

Project Details			
Name	Tyler Valentine	Date	04/26/2023
Location	673 Highgrove Drive, Spring Lake, NC 28390	Total modules	33
Module	Mission Solar Energy: MSE395SX9R (40mm)	Total watts	13,035
Dimensions	Dimensions: 75.08" x 41.5" x 1.57" (1907.0mm x 1054.0mm x 40.0mm)	Attachments	96
ASCE	7-10	Rails per row	2

System Weight	
Total system weight	1,915.4 lbs
Weight/attachment	20.0 lbs
Racking weight	314.9 lbs
Distributed weight	2.6 psf

Load Assumptions	
Wind exposure	C
Wind speed	119 mph
Ground snow load	15 psf
Attachment spacing portrait	4.0'
Attachment spacing landscape	4.0'

Roof Information			
Roof Material Family	Comp Shingle	Roof material	Comp Shingle
Building height	25 ft	Roof attachment	Flashfoot2
		Staggered attachments	Yes
Roof slope	35 °	Attachment hardware	Square
Risk category	II		

Span Details XR10 - Portrait		
Zone	Max span	Max cantilever
1	5' 6"	2' 2"
2	5' 6"	2' 2"
3	5' 6"	2' 2"

Reaction Forces XR10 - Portrait				
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral (lbs)
1	17	230	196	70
2	20	230	239	70
3	20	230	239	70

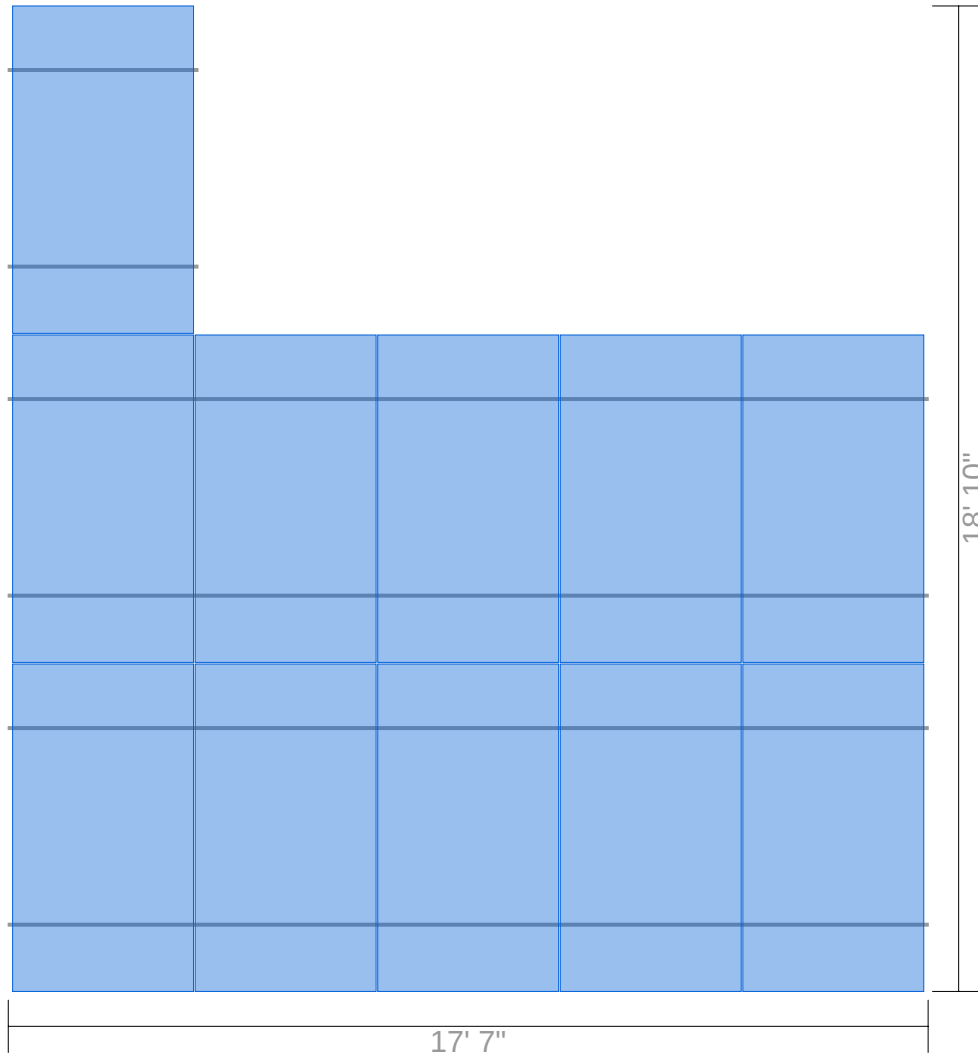
Span Details XR10 - Landscape		
Zone	Max span	Max cantilever
1	7' 1"	2' 10"
2	7' 1"	2' 10"
3	7' 1"	2' 10"

