

# SCOPE OF WORK

## PHOTOVOLTAIC SYSTEM SUMMARY

**SYSTEM SIZE:** DC - 18.57 KW  
AC - 15.00 KW

- (N) **MODULES:** (47) MISSION SOLAR: MSE395SX9R (395W) MONO MODULES
- (N) **INVERTER:** (1) SOLAREDEGE SE10000H-US (240V) INVERTER  
(1) SOLAREDEGE SE5000H-US (240V) INVERTER
- (N) **AC DISCONNECT:** 100A FUSED VISIBLE LOCKABLE LABELED AC DISCONNECT (240V)
- (N) **JUNCTION BOX:** JUNCTION BOX, 600V
- (N) 225A MAIN SERVICE PANEL WITH 200A MAIN BREAKER
- (N) MAIN BREAKER ENCLOSURE 200A RATED

ARRAY 1:- ARRAY TILT: 25°  
ARRAY 1:- AZIMUTH TILT: 180°

**ELECTRICAL INFORMATION**  
UTILITY COMPANY:  
MAIN SERVICE AMPERAGE: 225A

### GOVERNING CODES & STANDARDS

- 2021 INTERNATIONAL BUILDING CODE (IBC)
- 2021 INTERNATIONAL RESIDENTIAL CODE (IRC)
- 2021 INTERNATIONAL FIRE CODE (IFC) ONCOR
- 2020 NATIONAL ELECTRICAL CODE (NEC)

- **UTILITY ESID NO.:** 10443720001405742
- **INTERCONNECTION METHOD:** LINE SIDE TAP

## GENERAL NOTES:

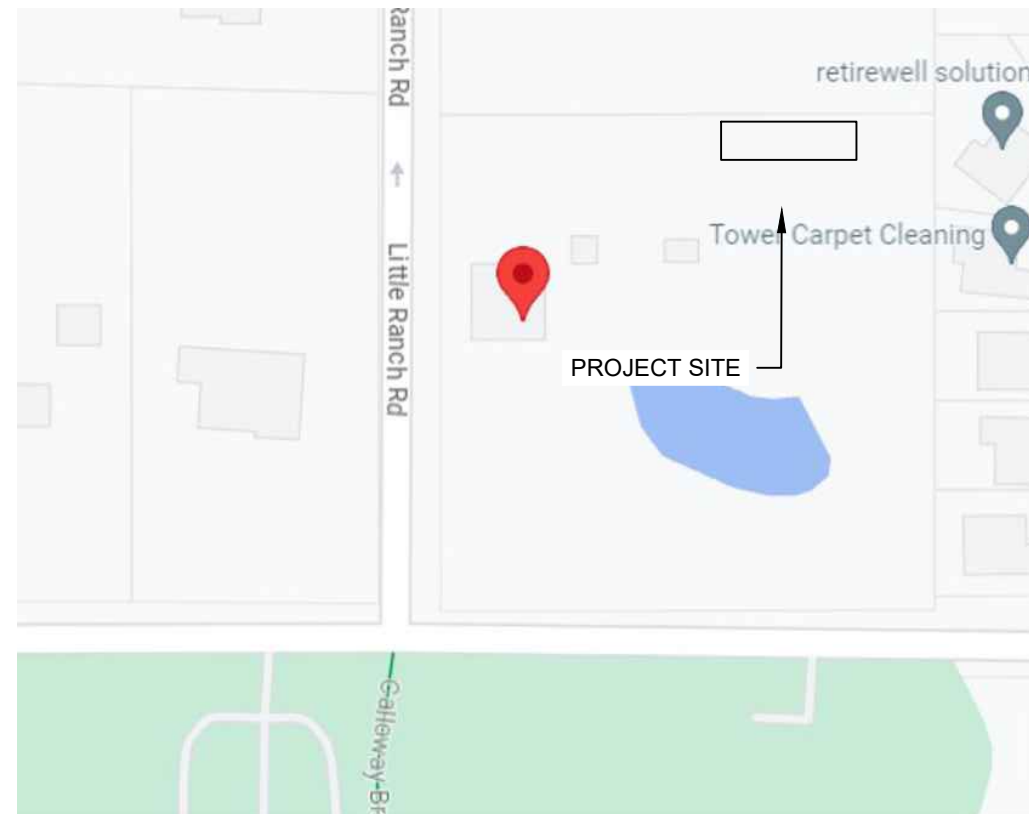
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO INITIATING CONSTRUCTION.
- CONTRACTOR SHALL REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
- ALL EQUIPMENT SHALL BE LISTED BY U.L. (OR EQUAL) AND LISTED FOR ITS SPECIFIC APPLICATION.
- ALL EQUIPMENT SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
- ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- ACCESS TO ELECTRICAL COMPONENTS OVER 150 VOLTS TO GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
- WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
- PV MODULE FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER G.E.C. PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
- PV MODULE RACKING RAIL SHALL BE BONDED TO BARE COPPER G.E.C. VIA WEEB LUG, ILSCO GBL-4DBT LAY-IN LUG, OR EQUIVALENT LISTED LUG.
- GROUNDING ELECTRODE CONDUCTOR (G.E.C.) SHALL BE CONTINUOUS AND/OR IRREVERSIBLY SPLICED/WELDED.
- ALL JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION.
- WORKING SPACE AROUND ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26

