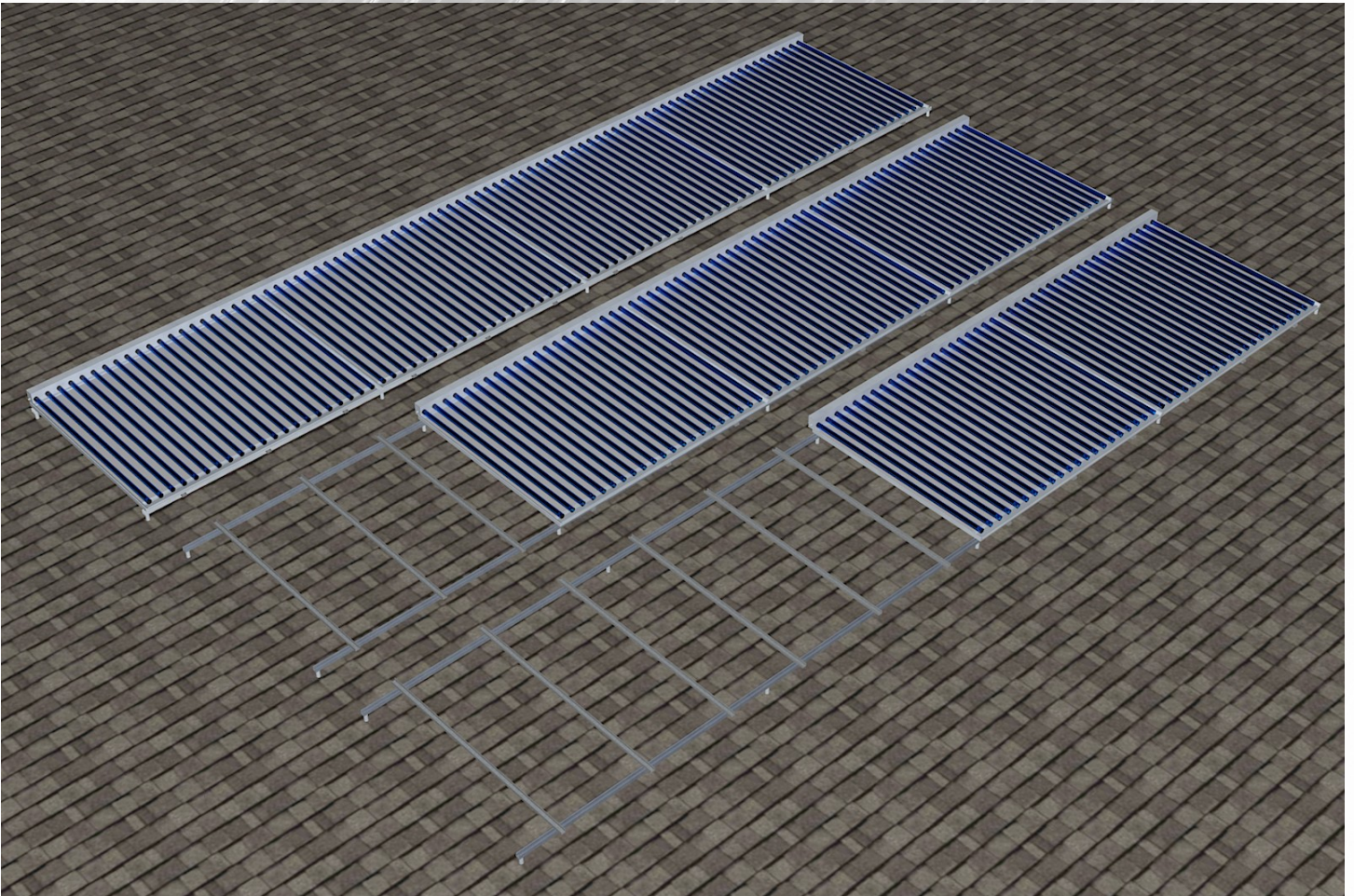




Installation Instructions



Asphalt Shingle Mounting Set

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Subject to technical modifications without notice!

Due to continuous development, the drawings, installation steps and technical data detailed here may change.