Reaction Forces XR10 - Landscape				
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral (lbs)
1	17	127	109	39
2	20	127	133	39
3	20	127	133	39

Roof Section 1

Details		Weights
Panels: 11	Provided rail: 140' [10 x 168"]	Total weight: 625.5 lbs
Rail orientation: East-West	Attachments: 27	Weight/attachment: 23.2 lbs
Panel orientation: Portrait	Splices: 4	Total Area: 243.3 sq ft
Entry type: Graphical	Clamps: 28	Distributed weight: 2.6 psf

Diagram



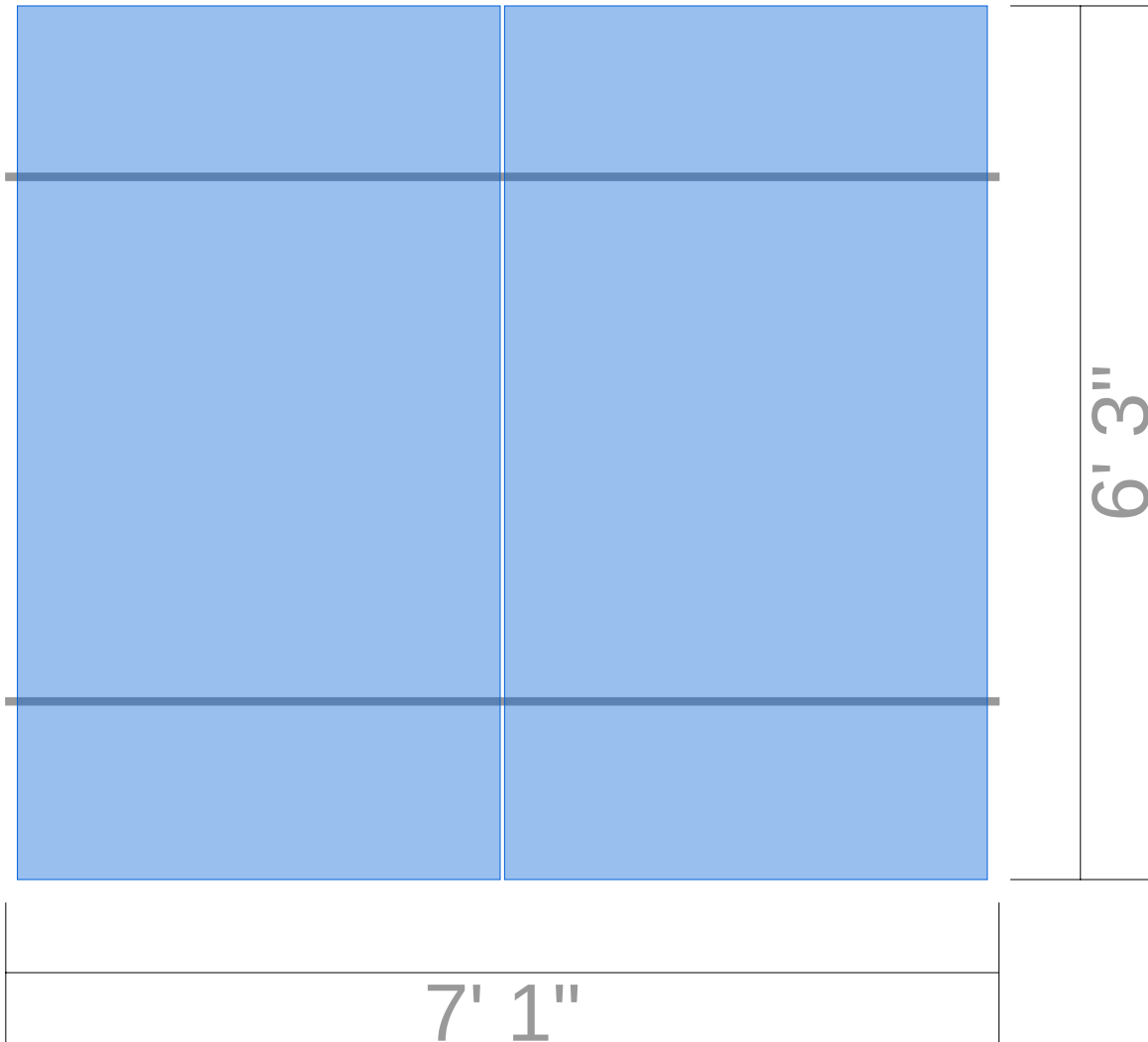
Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	1	3' 8"	3' 8"	0"	28' [2 x 168"]	5	0	4
B	5	17' 7"	17' 7"	10"	56' [4 x 168"]	11	2	12
Row segment totals (x 2) →					112' [8 x 168"]	22	4	24

