

# Ballasted Roof Mounting System

**2012 Edition** v1.21

This **Engineering Design Guide** was created to help our engineering partners more easily design and specify PV mounting applications using IronRidge components. In addition to this document, IronRidge provides a complete system of technical support including installation guides, pre-stamped certification letters for most PV-friendly states, our on-line Design Assistant software, and live, knowledgeable person-to-person customer service.

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## System Overview

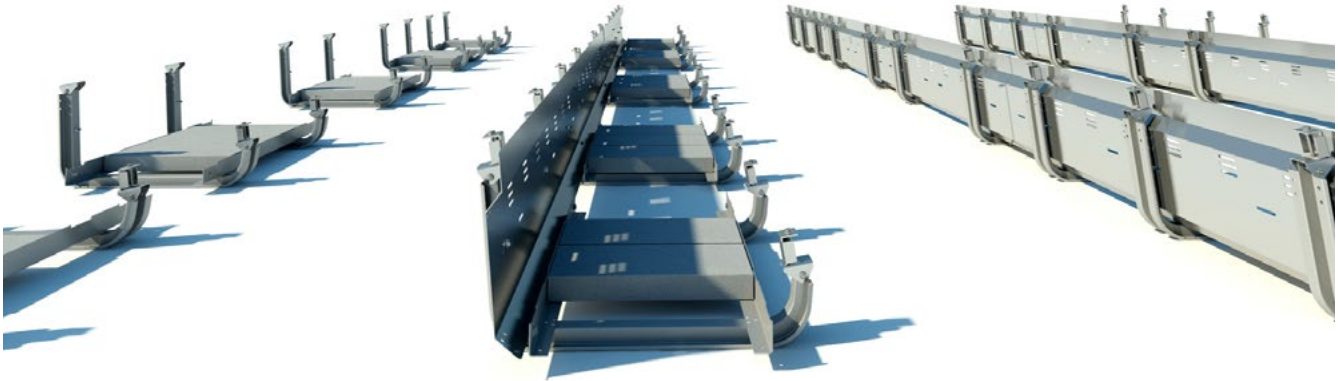
IronRidge provides a comprehensive platform for designing a wide variety of photovoltaic systems for ballasted roof mounting applications. Due to its modular architecture, it can handle nearly all commercially available PV modules and layout designs. The IronRidge Ballasted Roof Mount components are engineered and certified to work with best-in-class 3rd party components and roof connecting solutions including Ecofasten, Wiley/Burndy and Oldcastle. IronRidge products are engineered to last in the most extreme weather conditions and have been installed in every continent in the world.

## Technical Specifications

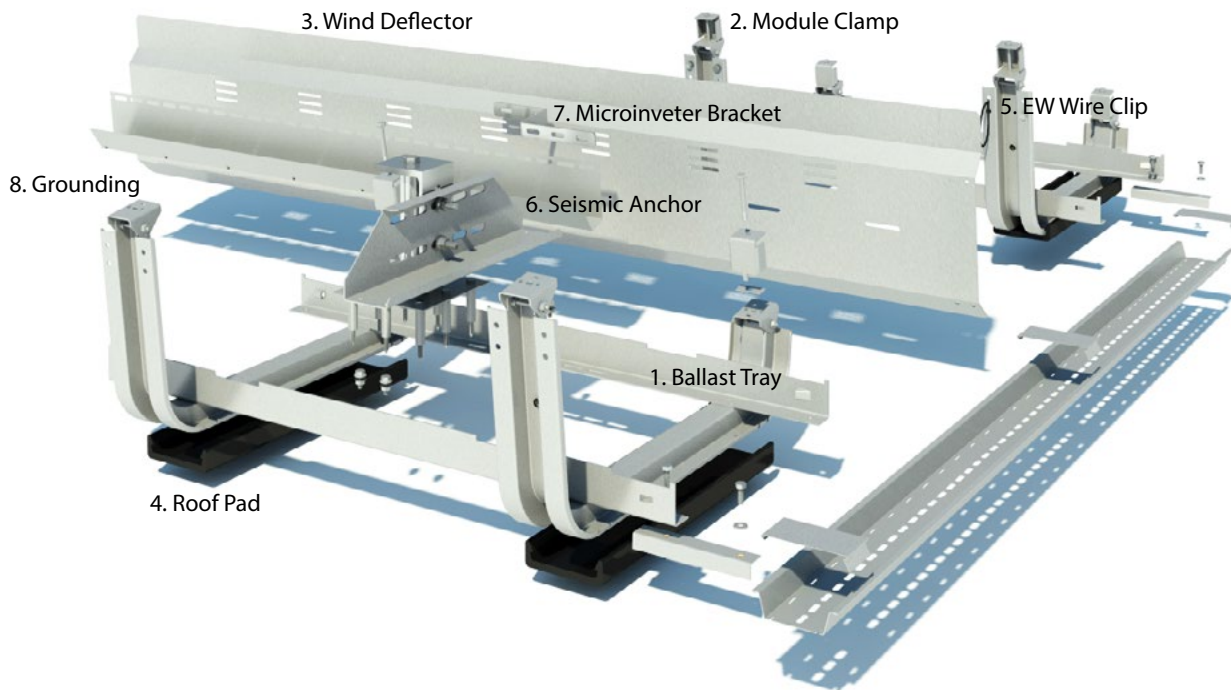
Below is a brief summary of the technical specifications of the IronRidge Ballasted Roof Mount platform. More detail will be provided in the following pages. If there is additional information you require that is not listed in this Engineering Design Guide, please do not hesitate to contact us at [support@ironridge.com](mailto:support@ironridge.com).

