SKY-RACK 2.0 Ground Mount System

INSTALLATION GUIDE

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PRODUCT SPEC SHEET

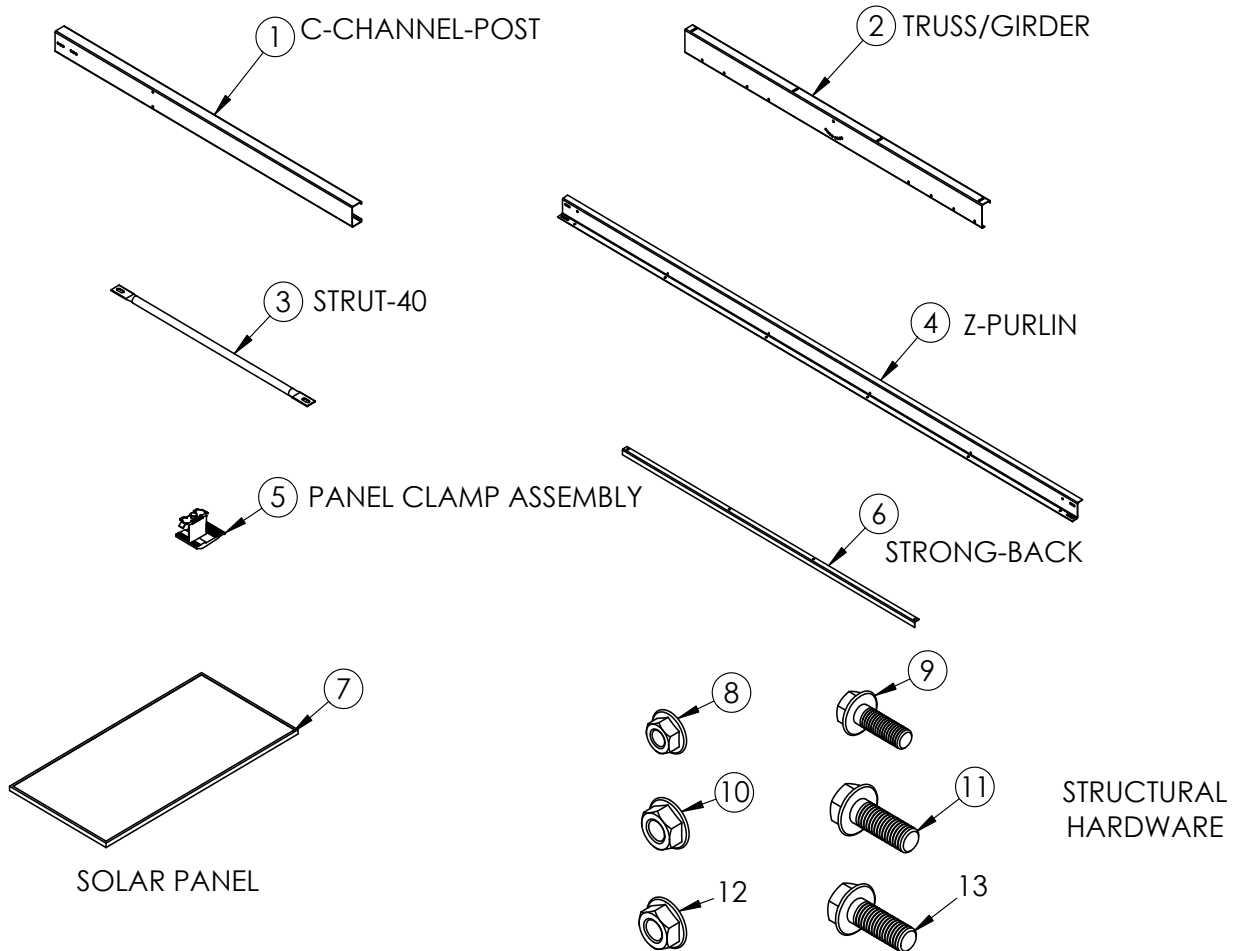Fixed Tilt System - Module Clamp Kits or Direct to Frame   Season Adjust - Manual

TILT ANGLE	5 - 40 DEGREES	TERRAIN	+/- 5 DEG E/W
MODULE ORIENTATION	2 HIGH PORTRAIT	WIRE MANAGEMENT	ZIP TIE HOLES AVAILABLE
WIND LOAD	125 MPH	WARRANTY	20 - 25 YEAR OPTIONS
SNOW LOAD	60 PSF	MATERIAL	GRADE 50 - 60 HSLA STEEL
GROUND CLEARANCE	24 - 36 IN	COATING	GALVANIZED
MODULE CLAMPS OR DIRECT TO FRAME	OPTIONAL	MANUFACTURING	USA - MICHIGAN MADE

Note: Higher wind load/snow load options are available.
Formal site specific structural calculations available upon request.

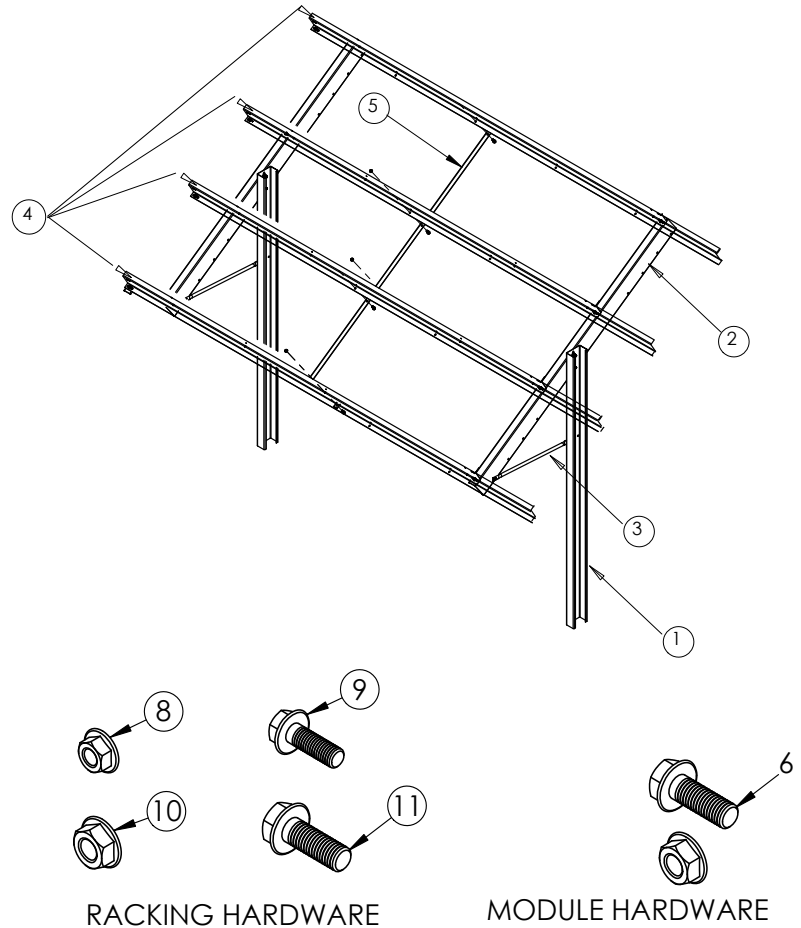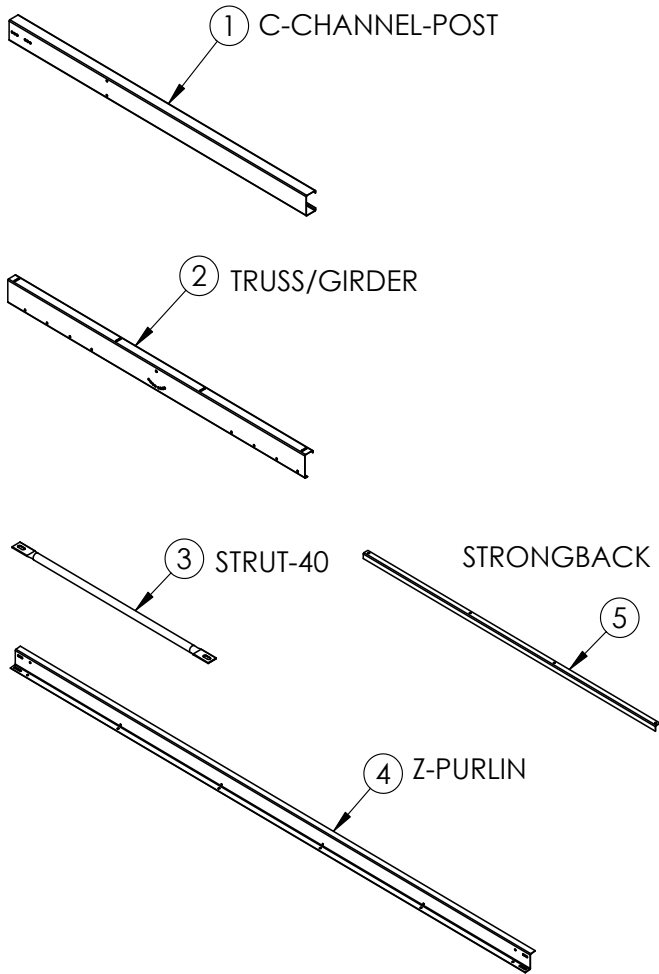| 4X MAIN COMPONENTS	ADDITIONAL COMPONENTS	MINIMAL HARDWARE
1. C-CHANNEL-POST	HIGH WIND/SNOW	2 X 5/8-11 X 1 3/4 BOLTS
2. STRUT-40	STRONG-BACKS	2 X 5/8-11 SERRATED NUTS
3. TRUSS/GIRDER	CANTILEVERS	14 X 1/2-13 X 1 3/4 BOLTS
4. Z-PURLIN (2-5 PANEL LENGTHS)	STRUT-50	14 X 1/2-13 SERRATED NUTS