Roof Section 2

Details		Weights
Panels: 2	Provided rail: 28' [2 x 168"]	Total weight: 114.8 lbs
Rail orientation: East-West	Attachments: 5	Weight/attachment: 23.0 lbs
Panel orientation: Portrait	Splices: 0	Total Area: 44.5 sq ft
Entry type: Graphical	Clamps: 6	Distributed weight: 2.6 psf

Diagram



Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	2	7' 1"	7' 1"	1' 7"	28' [2 x 168"]	5	0	6

Roof Section 3

Details		Weights
Panels: 1	Provided rail: 28' [2 x 168"]	Total weight: 66.2 lbs
Rail orientation: East-West	Attachments: 5	Weight/attachment: 13.2 lbs
Panel orientation: Landscape	Splices: 0	Total Area: 22.2 sq ft
Entry type: Graphical	Clamps: 4	Distributed weight: 3.0 psf

Diagram



Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	1	6' 5"	6' 5"	1' 3"	28' [2 x 168"]	5	0	4

Roof Section 4

Details		Weights
Panels: 1	Provided rail: 28' [2 x 168"]	Total weight: 66.2 lbs
Rail orientation: East-West	Attachments: 5	Weight/attachment: 13.2 lbs
Panel orientation: Landscape	Splices: 0	Total Area: 22.2 sq ft
Entry type: Graphical	Clamps: 4	Distributed weight: 3.0 psf

Diagram



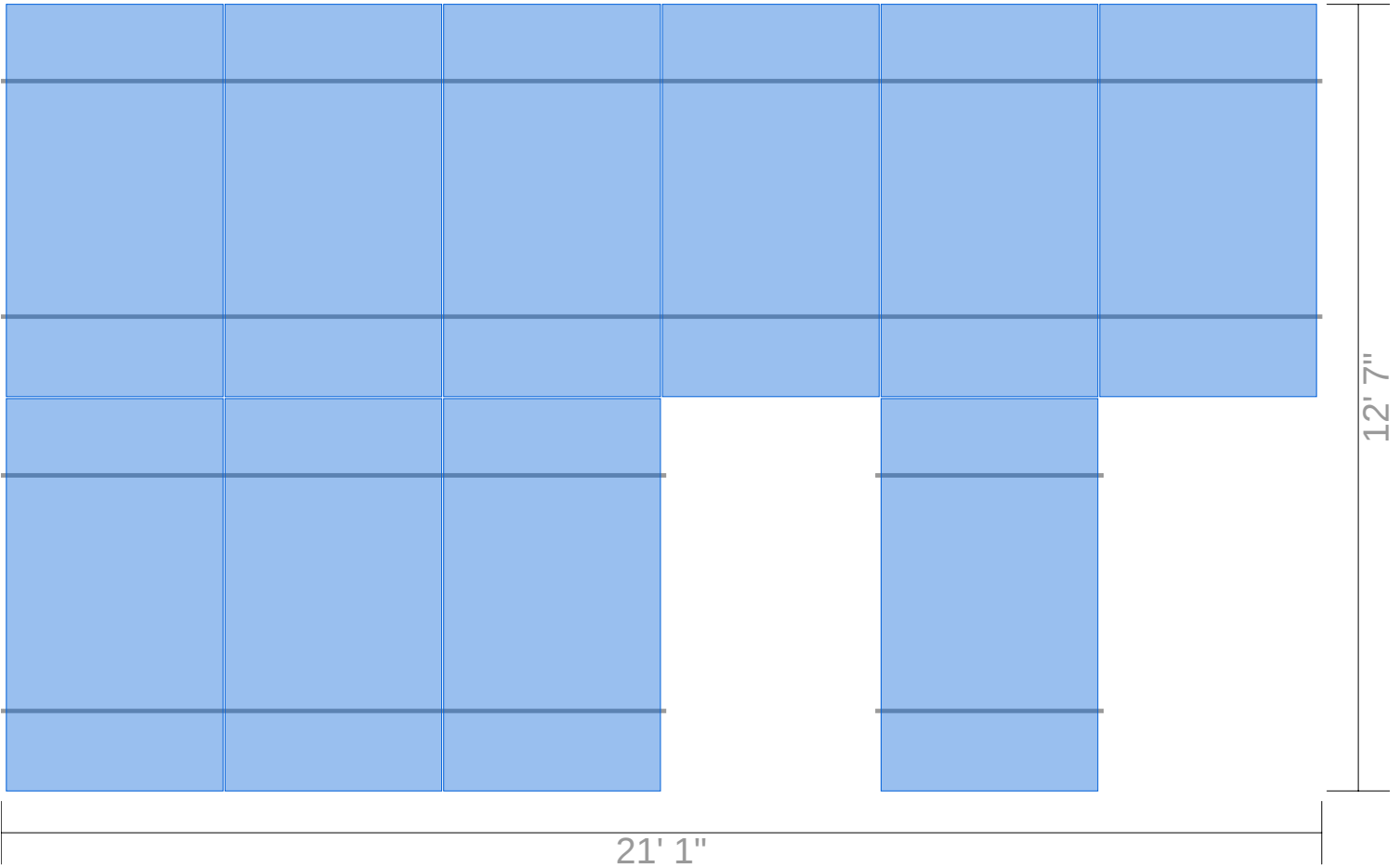
Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	1	6' 5"	6' 5"	1' 3"	28' [2 x 168"]	5	0	4