## SHEET INDEX

- PV-1 COVER SHEET
- PV-2 SITE PLAN AND ROOF PLAN
- PV-3 ROOF PLAN & MODULES
- PV-4 ELECTRICAL SITE PLAN
- PV-5 ATTACHMENT DETAIL
- PV-6 ELECTRIC LINE DIAGRAM
- PV-7 WIRING CALCULATIONS
- PV-8 PLACARDS
- PV-9 MICROINVERTER CHART
- PV-10+ EQUIPMENT SPECIFICATION



**1 AERIAL VIEW**  
PV-1 SCALE: NTS



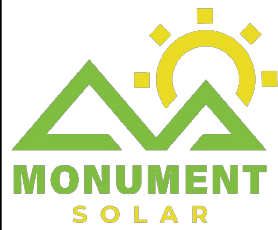
**2 VICINITY MAP**  
PV-1 SCALE: NTS



08/17/2023

Firm License Number: F11411  
VSE Project Number: U4999.0187.231

Vector Structural Engineering scope of work is for the ground mount foundation only. All other structural, mechanical, architectural and all other nonstructural aspects of the design is the responsibility of others. Electrical is by others unless stamped by Dean Levorsen.



REVISIONS		
DESCRIPTION	DATE	REV

DATE: 08/11/2023

Signature with Seal

### PROJECT NAME & ADDRESS

**DONNA REYNOLDS RESIDENCE**  
6708 LITTLE RANCH RD.  
NORTH RICHLAND HILLS, TX 76182  
APN: 01816276  
AHJ: CITY OF NORTH RICHLAND HILLS  
UTILITY: ONCOR  
ESID: 10443720001405742

SHEET NAME  
**COVER SHEET**

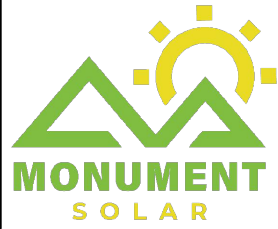
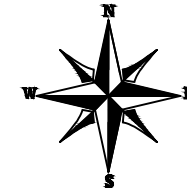
SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-1**

DC SYSTEM SIZE - 18.57 KW  
AC SYSTEM SIZE - 15.00 KW

(47) MISSION SOLAR: MSE395SX9R (395W) MONO MODULES  
(1) SOLAREDEGE SE10000H-US (240V) INVERTER  
(1) SOLAREDEGE SE5000H-US (240V) INVERTER

