CHIKOUSA

CK- | STEEL SOLAR CARPORT | GAZEBO

1-CAR PREMIER
STEEL SOLAR CARPORT | GAZEBO
INSTALLATION MANUAL

VERSION: 03.25.2024VO2 | ENG

Always use the most recent version of the installation manual before installing your Carport/Gazebo. The installation Manual is subject to change without notice. Please consult with CHIKOUSA to ensure you are utilizing the latest Install Manual.

BRIEF DESCRIPTION

The CK-Steel Carport/Gazebo is a robust solar carport that can accommodate a wide range of panel sizes, with a max (North/South or Up/Down) span of 270”. This structure can be installed with a 2-3 person crew, without the need of any heavy duty tools. The Installation should always be completed by trained professional and/or qualified individuals, who have been adequately instructed and trained about the tasks involved with the installation, including the usage of protective devices, protective measures, relevant provisions, safety regulations and local operating site conditions and have proven competence in all areas of the installation.

Please read carefully this installation manual and all other applicable documents before starting your installation. Please contact CHIKO with any questions that you may have.

MAINTENANCE

1. When signs of rust appear, or when the paint is peeled or removed, you must take steps to remove the rust and paint the affected areas.
2. You must check the bolts once a year ensuring all connections are secure, and after any major storm or weather occurrence. Tighten all bolts according to torque specs.
3. If the columns of the structure are hit, you must replace the columns of the structure immediately.

WARNING

If any structural component of the system to include the column, beam, base plate, or rail are damaged they must be replaced immediately.

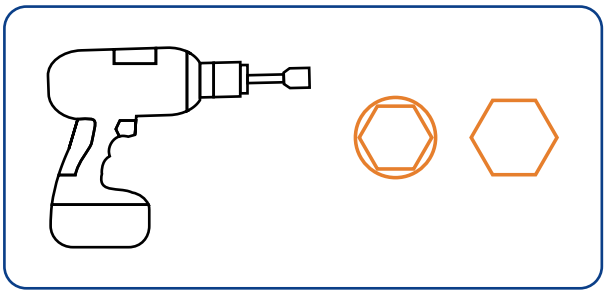
FOOTER WARNING

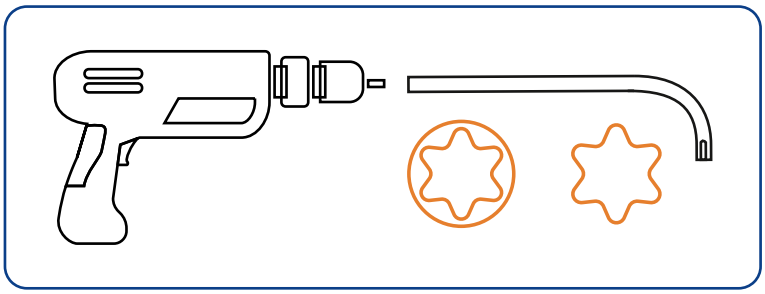
Anyone who plans to dig should call 811 or visit their state’s 811 center’s website a few business days before digging to request that the approximate location of buried utilities be marked with paint or flags so that you don’t unintentionally dig into an underground utility line.

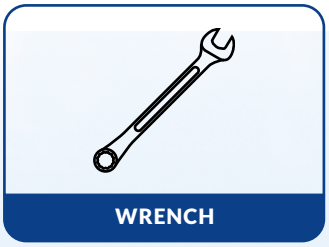
MEASUREMENT NOTE

All measurements have been converted from MM to Inches. The accuracy of measurement can vary slightly from mm to inches. All measurements are available in MM for detailed accuracy. The most critical measurement required is the Base Plate placement location. Please review the Construction Drawings for the Base Plate and Base Plate locations prior to installation.

REQUIRED INSTALLATION TOOLS

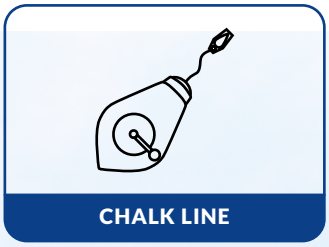




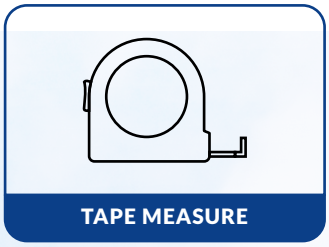


WRENCH

GLOVES



CHALK LINE



TAPE MEASURE

RUBBER MALLET

HARDHAT

SAFETY GLASSES

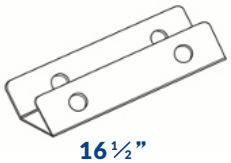
MAIN COMPONENTS

142 1/8”

M RAIL

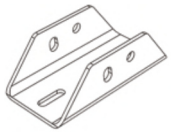
C-RAIL FIXED KIT

BASE PLATE



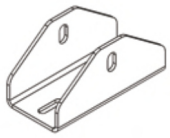
16 1/2”

LOWER BEAM & DIAGONAL BRACE ADAPTER



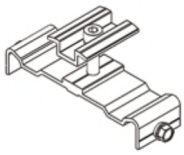
10 3/16”

TOP COLUMN ADAPTER

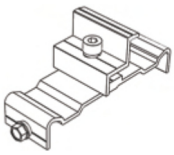


10 3/16”

DIAGONAL BRACE ADAPTER



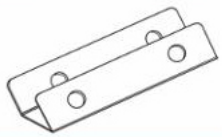
MID-CLAMP



END-CLAMP

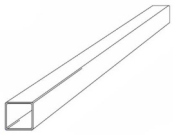
WATER CHANNEL

WATER-PROOF RUBBER



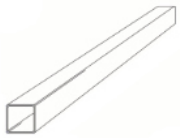
16 1/2”

LOW BEAM/DIAGONAL BRACE ADAPTER



111”

FRONT COLUMN

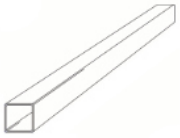


126 1/2”

REAR COLUMN

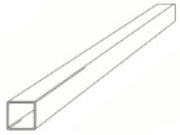
224 7/16”

L-ANGLE SUPPORT



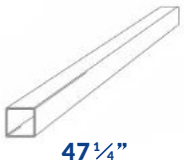
228 5/16”

SUPPORT BEAM



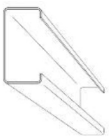
168 1/8”

LOWER HORIZONTAL BEAM



47 1/4”

DIAGONAL BRACE



149 5/8”

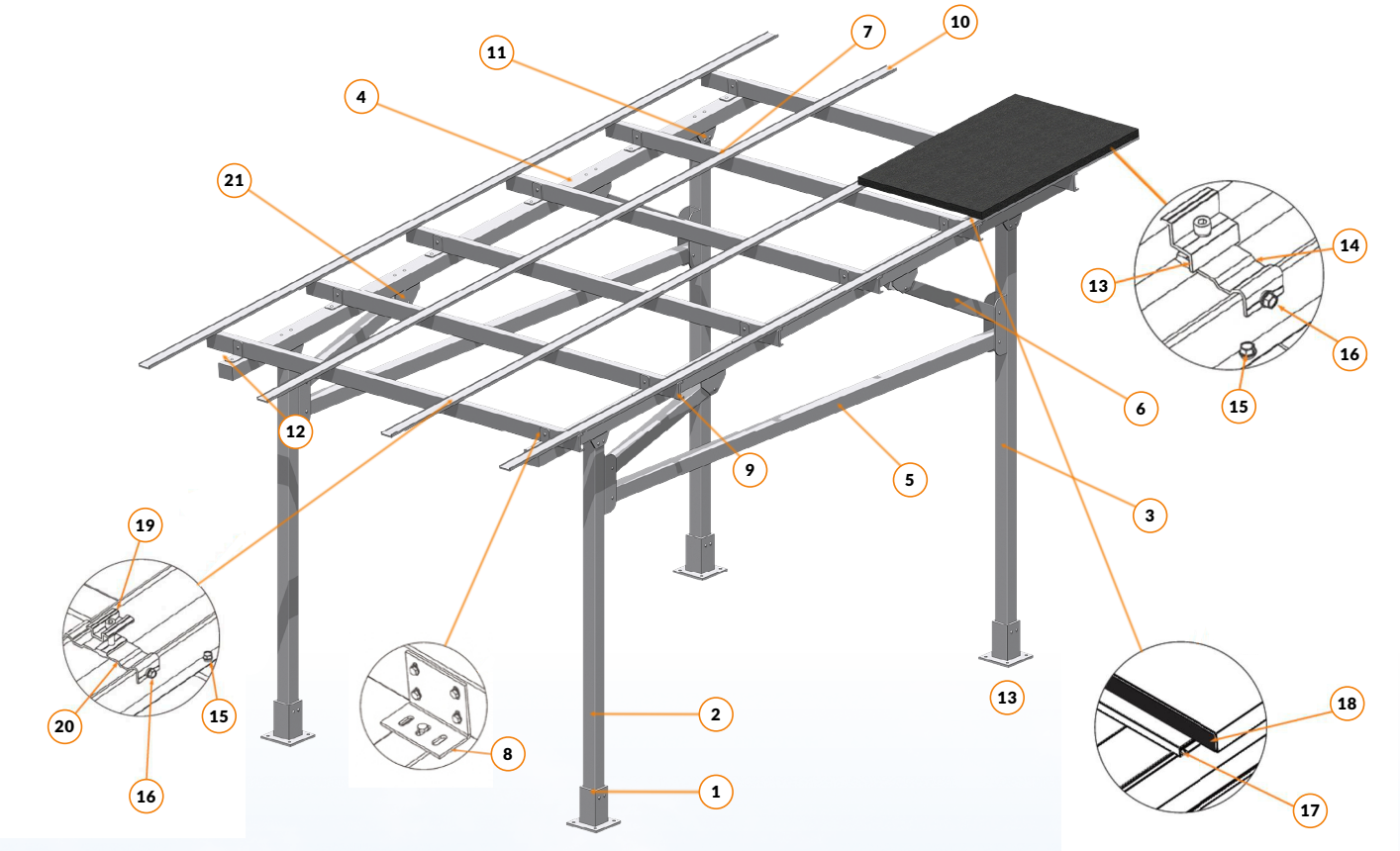
C-CHANNEL

NOTE Customer needs to source materials for footings based on structural engineer specifications.

MAIN COMPONENTS

Overview

The following is a diagram that lists the main components of the CK- Carport System.

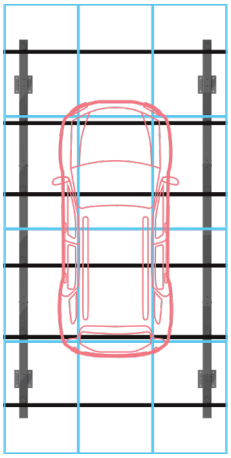


No	Description	QTY
1	Base Plate	4
2	Front Column 111”	2
3	Rear Column 126 1/2”	2
4	Support Beam 228 3/8”	2
5	Lower Horizontal Beam 168 1/16”	2
6	Diagonal Brace 47 1/4”	4
7	L-Angle Support 224 7/16”	1
8	C Rail Fix Kit	12
9	C-Channel 149 5/8”	6
10	M-Rail 142 1/8”	8
11	Top Column Adapter 10 3/16”	4

No	Description	QTY
12	Low Beam & Diagonal Brace Adapter 16 1/16”	4
13	End Clamp 30, 35, & 40MM	16
14	End Clamp Share Plate	16
15	M10*35 Bolt Kit	48
16	M16*180 Bolt Kit	104
17	Water Channel	9
18	Waterproof Rubber	
19	Mid Clamp	16
20	Mid Clamp Share Plate	16
21	Diagonal Brace Adapter 10 3/16”	4

FRONT VIEW

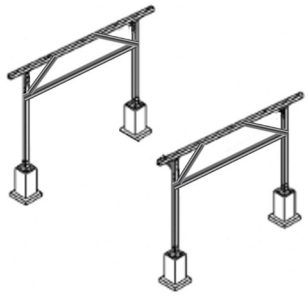
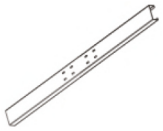
SIDE VIEW