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1. About this Document

1.1 Important Information

The equipment must be installed in accordance with installation regulations required in the area where the installation is located. Local regulations must be carefully followed in all cases. Authorities having jurisdiction shall be consulted before installations are made.

1.2 Purpose of this Document

This document provides you with information regarding the asphalt shingle mounting set. It contains information concerning:

• design and function • technical specification • installation

1.3 Target Group for this Document

These installation instructions are intended for installation engineers.

1.4 Symbols used in this Document

The following terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or important information concerning product life.



Indicates an imminently hazardous situation, which, if not avoided, will result in death, serious injury, or substantial property damage.



Indicates a potentially hazardous situation, which, if not avoided, could result in death, serious injury, or substantial property damage.



Indicates a potentially hazardous situation, which, if not avoided, may result in moderate, or minor injury or property damage.



Indicates special instructions on installation, operation or maintenance, which are important but not related to personal injury hazards.

1.5 Applicability

These installation instructions apply for asphalt shingle mounting set as of 02/18/2012.

1.6 General Information

Carefully read through these installation instructions. Failure to follow these instructions will void any manufacturer's warranty or legal guarantee claims.

1.7 Standards and Regulations

The equipment used in the installation must be in accordance with those regulations of local code authorities and utility companies in the area in which it is installed. All regulations must be carefully and thoroughly followed in every case. Local authorities should be consulted prior to the installation of any equipment.

INSTALLATIONS OR SERVICE OF ANY SOLAR EQUIPMENT IS REQUIRED TO BE PREFORMED BY LICENSED PROFESSIONALS, WHEN SOLAR, ELECTRICAL OR PLUMBING WORK IS REQUIRED!

The installer should read and follow all directions or instructions included with equipment.

All wiring must be in accordance with the latest edition of National Electric Code, ANSI/NFPA 70. In Canada use the latest edition of the Canadian Electric Code CSA C22.1.

2. General Notes

- Collectors should be aligned such that they face as close to true south as possible
- The collectors should not be located where they experience any shading between 10 am and 3 pm
- Generally, the manifold is always to be installed as the highest part of the collector
- In areas prone to heavy snowfall, the bottom of the collectors should be higher than the anticipated snow pack. To help promote snow sliding off the collectors, the mounting angle should be 45° or greater
- Work must comply with regulations of local code authorities and utilities companies in the area in which it is installed
- Solar collectors may require registration or permits in accordance with local or state building codes
- The installer is responsible for determining structural strength of the roof. A registered structural engineer should be consulted
- Installation, maintenance and repairs must be carried out by authorized service personnel
- The substructure may only be connected to existing or new lightning protection systems or equipotential bonding by authorized service personnel
- All wiring must be in accordance with the latest edition of national Electric Code, ANSI/NFPA 70. In Canada use the latest edition of the Canadian Electric Code CSA C22.1.

**The respective state's specific standards and safety regulations must be adhered to.
Carefully read through these planning instructions.**



Working on the roof is extremely dangerous. Plan the installation out carefully such that a safe distance from the edge of the roof can be maintained. Sure footing is also required. Be sure to wear sturdy, rubber soled shoes. NO SANDALS OR FLIP FLOPS. Harnessing equipment may be required and is always recommended.



Be sure that the roof is dry before you begin installation. Be sure that any ladders used are set firmly against the side of the buildings and mounted properly. Have someone hold the ladder for you while you climb.



Be aware of any electric lines overhead or under the roof. Maintain a safe distance from all overhead electrical lines and be aware that direct contact is not necessary to receive an electrical shock.

3. Design and Function

3.1 Design and Functioning of the Asphalt Shingle Mounting Set

The Asphalt Shingle Mounting Set is The Ritter XL Solar mounting solution for flush mounting the CPC Solar Thermal Collectors to shingled roofs or some structural walls. The Asphalt Shingle Mounting Set is an easy to assemble and install mounting solution that can be used with any of the collectors offered by Ritter XL Solar. The galvanized steel and aluminum are strong long lasting materials and are also weather resistant. The stand offs provide clearance for equipment and help prevent build up of debris or precipitation around the edges of the collectors.