• UTILITY ESID NO.:10443720001405742  
• INTERCONNECTION METHOD: LINE SIDE TAP



REVISIONS		
DESCRIPTION	DATE	REV

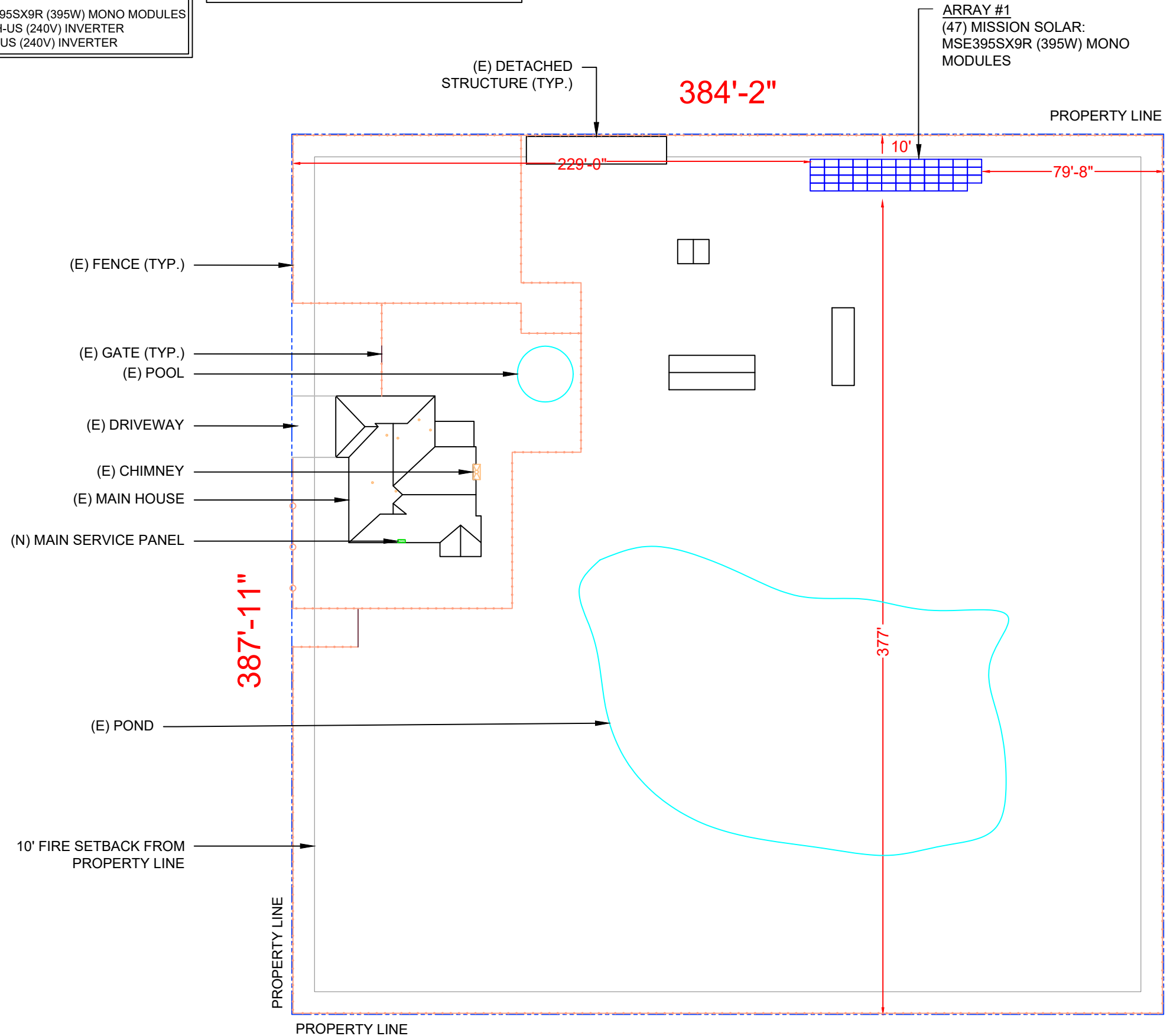
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LITTLE RANCH RD.



387'-11"



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384'-2"  
CHAPMAN DR.

1 | SITE PLAN  
PV-2 | SCALE: 1"=50'

SHEET NAME  
SITE PLAN &  
ROOF PLAN

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-2

**MODULE TYPE, DIMENSIONS & WEIGHT**

NUMBER OF MODULES = 47 MODULES  
 MODULE TYPE = MISSION SOLAR: MSE395SX9R (395W) MONO MODULES  
 WEIGHT = 48.5 LBS / 22.00 KG.  
 MODULE DIMENSIONS = 75.08" x 41.5" = 21.64 SF

DC SYSTEM SIZE - 18.57 KW  
 AC SYSTEM SIZE - 15.00 KW  
 (47) MISSION SOLAR: MSE395SX9R (395W) MONO MODULES  
 (1) SOLAREDEGE SE10000H-US (240V) INVERTER  
 (1) SOLAREDEGE SE5000H-US (240V) INVERTER