CLAMP DESIGN: Included Parts List

SDE

① C-CHANNEL-POST

② TRUSS/GIRDER

③ STRUT-40

④ Z-PURLIN

⑤ PANEL CLAMP ASSEMBLY

⑥ STRONG-BACK

⑦ SOLAR PANEL

⑧ ⑨ ⑩ ⑪ ⑫ ⑬ STRUCTURAL HARDWARE

ITEM NO.		QTY
1	C-CHANNEL-POST	2
2	TRUSS/GIRDER	2
3	STRUT-40	21
4	Z-PURLIN	4
5	PANEL CLAMP ASSEMBLY	20
6	STRONG-BACK	1
7	PV MODULE	10
8	1/2-13 FLANGE HEAD NUT	14
9	1/2-13 X 1.5 FLANGE HEAD BOLT	14
10	5/8-11 FLANGE HEAD NUT	4
11	5/8-11 X 1.75 FLANGE HEAD BOLT	4

ITEM NO.	Recommended Installation Tools:	QTY
	1/4 or 1/2 1500 in/lb MIN Impact Driver 1/2 - 3/4 - 15/16 in Impact Sockets (Always take extra batteries)	
5	**TORQUE SPEC =12 ft/lbs**	20
9	**TORQUE SPEC =57 ft/lbs**	14
11	**TORQUE SPEC = 112 ft/lbs**	2

Note: Z-PURLIN 49.5 East & West Cantilevers are available - See Design Requirements & Bill of Materials

DIRECT TO FRAME DESIGN:
Included Parts List

1 C-CHANNEL-POST

2 TRUSS/GIRDER

3 STRUT-40

STRONGBACK

5

4 Z-PURLIN

8 9 10 11 6

RACKING HARDWARE MODULE HARDWARE

ITEM NO.	DESCRIPTION	QTY
1	C-CHANNEL-POST	2
2	TRUSS/GIRDER	2
3	SUPPORT STRUT	2
4	Z-PURLIN	4
5	STRONG-BACK	1
6	1/4-20 SERRATED FLANGED BOLT/NUT	40
7	PV MODULE	10
8	1/2-13 FLANGE HEAD NUT	14
9	1/2-13 X 1.5 FLANGE HEAD BOLT	14
10	5/8-11 FLANGE HEAD NUT	4
11	5/8-11 X 1.75 FLANGE HEAD BOLT	4

TORQUE	Recommended Installation Tools:	
	1/4 or 1/2 1500 in/lb MIN Impact Driver 1/2 - 3/4 - 15/16 in Impact Sockets (Always take extra batteries)	
6	**TORQUE SPEC =6 ft/lbs**	40
9	**TORQUE SPEC =57 ft/lbs**	14
11	**TORQUE SPEC = 112 ft/lbs**	4

Note: Z-PURLIN 49.5 East & West Cantilevers are available - See Design Requirements & Bill of Materials

Safety Information

⚠ IMPORTANT

It is highly recommended that system installation and any subsequent modifications, disassembly, or reassembly be conducted by a factory authorized representative. Contact SDE for additional information.

⚠ CAUTION: WATCH FOR WIRES!

Extreme caution should be taken when installing near power lines. For your own personal protection, the following safety steps should be taken:
- Perform as many functions as possible on the ground.
- Watch out for overhead power lines. Check the distance to the power lines before starting installation.
- Recommended minimum distance of 6 meters (20 feet) from all power lines.
- Do not use metal ladders.
- Do not install assembly on a windy day.
- If assembly slips, move away from it and let if fall.
- If any part of the assembly comes in contact with a power line, call your local power company. DO NOT TRY TO REMOVE IT YOURSELF! They will remove it safely.
- Make sure that the assembly is properly grounded.

⚠ WARNING

Assembling on windy days can be dangerous. Additional precautions should be taken when assembling in high wind areas. The modules surface, even in slight winds, create strong forces. Be prepared to safely handle these forces at unexpected moments. Do not attempt to assemble, move or mount assembly on windy days or serious, even fatal accidents may occur.
SDE is not responsible or liable for damage or injury resulting from antenna installations.

⚠ WARNING

Units improperly installed or installed to an inadequate structure can be susceptible to wind damage. This damage can be very serious and even life threatening. The owner and installer assumes full responsibility that the installation is structurally sound to support all loads (weight, wind and ice) and properly sealed against leaks. SDE will not accept liability for any damage caused due to the many unknown variable applications.
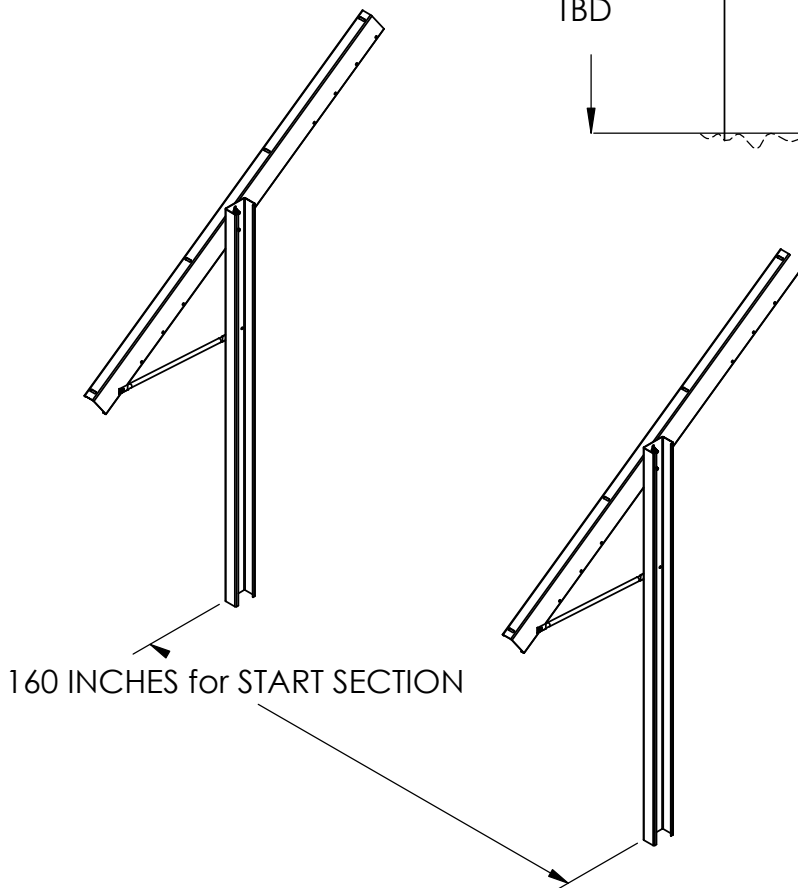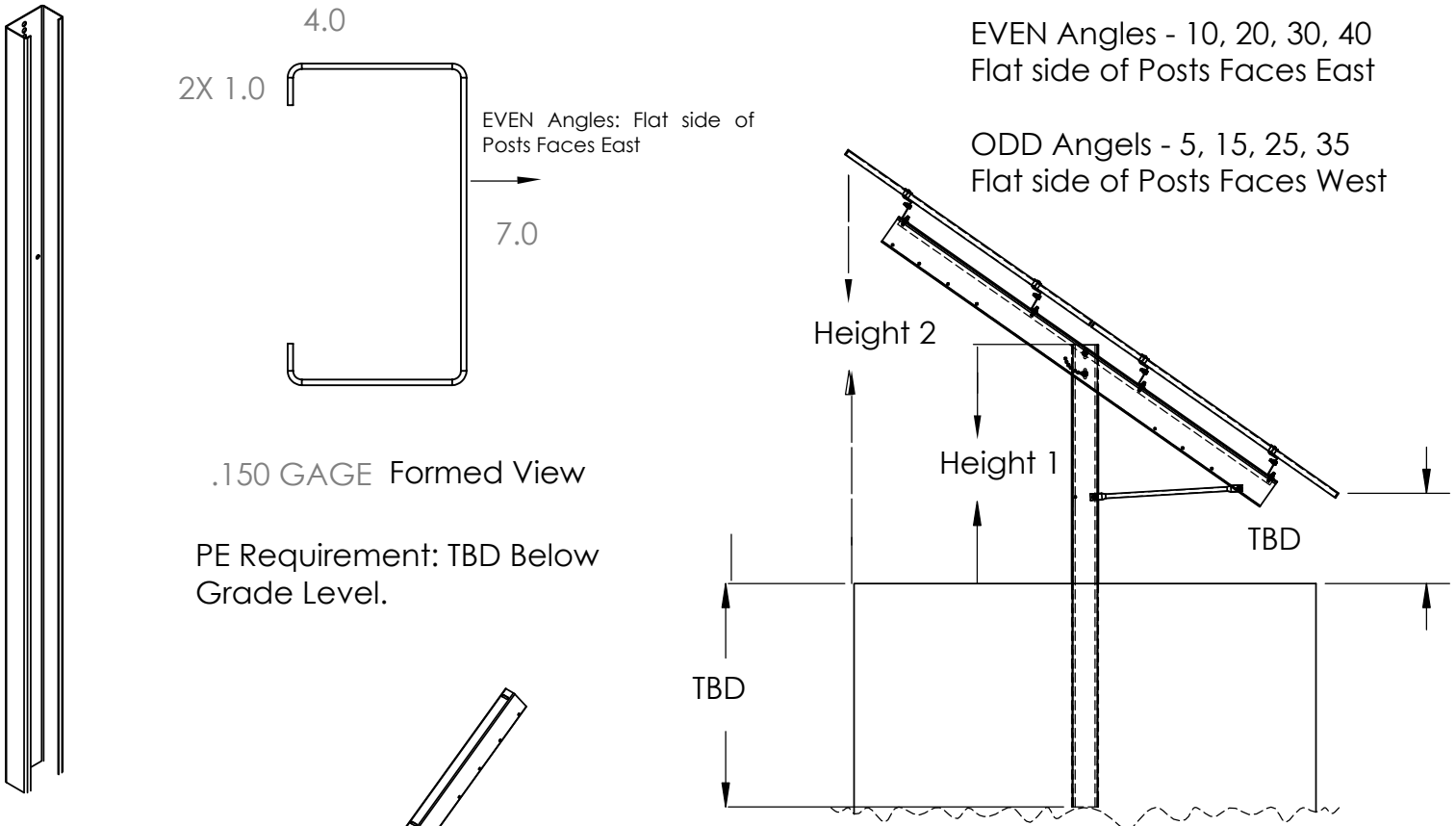
1.0 System Set-up Procedure