3.2 Main Features

Attractive Design

- State-of-the-art design
- Compact dimensions
- Suitable for installation on flat roofs, and some wall mounting installations
- Extreme ease of installation
- Use of simple connection technology minimizes the amount of tools needed to install
- Fully recyclable thanks to easy-to-dismantle design and re-usable materials
- High reliability and long service life via the use of high-quality, corrosion-resistant materials. such as galvanized steel and aluminum
- Fast installation time helps minimizes labor component of system cost
- Innovative design for longevity. Designed with no exposed rubber or threads to leak, this system keeps water out and on the roof where it belongs

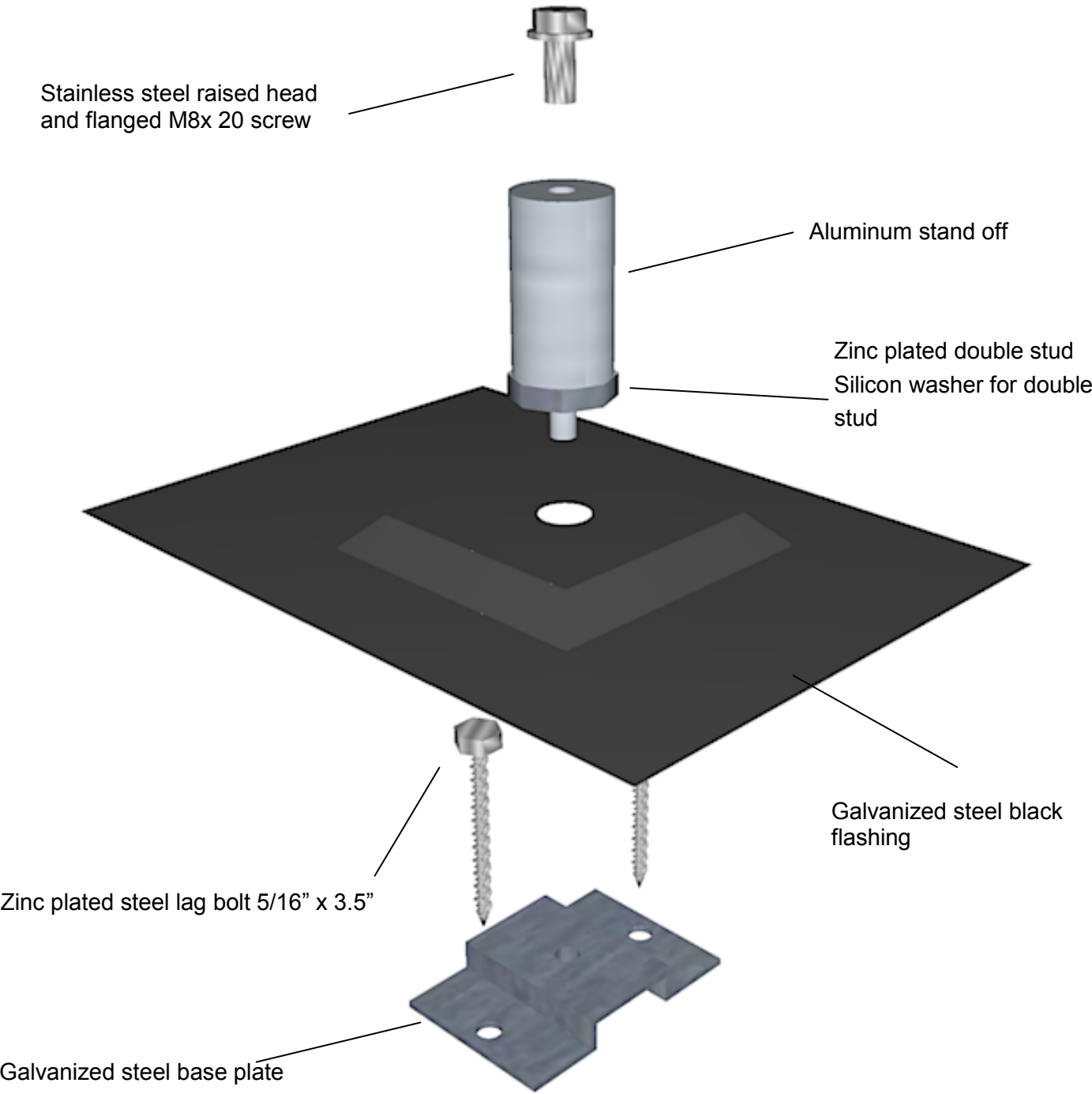
3.3 Delivery Contents

Asphalt Mounting Set, supplied with:

- Galvanized steel black flashing
- Galvanized steel base plate
- Zinc plated double stud
- Silicon washer for double stud
- Aluminum stand off base
- Zinc plated steel lag bolt 5/16" x 3.5"
- Stainless steel raised head and flanged M8 x 20 screw

3.4 Technical data

Item	Dimensions (h x w x d)	Material	Weight
Double Stud	3/8"-16 thread 5/8" x 3"	Zinc plated steel & high temp silicone washer	0.170 lb.
	3/8"-16 thread 15mm x 76 mm		77 g
Flashing	10" x 8" x 1/2"	Galvanized steel (black)	0.640 lb.
	254 mm x 203 mm x 12.7 mm		290 g
Base Plate	3 7/8" x 3" x 1/2"	Stainless Steel	0.418 lb.
	98 mm x 76 mm x 12.7 mm		190 g
Stand Off	1 3/8" ø x 2 1/2"	6005 T5 Aluminum	0.380 lb.
	624 mm ø x 1134		172 g



4. Installing the Asphalt Shingle Mounting Set

4.1 Tools List

- Power Drill
- Roofing Caulk, and
- Caulk Gun
- Level
- Adjustable wrench or open ended socket
- Utility Knife
- Measuring Tape
- Torx bits (Hex bits)
- Wide Metal Putty Knife
- Chalk line (optional)
- Washable Chalk (optional)

4.2 Installation



WARNING

Ensure that the structural members (rafters) are in usable condition and thick enough to drill lag bolts into. If rafters are less than 1" (25mm) across a spanner section may need to be installed between rafters. This will need to be specified by an structural engineer or authority having jurisdiction. Check rafters for water damage or signs of degradation. If there is visible evidence consult with authority having jurisdiction over project and wait until rafters are deemed structurally sound before continuing installation. It is the responsibility of the installation engineer or customer to ensure that the mounting solution is suitable. When applicable, inspection by a building inspector or structural engineer should be completed to ensure the collector installation site and mounting solution is in accordance with the current building regulations. A structural engineer or qualified person should specify the specifications for roof or wall fastening equipment to be used. **RITTER GROUP USA TAKES NO RESPONSIBILITY FOR DAMAGES IF ROOF IS NOT STRUCTURALLY SOUND OR INSPECTED PRIOR TO INSTALLATION OF ANY SOLAR THERMAL EQUIPMENT.**

NOTICE

Refer to SE_0214 for spacing requirements for distance between stands offs and banks of collectors.

1. Locate a rafter and make note of the center to center distance between rafters (X) and thickness of structural members (Y) (See figure 1). One option to locate member is to drill from inside the attic through the roof. Another options is to drill pilot holes on roof until member is found. **Immediately caulk any pilot hole that is not on a rafter to prevent roof leaks.** Keep the SE_0214 document on hand during the installation process. It will be needed throughout the installation process.

2. Refer to the SE_0214 document for information on crucial installation distances. Once the model of collector is known mark off the height dimension (distance top to bottom of collector) on roof. Using the top of the collector as a base line, measure down distance A and mark off the area for the first base plate. Repeat this process for distance B. See figure 2.1 & 2.2. Using a chalk line will help ensure that all equipment is properly aligned, both vertically and horizontally. The white area in figure 2.2 represents the collector, and the full assembly is shown for clarity. Distance A and B vary depending on collector being used. The area marked at distance A is the position of first base plate on the mounting surface. This base plate will be the upper left most base pate. Next make sure that there is adequate amounts of room to the right to allow for all the solar thermal panels in the array. Measure down to ensure the proper spacing for each row of collectors. Once roof spacing is confirmed use a level and a chalk line to mark all mounting points that fall on distance A. Repeat for distance B. Ensure all chalk lines are level. Mark where the rafters lay on the chalk lines with chalk. This will help with the next step in the installation. Refer to local building and safety codes for recommended distances from edge or peak of roof when installing roof mounted equipment.