- UTILITY ESID NO.:10443720001405742
- INTERCONNECTION METHOD: LINE SIDE TAP

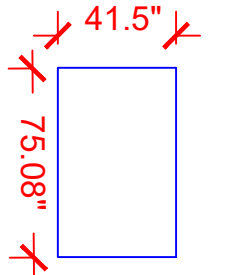
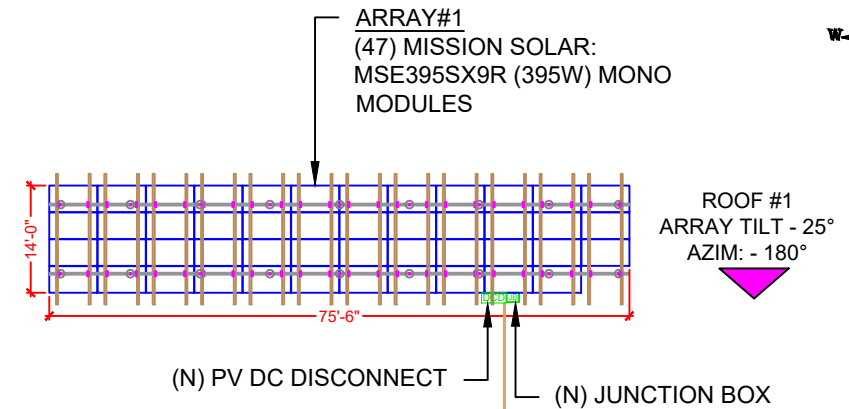
NOTE:  
 THE VISIBLE LOCKABLE LABELED AC DISCONNECT IS WITHIN 10FT OF METER.

ROOF DESCRIPTION			
ROOF TYPE			GROUND MOUNT
ARRAY	ARRAY TILT	AZIMUT H	GROUND TILT
#1	25	180°	0°

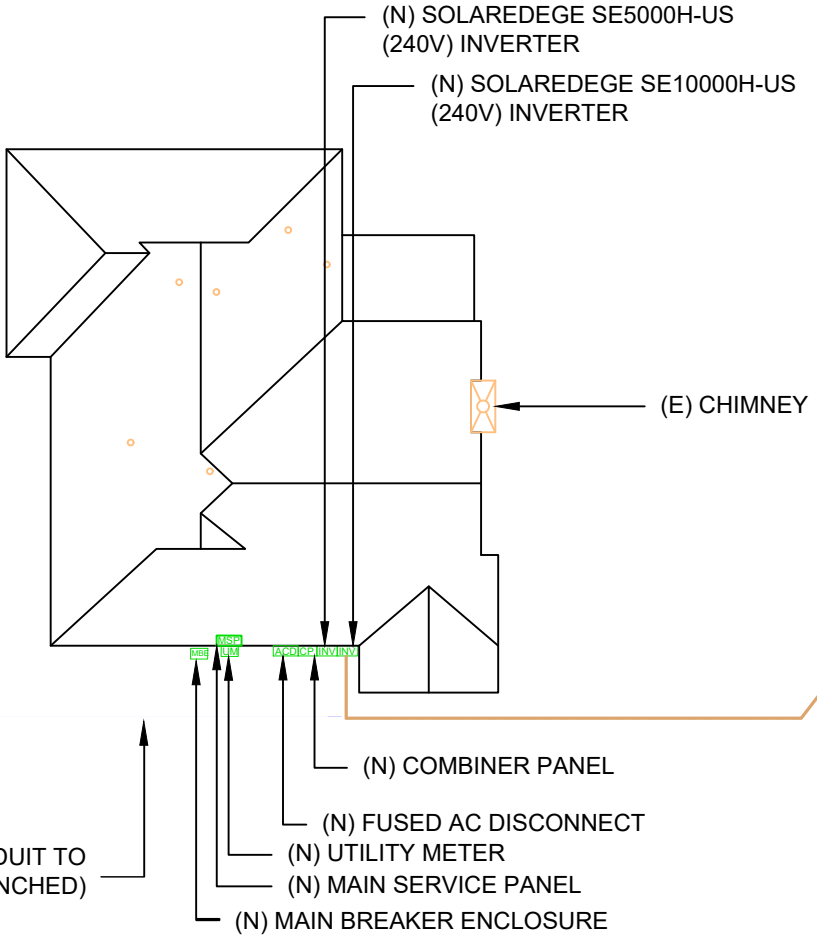


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MISSION SOLAR: MSE395SX9R (395W) MONO MODULES