Warning: Extreme care must be taken for this setup procedure to avoid bodily injury and/or equipment damage.

1.1 Post Install

Choose a site that is as level as possible. Install depth will be determined by many factors, such as region and local building code & national ASCE requirements.

4x7 C-Channel (.150 GAGE) GRADE 50 - G90 Coating with Chem-Guard

4.0

2X 1.0

EVEN Angles: Flat side of Posts Faces East

7.0

EVEN Angles - 10, 20, 30, 40
Flat side of Posts Faces East

ODD Angels - 5, 15, 25, 35
Flat side of Posts Faces West

.150 GAGE Formed View

PE Requirement: TBD Below Grade Level.

Height 2

Height 1

TBD

TBD

160 INCHES for START SECTION

Angle	Height 1	Height 2
45	73.5	134
40	68	124
35	62.5	113
30	57	102
25	51	90
20	44	77
15	38	64
10	31	51
5	25	38

4

1.0 System Set-up Procedure - POST DRIVEN SYSTEM

Warning: Extreme care must be taken for this setup procedure to avoid bodily injury and/or equipment damage.

STEP 1: IF USING CLAMPS, VERIFY YOUR PANEL PROGRESSION CALCULATION
(Module Width + .4in Clamp Width) Multiplied by # of Modules. This will determine the minimum amount of racking needed.

STEP 2: POST SPACING DIMENSIONS FOR Z-PURLIN-204
202in Center to Center spacing (10x Panel Section)
182 or *142in Center to Center spacing (8x Panel Section Options)
142 or *102in Center to Center spacing (6x Panel Section Options)

2x or 4x Panels can be added with Cantilever Extensions on the end of the arrays (Z-PURLIN-48.5)

We recommend building the system from East to West, as it is more efficient to overlap the z-purlins progressively on top.

STEP 2: POST SPACING DIMENSIONS FOR Z-PURLIN-214
212in Center to Center spacing (10x Panel Section)
153 Center to Center spacing (8x Panel Section Options)
111 Center to Center spacing (6x Panel Section Options)

2x or 4x Panels can be added with Cantilever Extensions on the end of the arrays (Z-PURLIN-48.5)

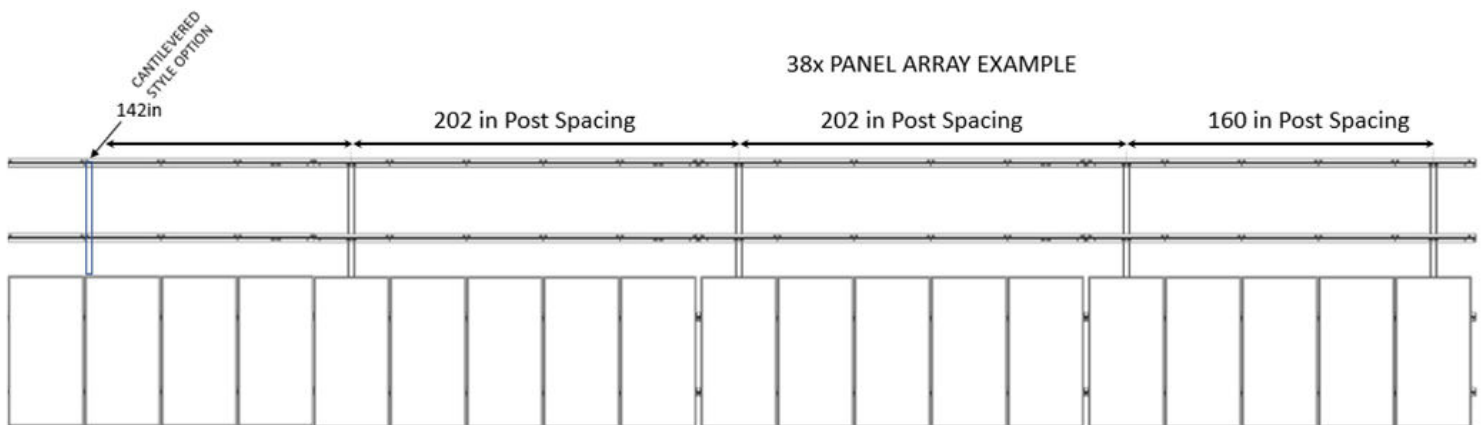**We recommend building the system from East to West, as it is more efficient to overlap the**

* Recommended for Cantilever Design

204in Z-PURLIN POST TEMPLATE OVERVIEW BY MODULE QUANTITY

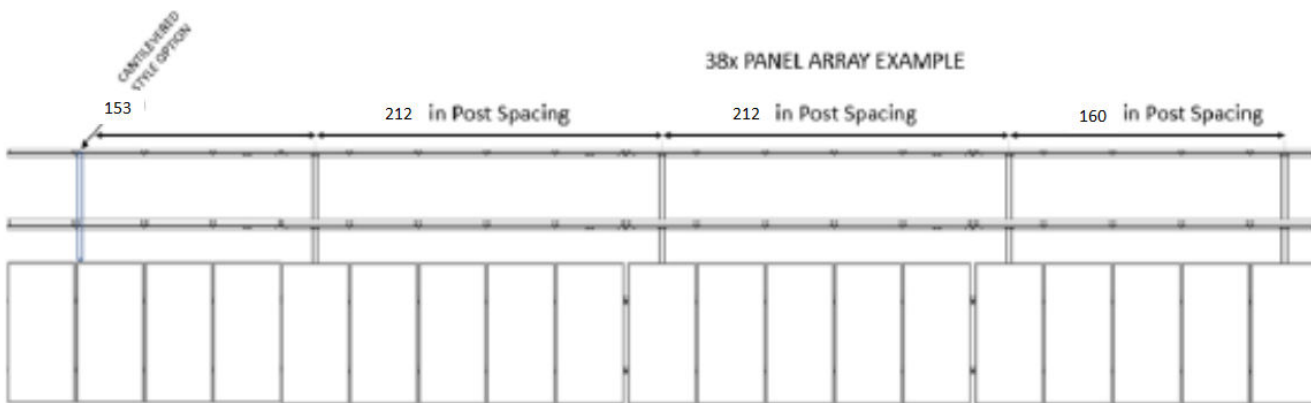| # OF MODULES	START SECTION	ADD SECTION 1	ADD SECTION 2	ADD SECTION 3	ADD SECTION 4	ADD SECTION 5
8	142 in					
10	160 in (10x PANEL SECTION)					
12	160 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)				
14	160 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)				
16	160 in (10x PANEL SECTION)	102 in (6x PANEL SECTION)				
18	160 in (10x PANEL SECTION)	142 in (8x PANEL SECTION)				
20	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)				
22	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)			
24	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)			
26	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	102 in (6x PANEL SECTION)			
28	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	142 in (8x PANEL SECTION)			
30	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)			
32	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)		
34	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)		
36	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	102 in (6x PANEL SECTION)		
38	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	142 in (8x PANEL SECTION)		
40	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)		
42	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)	
44	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)	
46	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	102 in (6x PANEL SECTION)	
48	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	142 in (8x PANEL SECTION)	
50	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	
52	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)
54	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)
56	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	102 in (6x PANEL SECTION)
58	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	142 in (8x PANEL SECTION)
60	160 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)

