Tech Brief

Ground Mount Configurations

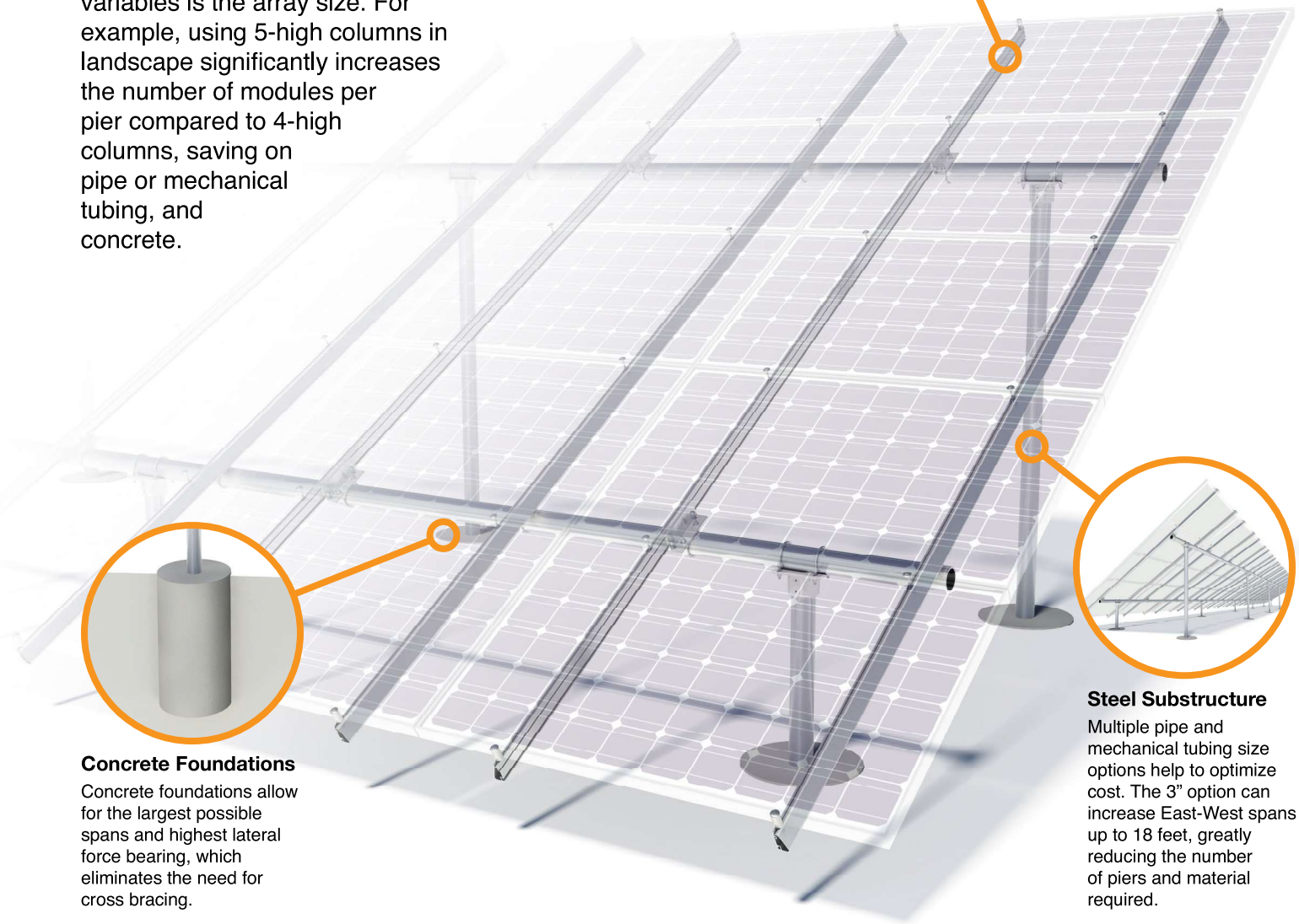
Strength Meets Flexibility

The IronRidge® Ground Mount System supports a wide adjustment of tilt angle, foundation size and depth, and module size. These variables can be quickly optimized for cost and performance using the online Design Assistant tool.