Roof Section 5

Details		Weights
Panels: 10	Provided rail: 112' [8 x 168"]	Total weight: 561.9 lbs
Rail orientation: East-West	Attachments: 25	Weight/attachment: 22.5 lbs
Panel orientation: Portrait	Splices: 2	Total Area: 220.9 sq ft
Entry type: Graphical	Clamps: 26	Distributed weight: 2.5 psf

Diagram



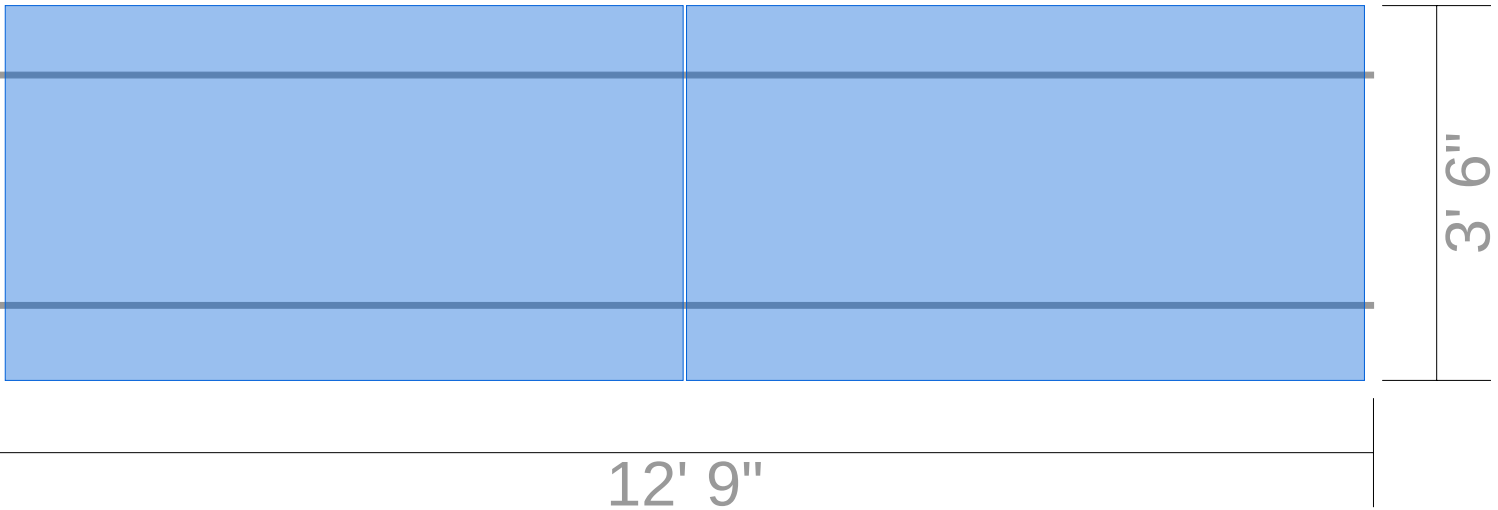
Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	6	21' 1"	21' 1"	6"	56' [4 x 168"]	13	2	14
B	3	10' 7"	10' 7"	1' 4"	28' [2 x 168"]	7	0	8
C	1	3' 8"	3' 8"	0"	28' [2 x 168"]	5	0	4