38x PANEL ARRAY EXAMPLE

CANTILEVERED STYLE OPTION — 142in — 202 in Post Spacing — 202 in Post Spacing — 160 in Post Spacing

214in Z-PURLIN POST TEMPLATE OVERVIEW BY MODULE QUANTITY

POST DESIGN TEMPLATE

# OF MODULES	START SECTION	ADD SECTION 1	ADD SECTION 2	ADD SECTION 3	ADD SECTION 4	ADD SECTION 5
8	153 in					
10	160 in (10x PANEL SECTION)					
12	160 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)				
14	160 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)				
16	160 in (10x PANEL SECTION)	111 in (6x PANEL SECTION)				
18	160 in (10x PANEL SECTION)	153 in (8x PANEL SECTION)				
20	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)				
22	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)			
24	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)			
26	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	111 in (6x PANEL SECTION)			
28	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	153 in (8x PANEL SECTION)			
30	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)			
32	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)		
34	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)		
36	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	111 in (6x PANEL SECTION)		
38	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	153 in (8x PANEL SECTION)		
40	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)		
42	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)	
44	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)	
46	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	111 in (6x PANEL SECTION)	
48	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	153 in (8x PANEL SECTION)	
50	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	
52	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	(ADD 4x CANTILEVERS)
54	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	(ADD 8x CANTILEVERS)
56	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	111 in (6x PANEL SECTION)
58	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	153 in (8x PANEL SECTION)
60	160 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)

CANTILEVERED STYLE OPTION

38x PANEL ARRAY EXAMPLE

153 | 212 in Post Spacing | 212 in Post Spacing | 160 in Post Spacing
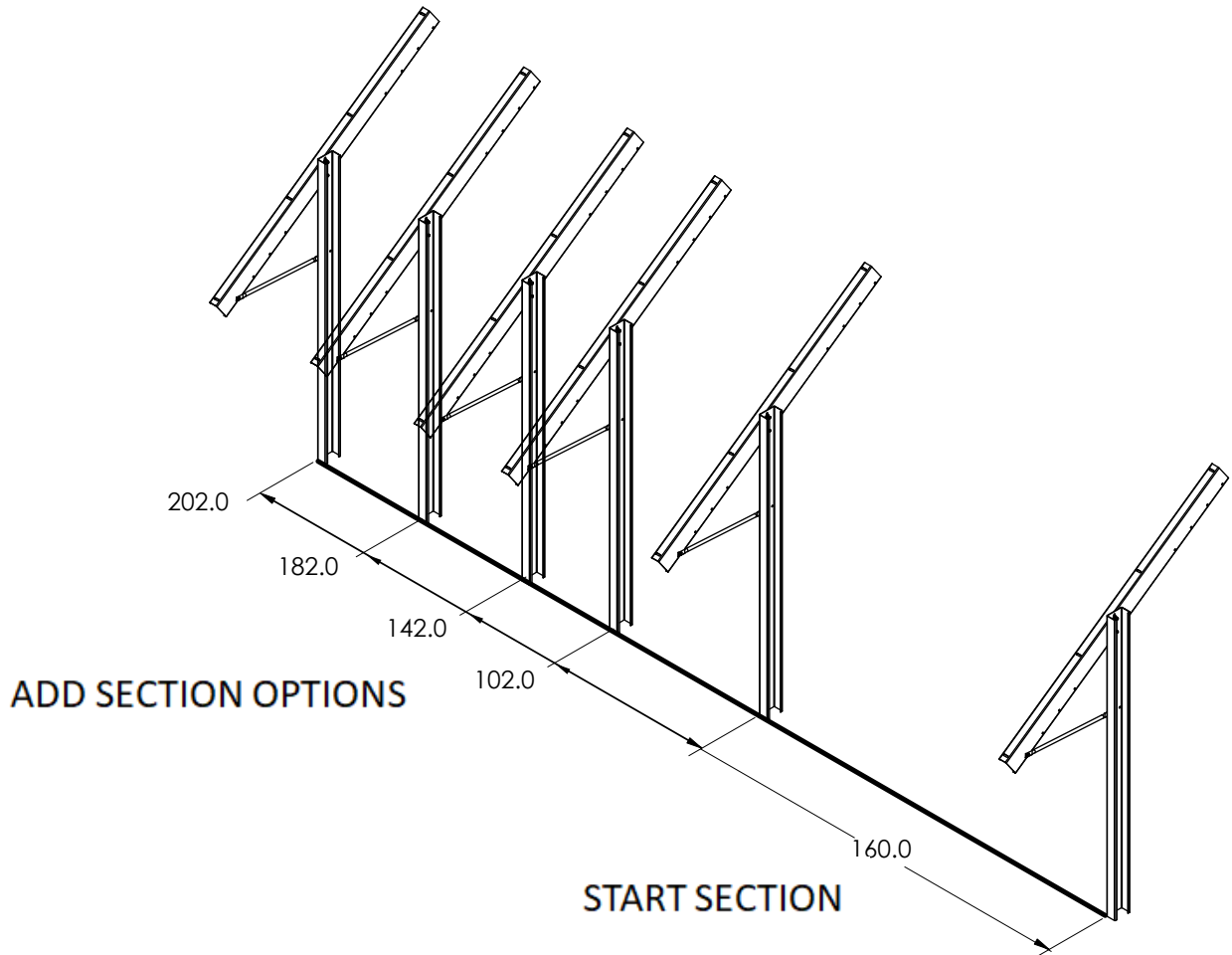
1.0 System Set-up Procedure

1.3 POST SPACING TEMPLATE

10x Panel "START" section requires 160in Post Spacing. 10x Panel
"ADD" sections require 202in Post Spacing.
8x Panel "ADD" sections require 142in Post Spacing.
6x Panel "ADD" sections require 102in Post Spacing.
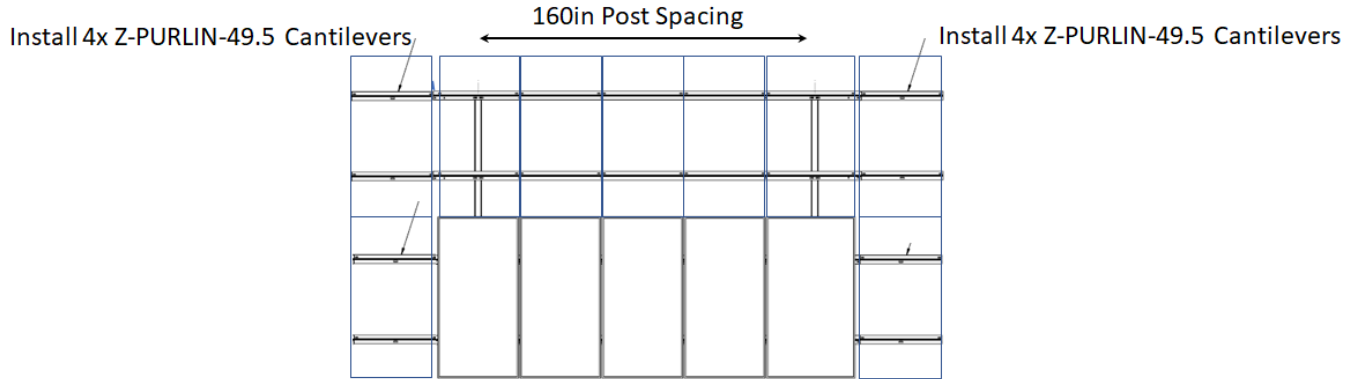2x & 4x Panel "ADD" sections require Z-PURLIN-49.5 Cantilevers