<b>Allowable Roof Slope</b>	Up to 5 Degrees (1:12)	<b>Warranty</b>	20 Yr Mfg
<b>Max Wind Speed</b>	140 Mph	<b>Roof Loading</b>	As Low As 2.8 Psf
<b>Module Orientation</b>	Landscape	<b>Wind Tunnel Tested</b>	Yes
<b>Wind Exposure</b>	Category B, C & D	<b>Max Building Height</b>	60'
<b>Installation Speed</b>	12+ Modules/Person/Hour	<b>Integrated Tray Grounding</b>	Yes
<b>Module Tilt Angle</b>	10 Degrees	<b>Adapts to Slope Anomalies</b>	Yes (Rail-less Design)
<b>Wire Management</b>	Yes, E/W	<b>Roof Protection</b>	Upon Request
<b>Materials</b>	G90 Galvanized Ballast Trays	<b>All Metal Construction</b>	Yes
	5052 Aluminum Wind		
	Deflectors & Clamps		
	Stainless Steel Fasteners		

## Assembled View



## Component View



For a complete 360 degree interactive viewing environment, go to: [ironridge.com/products/ballastedroofmounting/360view](http://ironridge.com/products/ballastedroofmounting/360view).

**1. Ballast Tray:** Supports the PV modules. Ballast tray supports four internal modules and two edge modules and electrically bonds connected modules. Attaches to modules 12" from edge of module.

**2. Module Clamp:** Secures the PV module to the rail. Use four clamps for each Ballast Tray, two on north and south two Ballast Trays. Multiple sizes available depending on thickness of PV module.

**3. Wind Deflector:** Joins Ballast Trays together into a continuous structural member. Distributes and reduces loading on roof structure. Available in various lengths, each with a 2" module range.

**4. Roof Pad:** Protects roofing material and substrate from possible damage over time. Helps distribute loading on roofing material. Meets or exceeds most roofing manufacturers' requirements.

**5. EW Wire Clip:** The EW Wire Clip is a snap-in cable tie that attaches to the ballast tray and can hold up to 50 lbs. The Wire Clips made of durable UV Resistant Nylon and can hold wire bundles from 1/16"-1" in size.

**6. Seismic Anchor:** Secures the Ballast Tray directly to the building structure through roofing material and/or decking. Provides seismic lateral stability for module array.

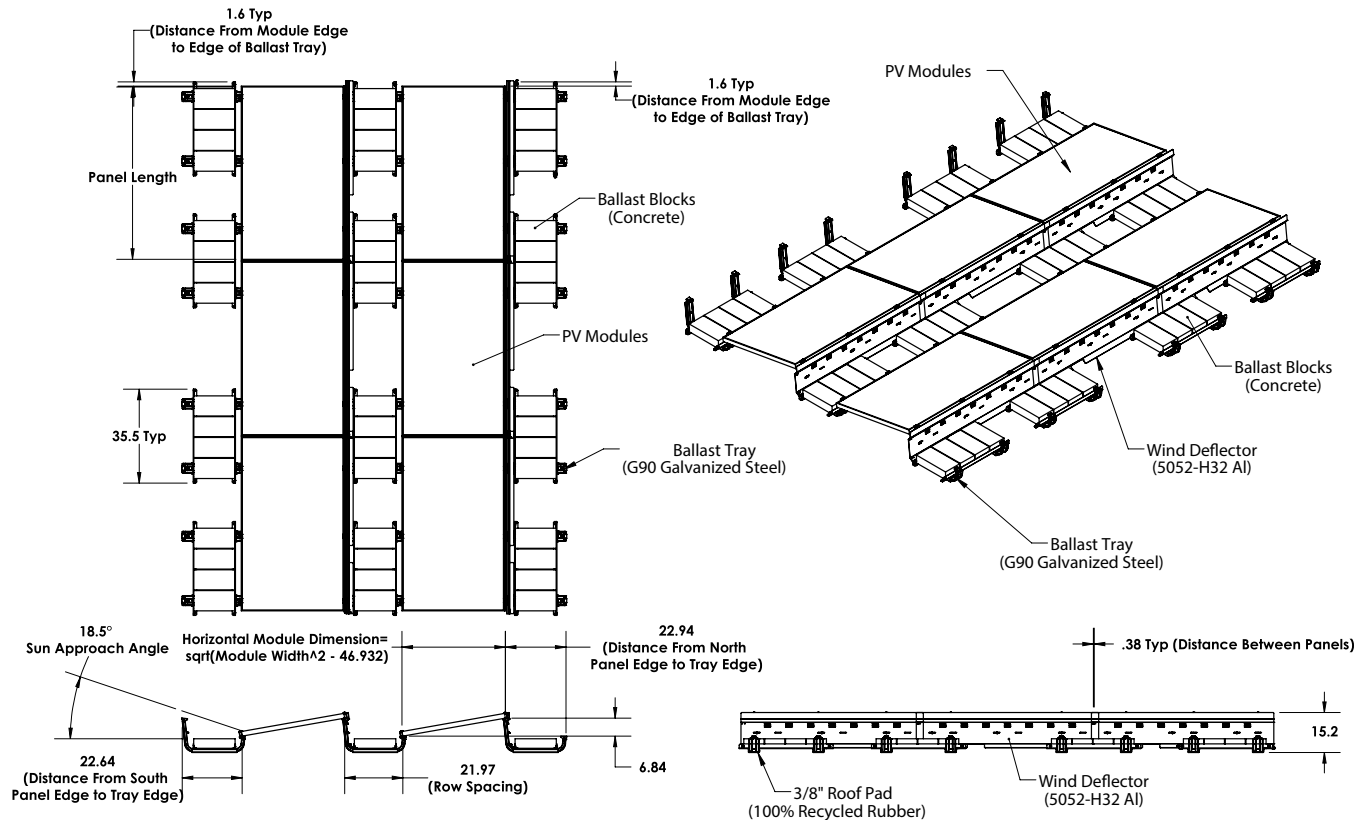
**7. Microinverter Bracket:** Attaches to Ballast Tray and secures microinverter. Works with Enphase, SolarEdge and DirectGrid microinverters.