Roof Section 6

Details		Weights
Panels: 2	Provided rail: 28' [2 x 168"]	Total weight: 118.8 lbs
Rail orientation: East-West	Attachments: 9	Weight/attachment: 13.2 lbs
Panel orientation: Landscape	Splices: 0	Total Area: 44.0 sq ft
Entry type: Graphical	Clamps: 6	Distributed weight: 2.7 psf

Diagram



Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	2	12' 9"	12' 9"	4"	28' [2 x 168"]	9	0	6

Roof Section 7

Details		Weights
Panels: 1	Provided rail: 28' [2 x 168"]	Total weight: 66.2 lbs
Rail orientation: East-West	Attachments: 5	Weight/attachment: 13.2 lbs
Panel orientation: Landscape	Splices: 0	Total Area: 22.2 sq ft
Entry type: Graphical	Clamps: 4	Distributed weight: 3.0 psf

Diagram



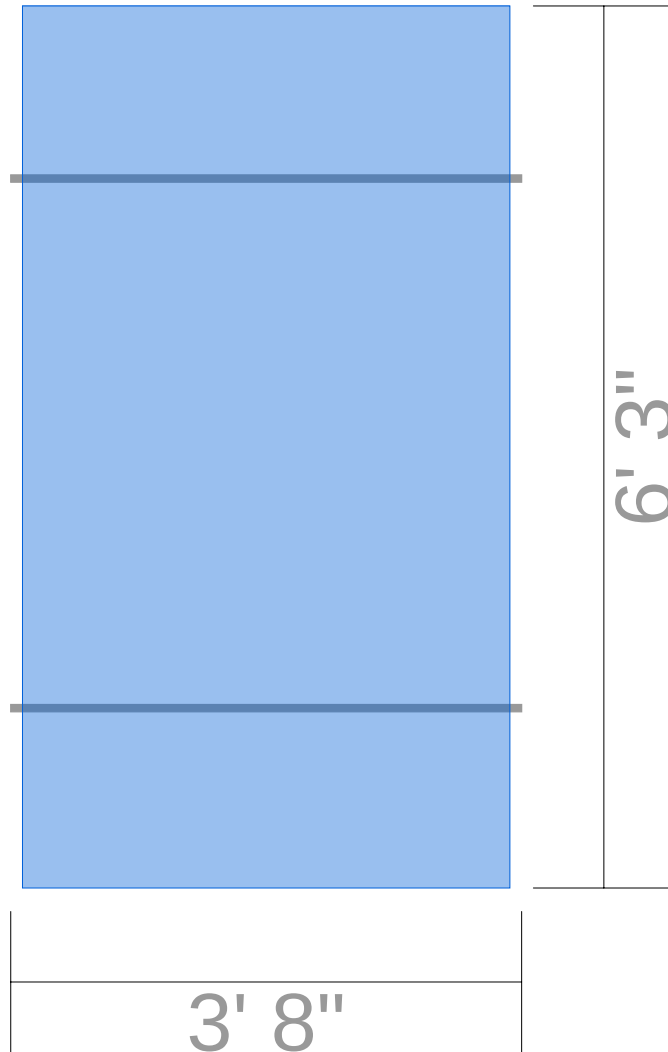
Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	1	6' 5"	6' 5"	1' 3"	28' [2 x 168"]	5	0	4

Roof Section 8

Details		Weights
Panels: 1	Provided rail: 28' [2 x 168"]	Total weight: 66.2 lbs
Rail orientation: East-West	Attachments: 5	Weight/attachment: 13.2 lbs
Panel orientation: Portrait	Splices: 0	Total Area: 22.7 sq ft
Entry type: Graphical	Clamps: 4	Distributed weight: 2.9 psf