202.0

182.0

142.0

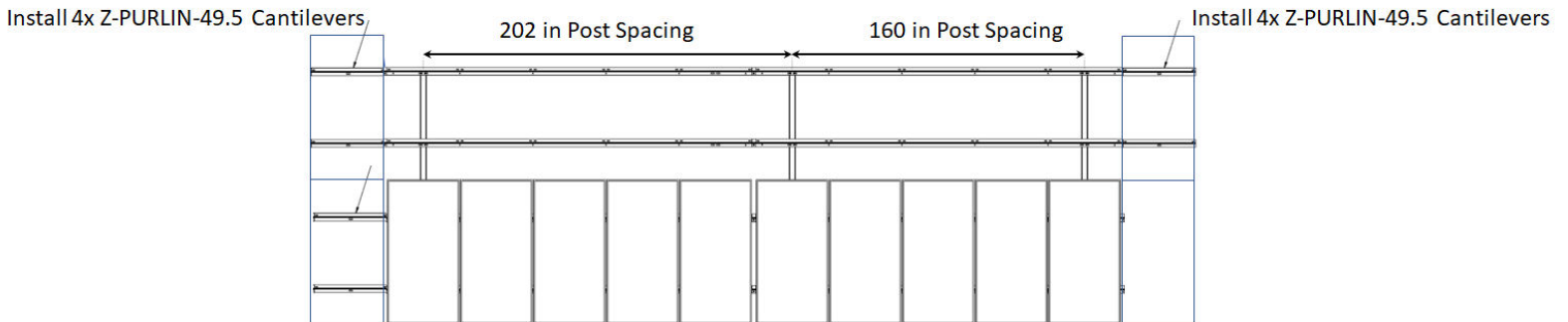**ADD SECTION OPTIONS**

102.0

160.0

START SECTION

1.4 POST SPACING TEMPLATE CONTINUED
SEE BELOW CANTILEVER DESIGN OPTIONS

12x or 14x Panel Array Example with Cantilever Options

160in Post Spacing

Install 4x Z-PURLIN-49.5 Cantilevers   Install 4x Z-PURLIN-49.5 Cantilevers

22x or 24x Panel Array Example with Cantilever Options

Install 4x Z-PURLIN-49.5 Cantilevers   202 in Post Spacing   160 in Post Spacing   Install 4x Z-PURLIN-49.5 Cantilevers

30x PANEL ARRAY EXAMPLE

202 in Post Spacing   202 in Post Spacing   160 in Post Spacing
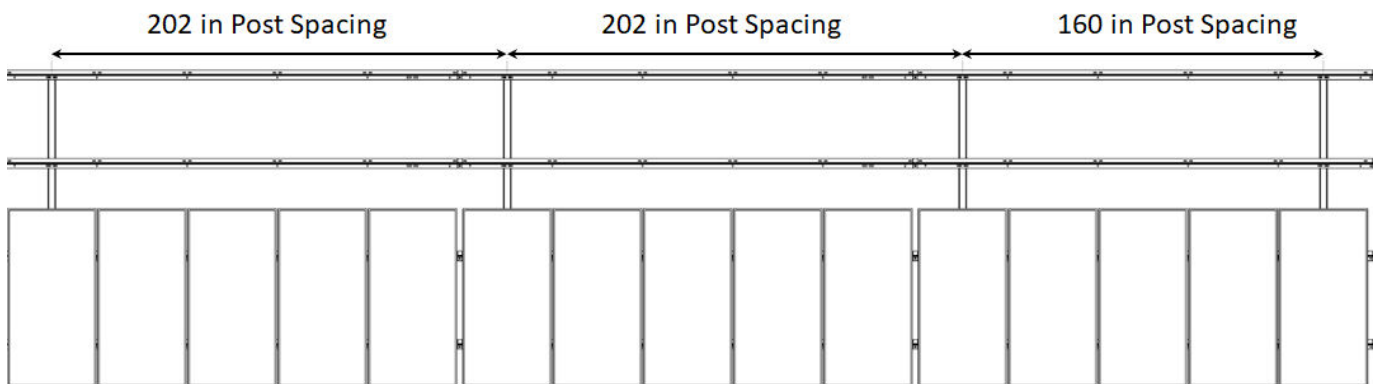
1.0 System Set-up Procedure

1.4 POST SPACING TEMPLATE CONTINUED
SEE BELOW CANTILEVER DESIGN OPTIONS

ENDS AT TRUSS OPTION
142in

CANTILEVERED STYLE OPTION
102in

START SECTION

160 in Post Spacing
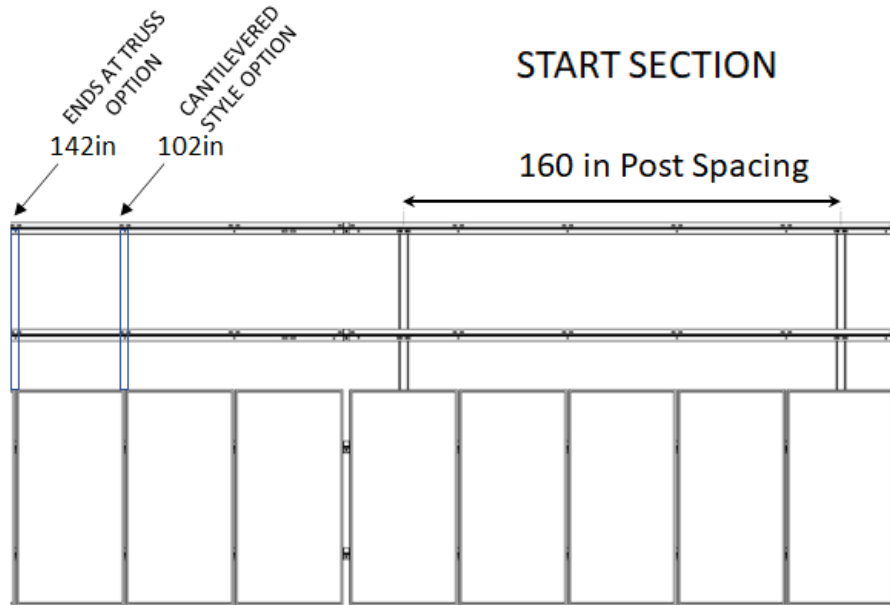
EXAMPLE: 6x PANEL ADD SECTION DESIGN OPTIONS

ENDS AT TRUSS OPTION
182in

CANTILEVERED STYLE OPTION
142in

START SECTION

160 in Post Spacing
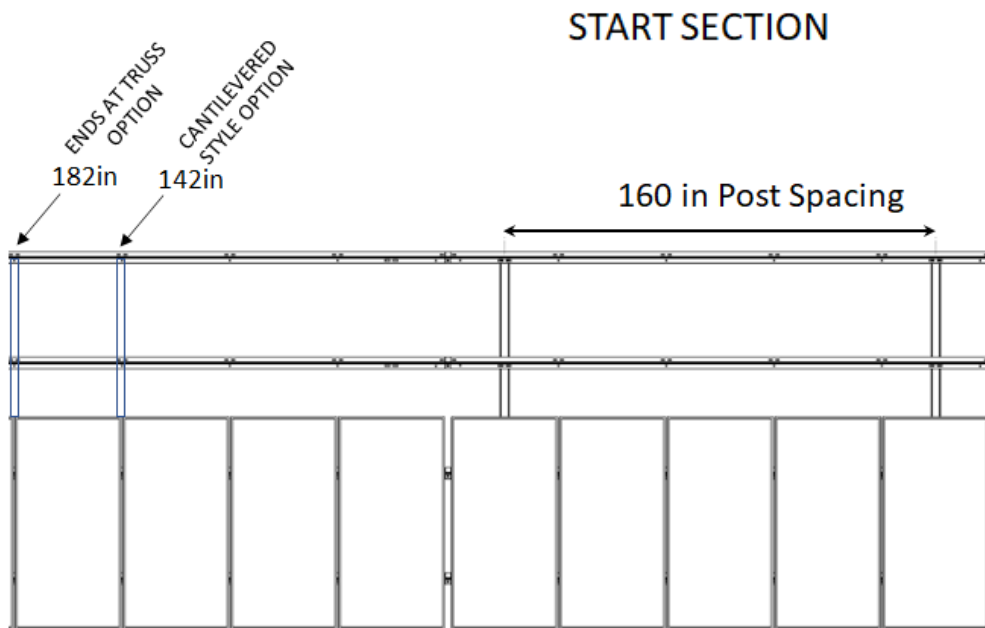
EXAMPLE: 8x PANEL ADD SECTION DESIGN OPTIONS

1.0 System Set-up Procedure

1.2 TRUSS-120 ASSEMBLY TO POST

Fasten angled mount on driven post with provided hardware. Then add support strut with hardware shown. Note: the C-Channel has a 6x hole pattern for +/- 1.0 in tolerance.