One of the most critical engineering variables is the array size. For example, using 5-high columns in landscape significantly increases the number of modules per pier compared to 4-high columns, saving on pipe or mechanical tubing, and concrete.

XR100® & XR1000® Rail

The curved shape of XR Rail® increases vertical and lateral strength, while also resisting bending and twisting. Modules are attached using familiar top-down clamps or under clamps.



Concrete Foundations

Concrete foundations allow for the largest possible spans and highest lateral force bearing, which eliminates the need for cross bracing.

Steel Substructure

Multiple pipe and mechanical tubing size options help to optimize cost. The 3" option can increase East-West spans up to 18 feet, greatly reducing the number of piers and material required.

Compatible with Soil Classes 2-4

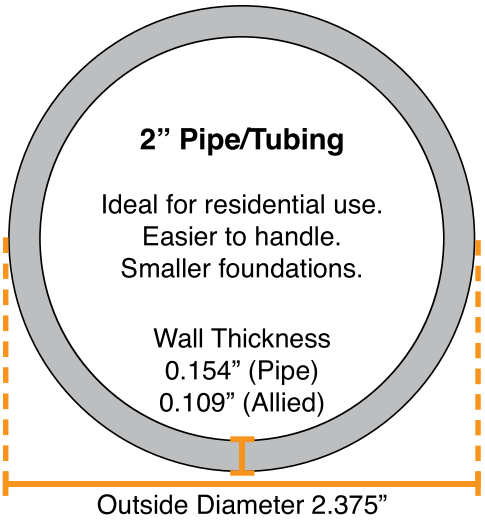
The size of Ground Mount foundations depends on a number of factors, including column height and site loading conditions. Stronger and sturdier soil classes (Class 2 and Class 3) allow for reduced foundation depth, saving on materials and labor.

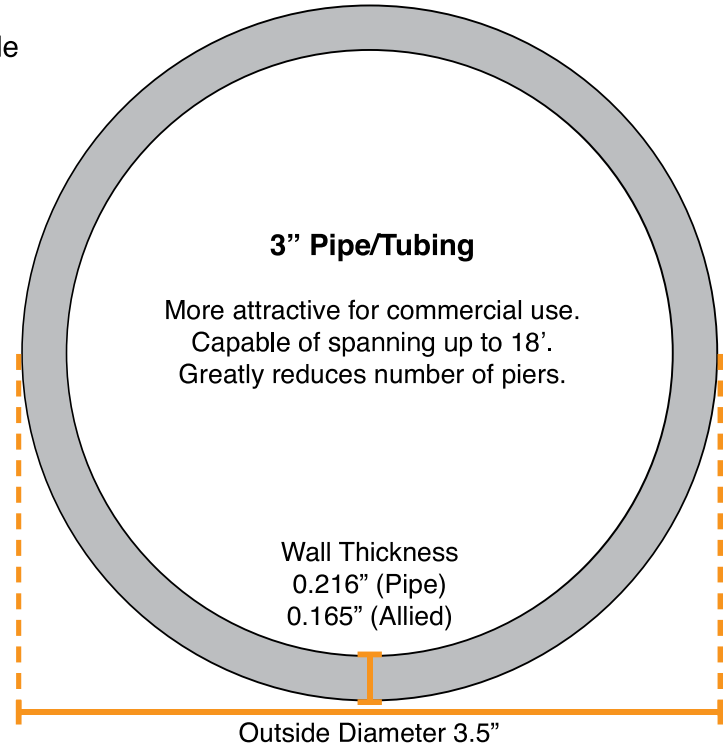
Wide Tilt Angle Range (0-45 Degrees)

Lower tilt angles are an effective way of reducing wind loads on ground mount structures, resulting in increased East-West pipe spans and reduced number of foundations. Refer to table on backside to see how tilt angle affects spans.