**8. Grounding:** This system utilizes WEEB-UMC on each mounting plate to bond the module frame to the Ballast Tray and Wiley/Burndy grounding lugs to connect each row.

## Assembly Details

[Download AutoCAD File](#) | [Download PDF](#)

### 10° Ballasted Roof Mounting System



NOTES: UNLESS OTHERWISE SPECIFIED

1. THIS DRAWING IS FOR LAYOUT REFERENCE ONLY.
2. All Stainless Steel hardware.
3. All dimensions are in inches.

## Ballast Tray

The IronRidge Ballast Tray is a high strength and durable module support frame constructed of G90 Galvanized Steel and Stainless Steel hardware. The modular design allows for the most complex subarray configurations and the articulating mounting plate accommodates roof undulations and varying modules size. The entire tray is constructed of structural-grade steel and attaches to modules 12" from each edge leaving a 3/8" gap between modules. The Ballast Tray is designed to accommodate standard size solid concrete blocks.



Property	Value
Material	Galvanized Steel
Finish	G90
Yield Strength	33ksi (min)
Height	12.2"
Width	35.6"
Depth	24"
Weight	13.5 Lbs
Ballast Retaining Feature	Yes
Grounding Lug Holes	Yes
Hardware	1/4"-20 SS Nuts and Bolts

## Module Clamp

The Module Clamp secures PV modules to the Ballast Tray Mounting Plates and arrives at the job site preassembled, as shown below. The Module Clamp is sized for the specific module thickness. Our Clamps are independent upon the module's mounting holes and attached to the edge of the module frame.



Property	Value
Material	5052-H32
Material (O-ring)	Neoprene, EPDM
Finish	Mill
Height	Varies depending on Module
Width	1.5"
Depth	1.28"
Weight	0.13 Lbs (varies)
Preassembled	Yes
Hardware	1/4"-20 SS Star Washer and Bolt

## Wind Deflector

The Wind Deflector links adjacent Ballast Trays together into a continuous structural member and wind dam to help distribute and reduce loading on roof structure. The Wind Deflector is sized for the specific module length with a 2" module range (See sizing and part number table for details). The Wind Deflector comes standard with all mounting hardware for most applications.



Property	Value
Material	5052-H32
Finish	Mill
Height	13"
Width	1.6"
Length	Varies depending on Module
Weight	5.4-7 Lbs (varies)
Module Range	60-80"
Hardware	1/4"-20 SS Nut and TEK Screws

Additional hardware may be required for some high wind cases. This is automatically calculated for you in IronRidge's online Design Assistant software. If you were provided the High Wind Deflector Hardware Kit (#BRM-DFK) you must secure deflectors together with an additional two (2) 1/4" TEK screws, for a total of four (4). Examples of high wind cases are below:



Property	Value
Material	300 Series Stainless Steel
Hardware	1/4"-20 x.75" TEK Screw
Quantity	2

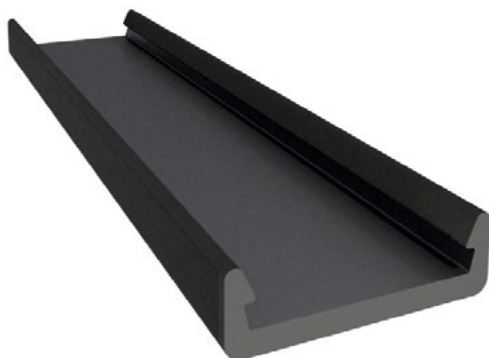
High Wind Site Examples (Module Size = 40" x 78" / Importance Factor = 1.0):

- A. Exposure B Wind Speed  $\geq$  120mph Building Height  $\geq$  30ft
- B. Exposure C Wind Speed  $\geq$  100mph Building Height  $\geq$  30ft

- C. Exposure B Wind Speed  $\geq$  110mph Building Height  $\geq$  60ft
- D. Exposure B Wind Speed  $\geq$  90mph Building Height  $\geq$  60ft

## Roof Pad

The Roof Pads are to be used as a protective barrier between the Ballast Tray and the roofing material. The Roof Pads simply snap onto the Ballast Tray, two per tray. Please consult the roofing manufacturer as the Roof Pads may or may not be required.\*



Property	Value
Material	100% Recycled Santoprene
Color	Black
Thickness	3/8"
Height	1.27"
Width	4.2"
Length	17"
Weight	1.7 Lbs
Quantity (per Ballast Tray)	2
Hardware	None

*\*Important: If the roof is under warranty, you must consult with the local roofing manufacturer representative to determine warranty requirements. Some roofing manufacturers require pre-installation approvals and the use of proprietary materials for a protective barrier between racking components and the roofing material. If using another manufacturers roof pad or slip sheet under the Ballast Tray, then a professional-grade adhesive MUST be used to attach the Ballast Tray to the other protective barrier.*



## EW Wire Management Clip

The EW Wire Clip is a simple and easy snap-in cable tie that attaches to the Ballast Tray and can hold wire bundles from 1/16"-1" in size, up to 50 lbs. The Wire Clips made of durable UV Resistant Nylon.



