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For product and purchasing inquiries contact:

ecoDIRECT
CLEAN ENERGY SOLUTIONS
www.ecodirect.com



Installation Manual

Universal Top-of-Pole Mount

UNI-TP/02



 **IRONRIDGE**
Solar Mounting Solutions

Introduction

The Universal Top-of-Pole Mount UNI-TP/02 is a very sturdy and straightforward pole mounting solution for small area solar photo voltaic (PV) needs. With its user-adjustable angle settings, it can support installations in a wide range of locations.

In addition, the UNI-TP/02 supports:

- ◆ Up to two PV panels with a combined width of up to 45 inches.
- ◆ A pole diameter of 4.0 inches (requires a properly anchored schedule 40 pipe).

1. Installer Responsibility

The installer is solely responsible for:

- ◆ Complying with all applicable local or national building codes, including any that may supersede this manual
- ◆ Ensuring that IronRidge and other products are appropriate for the particular installation and the installation environment
- ◆ Ensuring that the selected mount can support the array under live load conditions
- ◆ Using only IronRidge parts and installer-supplied parts as specified by IronRidge. Substitution parts may void the warranty
- ◆ Ensuring safe installation of all electrical aspects of the PV array.

2. Customer Support

IronRidge makes every effort to ensure your mounting kit is easy to install. If you need assistance at any point with your installation or have suggestions on how we can improve your experience, call IronRidge customer support: (800) 227-9523

3. Tools Required For Assembly

The following tools are required to assemble the Universal Top-of-Pole Mount:

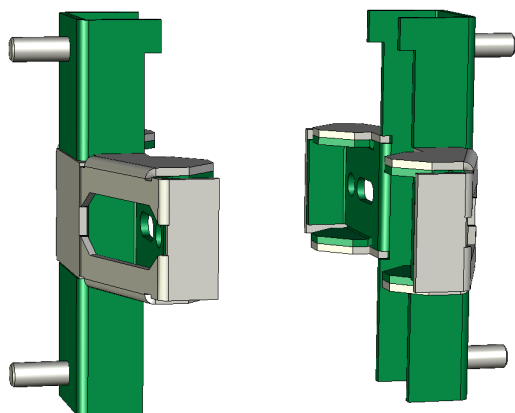
Tool	Use for
Wrenches Open-end wrench, Box-end wrench, or 3/8" or greater socket drive with sockets to support the following size hex heads: ◆ 3/8" ◆ 5/16" ◆ 1/4"	◆ 3/8 cap-end screws, 3/8 bolts ◆ 5/16 cap-end screws, 5/16 bolts ◆ 1/4 cap-end screws, 1/4 bolts

4. Component List

The Universal Top-of-Pole Mount UNI-TP/02 kit contains the following parts:

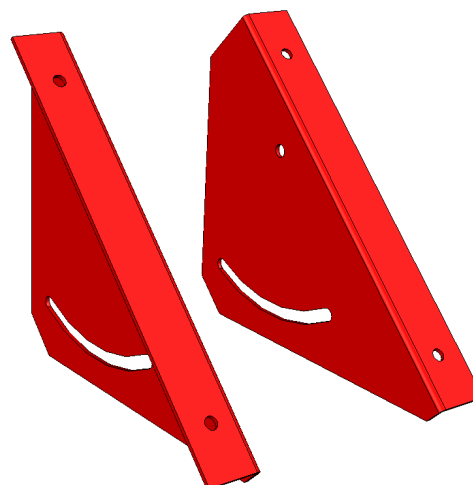
Brace Assembly (51-0626-300) x2

Attaches to the top of the 4-inch pole, providing the foundation for the mount



Tilt Plate, left (51-0627-018) and right (51-0627-018A)

Attaches to the brace, providing tilt adjustment for the panel assembly



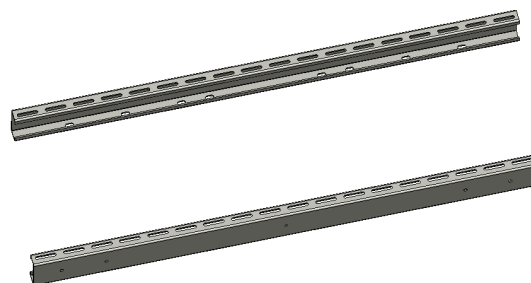
Cross Rail (51-0627-016) x2

Attaches to the tilt plates and support the channel rails



Channel rail (51-0545-000) x2

Attaches directly to the back of the PV modules



Component List continued...