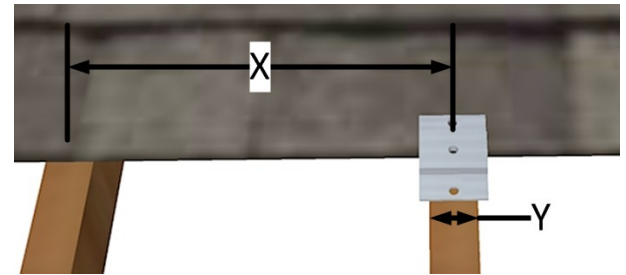


Fig. 1

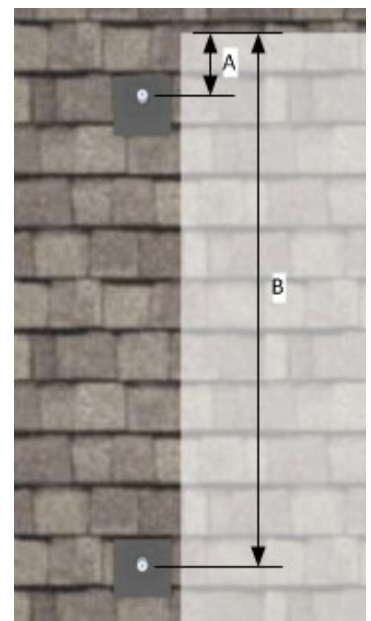


Fig. 2.2

Distance	CPC 6/12/18 // CPC 14/ 21	CPC 30 // CPC 45
A	13 ± 8 in (33 ± 20 mm)	13 ± 8 in (33 ± 20 mm)
B	52 ± 8 in (132 ± 20 mm)	52 ± 8 in (160 ± 20 mm)

Fig. 2.1

3. After rafter spacing has been confirmed, place baseplate down on marked location and drill pilot holes for lag bolts. Use the two holes on lower part of baseplate as a guide for where to drill. **Do not drill through the center hole.** Once pilot holes are drilled place a small amount of roofing caulk on the pilot holes. See Figure 3.1



Fig. 3.1

4. Attach the Base Plate to the structural member through the mounting holes with appropriate fasteners for your project; and in accordance with AHJ (Authority Having Jurisdiction). Be careful not to over tighten fasteners used to attach Base Plate. See figure 3.2



Fig. 3.2

5. Carefully install the flashing under the shingle row above base plate with the required coverage and align the center hole over the threaded hole in the base plate. Install a bead of caulk on the underside of the Flashing at the top and side edges prior to installing. Caulking locations shown in figure 4, are between flashing and shingles below flashing.

NOTICE

Do not caulk down slope edge of the Flashing.

6. Thread the Double Stud and stand-off into the hole sandwiching the flashing between the top of the base plate and Double Stud (washer). Turn Double Stud (by hand) until flashing is compressed between top of base plate and washer. Once Flashing is in contact with Base Plate and washer, turn Double Stud 1/8 to 1/4 turn to tighten. This is done best by marking the starting position of the stub and the base plate with chalk or a marker, giving the installer a reference point. **DO NOT OVER TIGHTEN.** See Figure 5