Use hole Combo #'s 2 & 5 with 5/8 HDW 1-4 & 3-6 Combos are for additional 1.0in +/- tolerance, if required on the installation site.
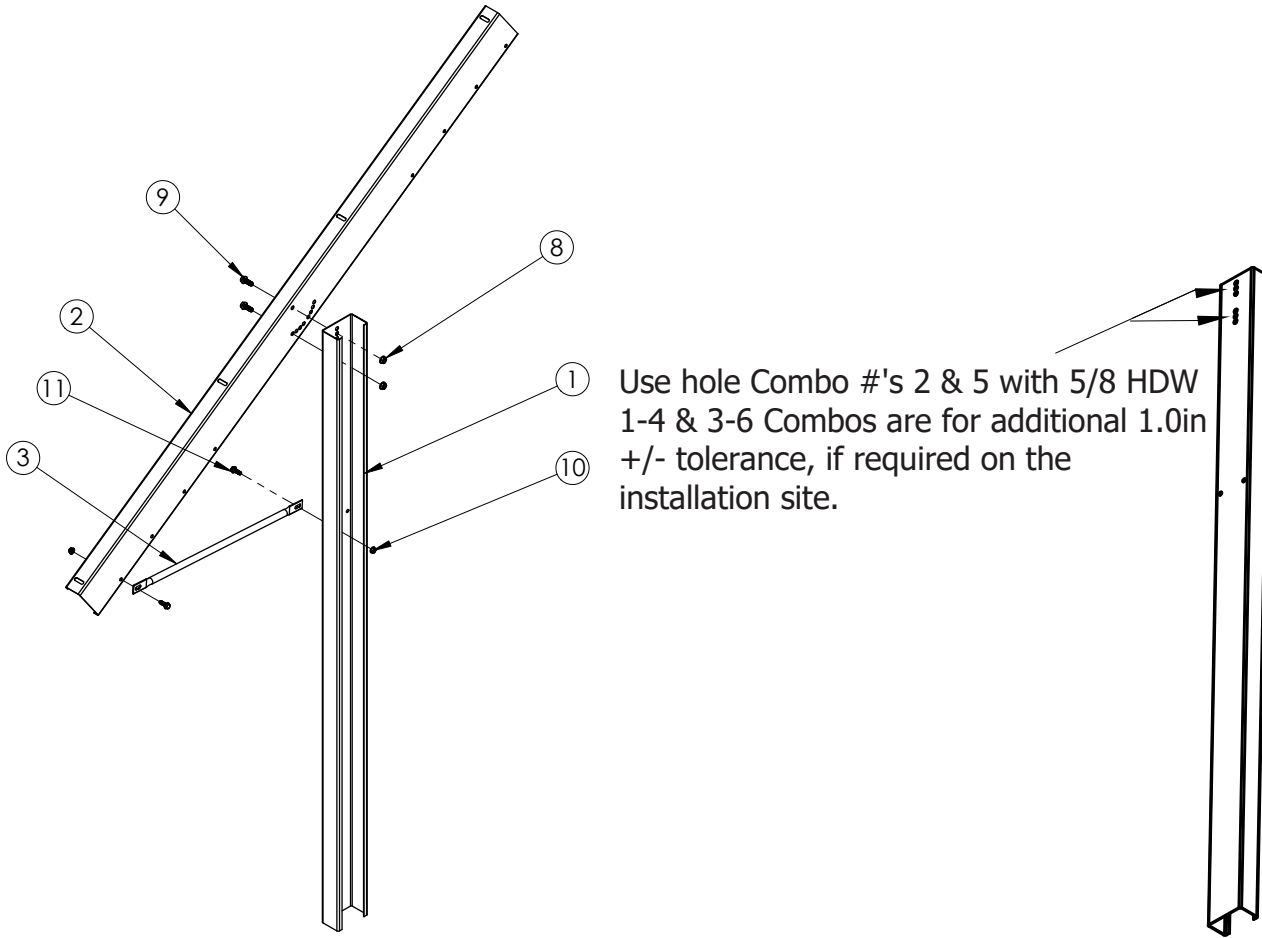
STEP 1: Install TRUSS to the C-Channel Post with 2x 5/8-11 x 1 1/2in Bolts/Nuts.

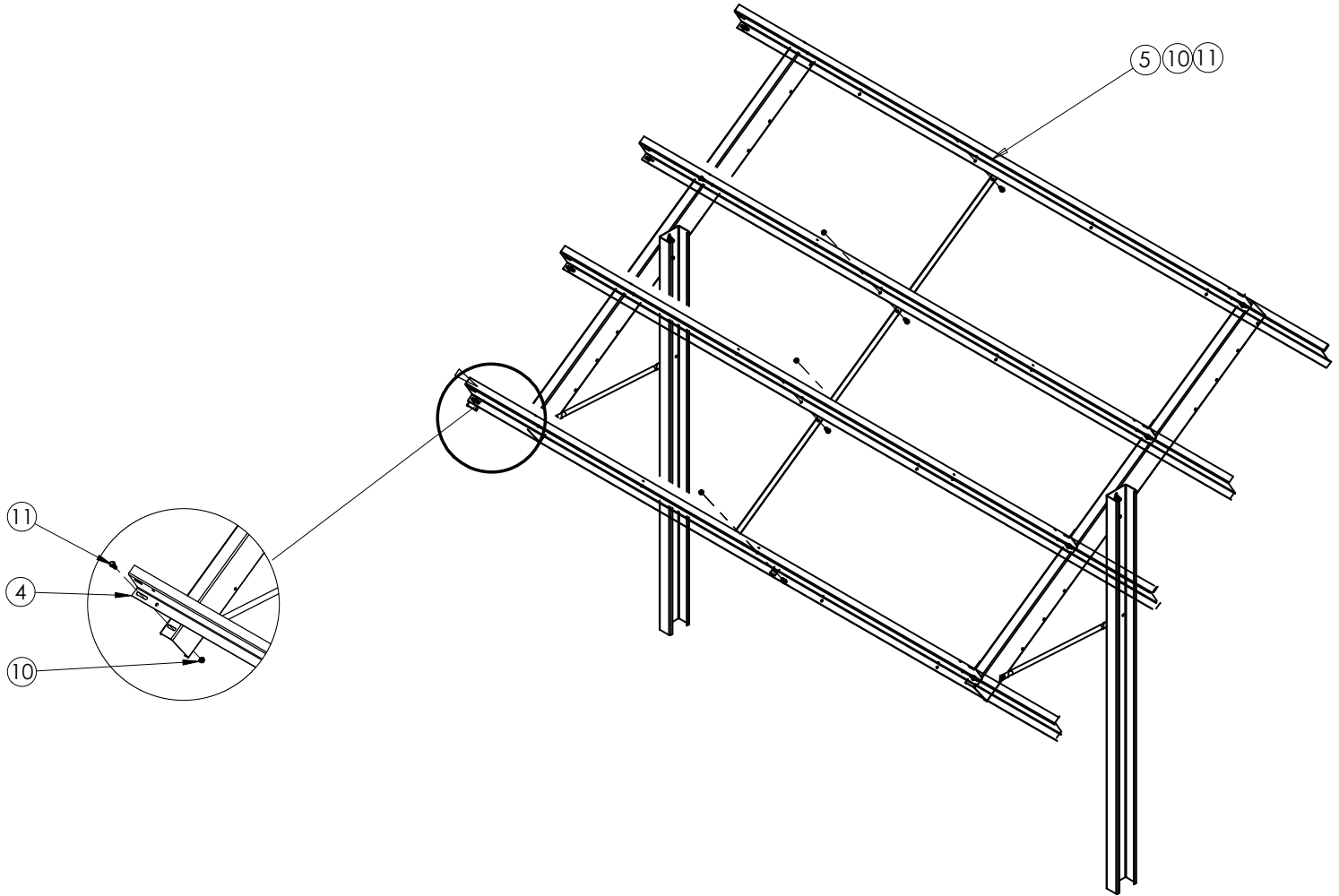**STEP 2: Install STRUT-40 to the C-Channel Post & Truss with 2x 1/2-13 x 1 1/2in Bolts/Nuts**

