	77	77	71	71	71	71	74	74	68	68	68	68	68	71	71</																

[illegible]

Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- Landscape																																															
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed >> Roof Zone >>	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph																	
				1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r	1'	1'	2e	2e	2n	3e	3r						
30 psf	B	0 to 7	Array Interior	81	81	80	80	80	71	71	81	81	76	76	76	68	68	81	80	72	72	72	64	64	81	77	69	69	69	62	62	81	74	66	66	66	59	59	81	71	64	64	64	55	55						
			Array Edge	81	77	69	69	69	62	62	81	73	66	66	66	58	58	81	70	63	63	63	54	54	81	67	60	60	60	51	51	80	64	56	56	56	48	48	77	61	53	53	53	45	45						
		7 to 20	Array Interior	83	83	63	73	73	73	68	80	80	80	69	69	69	65	65	76	76	76	66	66	66	62	72	72	63	63	63	59	69	69	69	60	60	55	67	67	67	57	57	57	57	52	52					
			Array Edge	73	73	73	63	63	63	59	69	69	69	60	60	60	55	55	66	66	66	56	56	56	51	63	63	63	52	52	52	60	60	60	49	49	45	57	57	57	46	46	46	46	42	42					
		20 to 27	Array Interior	85	85	85	77	77	77	77	85	85	85	74	74	74	72	72	84	84	84	70	70	70	68	75	75	75	72	67	65	77	77	77	64	64	64	63	74	74	74	62	62	62	60	60					
			Array Edge	80	80	80	67	67	67	65	76	76	76	64	64	64	62	62	73	73	73	61	61	61	59	69	69	69	57	57	57	67	67	67	54	54	54	52	64	64	64	51	51	51	49	49					
	C	27 to 45	Array Interior	87	87	87	87	87	83	82	82	82	79	79	79	73	73	78	78	78	75	75	75	75	75	75	75	75	72	67	72	72	72	72	69	64	63	74	74	74	62	62	62	60	60						
			Array Edge	75	75	75	75	72	67	72	71	71	71	69	64	69	68	68	68	68	66	61	66	65	65	65	65	65	63	57	63	62	62	62	60	54	60	60	60	57	51	57	51	57	51	57					
		45 to 60	Array Interior	100	100	94	94	94	94	94	95	95	89	89	89	89	89	91	91	85	85	85	85	85	88	88	81	81	81	81	81	84	84	78	78	78	78	78	81	81	75	75	75	75	75						
			Array Edge	88	88	82	82	82	82	82	84	84	78	78	78	78	78	80	80	74	74	74	74	74	77	77	71	71	71	71	71	74	74	68	68	68	68	68	71	71	65	65	65	65	65						
		35 psf	B	0 to 7	Array Interior	79	79	79	79	79	71	71	79	79	76	76	76	68	68	79	79	72	72	72	64	64	79	77	69	69	69	62	62	79	74	66	66	66	59	59	79	71	64	64	64	55	55				
					Array Edge	79	77	69	69	69	62	62	79	73	66	66	66	58	58	79	70	63	63	63	54	54	79	67	60	60	60	51	51	79	64	56	56	56	48	48	77	61	53	53	53	45	45				
7 to 20	Array Interior			81	81	81	73	73	73	73	68	80	80	80	69	69	69	65	65	76	76	76	66	66	66	62	72	72	63	63	63	59	69	69	69	60	60	55	67	67	67	57	57	57	57	52	52				
	Array Edge			73	73	73	63	63	63	59	69	69	69	60	60	60	55	55	66	66	66	56	56	56	51	63	63	63	52	52	52	60	60	60	49	49	45	57	57	57	46	46	46	46	42	42					
20 to 27	Array Interior			82	82	82	77	77	77	77	82	82	82	74	74	74	72	72	82	82	82	70	70	70	68	80	80	80	67	67	67	65	77	77	77	64	64	64	63	74	74	74	62	62	62	60	60				
	Array Edge			80	80	80	67	67	67	65	76	76	76	64	64	64	62	62	73	73	73	61	61	61	59	69	69	69	57	57	57	67	67	67	54	54	54	52	64	64	64	51	51	51	49	49					
C	27 to 45		Array Interior	87	87	87	87	87	83	82	82	82	79	79	79	73	73	78	78	78	75	75	75	75	75	75	75	75	72	67	72	72	72	72	69	64	63	74	74	74	62	62	62	60	60						