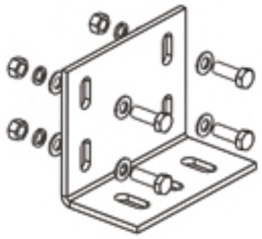
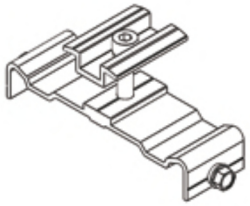
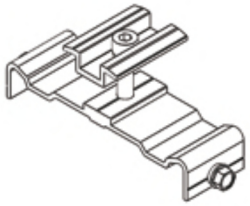
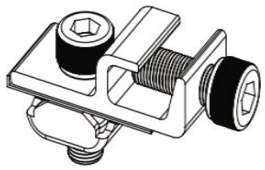


OVERHEAD VIEW

LARGE FORMAT MODULE VIEW

COMPONENTS LIST

CAT	Picture	Description Part	Details	QTY
1		Carport Support Structure CK-ZEM-CP3-5 COLUMNS CK-001-016-014 BEAMS GT-001-016-014 Base 'Plate' CK-GT-001-016-805 GT-001-016-805 Column/Beam Adapters Beam CK-GT-001-016-014 Column CK-001-016-014	Front Columns	2
			Rear Columns	2
			Base Plate	4
			Support Beam	2
			Top Column Adapter	4
			Lower Horizontal Beam	2
			Diagonal Brace	4
			Low Beam & Diagonal Brace Adapter	4
			HDG Bolt M10*35	48
			HDG Bolt M16*180	104
			HDG Nut M10	48
			HDG Nut M16	104
			HDG Washer M10	48
			HDG Washer M16	104
			HDG Spring Washer M10	96
			HDG Spring Washer M16	208
2		M Rail CK-ZEM-010-5760	M Water-proof Rail	8
			Self Tapping Screw	30
3		Water Channel CK-009-1062	Water Channel	9
4		Water Prooof Strip CK-IP-160-1133	Water Proof Rubber	
5		Purlin 'C' Channel CK-PL-C140-001-016-6000	C-Channel 149 5/8"	6
6		L Angle Support	224 3/8"	1

CAT	Picture	Description Part	Details	QTY
7		C RAIL Purlin Fix Kit CK-PL-GT001-016-14	Purlin Fixed Kit	12
			HDG Bolt M10*35	48
			HDG Bolt M16*140	24
			HDG Nut M10	48
			HDG Nut M16	24
			HDG Washer M10	96
			HDG Washer M16	48
			HDG Spring Washer M10	48
			HDG Spring Washer M16	24
8		Mid Clamp CK-782-4-60-Q BRACKET # #CK-A845-801	35mm Mid Clamp	16
			845 Share Plate	16
			M Grounding Plate	16
			Self Tapping Screw	64
			SS304 Bolt M8*45	16
			SS304 Spring Washer M8	16
9		End Clamp CK-737-3-60-Q BRACKET # #CK-1845-801	35mm End Clamp	16
			845 Share Plate	16
			M Grounding Plate	16
			Self Tapping Screw	24
			SS304 Bolt M8*45	12
			SS304 Spring Washer M8	12
10		Grounding Lug CK-GTC-R2	Grounding lug - weeb lug 8.0	6
			SS304 outer hex bolt 1/4" *0.6”	6
			SS304 inner hex bolt M8*20	6
			SS304 inner hex bolt M8*20	6

INSTALLATION STEPS

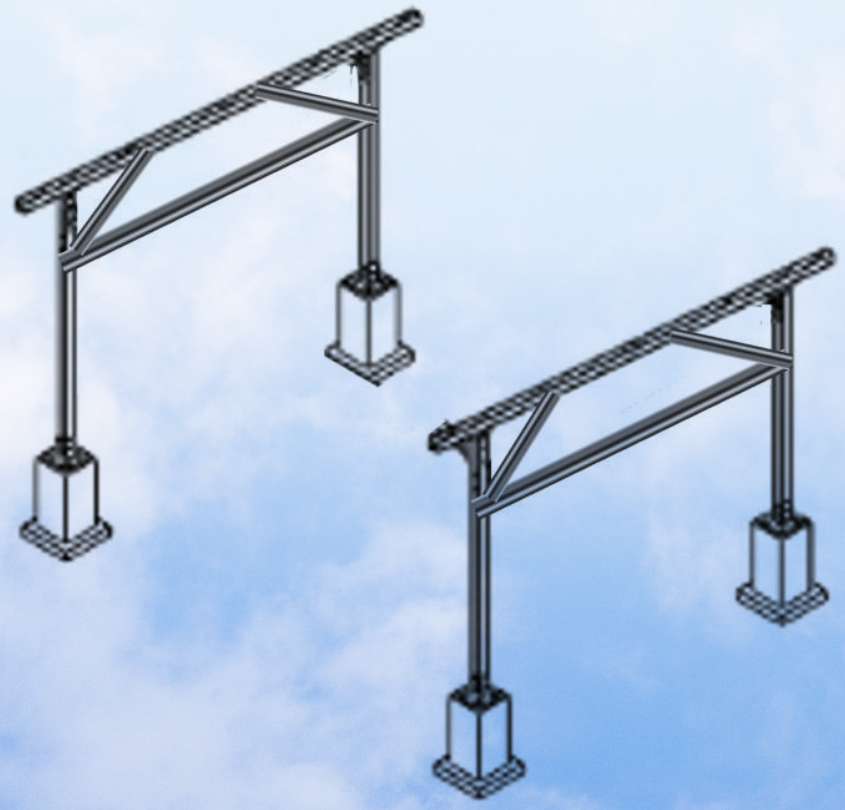
1. Build Base

Solution A, Build base

- ✓ Mark footer location according to the diagram. Verify all angles are square (See Attached Planset).
- ✓ Dig footers and make base with anchor bolts according to site conditions and system specifications and based on your structural engineer instructions for foundations requirements.
- ✓ If the ground is unlevel, ensure that all footer placements are level and at the same height regardless of the terrain elevation. Never install the structure tilted, the columns must always be straight.
- ✓ The structure's foundations should be calculated taking into account site conditions, soil type, seismic conditions, maximum wind and snow loads for the site location and the product mechanical loading specifications. In some cases, a geotechnical study is required. Please consult with your local structural engineer.
- ✓ In areas subject to freezing, footer depths may have to increase to resist freeze heave. Always consult a structural engineer to confirm footer depth and dimension.

Solution B, Concrete anchors

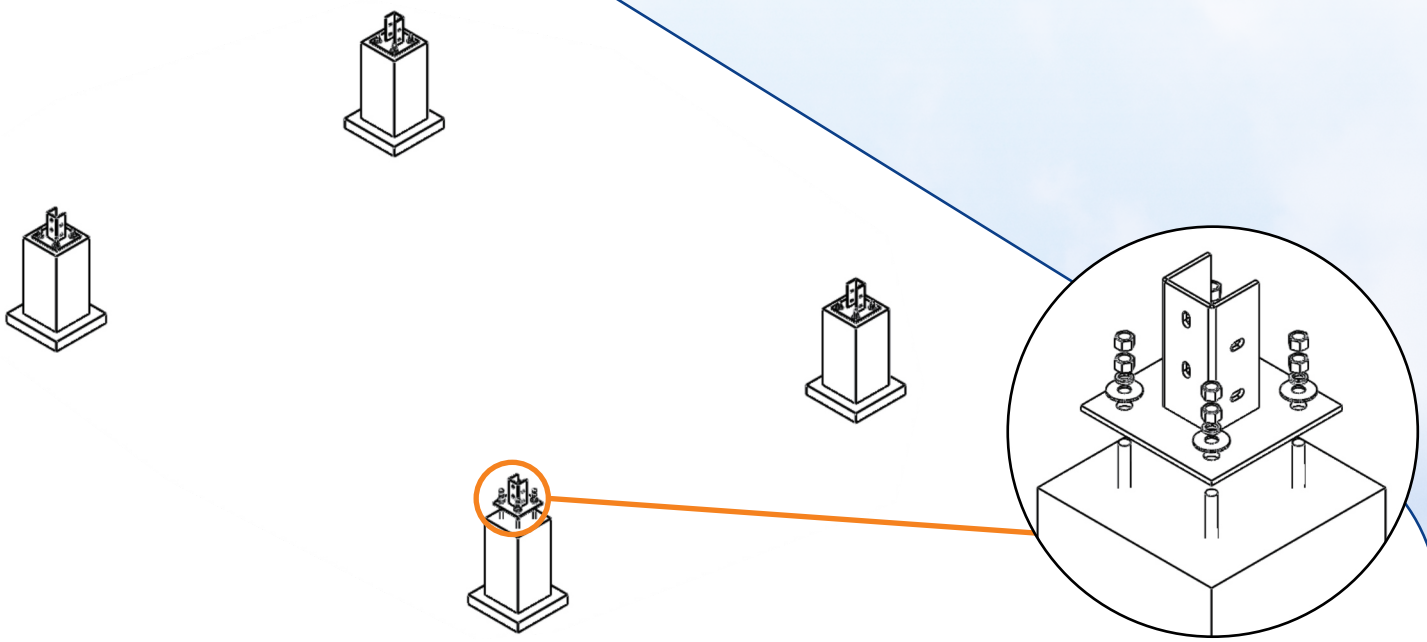
- ✓ Concrete anchors can be utilized if approved by a structural engineer.



2. Install Base Plates

- ✓ Slide the column base plate over the concrete anchors and secure them. If you are using leveling nuts to level the column base plate. Correct any shifting if needed and repeat for the other three column base plates. Fill the gap between the base plate and the footing with Dry-pack non-shrink grout.
- ✓ Verify the distance between the front and rear column conform with the attached planset.

Products Name	Quantity
Base	4

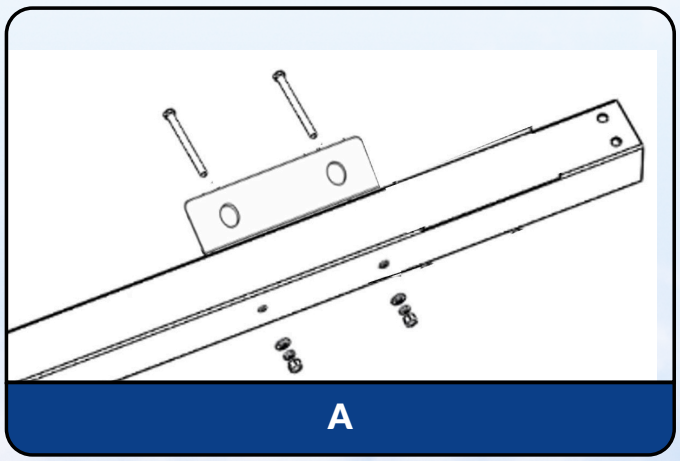


3. Fix Adapter

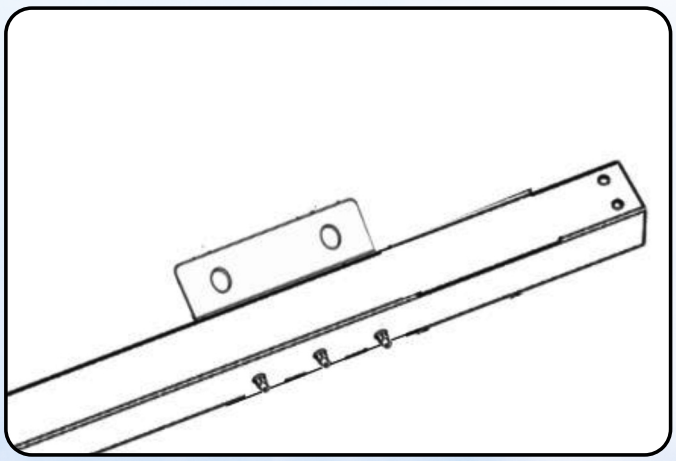
- ✓ A . Fix Low Beam/Diagonal Brace Adapter to Front & Rear Columns
- ✓ B1. Attach C-Rail Fix Kit to Support Beam
- ✓ B2. Attach Top Column Adapter to Support Beam