Diagram



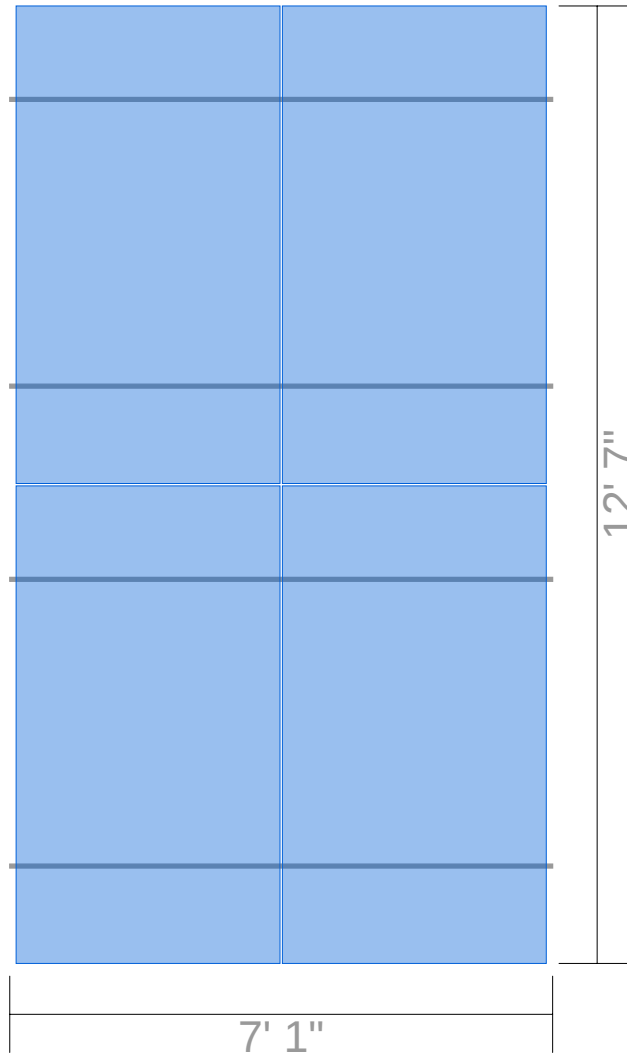
Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	1	3' 8"	3' 8"	0"	28' [2 x 168"]	5	0	4

Roof Section 9

Details		Weights
Panels: 4	Provided rail: 56' [4 x 168"]	Total weight: 229.7 lbs
Rail orientation: East-West	Attachments: 10	Weight/attachment: 23.0 lbs
Panel orientation: Portrait	Splices: 0	Total Area: 89.3 sq ft
Entry type: Graphical	Clamps: 12	Distributed weight: 2.6 psf

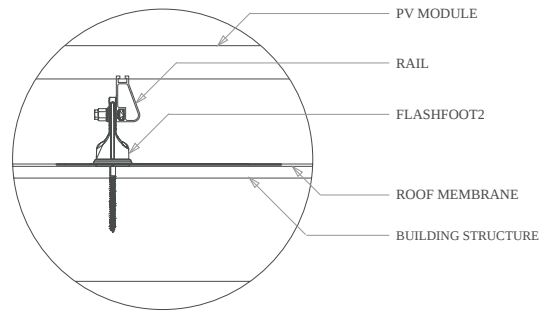
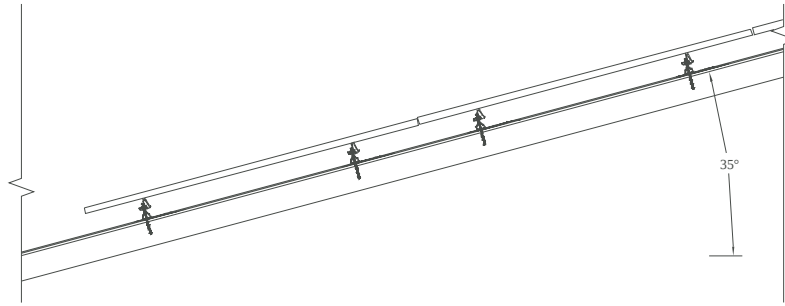
Diagram



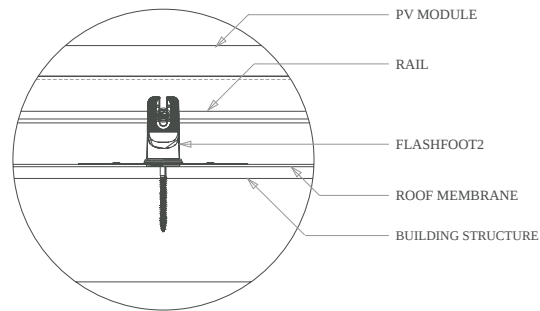
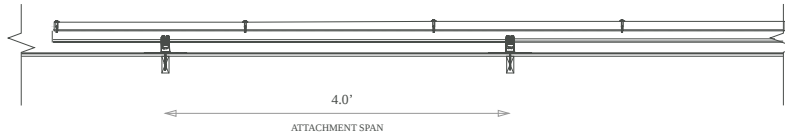
Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps	
A	2	7' 1"	7' 1"	1' 7"	28' [2 x 168"]	5	0	6	
					Row segment totals (x 2) →	56' [4 x 168"]	10	0	12