			Array Edge	75	75	75	75	72	67	72	71	71	71	69	64	69	68	68	68	68	66	61	66	65	65	65	65	65	63	57	63	62	62	62	60	54	60	60	60	57	51	57	51	57	51	57					
	45 to 60		Array Interior	100	100	94	94	94	94	94	95	95	89	89	89	89	89	91	91	85	85	85	85	85	88	88	81	81	81	81	81	84	84	78	78	78	78	78	81	81	75	75	75	75	75						
			Array Edge	88	88	82	82	82	82	82	84	84	78	78	78	78	78	80	80	74	74	74	74	74	77	77	71	71	71	71	71	74	74	68	68	68	68	68	71	71	65	65	65	65	65						
	40 psf		B	0 to 7	Array Interior	79	79	79	79	79	71	71	79	79	76	76	76	68	68	79	79	72	72	72	64	64	79	77	69	69	69	62	62	79	74	66	66	66	59	59	79	71	64	64	64	55	55				
					Array Edge	79	77	69	69	69	62	62	79	73	66	66	66	58	58	79	70	63	63	63	54	54	79	67	60	60	60	51	51	79	64	56	56	56	48	48	77	61	53	53	53	45	45				
7 to 20		Array Interior		81	81	81	73	73	73	73	68	80	80	80	69	69	69	65	65	76	76	76	66	66	66	62	72	72	63	63	63	59	69	69	69	60	60	55	67	67	67	57	57	57	57	52	52				
		Array Edge		73	73	73	63	63	63	59	69	69	69	60	60	60	55	55	66	66	66	56	56	56	51	63	63	63	52	52	52	60	60	60	49	49	45	57	57	57	46	46	46	46	42	42					
20 to 27		Array Interior		82	82	82	77	77	77	77	82	82	82	74	74	74	72	72	82	82	82	70	70	70	68	80	80	80	67	67	67	65	77	77	77	64	64	64	63	74	74	74	62	62	62	60	60				
		Array Edge		80	80	80	67	67	67	65	76	76	76	64	64	64	62	62	73	73	73	61	61	61	59	69	69	69	57	57	57	67	67	67	54	54	54	52	64	64	64	51	51	51	49	49					
C		27 to 45	Array Interior	87	87	87	87	87	83	82	82	82	79	79	79	73	73	78	78	78	75	75	75	75	75	75	75	75	72	67	72	72	72	72	69	64	63	74	74	74	62	62	62	60	60						
			Array Edge	75	75	75	75	72	67	72	71	71	71	69	64	69	68	68	68	68	66	61	66	65	65	65	65	65	63	57	63	62	62	62	60	54	60	60	60	57	51	57	51	57	51	57					
		45 to 60	Array Interior	100	100	94	94	94	94	94	95	95	89	89	89	89	89	91	91	85	85	85	85	85	88	88	81	81	81	81	81	84	84	78	78	78	78	78	81	81	75	75	75	75	75						
			Array Edge	88	88	82	82	82	82	82	84	84	78	78	78	78	78	80	80	74	74	74	74	74	77	77	71	71	71	71	71	74	74	68	68	68	68	68	71	71	65	65	65	65	65						
		45 psf	B	0 to 7	Array Interior	79	79	79	79	79	71	71	79	79	76	76	76	68	68	79	79	72	72	72	64	64	79	77	69	69	69	62	62	79	74	66	66	66	59	59	79	71	64	64	64	55	55				
					Array Edge	79	77	69	69	69	62	62	79	73	66	66	66	58	58	79	70	63	63	63	54	54	79	67	60	60	60	51	51	79	64	56	56	56	48	48	77	61	53	53	53	45	45				
7 to 20	Array Interior			81	81	81	73	73	73	73	68	80	80	80	69	69	69	65	65	76	76	76	66	66	66	62	72	72	63	63	63	59	69	69	69	60	60	55	67	67	67	57	57	57	57	52	52				
	Array Edge			73	73	73	63	63	63	59	69	69	69	60	60	60	55	55	66	66	66	56	56	56	51	63	63	63	52	52	52	60	60	60	49	49	45	57	57	57	46	46	46	46	42	42					
20 to 27	Array Interior			82	82	82	77	77	77	77	82	82	82	74	74	74	72	72	82	82	82	70	70	70	68	80	80	80	67	67	67	65	77	77	77	64	64	64	63	74	74	74	62	62	62	60	60				
	Array Edge			80	80	80	67	67	67	65	76	76	76	64	64	64	62	62	73	73	73	61	61	61	59	69	69	69	57	57	57	67	67	67	54	54	54	52	64	64	64	51	51	51	49	49					
C	27 to 45		Array Interior	87	87	87	87	87	83	82	82	82	79	79	79	73	73	78	78	78	75	75	75	75	75	75	75	75	72	67	72	72	72	72	69	64	63	74	74	74	62	62	62	60	60						
			Array Edge	75	75	75	75	72	67	72	7																																								