Substructure Selection

Ground Mount uses locally-sourced galvanized schedule 40 steel pipe (ASTM A53 Grade B, 35 ksi) or Allied mechanical tubing (2" – 50 ksi, 3" – 45 ksi) to reduce shipping costs. Mechanical tubing is lighter and can be easier to couple when building the substructure.





Refer to the following table to see how size impacts the East-West span between foundations. The table complies with ASCE 7-16 structural code. Values are based on 72-cell modules in Wind Exposure Category B.

Conditions				E-W Span							
Snow	Height	Tilt	Wind (MPH)	4'	6'	8'	10'	12'	14'	16'	18'
0 PSF	4-High	10°	100								
			120								
			140								
		30°	100		*	*					
			120	*	*						
			140	*	*						
	5-High	10°	100	2" Pipe/Tubing			3" Pipe/Tubing				
			120								
			140								
		30°	100		*	*					
			120	*	*			*			
30 PSF	4-High	10°	100								
			120								
			140								
		30°	100		*						
			120	*	*						
			140	*	*		*				
	5-High	10°	100								
			120								
			140								
		30°	100		*						

*Requires Diagonal Bracing

Datasheet

IRONRIDGE

Ground Mount System

All-Terrain Mounting

The IronRidge Ground Mount System combines our XR100 or XR1000 rails with locally-sourced steel pipes or mechanical tubing, to create a cost-effective structure capable of handling any site or terrain challenge.

Installation is simple with only a few structural components and no drilling, welding, or heavy machinery required. In addition, the system works with a variety of foundation options—including concrete piers, ground screws, helical or driven piles, and above-ground ballast blocks.

Rugged Construction

Engineered steel and aluminum components ensure durability.

PE Certified

Pre-stamped engineering letters available in most states.

UL 2703 Listed System

Meets newest effective UL 2703 standard.

Design Software

Online tool generates engineering values and bill of materials.

Flexible Architecture

Multiple foundation and array configuration options.

25-Year Warranty

Products guaranteed to be free of impairing defects.

Datasheet

360° Product Tour
Visit ironridge.com

Substructure

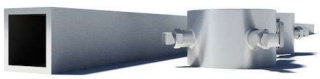
Top Caps

Connect vertical and cross pipes.

Bonded Rail Connectors

Attach and bond Rail Assembly to cross pipes.

Diagonal Braces



Optional Brace provides additional support.

Cross Pipe & Piers

Steel pipes or mechanical tubing for substructure.

Rail Assembly

XR100/XR1000 Rails

Curved rails increase spanning capabilities.

UFOs

Universal Fastening Objects bond modules to rails.

Stopper Sleeves

Snap onto the UFO to turn into a bonded end clamp.

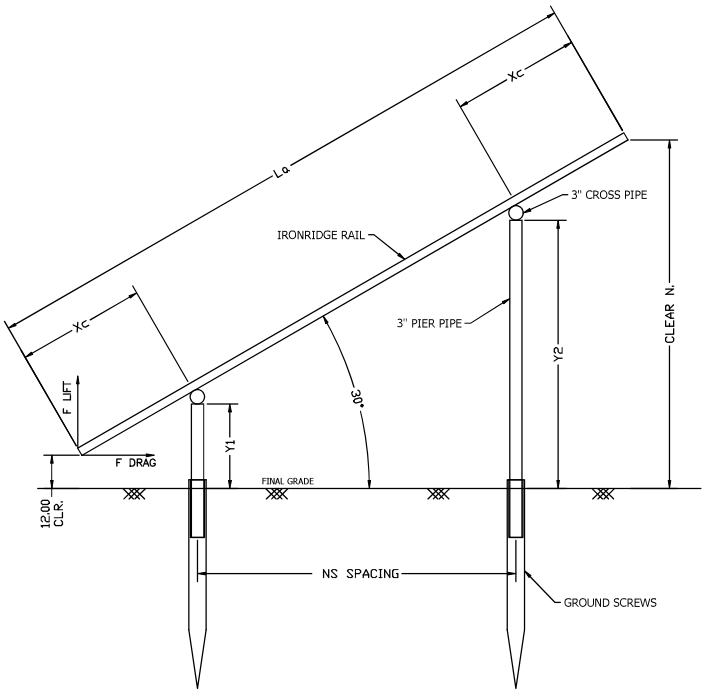
CAMO

Bond modules to rails while staying completely hidden.