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1.0 System Set-up Procedure

1.4 Z-PURLIN to TRUSS ASSEMBLY
Attach 4x Z-Purlins to the SLR-TRUSS with 1/2-13 x 1 1/2 Hardware.

Face Top Z-Purlin Flanges North

1.5 STRONG-BACK Install
Install STRONG-BACK to Z-purlins with 4x 1/2-13 hardware as detailed above.
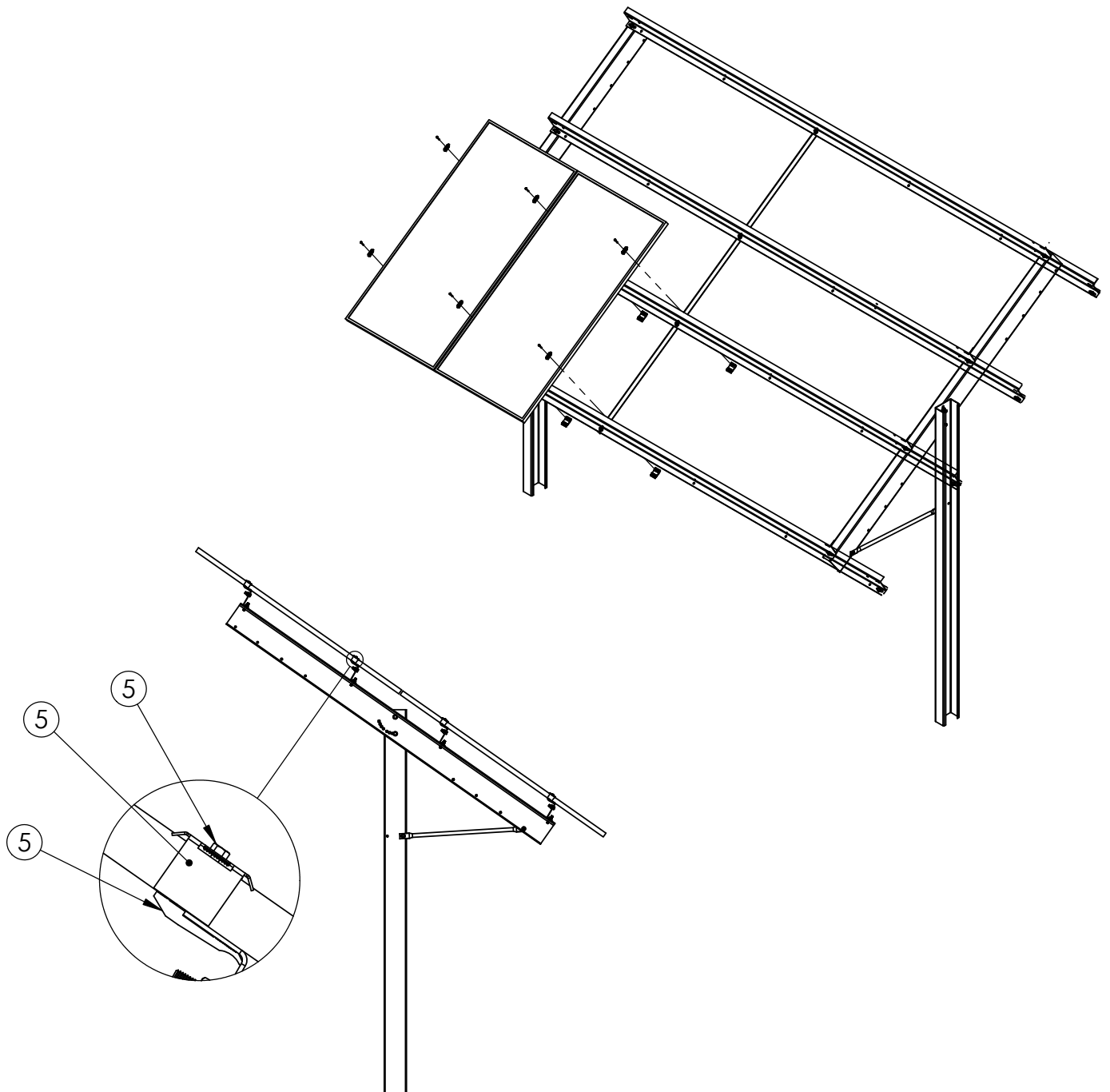
1.0 System Set-up Procedure

1.6 Panel Installation with Clamps

If Panels are to be installed with provided clamp assemblies. This clamp consists of three parts:
1x 5/16 x 2 1/2 Serrated Flanged Bolt - 1x UL Stainless Mid Clamp - 1x Tapped Aluminum Extrusion

1.6.1 Panel Installation without Clamps

If Panels are to be installed direct to frame, line up the module frame holes with the Z-Purlin slots and install 1/4-20 x 5/8 stainless serrated flanged bolts & nuts.
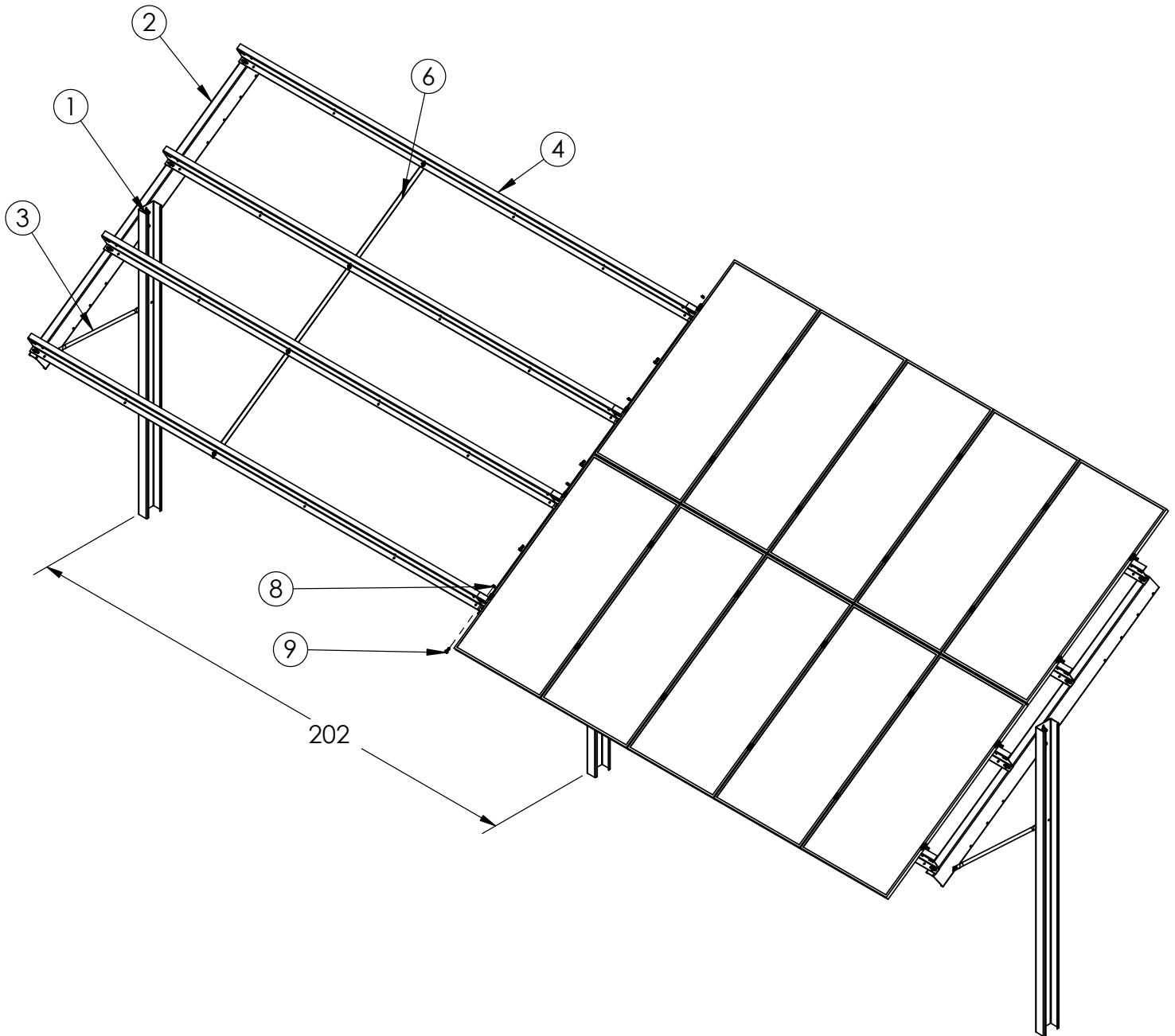
1.0 System Set-up Procedure