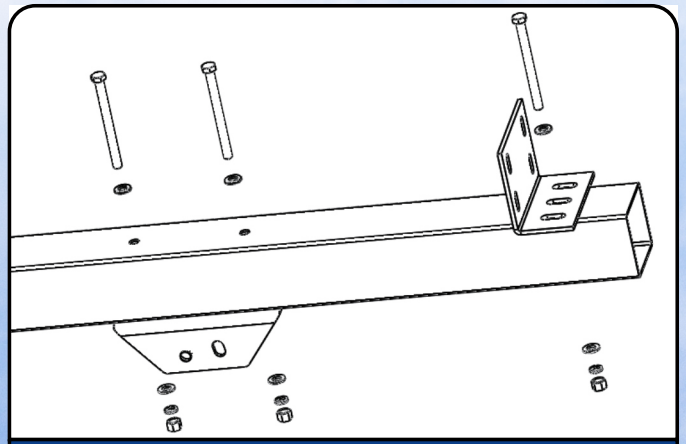
Front Column: 111”
Rear Column: 126 7/16”
Low Beam/Diagonal Brace Adapter: 16 ½”
Top Column Adapter: 10 3/16
Support Beams: 228 5/16

Products Name	Quantity
Top Column Adapter	4
M16*140mm Bolt Kits (1 big flat washer + 1spring washer + 1 nut)	32
Low Beam/Diagonal Brace Adapter	4
C-Rail Fix Kit	12

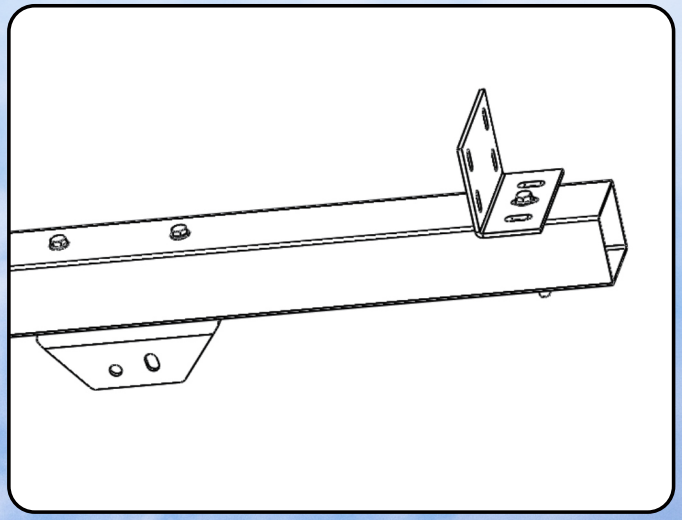


A





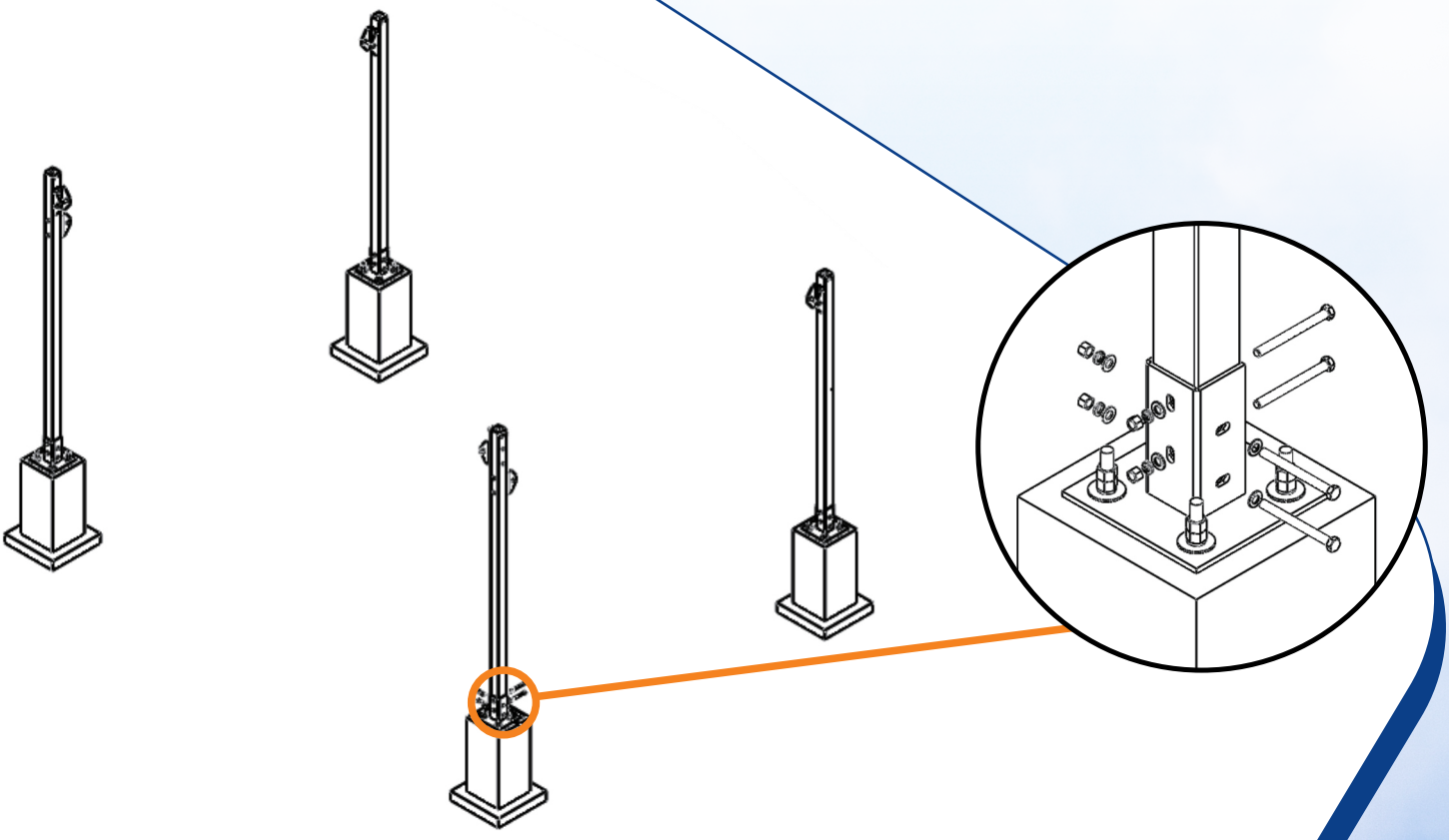
B1 & B2



4. Connect Columns

✓ Attach Columns to base plate

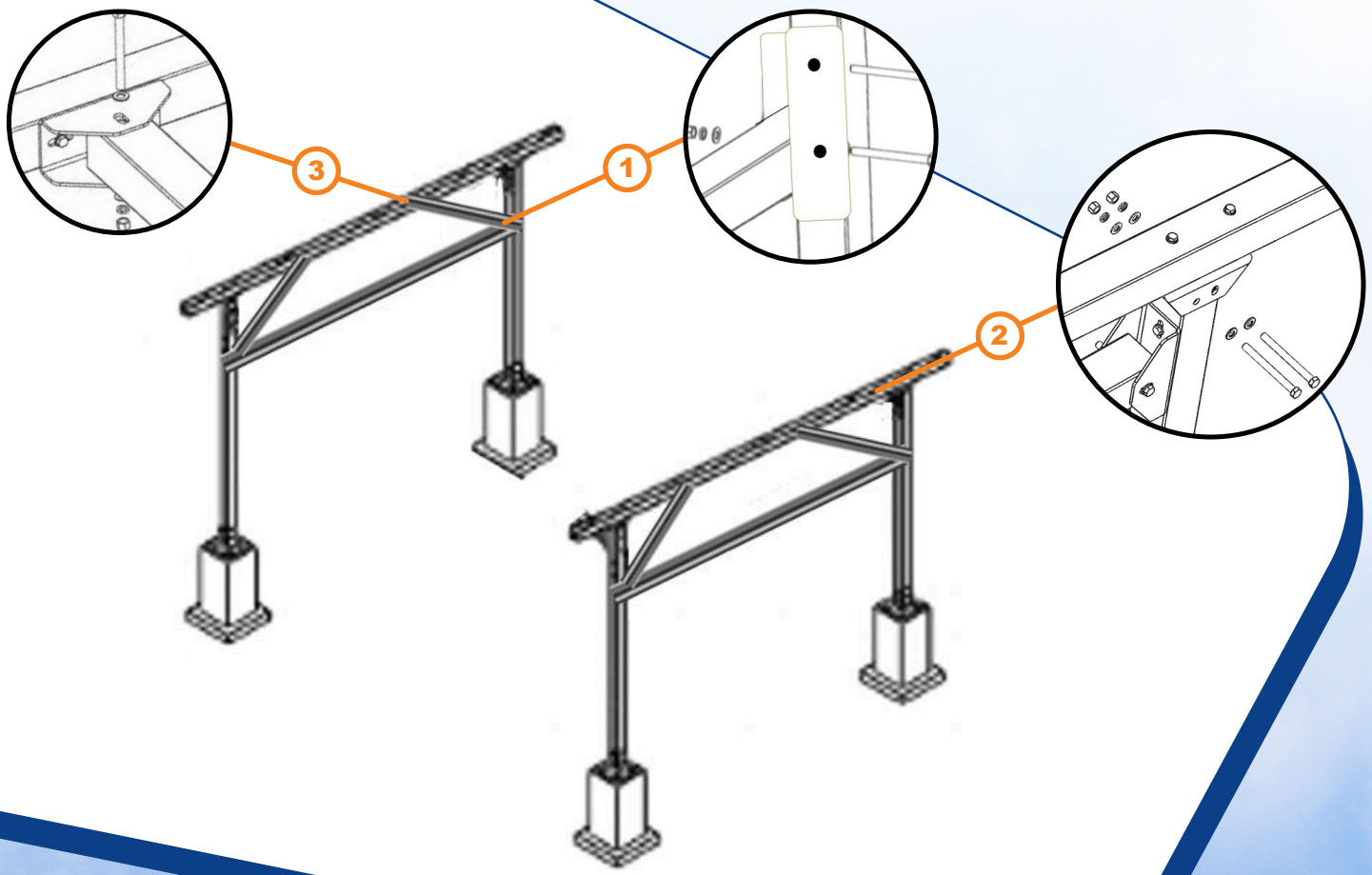
Products Name	Quantity
Front Columns --- 111”	2
Rear Columns --- 126 ½”	2
M16*180mm Bolt Kits (1 flat washer + 1 spring washer + 1 nut)	16



5. Connect Beams

- ✓ Connect Lower Horizontal Beam to front and rear Columns
- ✓ Connect Support Beam between front and rear columns on top
- ✓ Connect Diagonal Brace between Support Beam and Column

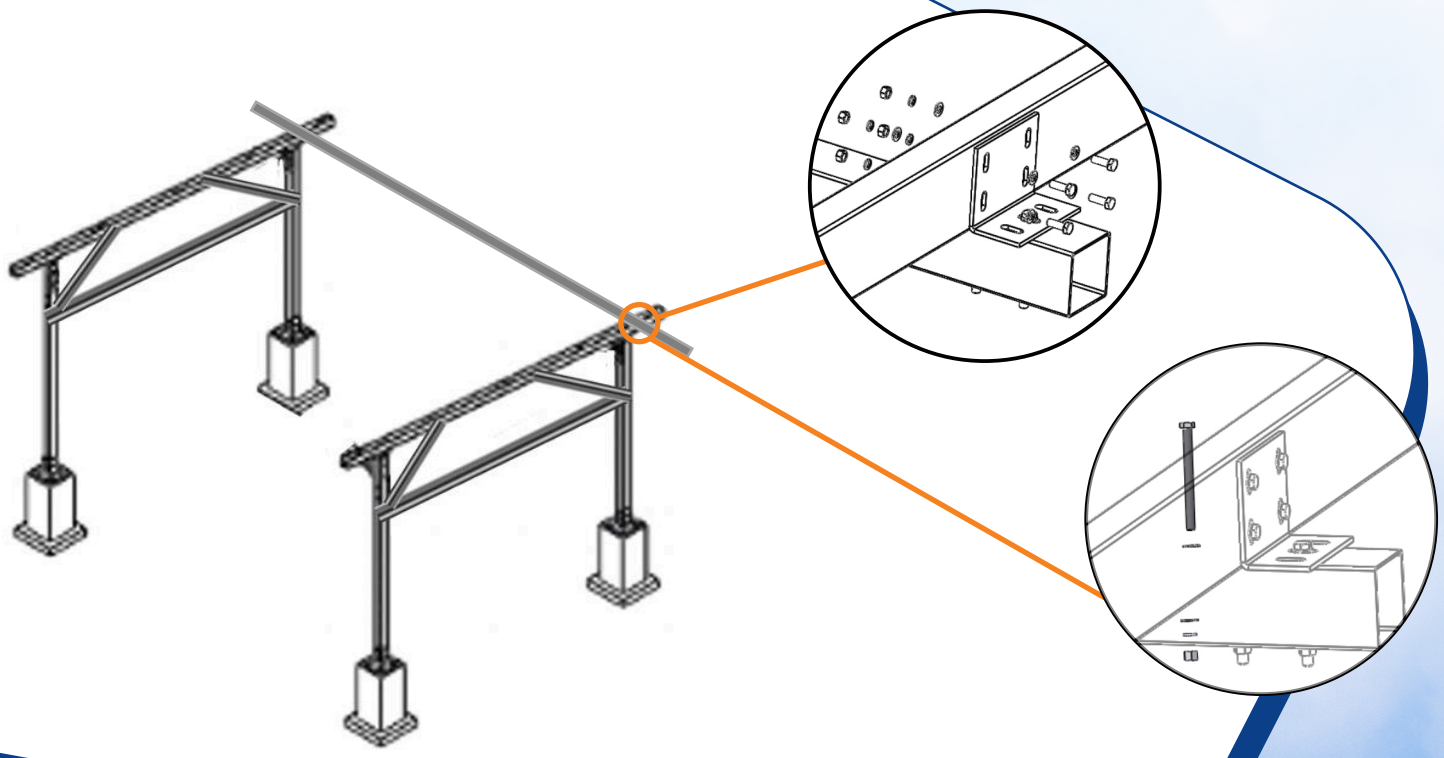
Products Name	Quantity
Lower Horizontal Beam 168 1/16"	2
Support Beam 228 5/16"	2
Diagonal Brace 47 3/16"	4