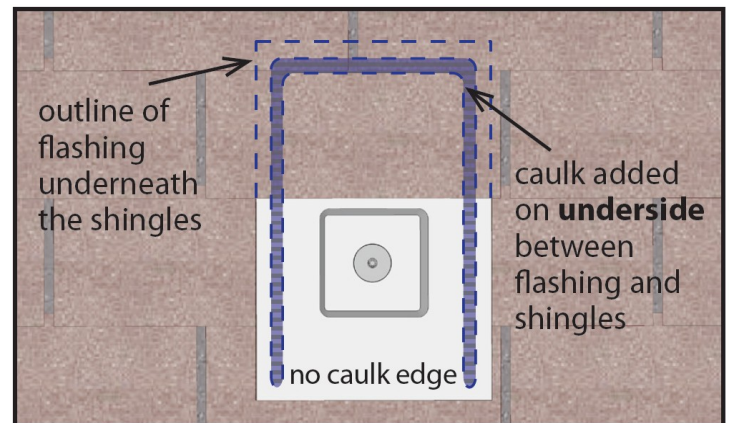


Fig. 4

7. Repeat steps 3 – 6 for all remaining left most stand offs.

Using leftmost stand offs as reference repeat steps 3 – 6 for each stand off called out in SE-0214 document. Place each stand-off on a structural member as close to location as shown in sections five or six . Figure 6 shows an example of a roof after all stand-offs have been installed.

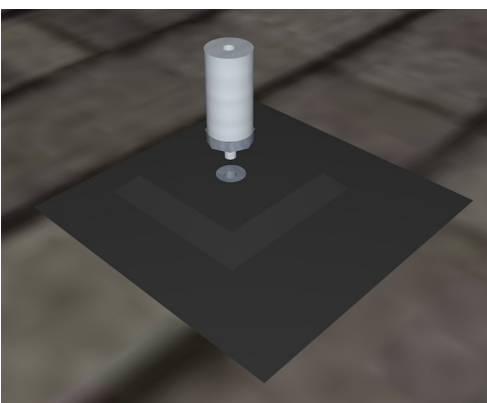


Fig. 5

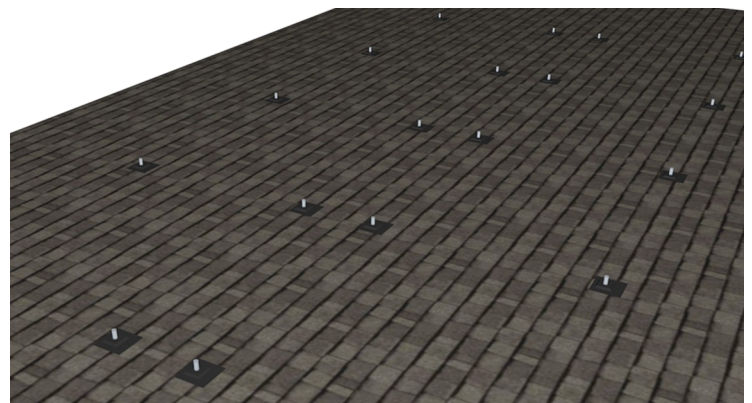


Fig. 6

6. Installing the Bearing Rails

6.1 Installing Bearing Rails

The first measurement should start from the center of the first stand off, which should be the upper left most stand off. The distance of the first rail is shown as distance C, on the table in figure 12 to the left of the left most stand off. Mark this distance, it will be used as the reference point for the rest of the bearing rails.

Please note that distance C and D are to the center of the bearing rails. Using the bolts supplied with the bearing rails, attach the bearing rail to the upper and lower stand offs. Repeat this process for the remaining rails needed, all information about the collector being used can be found in the SE_0214 drawing. Install all bearing rails before installing the collectors. Not all structural members or rafters will fall exactly on the measurements shown below. Place the stand off on the next closest structural member. Please note that the CPC 6, CPC 12, CPC 14 and CPC 30 use 2 bearing rails, while the CPC 21, CPC 45, and CPC 18 use 3 bearing rails. Add a multiple of distance B to each distance to determine the distance for the bearing rails of the next collector on that frame. Once all of the bearing rails have been installed, the substructure is ready for the collectors and the installation of the asphalt shingle mounting sets is complete (see Figure 11).