Property	Value
Material	Nylon 6.6 Weather Resistant
UV Resistant	Yes
Color	Black
Mounting Hole Size	¼"
Length	2"
Width	2"
Max. Wire Bundle Diameter	1"
Min. Wire Bundle Diameter	1/16"
Max. Wire Bundle Weight	50 Lbs
Temperature Rating	-40°F to 185°F
Flammability Rating	UL 94 V-2
RoHS Compliance	Yes

## Seismic Anchor

The IronRidge Seismic Anchor uses the EcoFasten Eco44R to attach to the roof structure and our customer bracket to securely attach to the Ballast Tray. Both the Seismic Anchor and Ballast Tray contain slots to accommodate for placement variances, up to +/- 4 inches of travel in every direction. The Anchor should be installed by a certified roofing representative and placed after the modules are installed and secure.\*



Property	Value
Material (Post & C-Bracket)	6000 series AL
Material (Bracket)	Galvanized Steel
Finish	Mill, G90
Allowable Lateral Load	547 Lbs (max)
Post Height	6"
Post Diameter	1.25"
Height (Bracket)	4"
Width (Bracket)	2.75"
Length (Bracket)	15.6"
Weight	5.4 Lbs
Hardware	3/8", ¼" SS

*\*Important: If the roof is under warranty, you must consult with the local roofing manufacturer representative to determine warranty requirements. Some roofing manufacturers require pre-installation approvals and the use of proprietary materials for a protective barrier*

## Microinverter Bracket

The IronRidge Microinverter Bracket attaches to Ballast Tray and secures microinverter. The bracket accommodates Enphase, SolarEdge and DirectGrid microinverters and includes all necessary mounting hardware.



Property	Value
Material	5052-H32
Finish	Mill
Height	1"
Width	3.5"
Length	10.5'
Weight	0.3 Lbs
Hardware	1/4" SS

## Grounding

Wiley grounding clips (WEEB DMC) are used in conjunction with the Module Clamps for grounding PV modules to Ballast Tray. WEEB's are included in the Module Clamp Assembly and quantities are automatically determined by our online Design Assistant software.



Property	Value
Material	304 Stainless Steel
ETL Listed	ANSI/UL 467 Compliant
Maximum Conductor Size	6 AWG ( with two WEEBs contacting each module)
Hardware	None

Wiley grounding lugs are used in conjunction with copper wire to provide a continuous ground for each row of Ballast Trays.



Property	Value
WEEB Material	304 Stainless Steel
Lug Material	Tin-plated Copper
ETL Listed	ANSI/UL 467 Compliant
Ground Conductor	One 14 AWG to 6 AWG or two 10 AWG, two 12 AWG
Hardware	1/4"-20 & 1/4"-28 SS

## Ballast Blocks

The Ballasted Roof Mount System is intended to be used with standard 4" x 8" x 16" solid concrete blocks weighing 35lbs (whole) or standard 2" x 8" x 16" solid concrete blocks weighing 13.5lbs (half). It is recommended that these solid concrete blocks have minimum compressive yield strength of 3000 psi or greater or comply with ASTM Designation C1491. Our recommended 3rd-Party supplier is Oldcastle\* (See Support Documents for locations and contact information). If you choose to use a Ballast Block with a compressive yield strength lower than 3000psi then we recommend you periodically inspect the Ballast Blocks to ensure the condition has not degraded and remains whole.



Property	Value
Material	Solid Concrete
Full Block	4"x8"x16"
Half Block	2"x8"x16"
Weight (Full Block)*	35 Lbs
Weight (Half Block)*	13.5 Lbs
Compressive Yield Strength	3000 psi
ASTM Designation	C1491

*\*Important: Actual concrete block weights vary by manufacturer. It is the sole responsibility of the installer to periodically check their installation and make adjustments as needed as the blocks could shift or disintegrate. It is also recommended that an industrial adhesive be used between ballast blocks when stacking. It is the sole responsibility of the installer to confirm the actual weights of the concrete blocks used and that sufficient ballasting is installed as required by the stamped project certification letter and drawings.*

## Summary

With the IronRidge Design Assistant™ our customers move from laboriously designing systems across the span of weeks, to intuitively designing while pricing, bill of materials and engineering calculations all update in real-time.

If you register for an online account, you will then be able to save your work and prevent losing your project's configuration settings between sessions.

The application is so quick and easy to use, multiple what-if scenarios can be evaluated through immediate engineering and pricing feedback. Engineered calculations comply with ASCE 7-05 building codes for expedited P.E. approval.

The IronRidge Design Assistant™ is provided free of charge to IronRidge customers.

## Design, engineer and quote, online, in just minutes.

[ironridge.com/support/designassistant](http://ironridge.com/support/designassistant)



## Code Compliance

IronRidge Ballasted Roof Mount components, when installed in accordance with the IronRidge Ballasted Roof Mount Installation Manual, will be structurally adequate and will meet the structural requirements of:

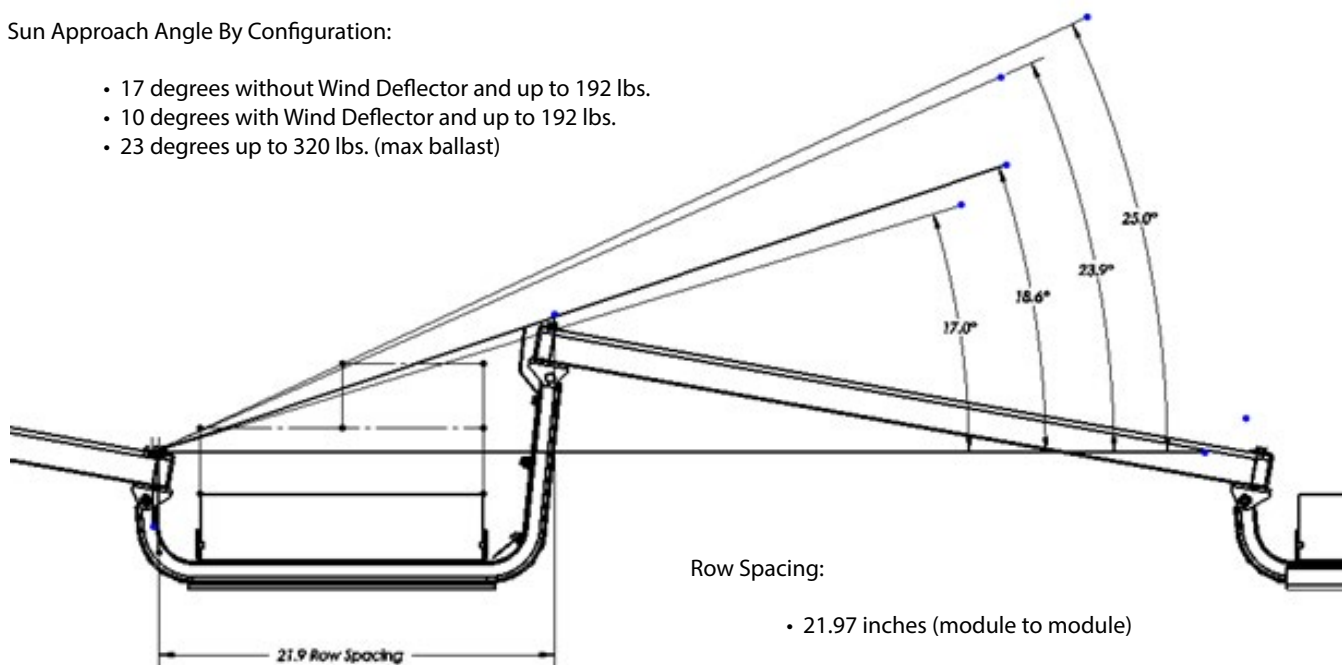
- ASCE/SEI 7-05 Minimum Design Loads for Buildings & Other Structures
- International Building Code, 2006 & 2009 Editions
- California Building Code, 2007 & 2010 Editions
- Aluminum Design Manual, 2005 Edition
- AISI S100-2007, Spec. for the Design of Cold Formed Steel Structural Members

## Sun Approach Angles/Row Spacing

The sun approach angle of the Ballasted Roof Mount system varies depending upon the amount of ballast required for your installation and whether or not Wind Deflectors are utilized. The sun approach angle for most installations will be 17 degrees. The row spacing for this system is 21.97 inches (module to module).

Sun Approach Angle By Configuration:

- 17 degrees without Wind Deflector and up to 192 lbs.
- 10 degrees with Wind Deflector and up to 192 lbs.
- 23 degrees up to 320 lbs. (max ballast)