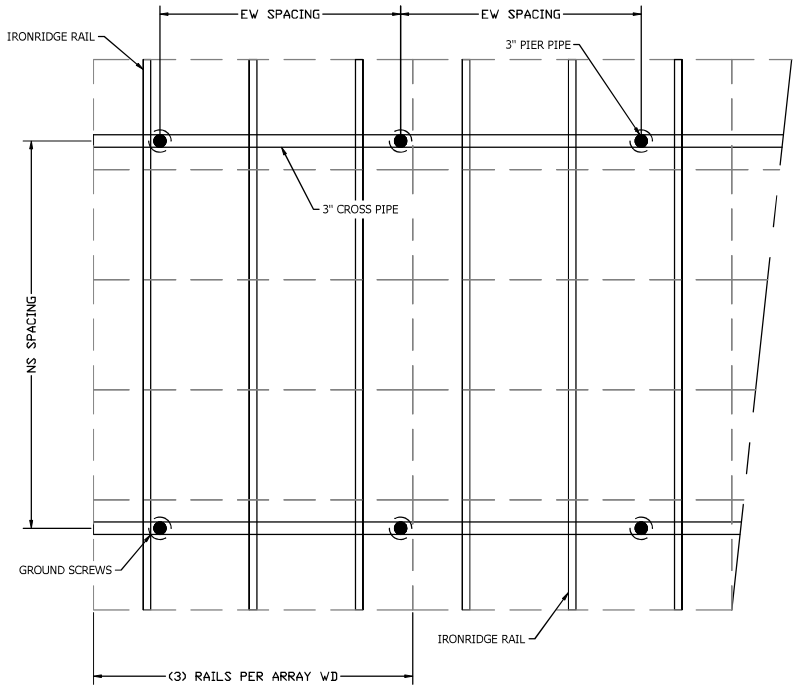
Resources

Design Assistant
Go from rough layout to fully engineered system. For free.
Go to ironridge.com/design

NABCEP Certified Training
Earn free continuing education credits, while learning more about our systems.
Go to ironridge.com/training



GROUND MOUNT ELEVATION



GROUND MOUNT PLAN

SOLAR ARRAY GROUND MOUNT SYSTEM

ARRAY LENGTH La = 19FT (5) PANELS
ARRAY DEGREE = 30°
NS PIER SPACING = 11FT 8IN
EW PIER SPACING = 7FT 3IN
CANTILVER LNG Xc = 33IN

Y1 = 28.5 IN
Y2 = 109.5 IN
CLEAR N. = 126 IN

TOTAL PIER # = 28
TOTAL RAIL # = 36

GROUND SCREW DATA

AMERICAN GROUND SCREW INC – BORED PILES
(WI DSPS APPROVAL # BP-032100002-BVP)

MODEL 3 GROUND SCREWS – 4.5IN DIAMETER
INSTALL GROUND SCREWS PER MANUFACTURER SPECIFICATIONS.

FRAME COMPONENTS

STEEL PIPE – 3IN ID SCH40 PIPE, FY=35KSI, FU=60KSI
RAIL XR1000 – IRONRIDGE ALUMINUM RAIL, SEE MANUFACTURER SPECIFCATION

WISCONSIN
VINCENT MATARRESE
E-45530
NEW BERLIN
WISCONSIN
PROFESSIONAL ENGINEER

No.	Revision/Issue	Date

Firm Name and Address

VM ENGINEERING LTD
VINCE MATARRESE, PE
E-45530

WATTS UP ENGINEERING LLC

Project Name and Address

GRAYLINE SOLAR ARRAY PROJECT
19FT LENGTH

2101 AIRPORT ROAD
WAUKESHA, WI 53188

Project	Sheet
GRAYLINE ARRAY	S1.0
Date: 2/27/2025	
Scale: AS NOTED	