(N) PVC CONDUIT (DC TRENCHED ~500')

LEGEND	
[JB]	- JUNCTION BOX
[CP]	- COMBINER PANEL
[ACD]	- AC DISCONNECT
[SLD]	- SOLAR LOAD CENTER
[UM]	- UTILITY METER
[MSP]	- MAIN SERVICE PANEL
[INV]	- INVERTER
[SD]	- SOLADECK
○	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
●	- ROOF ATTACHMENT
- - -	-



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SHEET NAME  
**ROOF PLAN & MODULES**

SHEET SIZE  
**ANSI B  
 11" X 17"**

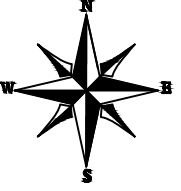
SHEET NUMBER  
**PV-3**

**1 SITE PLAN & MODULES**

PV-3 SCALE: 1"-25'-0"

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	47	MISSION SOLAR: MSE395SX9R (395W) MONO MODULES
INVERTER #1	1	SOLAREDEGE SE10000H-US (240V) INVERTER
INVERTER #2	1	SOLAREDEGE SE5000H-US (240V) INVERTER
AC DISCONNECT	1	100A FUSED, 240V, NEMA 3R, UL LISTED,
COMBINER PANEL	1	125A COMBINER PANEL

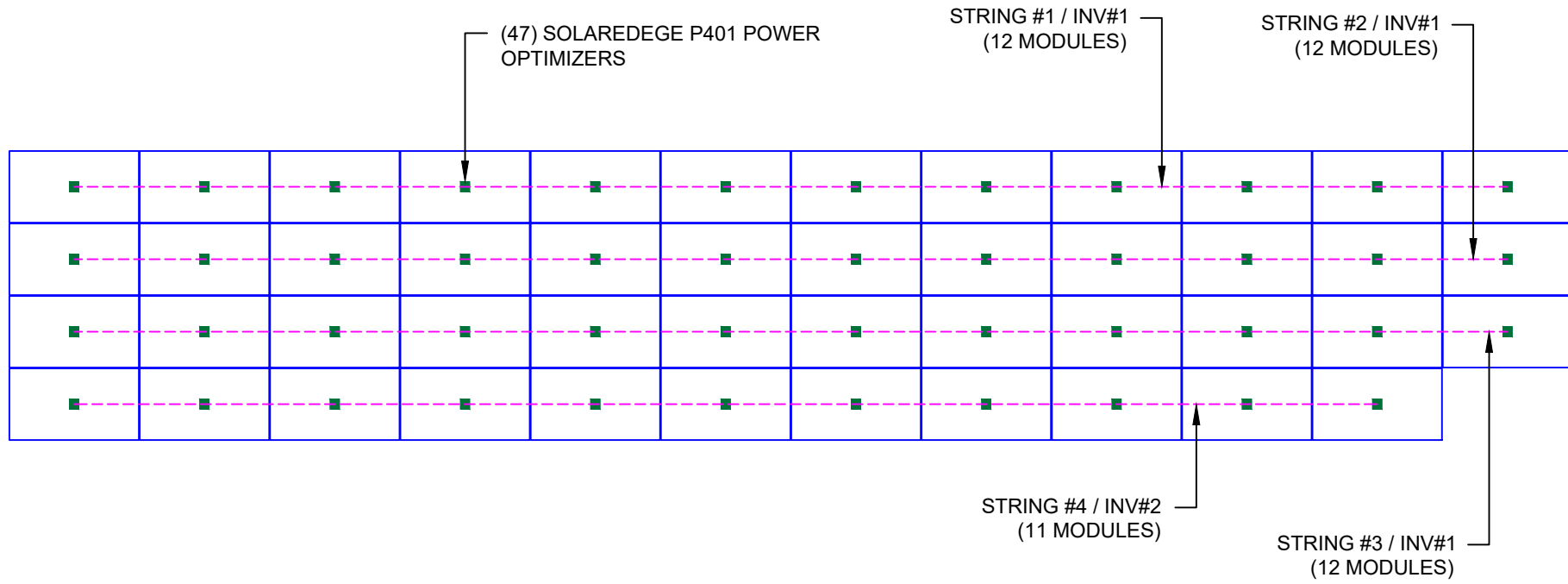
- UTILITY ESID NO.:10443720001405742
- INTERCONNECTION METHOD: LINE SIDE TAP



DC SYSTEM SIZE - 18.57 KW  
AC SYSTEM SIZE - 15.00 KW

(47) MISSION SOLAR: MSE395SX9R (395W) MONO MODULES  
(1) SOLAREDEGE SE10000H-US (240V) INVERTER  
(1) SOLAREDEGE SE5000H-US (240V) INVERTER