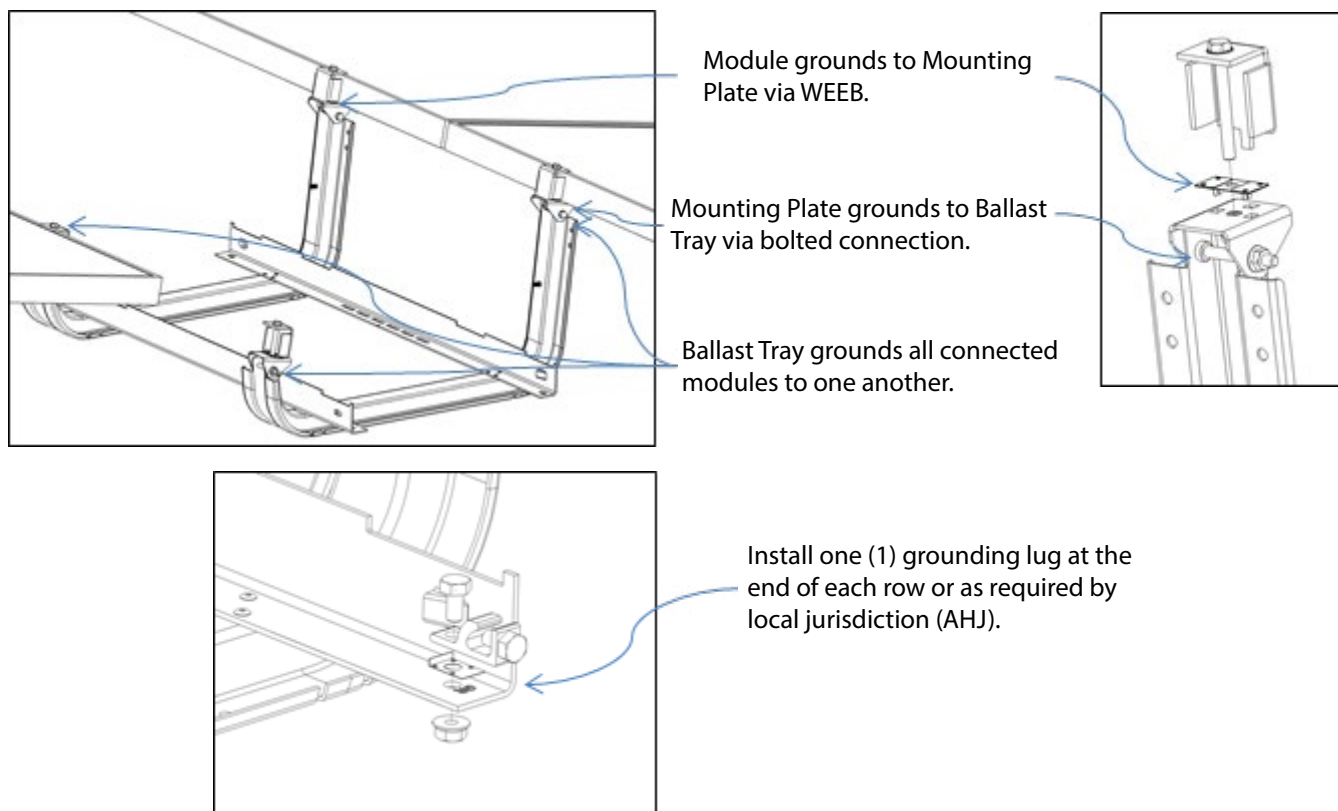
## Thermal Expansion

To help reduce thermal expansion, it is recommended for a row of 12 or more modules to not connect together the 6th and 7th deflector. In other words, a maximum of 11 deflectors and a minimum of six deflectors are connected together with TEK screws. For example, a row with 11 modules all deflectors should be connected together with TEK screws. For a row with 12 modules, the sixth and seventh deflectors should not need to be connected together with TEK screws. There must always be a minimum of six deflectors connected together with TEK screws, if more than six deflectors exist in that row. (Connecting deflectors together with TEK screw provides stiffening which reduce ballast requirements.)

## Roof Considerations

The Ballasted Roof System may be installed on flat roofs with slopes from 0-5 degrees. The Ballasted Roof System may be installed on the following roofing materials: EPDM, TPO, PVC, Modified Bitumen, Built-Up Roof and Tar and Gravel. All loose debris or gravel must be completely removed prior to installation. For Tar and Gravel roofs, gravel may not be loose and must be permanently attached to roof; gravel tarred to the roof may not exceed  $\frac{3}{4}$ " in length; gravel over the size of  $\frac{3}{4}$ " must be completely removed at the ballast tray interface to roof; our custom roof pad or a rubber pad of at least  $\frac{1}{16}$ " thickness is required between the fixed gravel and trays.

## Grounding Path Illustration



**Ballast Trays** The Ballast Tray is constructed of structural-grade steel and includes all necessary hardware.

Part Number	Description	Weight	Packaging
BRM-10BT-G	Ballast Tray (10 degree)	13.65 Lbs	Sub-bundles of 4; Bundles of 56

**Module Clamps** Module Clamps depend on the module thickness and are based on the nominal thickness of the module. Part numbers are BRM-MCL-XX, where "XX" is equal to the thickness of the module in mm. For example, a 50mm module would need the BRM-MCL-50 clamp.

Part Number	Description	Weight	Packaging
BRM-MCL-31	Module Clamp (fits 30.5mm-31.4mm)	0.3 Lbs	50/Box
BRM-MCL-32	Module Clamp (fits 31.5mm-32.4mm)	0.3 Lbs	50/Box
BRM-MCL-33	Module Clamp (fits 32.5mm-33.4mm)	0.3 Lbs	50/Box
BRM-MCL-34	Module Clamp (fits 33.5mm-34.4mm)	0.3 Lbs	50/Box
BRM-MCL-35	Module Clamp (fits 34.5mm-35.4mm)	0.3 Lbs	50/Box
BRM-MCL-36	Module Clamp (fits 35.5mm-36.4mm)	0.3 Lbs	50/Box
BRM-MCL-37	Module Clamp (fits 36.5mm-37.4mm)	0.3 Lbs	50/Box
BRM-MCL-38	Module Clamp (fits 37.5mm-38.4mm)	0.3 Lbs	50/Box
BRM-MCL-39	Module Clamp (fits 38.5mm-39.4mm)	0.3 Lbs	50/Box
BRM-MCL-40	Module Clamp (fits 39.5mm-40.4mm)	0.3 Lbs	50/Box
BRM-MCL-41	Module Clamp (fits 40.5mm-41.4mm)	0.3 Lbs	50/Box
BRM-MCL-42	Module Clamp (fits 41.5mm-42.4mm)	0.3 Lbs	50/Box
BRM-MCL-43	Module Clamp (fits 42.5mm-43.4mm)	0.3 Lbs	50/Box
BRM-MCL-44	Module Clamp (fits 43.5mm-44.4mm)	0.3 Lbs	50/Box
BRM-MCL-45	Module Clamp (fits 44.5mm-45.4mm)	0.3 Lbs	50/Box
BRM-MCL-46	Module Clamp (fits 45.5mm-46.4mm)	0.3 Lbs	50/Box
BRM-MCL-47	Module Clamp (fits 46.5mm-47.4mm)	0.3 Lbs	50/Box
BRM-MCL-48	Module Clamp (fits 47.5mm-48.4mm)	0.3 Lbs	50/Box
BRM-MCL-49	Module Clamp (fits 48.5mm-49.4mm)	0.3 Lbs	50/Box
BRM-MCL-50	Module Clamp (fits 49.5mm-50.4mm)	0.3 Lbs	50/Box

**Wind Deflectors** Wind Deflectors depend on the module length and accommodates modules from 60"-80" length. Custom Wind Deflectors may be available upon request. See part descriptions below for matching part number.