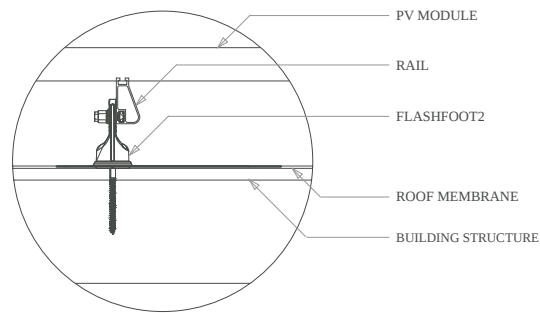
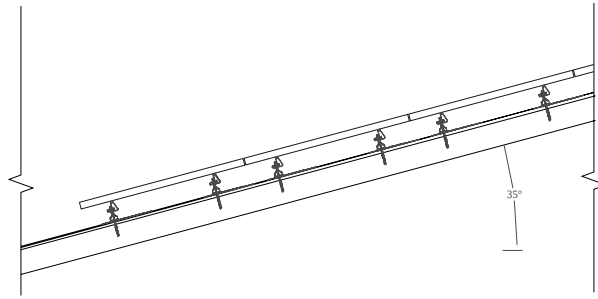
Side View (portrait)



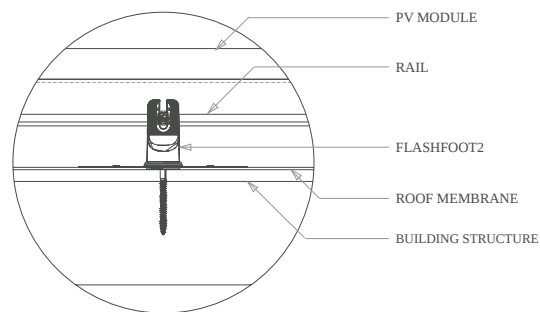
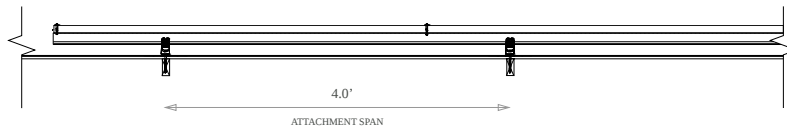
Front View (portrait)



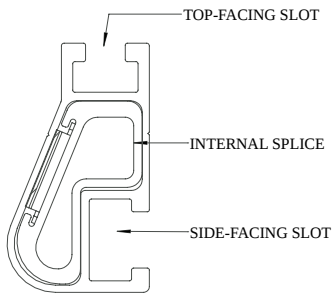
Side View (landscape)



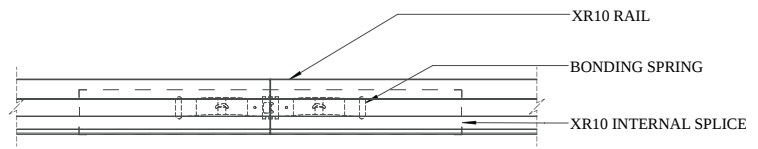
Front View (landscape)