(3) STRINGS OF 12 MODULES  
(1) STRING OF 11 MODULES



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Bill of Materials		
Part	Spares	Total Qty
<b>Rails</b>		
XR-1000-204A XR1000, Rail 204" Clear	0	24
<b>Clamps &amp; Grounding</b>		
UFO-CL-01-A1 Universal Module Clamp, Clear	0	120
UFO-STP-40MM-M1 Stopper Sleeve, 40MM, Mill	0	48
XR-LUG-03-A1 Grounding Lug, Low Profile	0	1
<b>Substructure</b>		
70-0300-SGA SGA Top Cap at 3"	0	18
GM-BRC3-01-M1 Ground Mount Bonded Rail Connector - 3"	0	48



651 W. GALENA PARK BLVD., STE. 101 DRAPER, UTAH 84020 PHONE (801) 990-1775 WWW.VECTORSE.COM

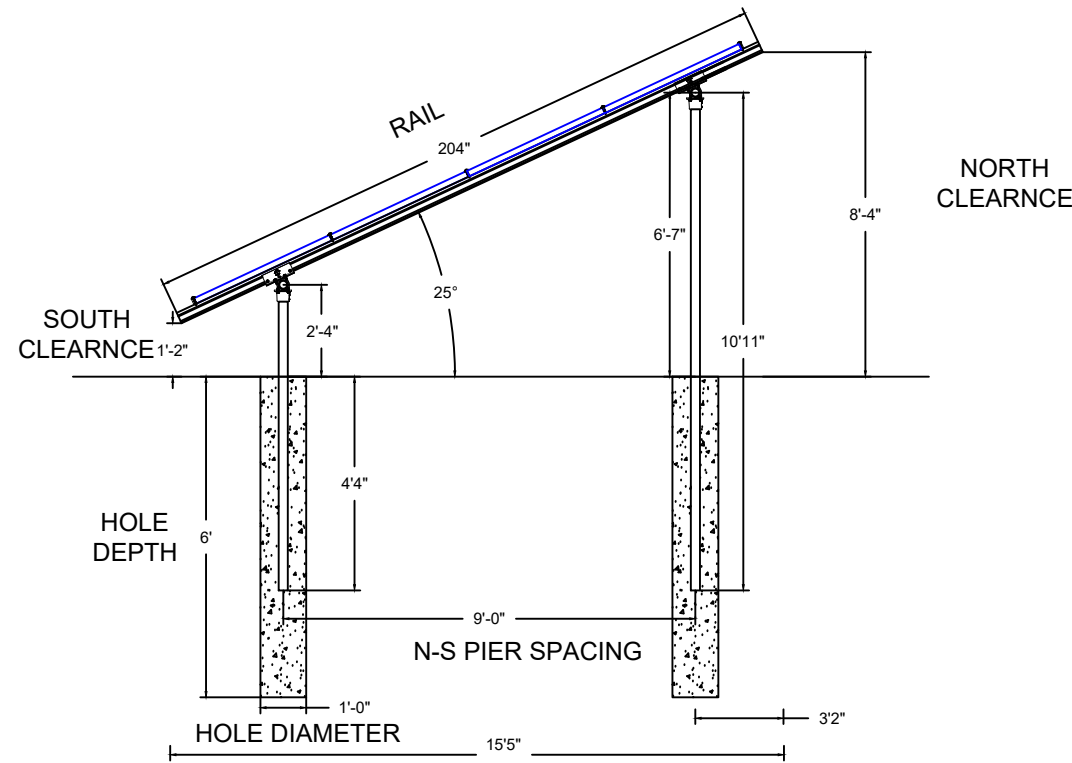


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**1** ATTACHMENT DETAIL  
PV-5 SCALE: NTS