[illegible]

Maximum Rail Spans (Inches)				ClickFit Rail 450124 (REVX03) Flush-Mount on 0 to 30 Foot Roof -- L-Foot -- Landscape																																									
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed->	130 mph						140 mph						150 mph						160 mph						170 mph						180 mph											
				Roof Zone->	1'	1'	2e	2r	3e	3r	1'	1'	2e	2r	3e	3r	1'	1'	2e	2r	3e	3r	1'	1'	2e	2r	3e	3r	1'	1'	2e	2r	3e	3r	1'	1'	2e	2r	3e	3r					
45 psf	B	0 to 7	Array Interior	74	74	74	74	74	71	71	74	74	74	74	74	68	68	74	74	72	72	72	64	64	74	74	69	69	69	62	62	74	74	66	66	66	55	55							
			Array Edge	74	74	69	69	69	62	62	74	73	73	66	66	66	58	58	74	70	63	63	63	54	54	74	67	60	60	63	51	51	74	64	56	56	56	45	45						
		7 to 20	Array Interior	76	76	76	76	73	73	68	76	76	76	69	69	69	65	65	76	76	76	66	66	66	62	62	72	72	72	63	63	63	59	69	69	60	60	45	45						
			Array Edge	73	73	73	63	63	63	59	69	69	69	60	60	60	55	55	66	66	66	56	56	56	51	51	63	63	63	52	52	52	48	60	60	49	49	45	45						
		20 to 27	Array Interior	78	78	78	77	77	77	75	78	78	78	74	74	74	72	72	78	78	78	67	67	67	65	65	77	77	77	64	64	64	63	74	74	62	62	62	60	60					
			Array Edge	78	78	78	67	67	67	65	76	76	76	64	64	64	62	62	73	73	73	61	61	61	59	59	69	69	69	57	57	57	55	64	64	54	54	52	52						
		27 to 45	Array Interior	87	87	87	87	83	77	83	82	82	82	79	73	73	79	79	78	78	78	75	75	75	70	70	75	75	75	75	72	67	72	72	72	69	64	69	69	69	62	67			
			Array Edge	75	75	75	75	72	67	72	71	71	71	71	69	64	69	68	68	68	68	66	61	66	65	65	65	65	65	65	63	57	62	62	62	60	54	60	60	60	57	51			
	45 to 60	Array Interior	100	100	94	94	94	94	94	95	95	89	89	89	89	89	91	91	85	85	85	85	85	88	88	81	81	81	81	81	84	84	78	78	78	78	81	81	75	75	75	75			
		Array Edge	88	88	82	82	82	82	82	84	84	78	78	78	78	78	80	80	84	74	74	74	74	74	77	77	71	71	71	71	71	74	74	68	68	68	68	71	71	65	65	65	65		
	C	0 to 7	Array Interior	74	74	71	71	71	63	63	74	74	67	67	60	60	74	71	64	64	64	56	56	74	68	61	61	61	61	52	52	74	65	58	58	49	49	74	63	55	55	47	47		
			Array Edge	74	68	62	62	62	53	53	74	65	58	58	58	49	49	74	62	54	54	54	46	46	73	59	50	50	50	43	43	71	55	47	47	47	40	40	58	52	45	45			
		7 to 20	Array Interior	74	74	74	65	65	65	61	71	71	71	61	61	61	57	57	67	67	58	58	58	53	53	64	64	54	54	54	49	62	62	62	51	51	51								
			Array Edge	65	65	65	55	55	55	50	61	61	61	51	51	51	46	46	58	58	58	47	47	47	43	43	54	54	44	44	44	40	51	51	51	41	41	38	48	48	39	39	35		
		20 to 27	Array Interior	78	78	78	69	69	69	67	78	78	78	65	65	65	64	74	74	74	62	62	62	60	71	71	71	60	60	60	57	68	68	56	56	56	54	66	66	66	53	53	51		
			Array Edge	71	71	71	60	60	60	58	68	68	68	55	55	55	53	65	65	65	52	52	52	50	62	62	62	48	48	48	46	59	59	59	45	45	44	56	56	56	43	43	41		
27 to 45		Array Interior	77	77	77	77	74	69	74	73	73	73	70	65	70	70	70	70	70	67	62	67	67	67	67	67	67	67	67	64	64	64	59	64	64	64	62	56	62	61	61	61	59	53	59
		Array Edge	67	67	67	67	64	60	64	64	64	64	64	61	55	61	61	61	61	58	52	58	52	58	57	57	57	57	54	54	54	48	54	54	54	51	51	51	48	48	43	48	43	48	
45 to 60	Array Interior	90	90	84	84	84	84	84	86	86	79	79	79	79	79	82	82	76	76	76	66	66	66	68	68	63	63	63	63	63	66	66	60	60	60	60	73	73	67	67	67	67			