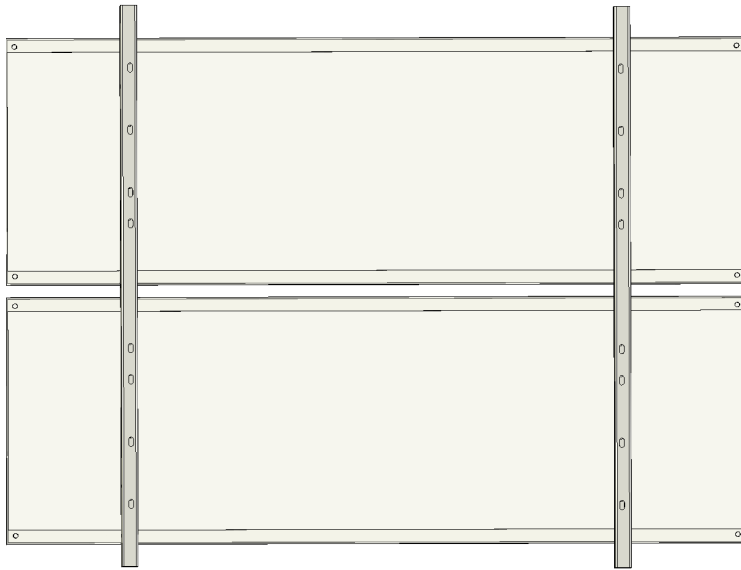
Part	Qty	Part Number
5/16 x 1" Kit	1	29-5006-005
5/16-18 x 1" SS hex-cap bolt	4	23-3118-021
5/16 flat washer, SS	8	25-3102-000
5/16 split lock washer, SS	4	25-3101-000
5/16 hex nut, SS	4	25-3118-440
Small Pole Bracket Kit	1	29-5008-001
Stud, 3/8-16 x 6" SS	2	27-1037-016
3/8 flat washer, Zinc	4	27-3702-001
3/8 split lock washer, Zinc	4	27-3701-001
3/8 hex nut, Zinc	4	24-3716-441
Small Tilt Plate Kit	1	29-5007-000
3/8 flat washer, Zinc	4	27-3702-001
3/8 split lock washer, Zinc	4	27-3701-001
3/8 hex nut, Zinc	4	24-3716-441
Cross Rail Kit	1	29-5010-000
5/16-18 x 2.50" hex-cap bolt, Zinc	4	23-3118-901
5/16 flat washer, Zinc	4	25-3102-001
5/16 med split lock washer, Zinc	4	25-3101-001
5/16-18 fin hex nut, Zinc	4	24-3118-441
Spare Pole Kit	1	29-5002-100
1/4-20 x 3/4" SS hex-cap bolt	4	23-2520-050
1/4 flat washer, SS	4	25-2502-000
1/4 split lock washer, SS	4	24-2501-000
1/4-20 fin hex nut, SS	4	24-2520-440
1/4 x 3/4" Kit	2	29-5000-000
1/4-20 x 3/4" SS hex-cap bolt	8	23-2520-050
1/4 flat washer, SS	8	25-2502-000
1/4 split lock washer, SS	8	24-2501-000
1/4-20 fin hex nut, SS	8	24-2520-440

5. Assembly

Step 1 -attaching the channel rails to the PV modules

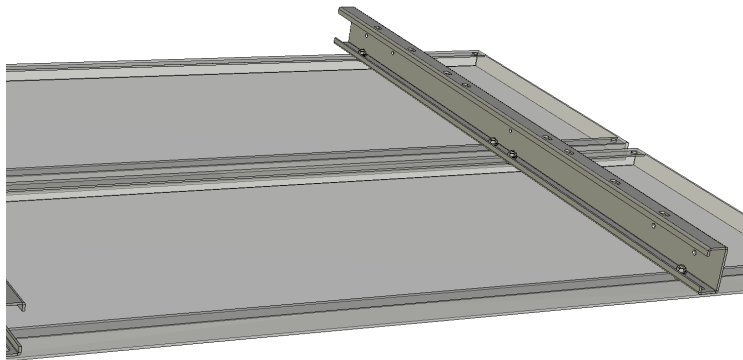
Parts Required	Qty	Part Number
PV Module	1-2	User-supplied
Rails	2	51-0545-000
1/4-20 x 3/4" SS hex-cap bolt	8	23-2520-050
1/4 flat washer, SS	8	25-2502-000
1/4 split lock washer, SS	8	24-2501-000
1/4-20 fin hex nut, SS	8	24-2520-440