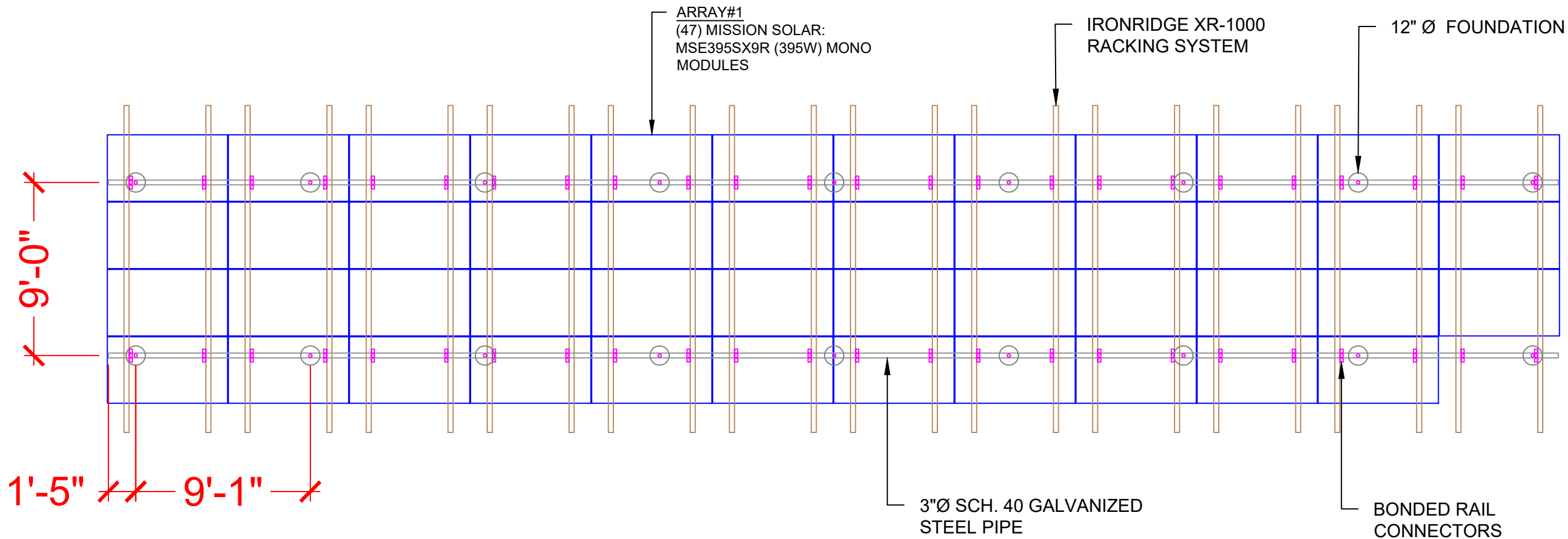
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DESCRIPTION	DATE	REV

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**2** ATTACHMENT DETAIL (SITE VIEW)  
PV-5 SCALE: NTS