Splice Details

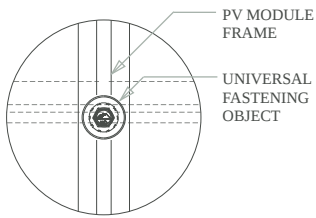


XR10

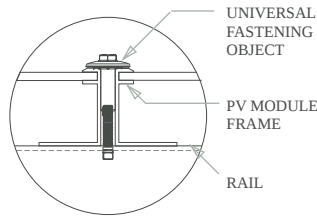


Splice Connection

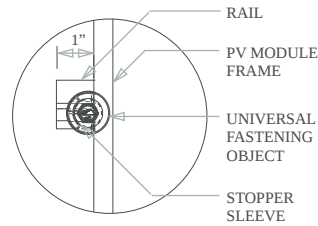
Clamp Detail



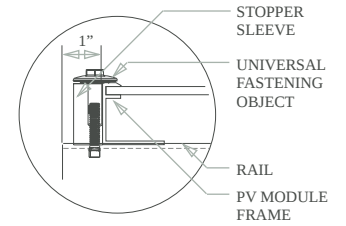
Mid Clamp, Plan



Mid Clamp, Front

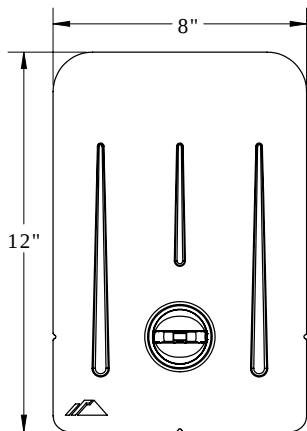


End Clamp, Plan

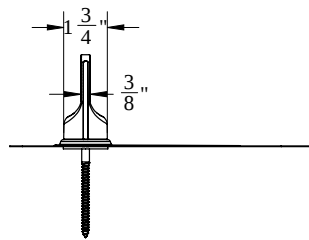


End Clamp, Front

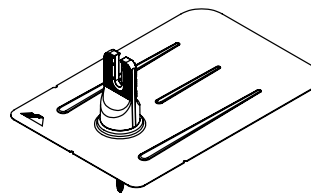
FlashFoot2 Detail



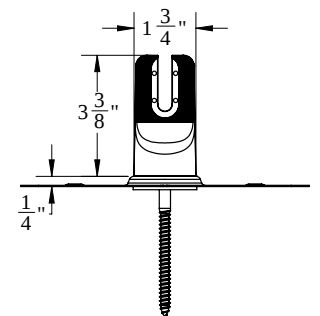
Plan View



Side View

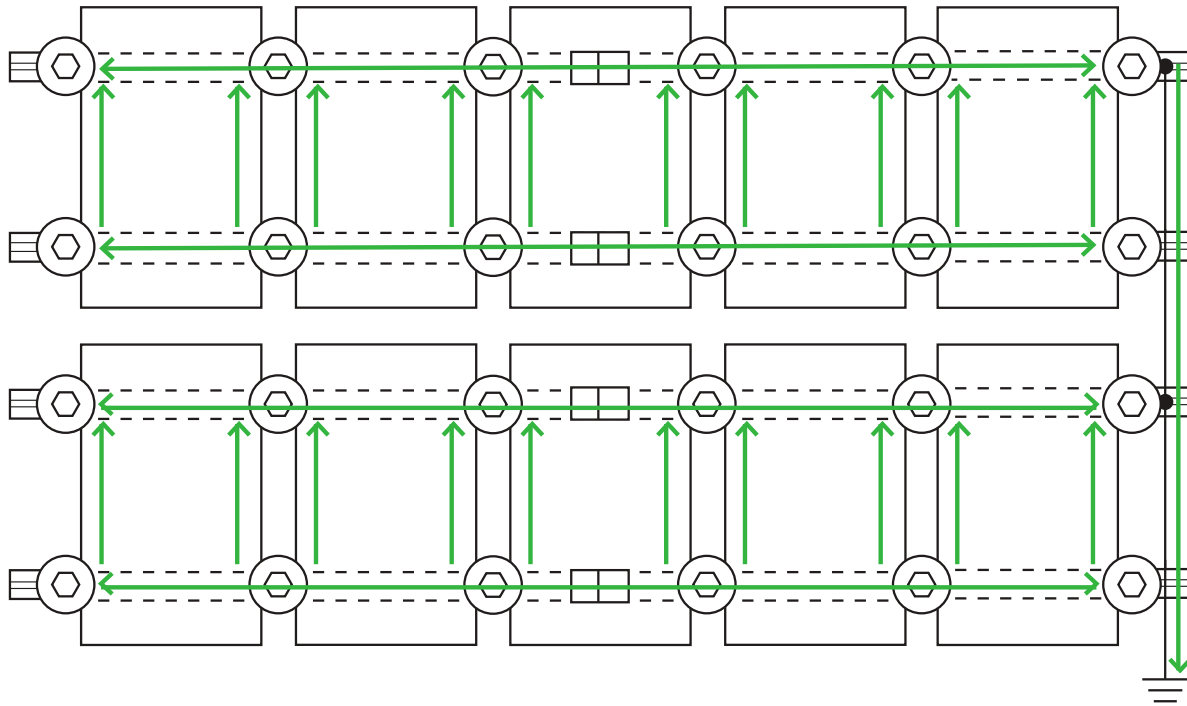


Perspective View





Front View

Grounding Diagram



 UFO Clamp

 Fault Current Ground Path

 Grounding Lug *

 Min 10 AWG Copper Wire *

 Bonded Splice (Rail Connection)

* Grounding Lugs and Wire are not required in systems using Enphase microinverters.

Bill of Materials

Part	Spares	Total Qty
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Rails & Splices

XR-10-168B XR10, Rail 168" (14 Feet) Black	0	34
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XR10-BOSS-01-M1 Bonded Splice, XR10	0	6
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Clamps & Grounding

UFO-CL-01-B1 Universal Module Clamp, Black	0	94
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UFO-STP-40MM-B1 Stopper Sleeve, 40MM, Black	0	56
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XR-LUG-03-A1 Grounding Lug, Low Profile	0	14
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Attachments

FF2-02-B2 FlashFoot2, Black	0	96
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BHW-SQ-02-A1 Square-Bolt Bonding Hardware	0	96
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