6. Fix C Rail

- Use C-Rail Fix Kit to connect C-rails to Support Beam
- Use M6*16mm Bolt Kits (1 flat washer + 1 Spring Washer + 1 Nut)
- Use M6*25mm Bolt Kits (1 flat washer + 1 Spring Washer + 1 Nut)

Products Name	Quantity
C Rail --- 149 5/8"	6
C-Rail Fix Kit	12
M10*40mm Bolt Kits (1 flat washer + 1 spring washer + 1 nut)	48
M16*140mm Bolt Kits (1 flat washer + 1 spring washer + 1 nut)	24



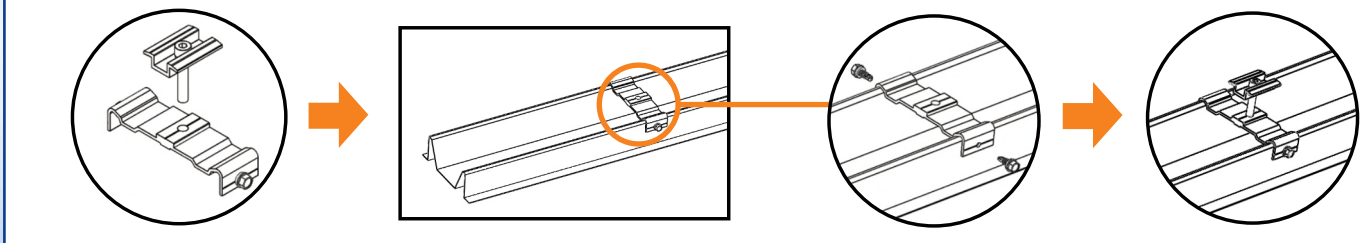
7. Pre-assemble clamps on M Rail

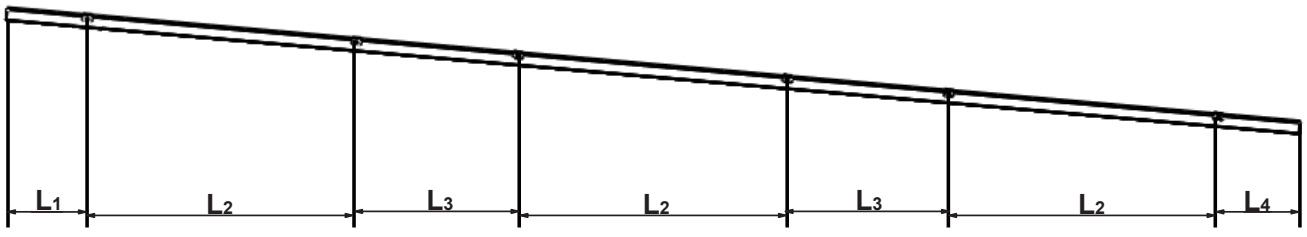
Overlap 2qty M-Rails, attach the 2 M-Rails together with 2 M6*16, ensure overlap is facing toward low slope side of installation, ensuring water flow over top of M-rails connection point. Apply waterproof adhesive at seam where 2qty M-rails overlap after they have been mechanically attached.

- ✓ Pre-fix share plate to M rail
- ✓ Connect mid clamps to share plate
- ✓ Please check L1/L2/L3/L4 before fixing

TIP: Place 2-Mrails in parallel on a flat level surface, then lay 3 or 4 modules on top of the M-Rails, ensuring proper spacing, then mark your share plate locations. Use these location measurements to install the remaining share plate locations on the remaining M-Rails. (3 or 4 module option correlates with your overall array configuration).

Products Name	Quantity
M Rails — 142 1/8"	8
Share Plates	32
Mid Clamps	16
End Clamps	16
M6.3*16	64





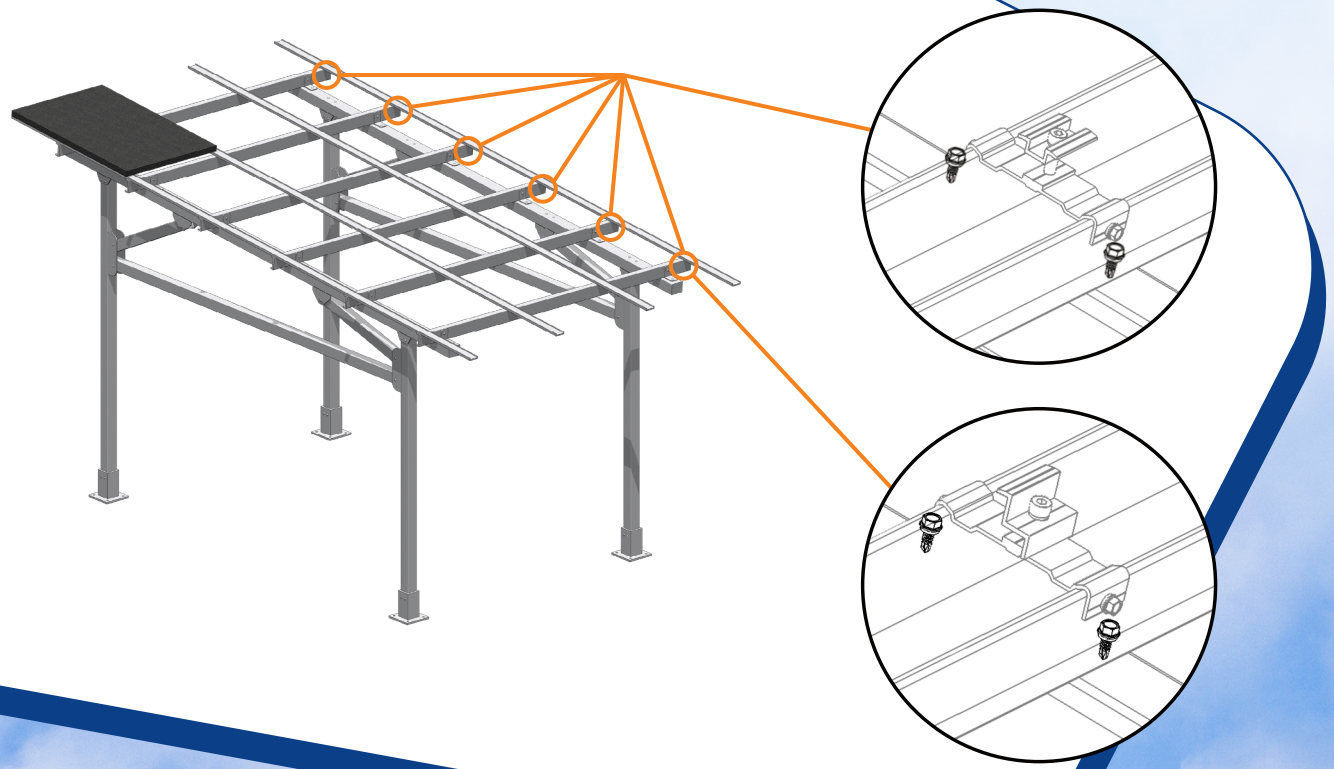
8. Fix M Rail

- Use M6.3*25 self tapping screw to fix M rail to C Rail
- With end clamps on the side M Rails
- With mid clamps on the inner M Rails
- Please check the L measurement before attaching

TIP: If possible lay 4qty M-Rails down on flat level surface; place 3 panels across these M-Rails in Portrait configuration, ensure rails and panels are square; take measurement to confirm your starting M-Rail attachment location.

Please Review Math Calculation in Appendix

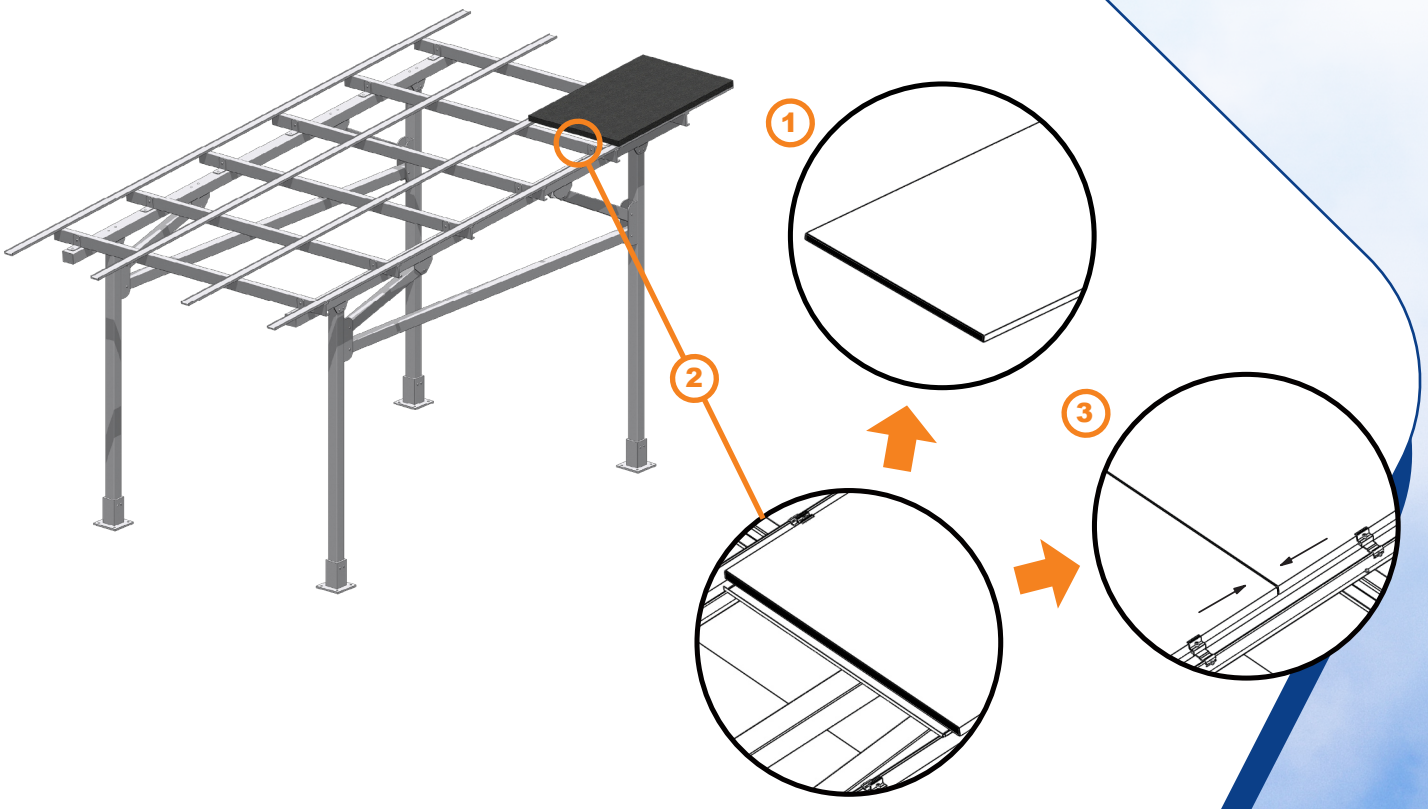
Products Name	Quantity
M Rails 142 1/8"	8
M6.3*16	36