1. Lay the modules face down on a protected surface in the appropriate orientation. Leave an inch or two between the panels.
2. Lay the channel rails on the back of the modules with the evenly-spaced holes down, so the flat side of the rails are facing towards the outside edges of the panels.



3. Secure the rails with a bolt, lock washer and hex nut in each of the PV mounting holes.

Tighten the bolts to 7 ft-lbs.



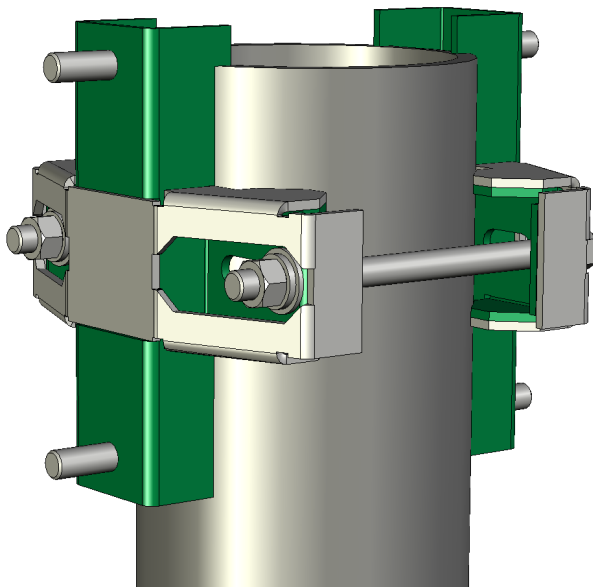
Step 2 - attaching the brace assembly to the pole

Parts Required	Qty	Part Number
Brace Assembly	2	51-0626-300
Stud, 3/8-16 x 6" SS	2	27-1037-016
3/8 flat washer, Zinc	4	27-3702-001
3/8 split lock washer, Zinc	4	27-3701-001
3/8 hex nut, Zinc	4	24-3716-441

1. Place the brace assembly onto the pole so the "lip" catches the top of the pole.
2. Install the studs and hardware as shown, using a washer and lock washer under each nut.
3. Tighten the stud nuts evenly, making sure that both studs are tightened the same amount so the distance between braces is the same on the front and the back.

Also, make sure that the nuts are approximately an equal number of threads in on the studs, so that the protruding part of the stud doesn't stick out too far.

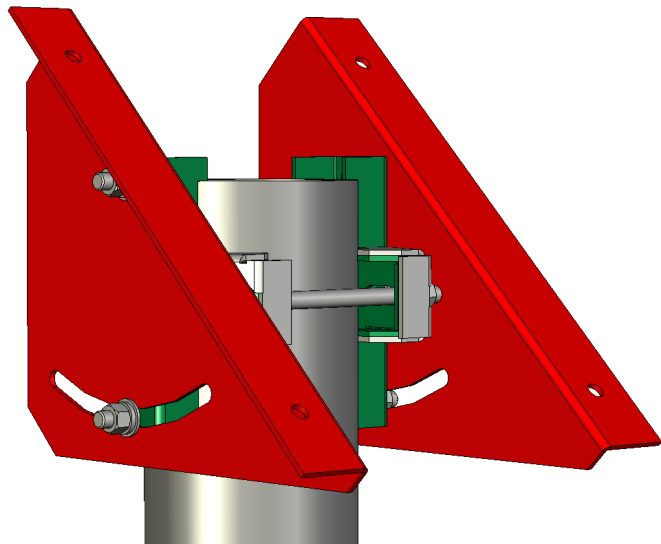
4. Tighten the studs to 12 ft-lbs.