SHEET NAME  
ATTACHMENT  
DETAIL

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-5

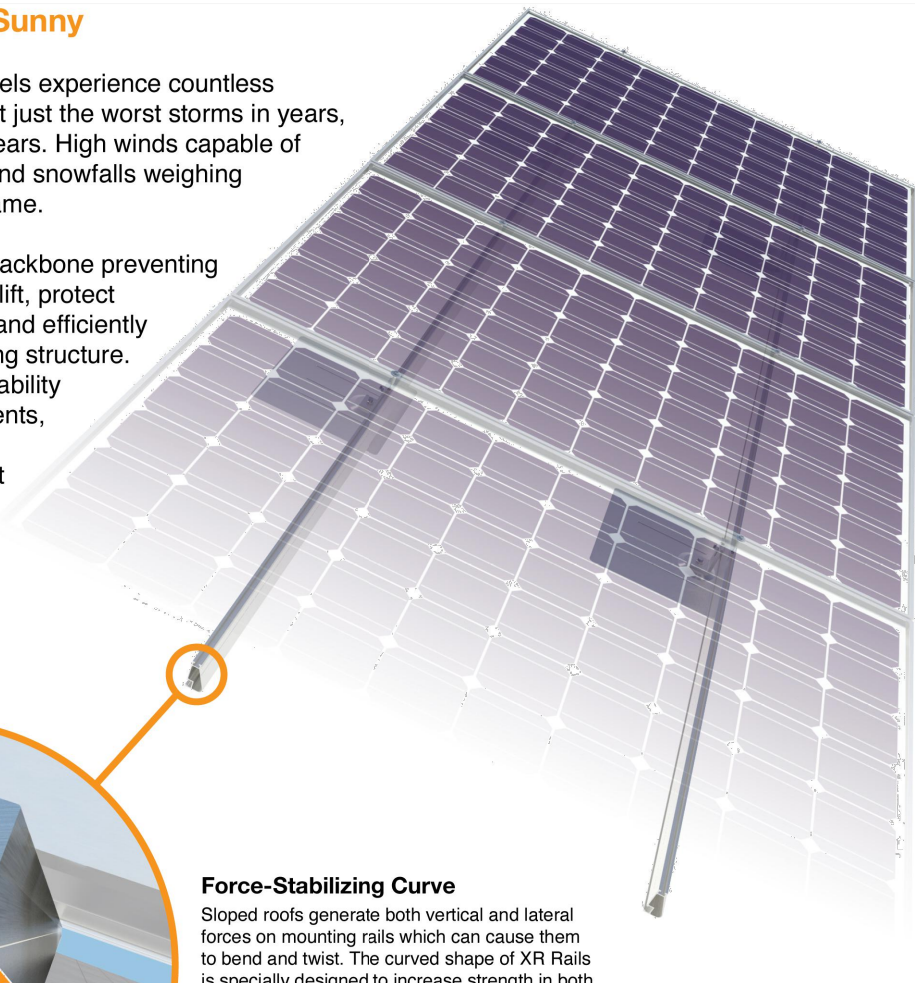


## XR Rail Family

### Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



#### Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

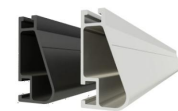
#### Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

#### Corrosion-Resistant Materials

All XR Rails are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



## XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



**XR10**

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available



**XR100**

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



**XR1000**

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

## Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.\* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90						
	120						
	140	XR10		XR100		XR1000	
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
	160						
120	160						
	160						

\*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.



REVISIONS

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 UTILITY: ONCOR  
 ESID: 10443720001405742

SHEET NAME

**EQUIPMENT SPECIFICATION**

SHEET SIZE

**ANSI B  
 11" X 17"**

SHEET NUMBER

**PV-12**



360° Product Tour  
Visit [ironridge.com](http://ironridge.com)

### Mount on all terrains, in no time.

The IronRidge Ground Mount System combines our 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 and driven piles.

**Rugged Construction**  
Engineered steel and aluminum components ensure durability.

**PE Certified**  
Pre-stamped engineering letters available in most states.

**Simple Assembly**  
Just a few simple components and no heavy equipment.

**Design Software**  
Online tool generates engineering values and bill of materials.

**Flexible Architecture**  
Multiple foundation and array configuration options.

**20 Year Warranty**  
Twice the protection offered by competitors.

### Substructure

#### Top Caps



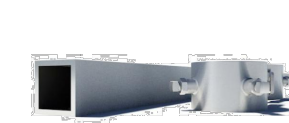
Connect vertical and cross pipes.

#### Rail Connectors



Attach Rail Assembly to horizontal pipes.

#### Diagonal Braces



Optional Brace provides additional support.

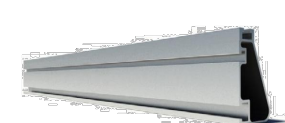
#### Cross Pipe & Piers



Steel pipes or mechanical tubing for substructure.

### Rail Assembly

#### XR1000 Rails



Curved rails increase spanning capabilities.

#### Top-Down Clamps



Secure modules to rails and substructure.

#### Under Clamps



Alternative clamps for pre-attaching modules to rails.

#### Accessories



Wire Clips and End Caps provide a finished look.

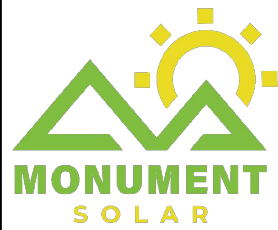
### Resources



**Design Assistant**  
Go from rough layout to fully engineered system. For free.  
[Go to ironridge.com/gm](http://ironridge.com/gm)



**NABCEP Certified Training**  
Earn free continuing education credits, while learning more about our systems.  
[Go to ironridge.com/training](http://ironridge.com/training)



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SHEET NAME  
**EQUIPMENT SPECIFICATION**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-14**