9. Install Solar Panels

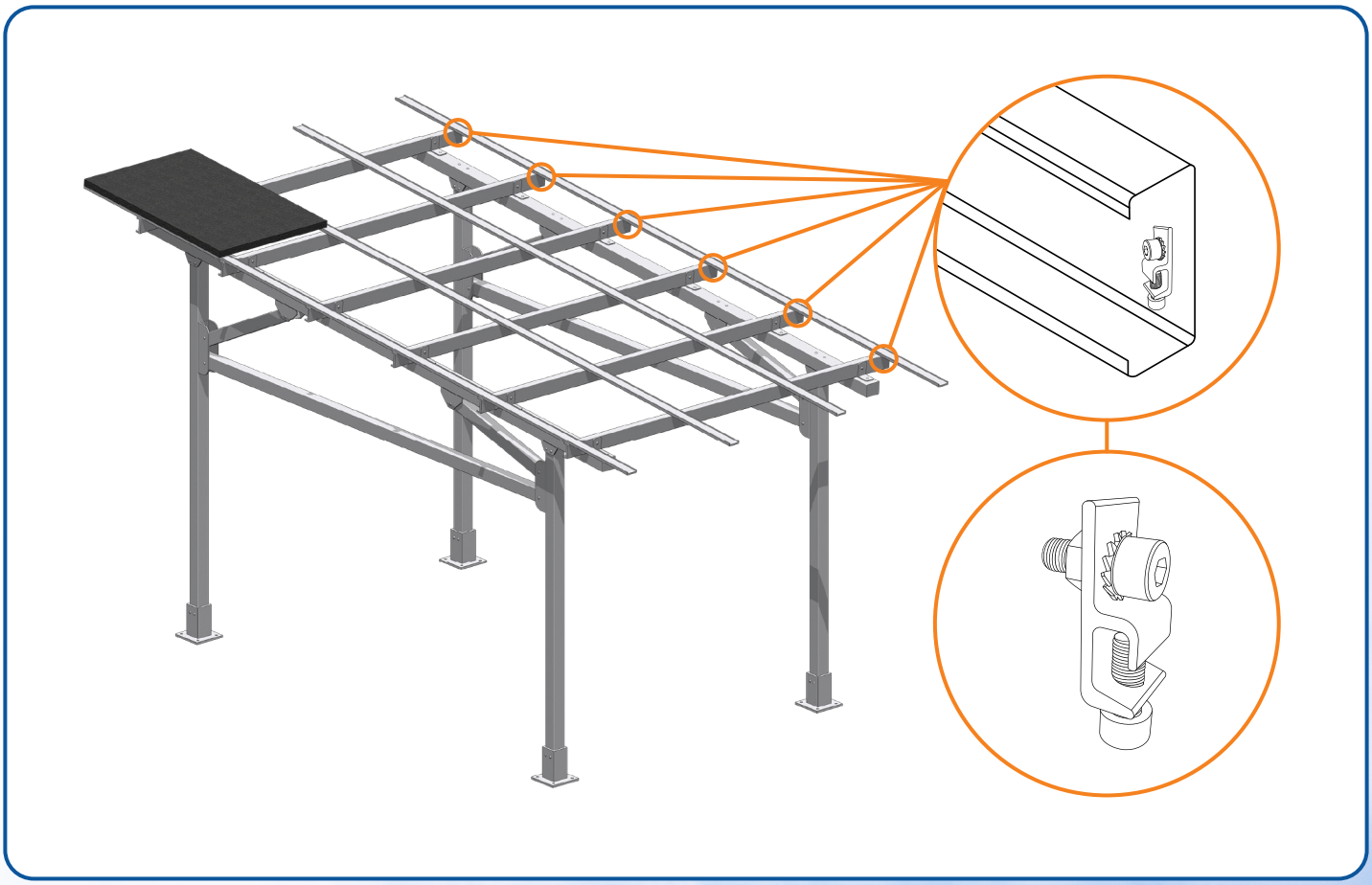
- ✓ For waterproofing stick rubber molding to exterior of module frame but only where the frames are adjacent to other module frames or on all interior seams
- ✓ Install water channel where 2 panels meet under the module frame

Products Name	Quantity
Modules	18 or 24
Rubber	1 Roll
Water channel	9



10. Grounding- Lug and Wiring

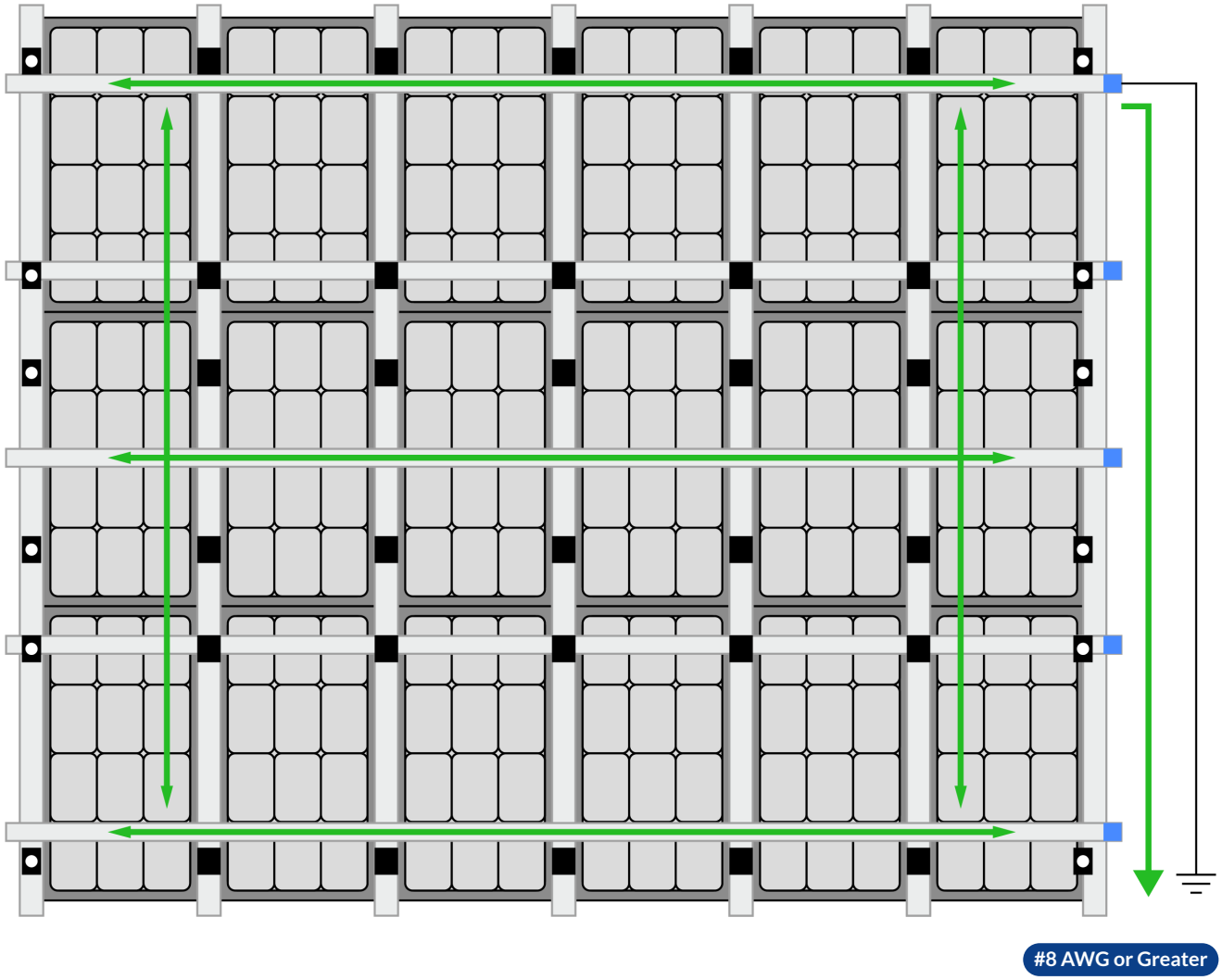
Install grounding lug at end of C-Rail on side of array that is most optimal for wire management. Ensure that all paint and any debris is removed from bonding site to achieve proper bonding connection. Attach the ground lug with a stainless steel nut then cross 8.4mm2 or greater than or equal to 8AWG copper wire through all 6 grounding lugs (fixed by M8*20 inner hex bolt), finally connect copper wire to the ground. The grounding lug completes a grounding function when fastened tight to connect all 6 C Rails and copper wire.



Electrical Characteristics of AWG Copper Wire

AWG	Diameter [inches]	Diameter [mm]	Resistance [Ohm / 1000ft.]	Resistance [Ohm / km]	Max Current [Amperes]	Max Frequency for 100% skin depth
6	0.162	4.1148	0.3951	1.295928	37	1100 Hz
7	0.1443	3.66522	0.4982	1.634096	30	1300 Hz
8	0.1285	3.2639	0.6282	2.060496	24	1650 Hz
9	0.1144	2.90576	0.7921	2.598088	19	2050 Hz
10	0.1019	2.58826	0.9989	3.276392	15	2600 Hz