Step 3 - attaching the tilt plates to the brace

Parts Required	Qty	Part Number
Tilt Plate, left	1	51-3517-243
Tilt Plate, right	1	51-3517-244
3/8 flat washer, Zinc	4	27-3702-001
3/8 split lock washer, Zinc	4	27-3701-001
3/8 hex nut, Zinc	4	24-3716-441

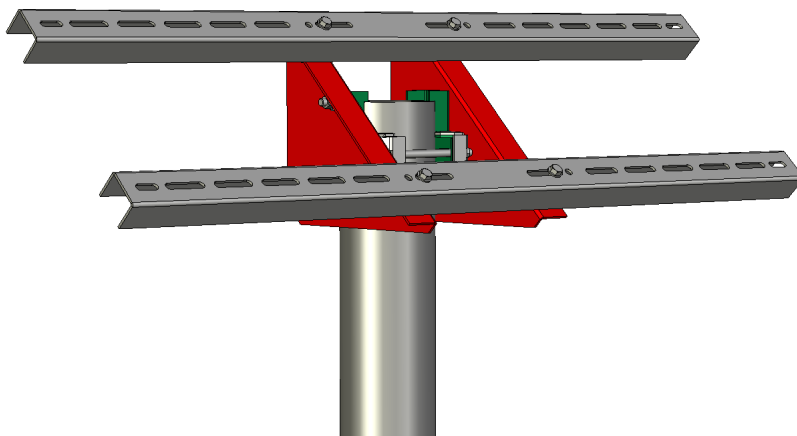
1. Place the tilt plates on the brace assembly as shown.
2. Use a washer, lock washer and nut on each screw, and finger-tighten.



Step 4 - attaching the cross rails to the tilt plates

Parts Required	Qty	Part Number
Cross Rail	2	27-0627-016
5/16-18 x 2.50" hex-cap bolt, Zinc	4	23-3118-901
5/16 flat washer, Zinc	8	25-3102-001
5/16 med split lock washer, Zinc	4	25-3101-001
5/16-18 fin hex nut, Zinc	4	24-3118-441

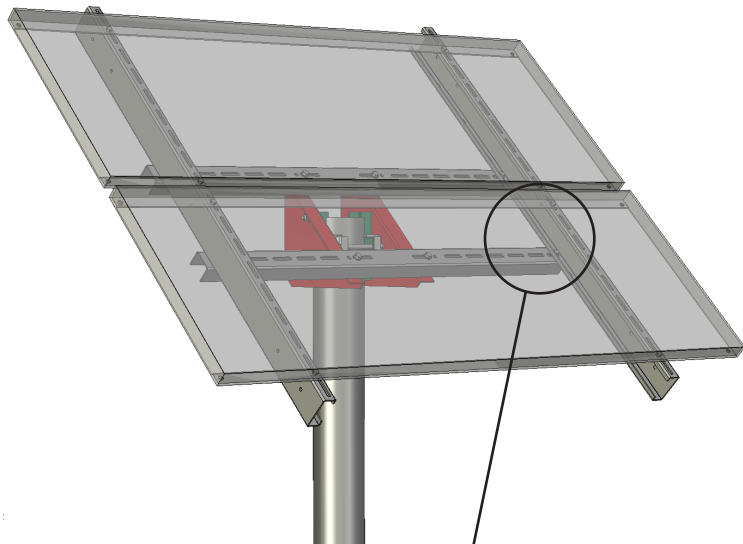
1. Place the cross rails on the tilt plates with the open side facing down and attach using the specified hardware.
2. Tighten the bolts to 12 ft-lbs.



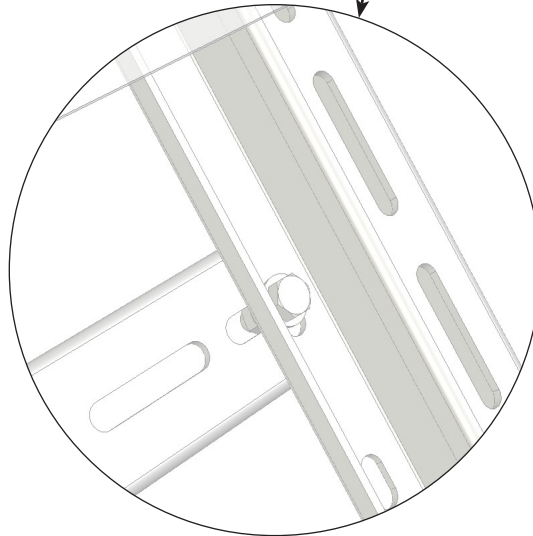
Step 5 - mounting the PV assembly

Parts Required	Qty	Part Number
5/16-18 x 1" SS hex-cap bolt	4	23-3118-021
5/16 flat washer, SS	8	25-3102-000
5/16 split lock washer, SS	4	25-3101-000
5/16 hex nut, SS	4	25-3118-440