Part Number	Description	Weight	Packaging
BRM-DF-61-06A	Deflector Assembly (fits >60"-62" modules)	5.6	50-400/Pallet
BRM-DF-63-06A	Deflector Assembly (fits >62"-64" modules)	5.8	50-400/Pallet
BRM-DF-65-06A	Deflector Assembly (fits >64"-66" modules)	5.9	50-400/Pallet
BRM-DF-67-06A	Deflector Assembly (fits >66"-68" modules)	6.1	50-400/Pallet
BRM-DF-69-06A	Deflector Assembly (fits >68"-70" modules)	6.3	50-400/Pallet
BRM-DF-71-06A	Deflector Assembly (fits >70"-72" modules)	6.5	50-400/Pallet
BRM-DF-73-06A	Deflector Assembly (fits >72"-74" modules)	6.7	50-400/Pallet
BRM-DF-75-06A	Deflector Assembly (fits >74"-76" modules)	6.8	50-400/Pallet
BRM-DF-77-06A	Deflector Assembly (fits >76"-78" modules)	7.0	50-400/Pallet
BRM-DF-79-06A	Deflector Assembly (fits >78"-80" modules)	7.2	50-400/Pallet

### High Wind Deflector Kit

Part Number	Description	Weight	Packaging
BRM-DFK	High Wind Deflector Hardware Kit (2 tek screws)	.50 Lbs/Box	Bulk Bag

### Accessories

Part Number	Description	Weight	Packaging
BRM-RP-01	Roof Pads (Qty 2, Extruded 100% Recycle Rubber, 3/8" Thick)	1.7 Lbs/unit	15 Pairs/Box
BRM-WTR-NS	N/S Wire Management Tray (Includes Hardware)	5.8 Lbs/unit	50-200/Pallet
BRM-WTR-EW	E/W Wire Management Tray (Includes Hardware)	4.2 Lbs/unit	50-200/Pallet
BRM-WCL-EW	E/W Wire Management Clips (Snap-in Cable Ties)(UV Resistant)	0.37/bag	100/Bag
BRM-ANC-06	Seismic Anchor (Includes Ballast Tray Attachment Hardware) (6")	5.4 Lbs/unit	25-50/Box
BRM-MIB-01	Microinverter Bracket (Includes Hardware)	0.3 Lbs/unit	50/Box

### Grounding

Part Number	Description	Weight	Packaging
29-4000-010*	WEEB UMC Compression Clip	.50 Lbs/Box	100 Clips/Box
29-4000-002	WEEB Grounding Lug	12.45 Lbs/Box	100 Lugs/Box

\*Included with Module Clamp Assembly (BRM-MCL-XX)



## System Support

IronRidge provides a complete system of technical support including installation guides, ultra-fast project-specific certification letters for most PV-friendly states, our on-line Design Assistant software, and live, knowledgeable person-to-person customer service.

## Downloadable Support Documents

Our website at [www.ironridge.com/products/roofmounting/systemsupport](http://www.ironridge.com/products/roofmounting/systemsupport) contains all of the technical support information necessary to design, quote, certify, and install an IronRidge Ballasted Roof Mount system. The specific documents that can be found here include:

- CAD files (AutoCAD format)
- Engineering Design Guide
- Pre-stamped Certification Letters
- Installation Guides
- Parts Catalog

## 3rd Party Partners

We've engineered best-of-class 3rd party solutions with our Roof Mount platform to further improve the quality we offer customers. Where appropriate, pre-stamped certification letters are included to simplify and expedite the design, quoting, and permitting processes. At this time, we work with roofing products from the following companies:

- Ecofasten
- Enphase
- Wiley, by Burndy
- Old Castle

## Design Assistant

The IronRidge Design Assistant automates much of the Design and Engineering phases of a project. Easily accessible from our website, the Design Assistant provides a highly intuitive layout interface, automatically calculates critical engineering information based on your project's specific load conditions, provides the ability to add optional components and 3rd party products, and determines an accurate bill of materials and quotation.

The Ballasted Roof Mount Design Assistant can be accessed at: [www.ironridge.com/brm](http://www.ironridge.com/brm)



**Starling Madison Lofquist, Inc.**  
*Consulting Structural and Forensic Engineers*

**5224 South 39<sup>th</sup> Street, Phoenix, Arizona 85040**  
**tel: (602) 438-2500 fax: (602) 438-2505 [www.smleng.com](http://www.smleng.com)**

IronRidge  
1435 Baechtel Road  
Willits, CA 95490

April 18, 2012

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Attn: Mr. William Kim, Chief Executive Officer

Subject: IronRidge Ballasted Roof Mounting System – Structural Analysis

Dear Sir:

We have analyzed the subject solar panel support system and determined that it is in compliance with the structural requirements of the following Reference Documents:

Codes: ASCE/SEI 7-05 Min. Design Loads for Buildings & Other Structures  
International Building Code, 2006 & 2009 Editions  
California Building Code, 2007 & 2010 Editions  
Other: Aluminum Design Manual, 2005 Edition  
AISI S100-2007, Spec. for the Design of Cold Formed Steel Structural Members

The Ballasted Roof Mounting system has PV panels laid out in a landscape orientation and attached near each corner to a proprietary framed ballast assembly. See Exhibit A, attached. The frames hold the panels at a 10 deg slope and are ballasted with concrete blocks as required for the wind loads. The frames may be connected by an aluminum or steel deflector beam. This beam serves to reduce the wind uplift loads by 1) preventing high wind pressures from developing on the underside of the panels and by 2) providing sufficient structural capacity to distribute higher localized wind loads over a larger area causing an averaging of the wind loads over several frames. Both these effects permit lower design wind loads to be used.

The wind uplift loads are resisted directly by the ballast. Lateral forces, both wind and seismic, are resisted by either friction between the ballast and the roof surface or by a proprietary anchorage system.