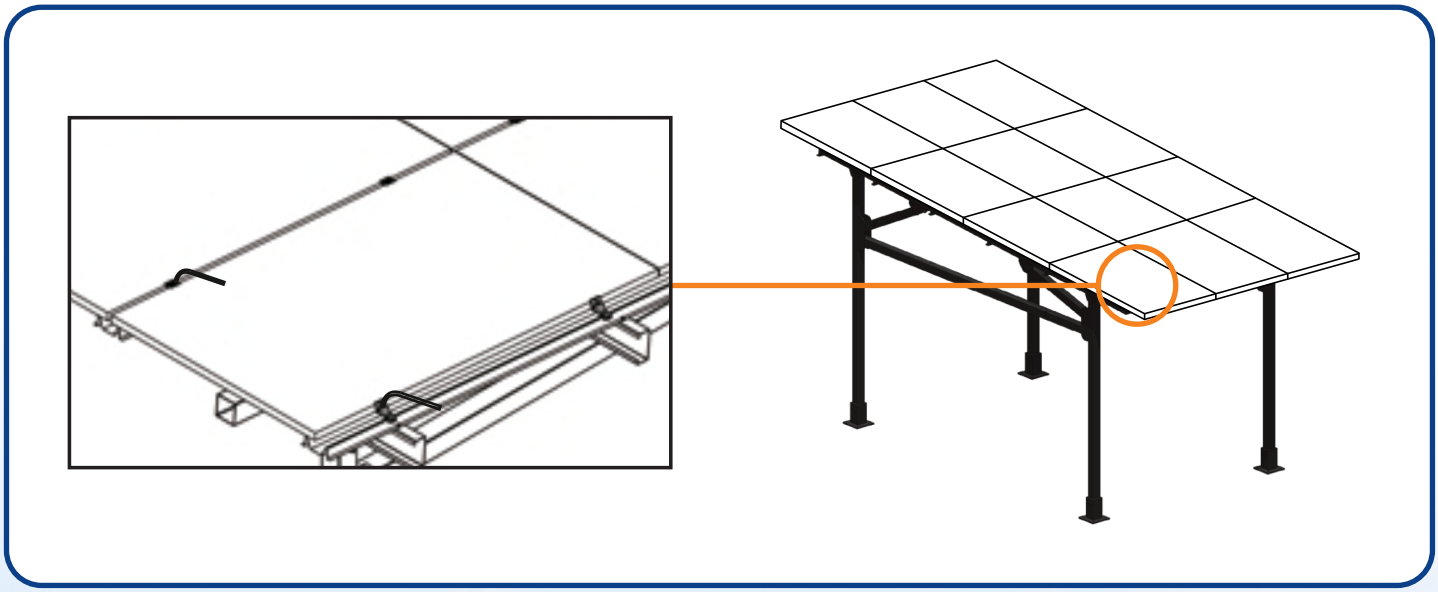
Grounding – Lug and Wiring Diagram



Grounded End Clamp | Grounded Mid Clamp | Ground Path | Grounding Lug

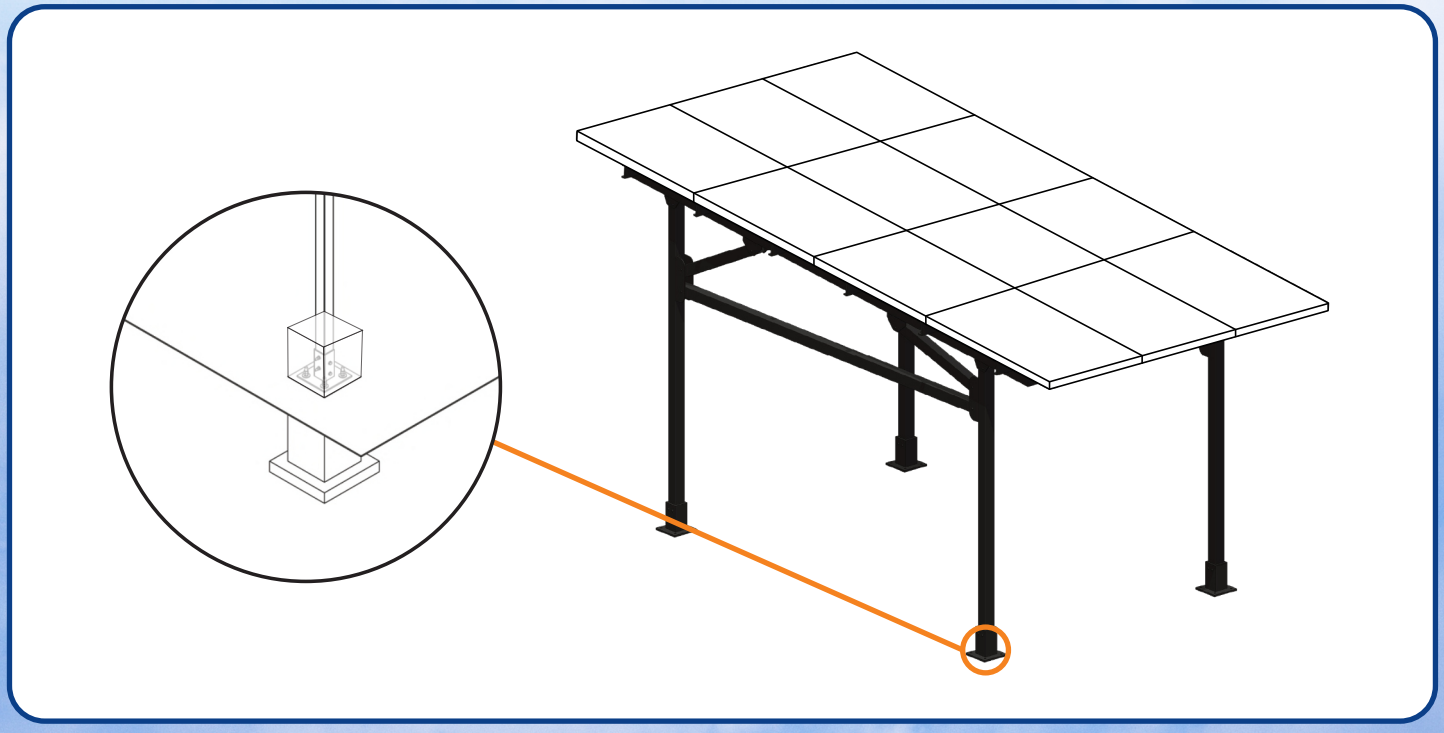
11. Final Check

- Check and verify that all components are properly fastened and installed properly in their correct positions and locations.
- Verify and re-adjust all components as needed within the structure.



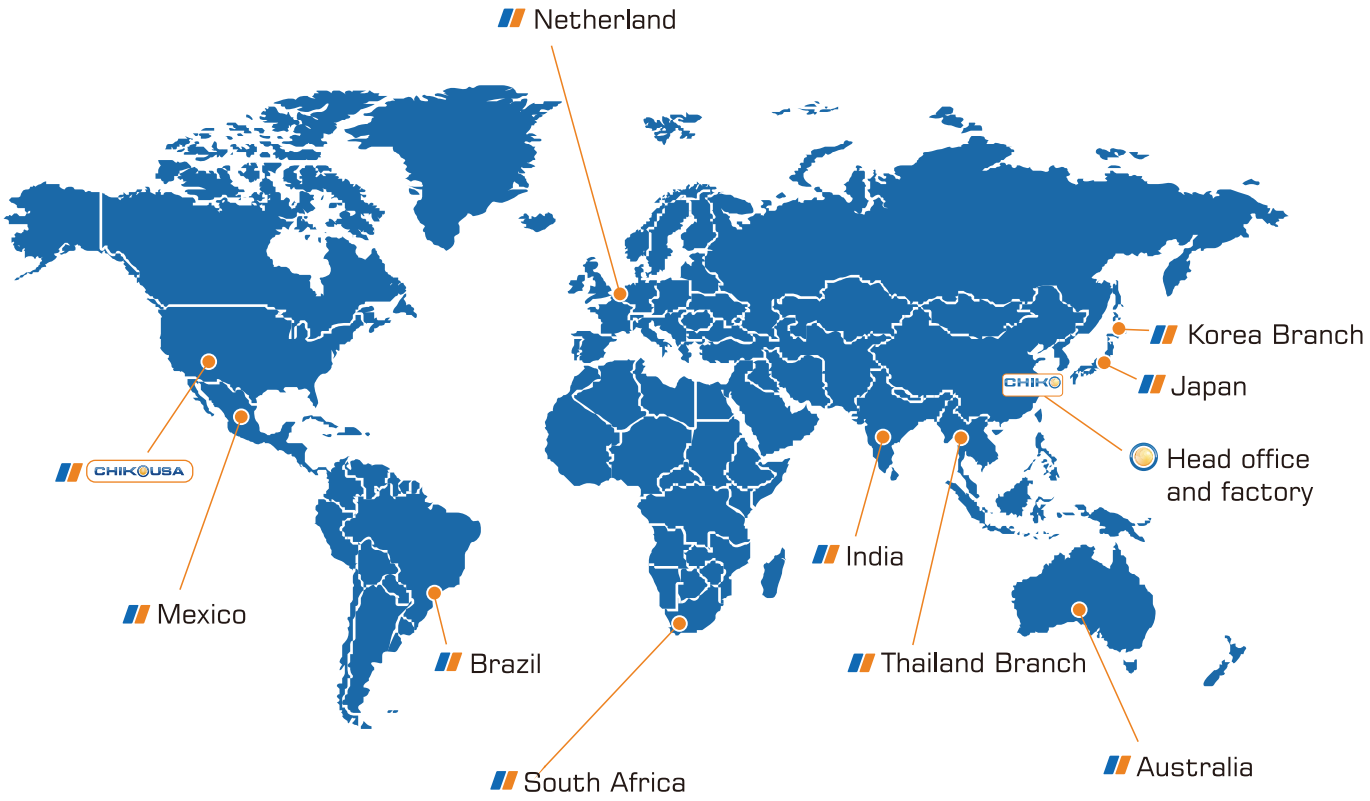
12. Hide Footing (Optional)

- Cladding of 4 bases is an option with engineer approval.



WORLD LEADING

MANUFACTURE



CHIKOUSA

RACKING MADE SIMPLE

Tel : 1-800-948-5390

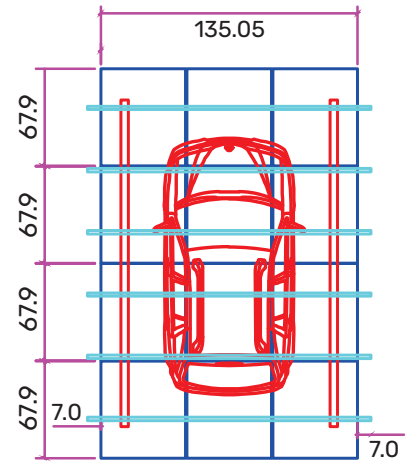
Email : info@chikousa.com

www.chikousa.com

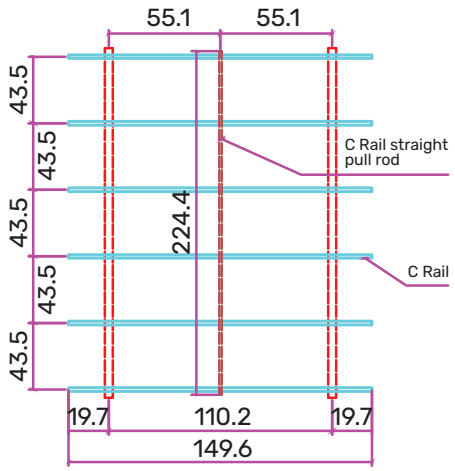
101 East Baseline Road
Buckeye, AZ 85326

ONE CAR CARPORT

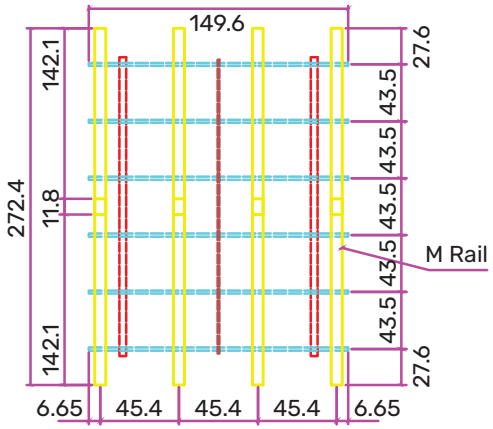
Panel Layout : 4x3



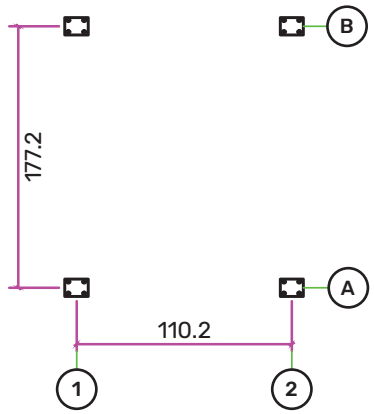
C Rail Layout



C Rail & M Rail Layout



Foundation Layout



Layout : 4x3 BOM

NO	DESCRIPTION	QTY
1	Beam & Column Set	2
2	End Clamp	16
3	End Clamp bracket	16
4	Mid Clamp	16
5	Mid Clamp bracket	16
6	C Rail fix kit	12
7	C Rail - 149.6	6
8	C Rail Splice Kit	
9	M Rail - 142. 1	8
10	C Rail straight pull rod - 224.4	1
11	Waterproof channel- 41. 8	9
12	Waterproof pad - 44. 6	9
13	M6. 3*16 (M Rail)	32
14	M6. 3*16 (End & Mid Clamp bracket)	64
15	M6. 3*25 (M Rail & C Rail)	48

Design Factors :
Module Dimensions : 67.9 x 44.6
Tilt Angle : 5°
Front Clearance : 111
Wind Speed
Snow Load : --

Modify by	Doc No.	Data	Des	J. Burton	231130
			Drw		
			Check		
			Craft		
			App		