1. Lift the PV array assembly onto the cross rails and attach using the supplied hardware.



2. Tighten the bolts to 12 ft-lbs.



3. Adjust the tilt of the panel, then tighten the tilt plate nuts to 12 ft-lbs.

IronRidge 10-Year Warranty

Terms and Conditions

IronRidge warrants each Mounting Structure to be free from defects in materials and workmanship for ten (10) years from the date of first purchase ("Warranty Period"), when installed properly and used for the purpose for which it is designed, except for the finish, which shall be free from visible peeling, or cracking or chalking under normal atmospheric conditions for a period of three (3) years, from the earlier of 1) the date the installation of the Product is completed, or 2) 30 days after the purchase of the Product by the original Purchaser ("Finish Warranty"). The Finish Warranty does not apply to any foreign residue deposited on the finish. All installations in corrosive atmospheric conditions are excluded. The Finish Warranty is VOID if the practices specified by AAMA 609 & 610-02 – "Cleaning and Maintenance for Architecturally Finished Aluminum" (www.aamanet.org) are not followed by Purchaser for IronRidge's aluminum based products.

The warranty covers the replacement cost of parts to repair the product to proper working condition. Transportation and incidental costs associated with warranty items are not reimbursable. The warranty does not cover normal wear, or damage resulting from misuse, abuse, improper installation, negligence, or accident. The warranty does not cover any defect that has not been reported in writing to IronRidge within ten (10) days after discovery of such defect. Furthermore, it does not cover units that have been altered, modified or repaired without written authorization from the manufacturer or its authorized representative, or units used in a manner or for a purpose other than that specified by the manufacturer. IronRidge's entire liability and Purchaser exclusive remedy, whether in contract, tort or otherwise, for any claim related to or arising out of breach of the warranty covering the Mounting Structures shall be correction of defects by repair, replacement, or credit, at IronRidge's discretion. Refurbished Mounting Structures may be used to repair or replace the Mounting Structures.

IronRidge shall have no liability for any injuries or damages to persons or property resulting from any cause, whatsoever, or any claims or demands brought against IronRidge by Purchaser, any employee of Purchaser, client of Purchaser, end-user of the Product or other party, even if IronRidge has been advised of the possibility of such claims or demands (collectively, "Third Party Claims"). This limitation applies to all materials provided by IronRidge during and after the Warranty Period.

Daniel W. Stiles, PE

26270 Omar Drive
Fort Bragg, CA 95437
Tel: 707-472-7519

September 8, 2008

IronRidge
Attn: Craig Carni
President
900 Cherry Ave. #400
San Bruno, CA 94066

Subject: Engineering Certification for IronRidge Top of Pole Mounts

Dear Mr. Carni:

I certify that the following IronRidge Pole Mounting Structure, when constructed of materials specified and supplied by IronRidge, meet or exceed the minimum design parameters specified by the 2007 California Building Code(CBC), the 1997 Uniform Building Code, ASCE Standard 7-05, and the Steel Construction Manual, AISC, 13th Edition:

Conditions and location for mounts listed below:

Height of pole: 6 feet above grade

Size of pole: 4" schedule 40

Wind: 90 mph, Exposure C

UNI-TP/02
UNI-TP/04A

UNI-TP/02A

UNI-TP/03

UNI-TP/04

Conditions and location for mounts listed below:

Height of pole: 6 feet above grade

Size of pole: 6" schedule 40

Wind: 90 mph, Exposure C

UNI-TP/06
UNI-TP/08LL
UNI-TP/12LL

UNI-TP/06LL
UNI-TP/10

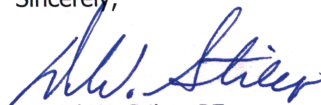
UNI-TP/08
UNI-TP/10LL

UNI-TP/12

I further certify by this letter that the IronRidge Top of Pole Mounts as listed above will be structurally adequate when installed in accordance with IronRidge Installation Manuals provided with, "Universal Top of Pole Mounts", copyrighted by IronRidge, 2008. The structure to which IronRidge Mounting Systems are connected should be evaluated on a case by case basis, per Part 1 of the installation manuals to ensure the adequacy to accept attachments and to support all applied loadings per the CBC.