1.7.1 Additional Panel Install

Additional panels can be added on to any system at the time of purchase or at a later date. For anything over 2 additional panels, the full extra structure will be required with additonal purlins.
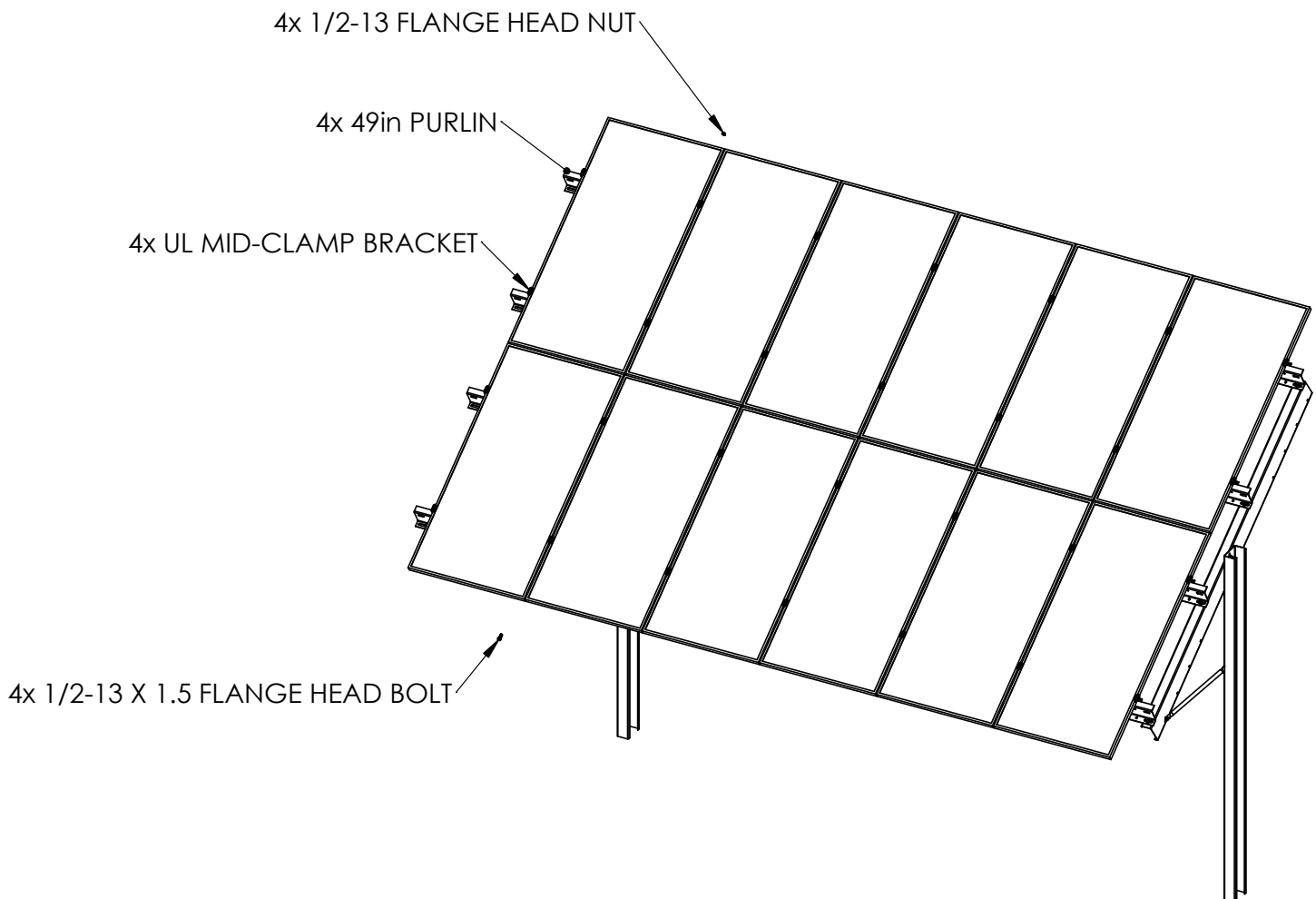
1.0 System Set-up Procedure

1.7.2 Additional Panel Install - 2 panels

Adding 2 panels requires (4) 49 in purlins, (2) additional clamp brackets, (4) bolts, and (4) nuts to attach the short purlins. This can be added on either side to provide shade for the controller.

4x 1/2-13 FLANGE HEAD NUT

4x 49in PURLIN

4x UL MID-CLAMP BRACKET

4x 1/2-13 X 1.5 FLANGE HEAD BOLT

1.0 System Set-up Procedure

1.7.4 Additional Panel Install - 6 panels

Adding 6 panels requires (4) 144 in Z-purlins, (6) additional clamp brackets, (4) bolts, and (4) nuts to attach the short purlins to the long purlins. This also requires the addition of another angled post assembly. You can also set the post spacing to 102in, if you prefer a cantilevered style option.

4X 144IN PURLIN

1X ANGLED POST
ASSEMBLY

142.0

102in Spacing for
Cantilever Option
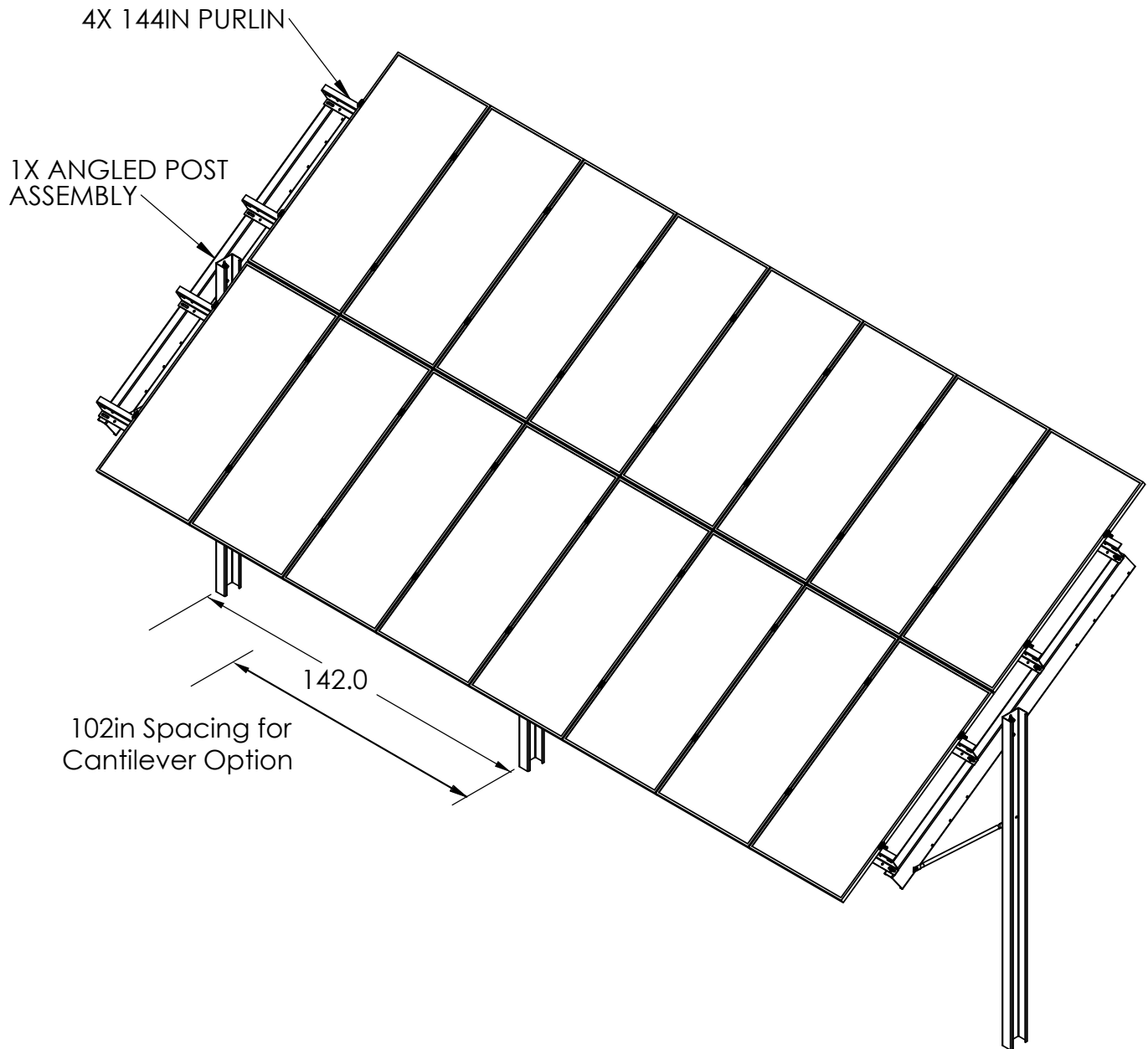
1.0 System Set-up Procedure

1.7.5 Additional Panel Install -8 panels
Adding 8 panels requires (4) 184 in purlins, (8) additional clamp brackets, (4) bolts, and (4) nuts to attach the short purlins to the long purlins. This also requires the addition of another angled post assembly.

4X 184IN PURLIN

1X ANGLED POST ASSEMBLY

182.0

142in Spacing for Cantilever Option