CHIKOUSA

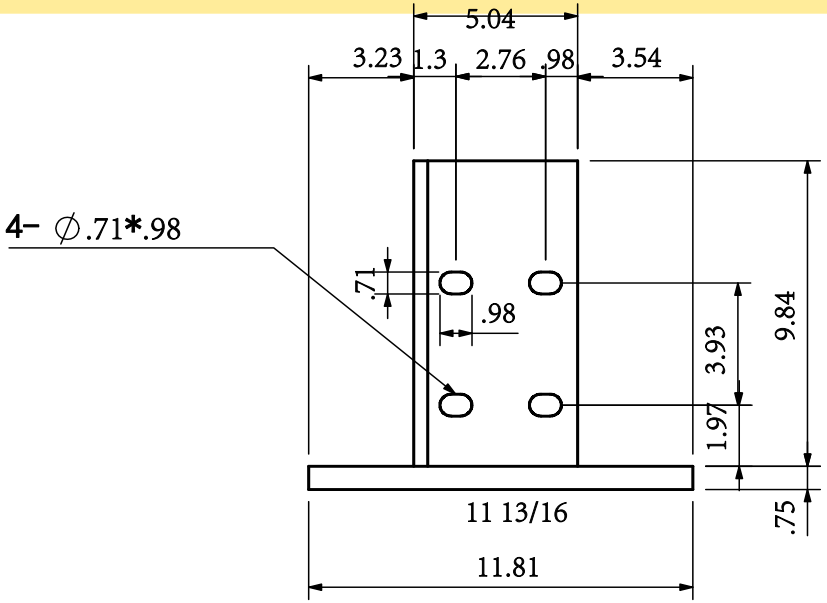
Beam & Column Set

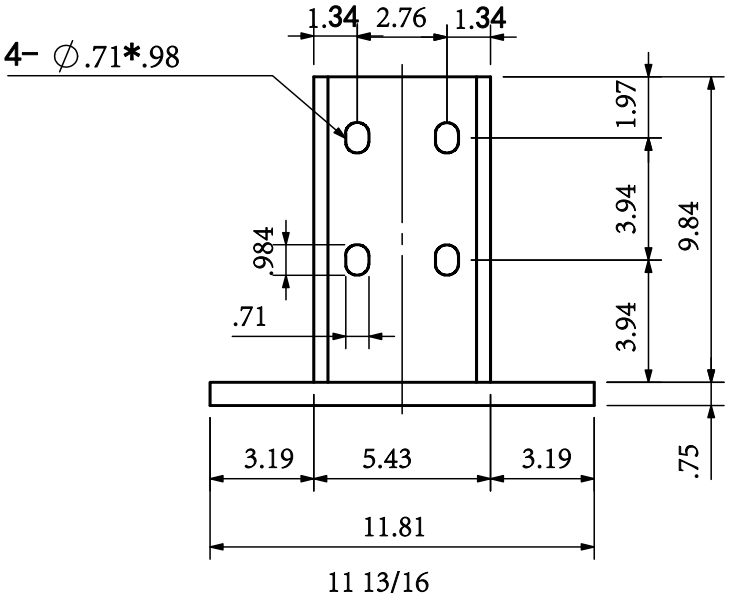
4x3-5°

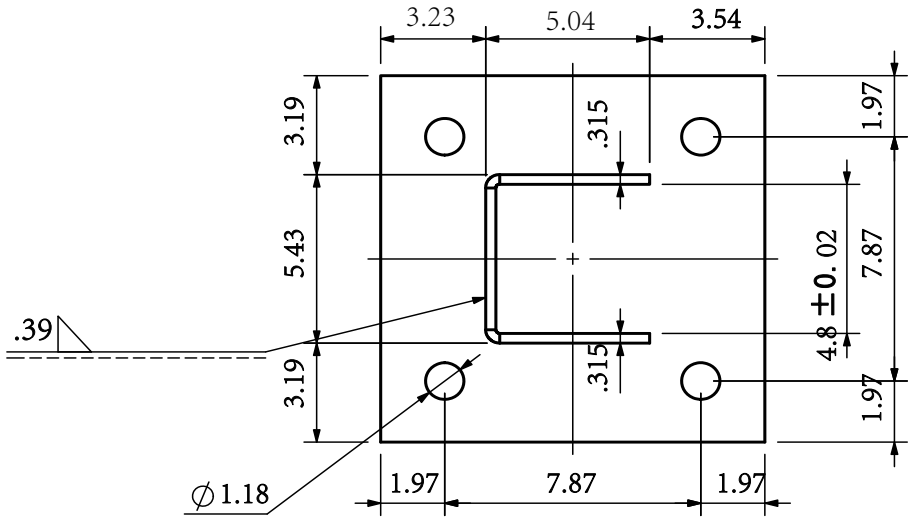
View : Rate Page /

CHIKO CARPORT- - BASE PLATE DRAWING - IN INCHES

BASEPLATEBOTTOMDIMENSION SQUARE:11 13/16" X 11 13/16"



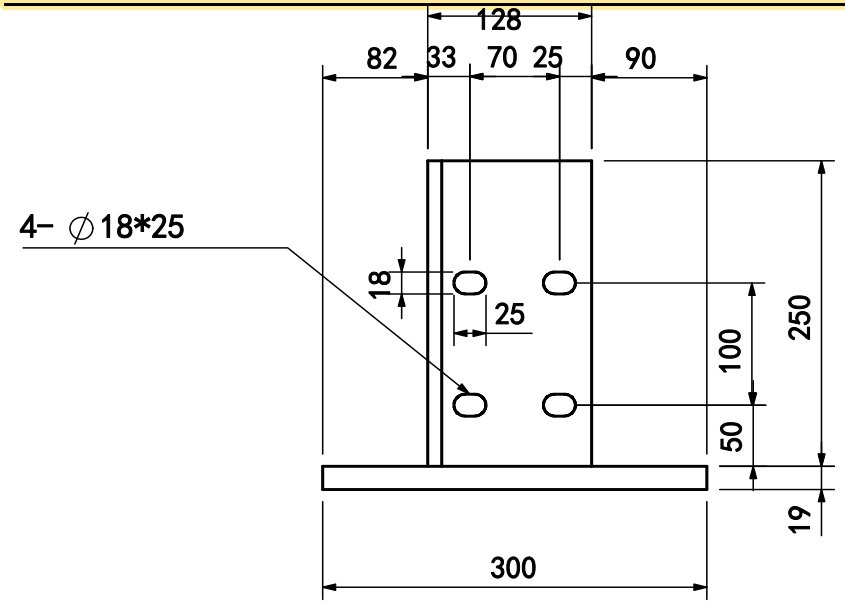


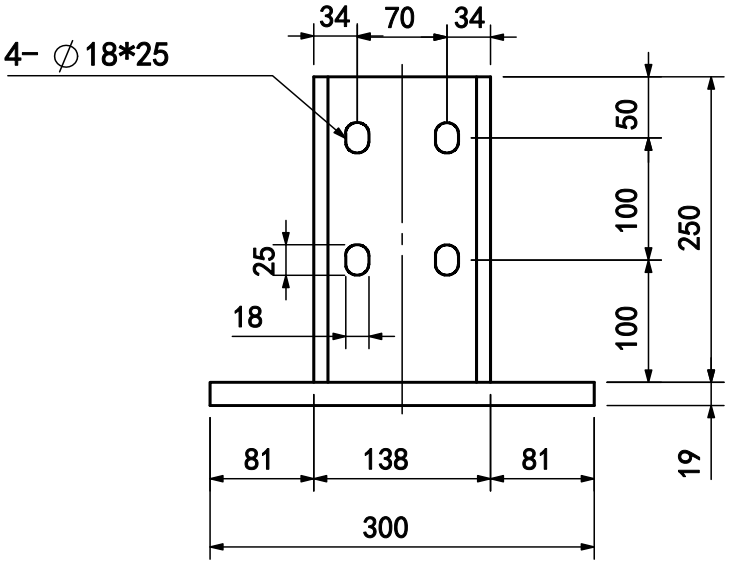


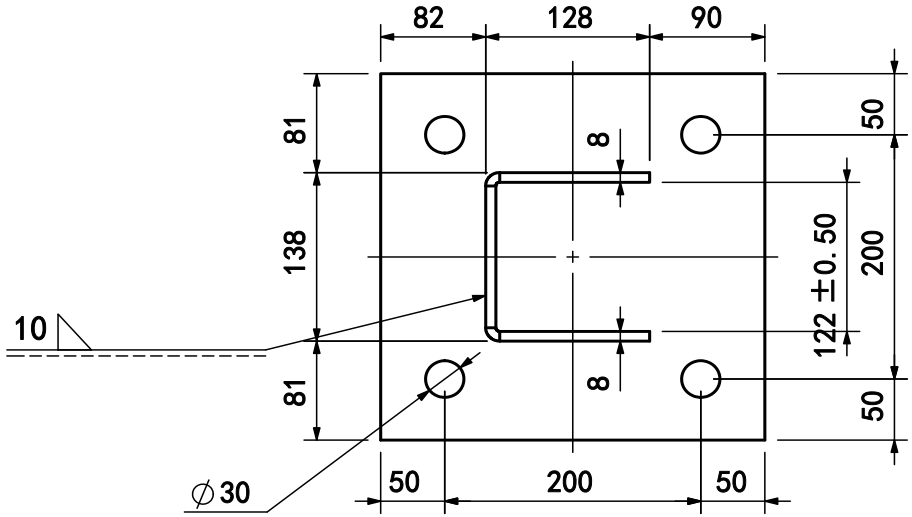
Des.		CHIKOUSA	
Drw.	Bowen231124		
Check.		Material Steel Q235B	Name.名称: Base Plate
Crsft.			Part # CK-GT-001-019-807
App.		View.:	Scale. / Page.

CHIKO CARPORT- - BASE PLATE DRAWING - IN MM

BASEPLATE BOTTOM DIMENSION SQUARE: 300MM X 300MM



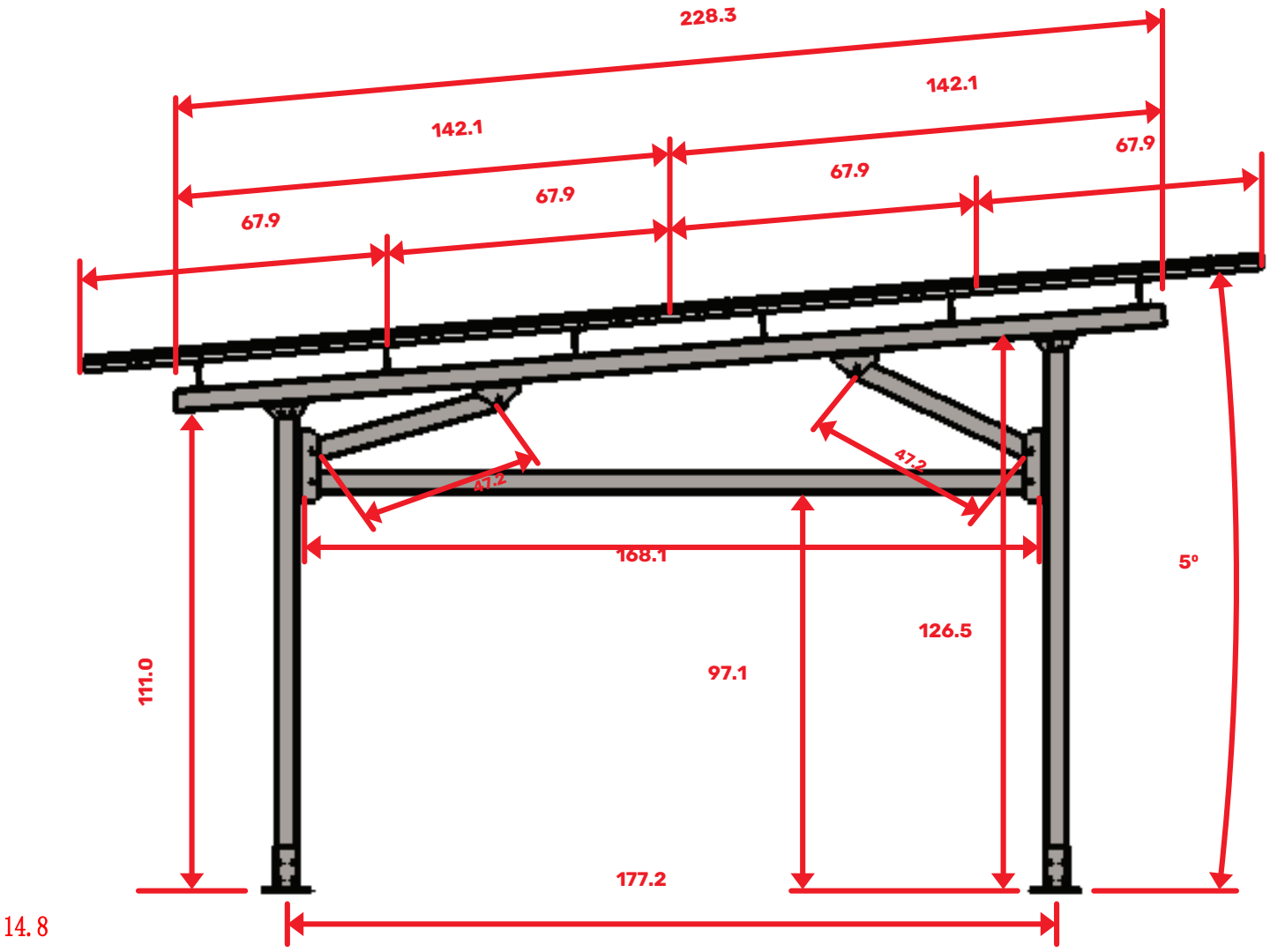




Des.		CHIKOUSA	
Drw.	Bowen231124		
Check.		Material Steel Q235B	Name.名称: Base Plate
Crsft.工			Part # CK-GT-001-019-807
App.		View	Scale. Page.