Please contact me if you have any questions or concerns.

Sincerely,


Daniel W. Stiles, PE

cc: DWS



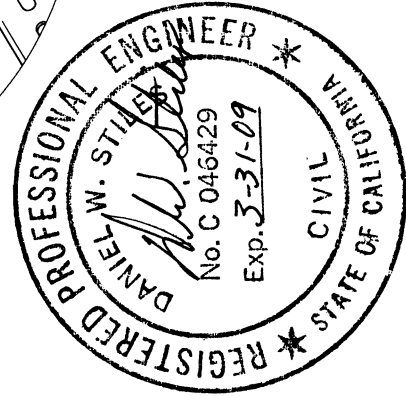
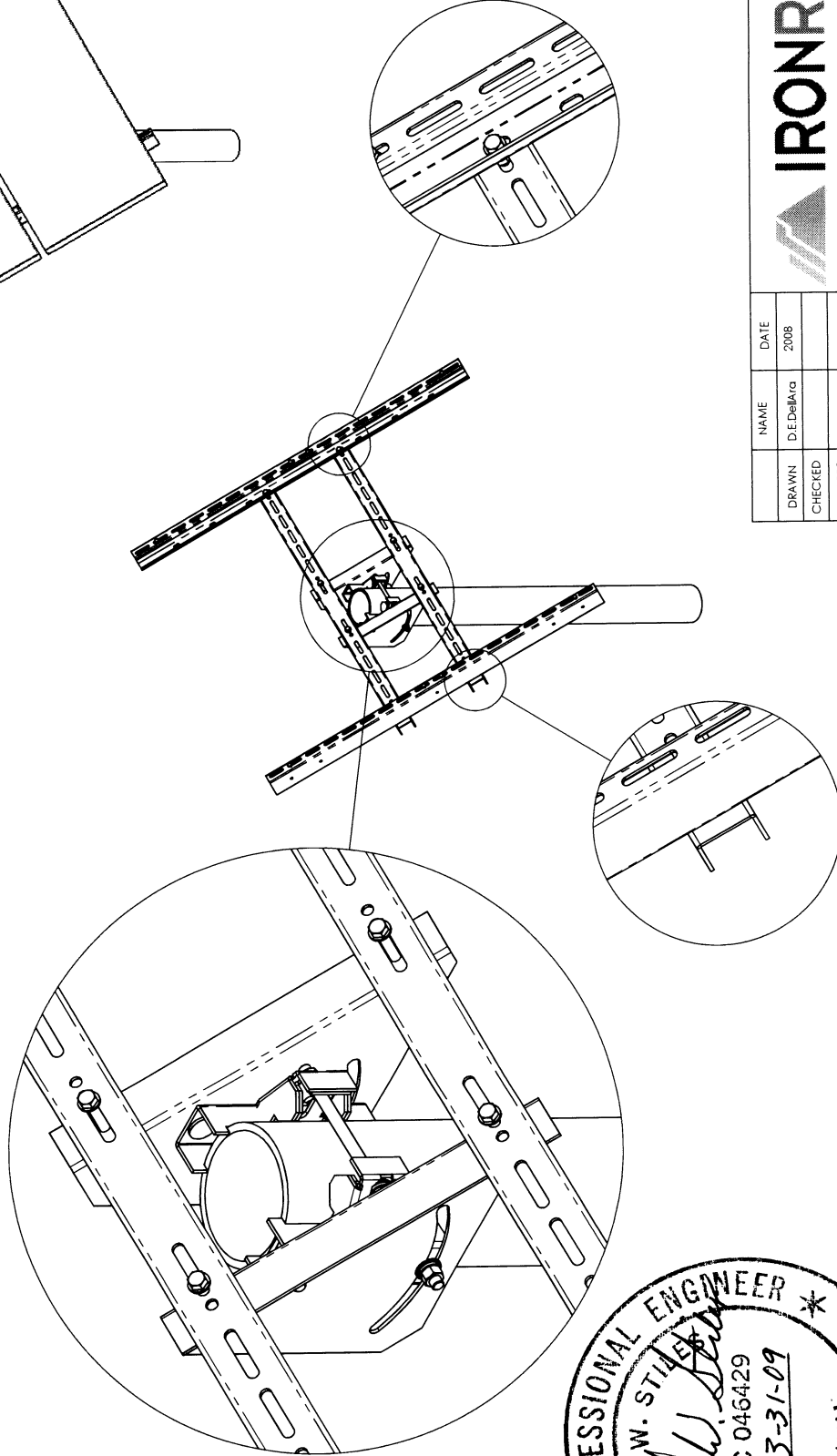
Design Criteria