	Array Edge	79	79	73	73	73	73	73	75	75	69	69	69	69	69	72	72	66	66	66	66	66	68	68	63	63	63	63	63	66	66	60	60	60	60	63	63	57	57	57	57				
D	0 to 7	Array Interior	76	65	57	57	57	48	48	76	61	61	61	53	53	45	76	61	61	61	51	51	74	64	57	57	57	48	48	67	51	44	44	44	37	37	64	48	41	41	34	34			
		Array Edge	70	70	70	61	61	61	56	67	67	67	57	57	52	52	64	64	64	53	53	53	48	48	61	61	61	50	50	50	45	58	58	47	47	47	40	54	54	44	44	40			
	7 to 20	Array Interior	70	70	70	61	61	61	56	67	67	67	57	57	52	52	64	64	64	53	53	48	48	61	61	61	50	50	40	37	47	47	47	38	38	33	44	44	44	36	36	30			
		Array Edge	61	61	61	50	50	50	46	57	57	57	46	46	46	42	42	53	53	53	43	43	43	39	50	50	50	40	40	40	37	47	47	47	38	38	33	44	44	44	36	36	30		
	20 to 27	Array Interior	78	78	78	65	65	65	63	74	74	74	62	62	62	60	70	70	70	58	58	58	56	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67			
		Array Edge	67	67	67	55	55	55	53	64	64	64	51	51	51	49	61	61	61	47	47	47	46	58	58	58	44	44	44	43	54	54	54	42	42	42	40	51	51	51	39	39	38		
	27 to 45	Array Interior	73	73	73	73	70	65	70	69	69	69	66	62	66	66	66	66	66	66	63	58	63	63	63	63	61	54	61	60	60	60	60	57	51	57	57	57	57	54	54	54			
		Array Edge	63	63	63	63	61	55	61	60	60	60	60	57	51	57	56	56	56	56	53	47	53	52	52	52	50	44	50	49	49	49	49	47	42	47	46	46	46	44	39	44			
45 to 60	Array Interior	85	85	79	79	79	79	79	81	81	75	75	75	75	75	78	78	71	71	71	71	71	74	74	68	68	68	68	68	71	71	66	66	66	66	66	68	68	63	63	63	63			
	Array Edge	75	75	69	69	69	69	69	71	71	65	65	65	65	65	68	68	62	62	62	62	62	65	65	59	59	59	59	59	62	62	62	56	56	56	56	60	60	53	53	53	53			
50 psf	B	0 to 7	Array Interior	72	72	72	72	72	71	71	72	72	72	72	68	68	72	72	72	72	72	64	64	72	72	69	69	69	62	62	72	72	66	66	66	59	59	72	71	64	64	55	55		
			Array Edge	72	72	69	69	69	62	62	72	72	72	66	66	66	58	58	72	70	63	63	63	54	54	72	67	60	60	60	51	51	72	64	56	56	56	48	48	72	61	53	53	45	45
		7 to 20	Array Interior	74	74	74	73	73	73	68	74	74	74	69	69	69	65	65	74	74	74	66	66	66	62	62	72	72	72	63	63	63	59	69	69	60	60	45	45						
			Array Edge	73	73	73	63	63	63	59	69	69	69	60	60	60	55	55	66	66	66	56	56	56	51	51	63	63	63	52	52	52	48	60	60	49	49	45	45						
		20 to 27	Array Interior	76	76	76	76	76	76	75	76	76	76	74	74	74	72	72	76	76	76	70	70	70	68	76	76	76	67	67	65	76	76	76	64	64	64	63	74	74	62	62	62	60	
			Array Edge	76	76	76	67	67	67	65	76	76	76	64	64	64	62	62	73	73	73	61	61	61	59	69	69	69	57	57	57	55	67	67	67	67	67	67	67	67	67	67			
		27 to 45	Array Interior	87	87	87	87	83	77	83	82	82	82	79	73	73	79	79	78	78	78	75	75	75	70	75	75	75	75	72	67	72	72	72	69	64	69	69	69	67	62	67			
			Array Edge	75	75	75	75	72	67	72	71	71	71	71	69	64	69	68	68	68	68	66	61	66	65	65	65	65	65	63	57	62	62	62	60	54	60	60	60	57	51				
	45 to 60	Array Interior	100	100	94	94	94	94	94	95	95	89	89	89	89	89	91	91	85	85	85	85	85	88	88	81	81	81	81	81	84	84	78	78	78	78	81	81	75	75	75	75			
		Array Edge	88	88	82	82	82	82	82	84	84	78	78	78	78	78	80	80	84	74	74	74	74	74	77	77	71	71	71	71	71	74	74	68	68	68	68	71	71	65	65	65	65		
	C	0 to 7	Array Interior	72	72	71	71	71	63	63	72	72	67	67	60	60	72	71	64	64	64	56	5																						