The ballasting requirements are determined using the online Design Assistant for the system at IronRidge.com. The Design Assistant covers a wide range of system configurations and loading and allows the user to customize the input to match the specific project conditions. Mounting heights up to 60 ft. and wind speeds up to 120 mph can be accommodated. The average weight of the system, the additional load the system imposes on the roof structure, is as low as 2.8 psf.

IronRidge  
Mr. William Kim  
Ballasted Roof Mounting System – Structural Analysis

April 18, 2012  
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Our analysis assumes that the panels and frames, including the connections and associated hardware, are installed in a workmanlike manner in accordance with the “Ballasted Roof Mounting Installation Manual” by IronRidge and generally accepted standards of construction practice.

The adequacy of the supporting roof framing is to be determined by others.

Please feel free to contact me at your convenience if you have any questions.

Respectfully yours,

Tres Warner, P.E.  
Design Division Manager



## Engineering Services

IronRidge provides pre-stamped certification letters for many standard load conditions. These letters are available in most PV-friendly states and a few countries including: (italicized states are in progress as of July 2012)

Arizona	Hawaii	Missouri	Oklahoma	Virginia
California	Illinois	Nevada	Oregon	Vermont
Colorado	Louisiana	New Hampshire	Pennsylvania	Washington
Connecticut	Massachusetts	New Jersey	<i>Rhode Island</i>	
D.C.	Maryland	New Mexico	<i>South Carolina</i>	
Delaware	Michigan	New York	Tennessee	
Florida	<i>Maine</i>	<i>North Carolina</i>	Texas	
Georgia	Minnesota	Ohio	Utah	

In addition, we provide pre-stamped certification letters for:

Ontario  
New Zealand  
*Puerto Rico*

We can also provide non-standard certifications, wet-stamped letters, or specialized engineering requests. Our preferred engineering firm is Starling Madison Lofquist, Inc. Their contact information is:

Starling Madison Lofquist, Inc.  
5224 South 39th Street  
Phoenix, Arizona 85040  
Phone: 602-438-2500

## Customer Service

The IronRidge support staff is knowledgeable, experienced, friendly, and responsive. We would be happy to provide assistance on any questions you may have. Please feel free to contact us through your preferred method at:

Email: [support@ironridge.com](mailto:support@ironridge.com)  
Phone: 800-227-9523

## Warranty Information

Effective for IronRidge, Inc. ("IronRidge") mounting structure components ("Products") manufactured after April 1st, 2012, IronRidge provides the following warranties, for Products installed properly and used for the purpose for which the Products are designed:

- finishes shall be free of visible defects, peeling, or cracking, under normal atmospheric conditions, for a period of three (3) years from the earlier of (i) the date of complete installation of the Product or (ii) thirty days after the original purchaser's date of purchase of the Product ("Finish Warranty");
- components shall be free of structurally-related defects in materials for a period of ten (10) years from the earlier of (i) the date of complete installation of the Product or (ii) thirty days after the original purchaser's date of purchase of the Product;
- components shall be free of functionally-related manufacturing defects for a period of twenty (20) years from date of manufacture.

The Finish Warranty does not apply to: (a) surface oxidation of the galvanized steel components or any foreign residue deposited on Product finish; and (b) Products installed in corrosive atmospheric conditions, as defined solely by IronRidge; corrosive atmospheric conditions include, but are not limited to, conditions where Product is exposed to corrosive chemicals, fumes, cement dust, salt water marine environments or to continual spraying of either salt or fresh water. The Finish Warranty is VOID if (c) the practices specified by AAMA 609 & 610-02 – "Cleaning and Maintenance for Architecturally Finished Aluminum" ([www.aamanet.org](http://www.aamanet.org)) are not followed by Purchaser for IronRidge's aluminum based components; and (d) if the practices specified by ASTM A780 / A780M - 09 "Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings" are not followed by Purchaser for IronRidge's galvanized steel-based components.

The warranties above do not cover any parts or materials not manufactured by IronRidge, and exclude non-functionally-related defects, as defined solely by IronRidge. The warranties do not cover any defect that has not been reported to IronRidge in writing within twenty (20) days after discovery of such defect.

In the event of breach of or non-compliance with the warranties set forth above, IronRidge's sole obligation and liability, and the sole and exclusive remedy for such breach or non-compliance, shall be correction of defects by repair, replacement, or credit, at IronRidge's sole discretion. Such repair, replacement or credit shall completely satisfy and discharge all of IronRidge's liability with respect to these warranties.

Refurbished Product may be used to repair or replace the defective components. Transportation, installation, labor, or any other costs associated with Product replacement are not covered by these warranties and are not reimbursable. These warranties additionally do not cover (a) normal wear, or damage resulting from misuse, overloading, abuse, improper installation (including failure to follow professional instruction and certification), negligence, or accident, or from force majeure acts including any natural disasters, war or criminal acts; and (b) Products that have been altered, modified or repaired without written authorization from IronRidge or its authorized representative; and (c) Products used in a manner or for a purpose other than that specified by IronRidge. A formal document proving the purchase and the purchase date of the Product is required with any warranty claim.

Except as set forth above, IronRidge sells the Products on an "AS IS" basis, which may not be free of errors or defects, and ALL EXPRESS OR IMPLIED REPRESENTATIONS AND WARRANTIES, INCLUDING ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUALITY, WORKMANLIKE EFFORT, CORRESPONDENCE TO DESCRIPTION, DESIGN, TITLE OR NON-INFRINGEMENT, OR ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE OR TRADE PRACTICE, ARE HEREBY DISCLAIMED.