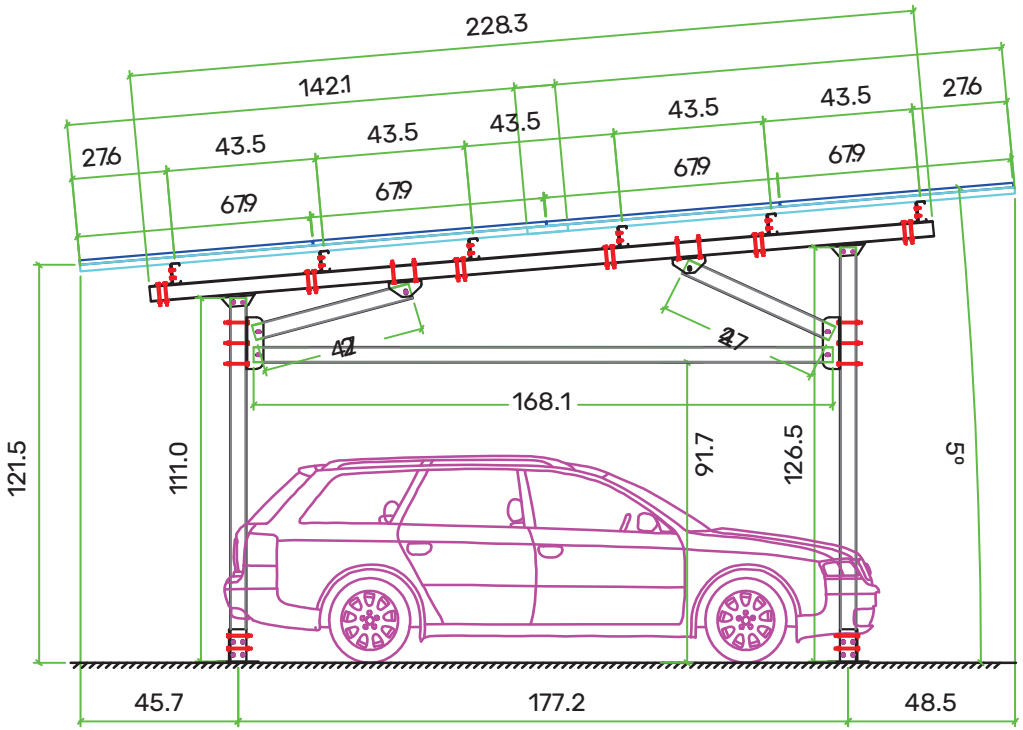
CHIKO USA PREMIER CARPORT-SIDE VIEW

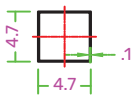
INCHES



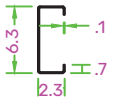
Mark	Modifivation	Modify by	Doc No.	Data	Des	J. Burton	231130	CHIKOUSA	
					Drw				
					Check				
					Craft			4x6-5°	
					App			View :	Rate / Page /

SIDE PROFILE AND PARTS DIAGRAMS

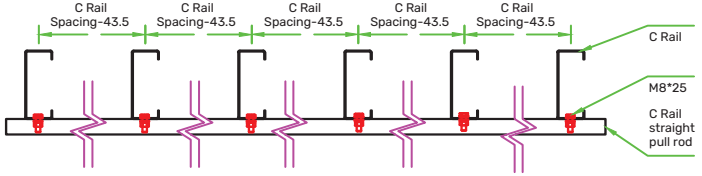


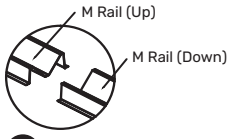


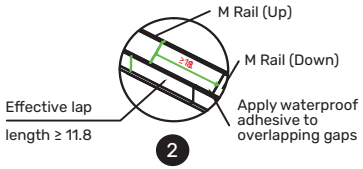
Profile Section

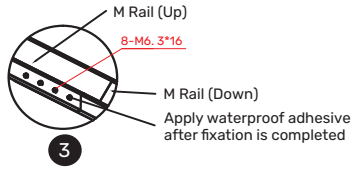


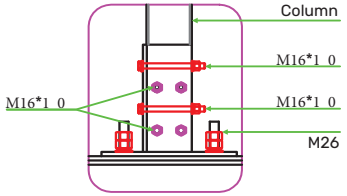
Profile Section

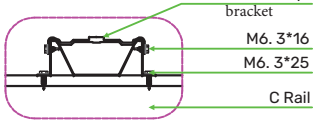




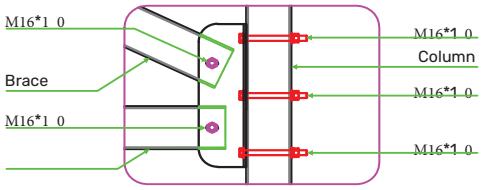


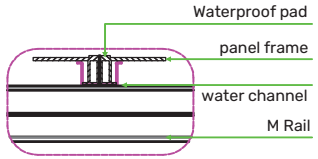


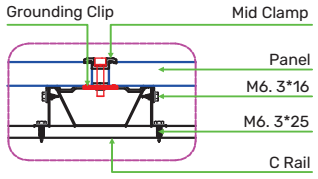


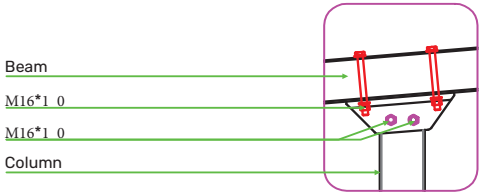


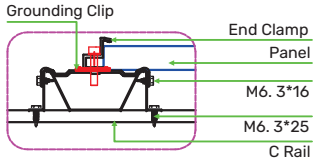
Column bracing



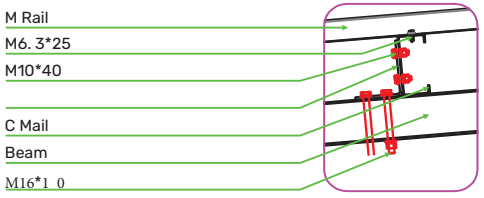


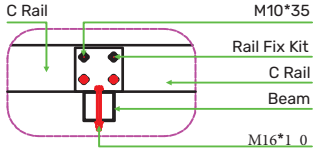


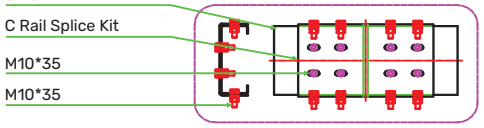


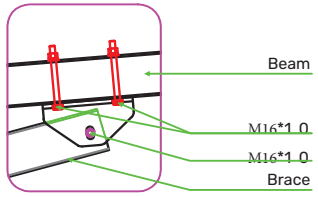


Rail Fix Kit









Design Factors	:
Module Dimensions	: 67.9 x 44.6
Tilt Angle	: 5°
Front Clearance	: 111
Wind Speed	
Snow Load	: --

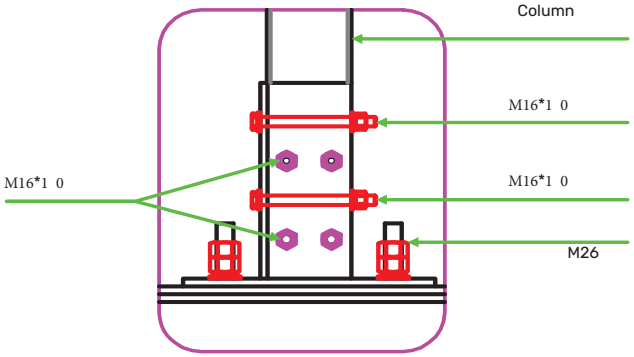
Modify by	Doc No.	Data	Des	J. Burton	231130
			Drw		
			Check		
			Craft		
			App		

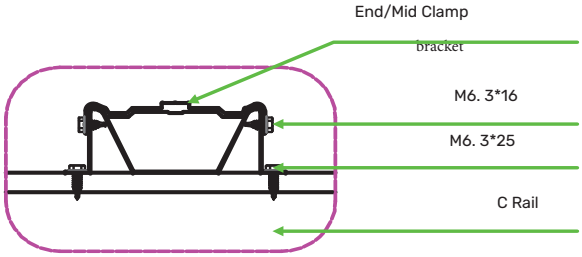
CHIKOUSA

Beam & Column Set

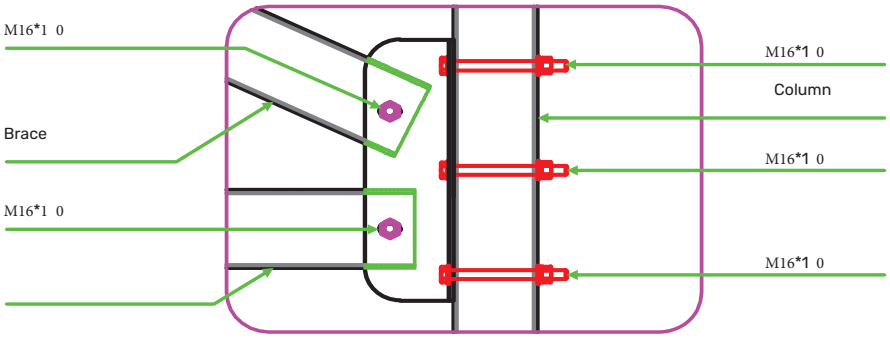
4xa-5°

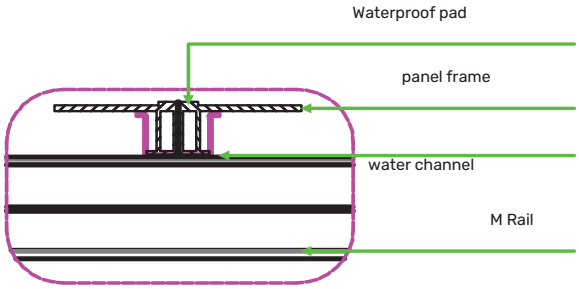
View : Rate Page /

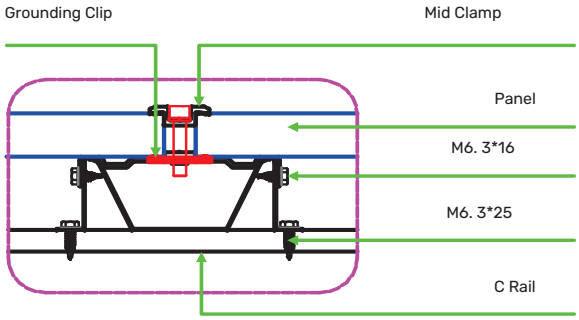


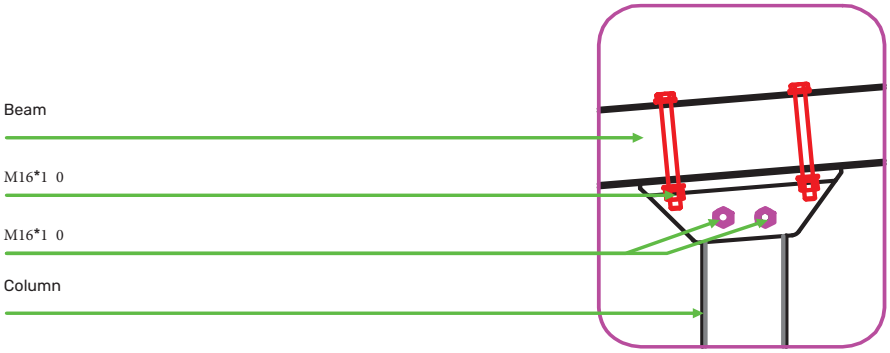


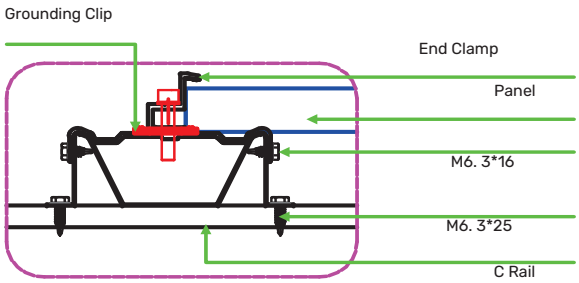
Column bracing











Rail Fix Kit