Wind Speed: 90 mph

Exposure: C

Max Height: 6' Above Ground

Tilt Range: 15° - 65°



REVISIONS		
REV.	DESCRIPTION	DATE
A	Release for Reference	09-04-08
-	-	-

IRONRIDGE		UNI-TP/02	
NAME	DATE	SIZE	DWG. NO.
DRAWN	2008	A	UNI-TP/02
CHECKED			
ENG APPR.			
DO NOT SCALE DRAWING		SHEET 1 OF 1	

PROPRIETARY AND CONFIDENTIAL
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 ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF TWO SEAS INC. IS PROHIBITED.

IronRidge Top of Pole Mounts

Foundation Recommendation Addendum

Note: The suggestions below are recommendations only. It is the installer's responsibility to validate foundation parameters prior to installation, as a local geotechnical report may be required to assess ground conditions. We recommend consulting with a local engineer familiar with local regulations and build site requirements, including soil conditions, terrain and load criteria (wind, snow, seismic). All of these parameters may impact foundation requirements.

Mounting Pole Guidelines

Table 1

Part Number	Pipe required
Small Top of Pole Mounts	
UNI-TP/02	4" Nominal Pipe Size, Schedule 40
UNI-TP/02A	4" Nominal Pipe Size, Schedule 40
UNI-TP/03	4" Nominal Pipe Size, Schedule 40
UNI-TP/04	4" Nominal Pipe Size, Schedule 40
UNI-TP/04A	4" Nominal Pipe Size, Schedule 40
Large Top of Pole Mounts	
UNI-TP/06	6" Nominal Pipe Size, Schedule 40
UNI-TP/06LL	6" Nominal Pipe Size, Schedule 40
UNI-TP/08	6" Nominal Pipe Size, Schedule 40
UNI-TP/08LL	6" Nominal Pipe Size, Schedule 40
UNI-TP/10	6" Nominal Pipe Size, Schedule 40
UNI-TP/10LL	6" Nominal Pipe Size, Schedule 40
UNI-TP/12	6" Nominal Pipe Size, Schedule 40
UNI-TP/12LL	6" Nominal Pipe Size, Schedule 40

Note: All IronRidge Top of Pole mounts are engineered for a maximum height of 6' above grade.

Foundation Hole Guidelines

Table 2

Module Area	Max. Wind Speed	Min. Hole Diameter	Min. Hole Depth	Min. Pole Depth
20 Sq Feet	90 MPH	15"	46"	40"
30 Sq Feet	90 MPH	18"	51"	45"
40 Sq Feet	90 MPH	18"	60"	54"
50 Sq Feet	90 MPH	18"	62"	56"
60 Sq Feet	90 MPH	24"	52"	46"
70 Sq Feet	90 MPH	24"	60"	54"
80 Sq Feet	90 MPH	24"	66"	60"
90 Sq Feet	90 MPH	24"	74"	68"
105 Sq Feet	90 MPH	24"	82"	76"



Installation Recommendations

- Auger hole to minimum depth shown in Table 2.
- 6" of hole should be filled with crushed rock or a blocking. This will prevent the pipe from touching the base of the hole, insuring complete encapsulation of the pipe when concrete is poured, as well as allowing for water drainage. See Fig. 1.
- Pipe should be installed vertically no matter the slope of the install site.
- Make arrangements to prevent the pipe from twisting prior to pouring concrete.
- Pipe should be braced to remain plumb until concrete has cured (at least 24 hours).

Fig. 1: Top of Pole Foundation Guideline Diagram