Section Properties: Section1_450124 (REV X03).DXF

Section Information:

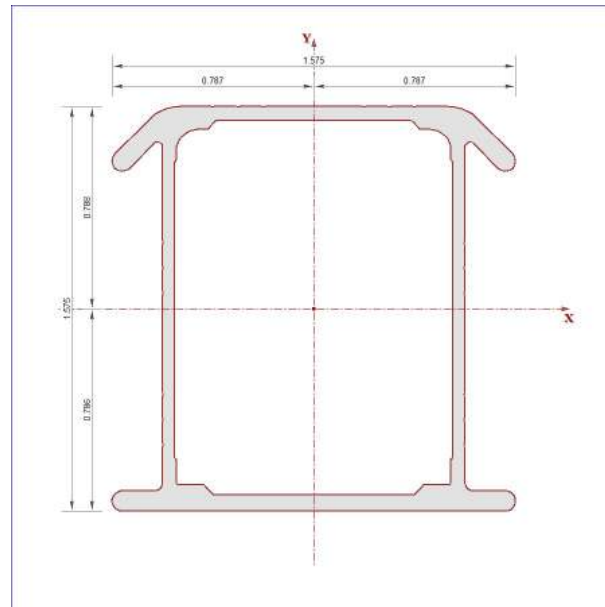
Material Type	=	General
Shape Type	=	Arbitrary
Number of Shapes	=	1

Basic Properties:

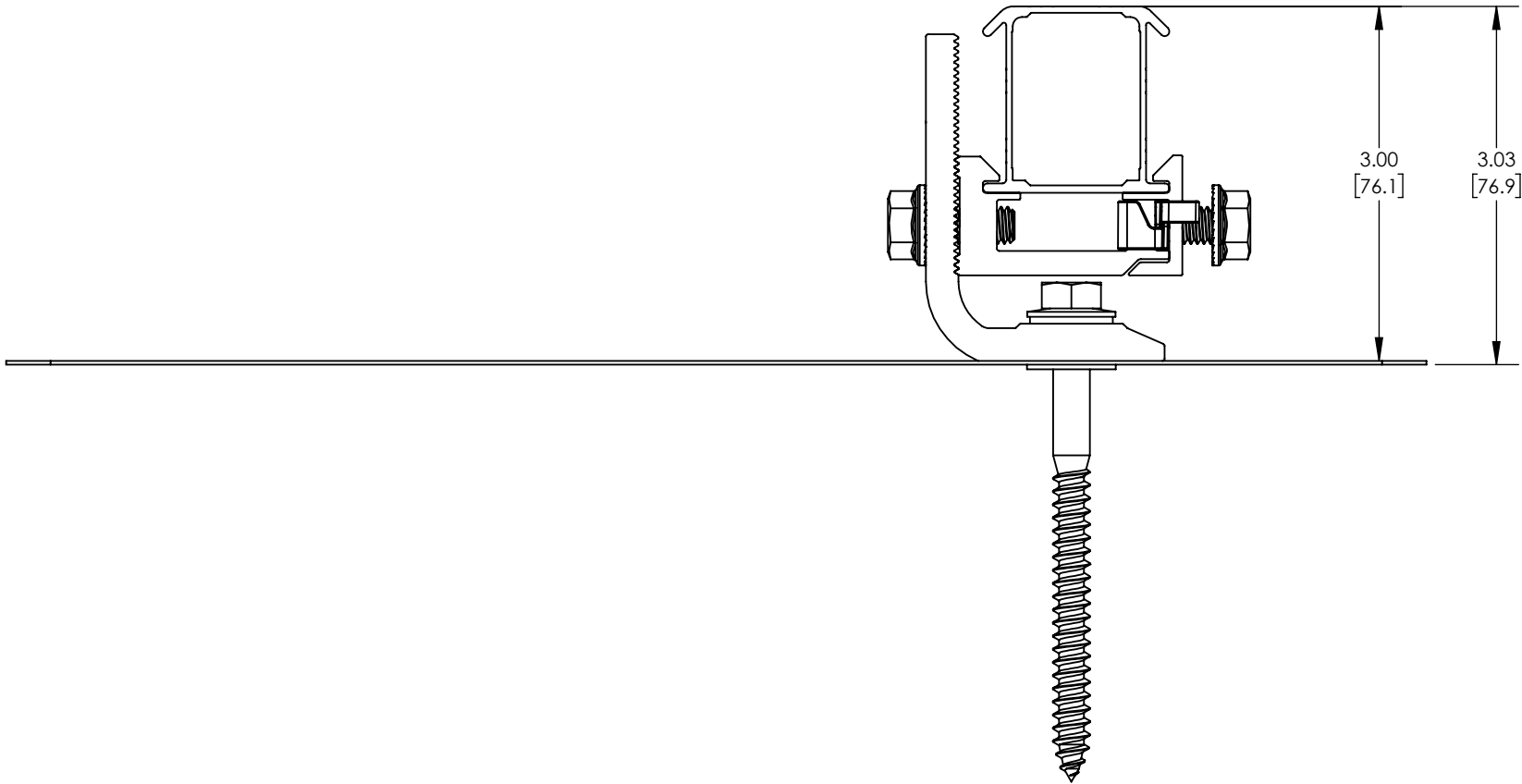
Total Width	=	1.575	in
Total Height	=	1.575	in
Centroid, X _o	=	0.000	in
Centroid, Y _o	=	0.786	in
X-Bar (Right)	=	0.787	in
X-Bar (Left)	=	0.787	in
Y-Bar (Top)	=	0.788	in
Y-Bar (Bot)	=	0.786	in
Max Thick	=	1.575	in

Equivalent Properties:

Area, A _x	=	0.373	in ²
Inertia, I _{xx}	=	0.151	in ⁴
Inertia, I _{yy}	=	0.100	in ⁴
Inertia, I _{xy}	=	-0.000	in ⁴
S _x (Top)	=	0.191	in ³
S _x (Bot)	=	0.191	in ³
S _y (Left)	=	0.126	in ³
S _y (Right)	=	0.126	in ³
r _x	=	0.635	in
r _y	=	0.516	in
Plastic Z _x	=	0.222	in ³
Plastic Z _y	=	0.180	in ³
Torsional J	=	<No Calc.>	
As-xx Def	=	1.000	
As-yy Def	=	1.000	
As-xx Stress	=	1.000	
As-yy Stress	=	1.000	



Section Diagram



THIRD ANGLE PROJECTION		DRAWN		-		-			
		CHECKED		-		-			
		ENG APPR.		-		-			
		MFG APPR.		-		-			
		Q.A.		-		-			
DO NOT SCALE DRAWING		INTERPRET DIM AND TOLERANCE PER ASME Y14.5[M]-2009							
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ESEDEC INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ESEDEC INC. IS PROHIBITED. COPYRIGHT © 2020 ESEDEC INC.		DIMENSIONS TOLERANCES ARE IN:							
		INCHES.		[MILLIMETERS]					
		.XX: +/- .030		.X: +/- .75					
		.XXX: +/- .010		.XX: +/- .25					
		ANGLES: +/- 1°							
		SIZE A		DWG. NO.		XX-XXXX-XXX		REV. X01	
		SCALE: 1:1.5		WEIGHT:		31 of 31		SHEET 1 OF 1	

INNOVATIVE MOUNTING SYSTEMS

MINIMUM MODULE HEIGHT EXAMPLE