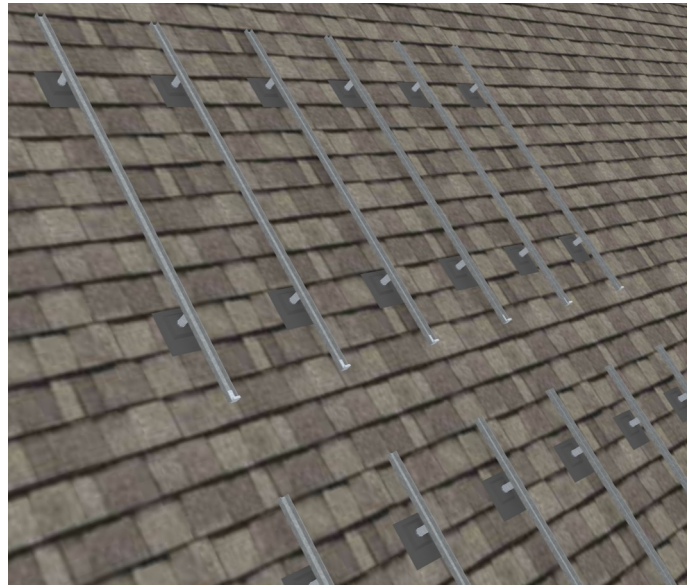
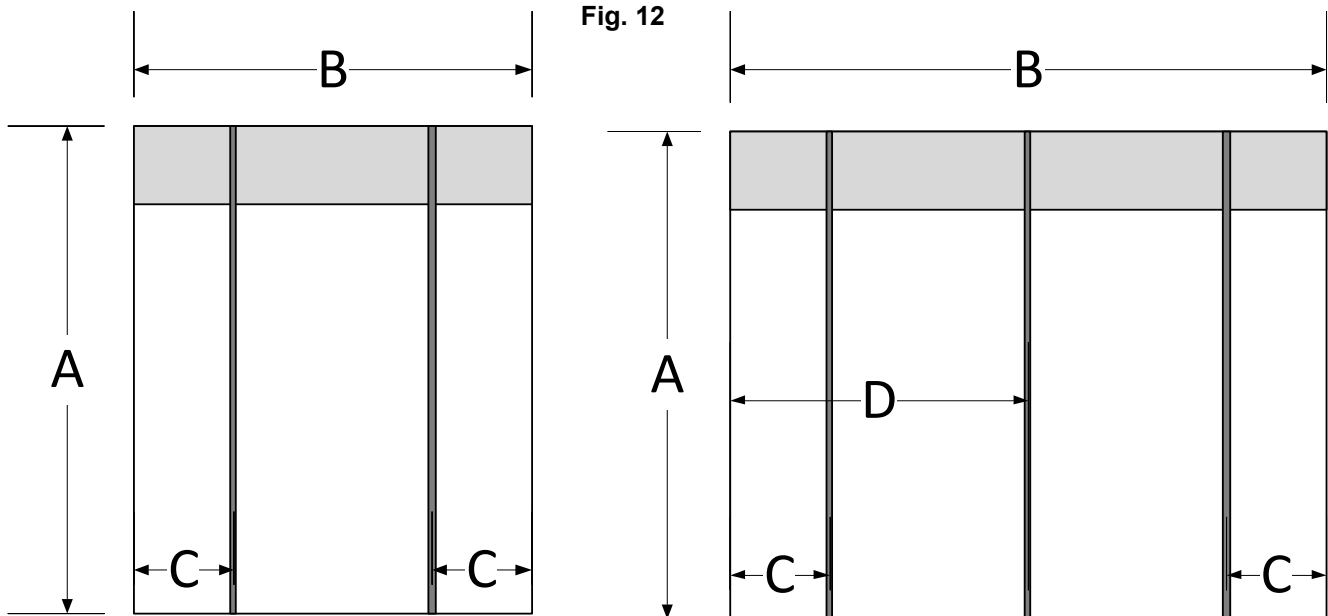


Fig. 11

i.e. The first bearing rail for the third CPC 18 in a bank would be, $(2 \times B) + C$, measured from the leftmost edge of the h-rail.
 $2 \times 82'' + 14'' = 178''$ from the left

Fig. 12



	CPC 18		CPC 21		CPC 45		CPC 6		CPC 12		CPC 14		CPC 30	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
A	64 9/16	1640	64 3/4	1620	80	2032	64 9/16	1640	64 9/16	1640	63 3/4	1620	80	2032
B	82	2032	95 5/8	2429	95 5/8	2429	27 5/8	700	54 3/4	1416	63 3/4	1620	63 3/4	1620
C	14	356	16	406	16	406	4 1/2	114	9	228	16	406	16	63 3/4
D	41	1041	48	1219	48	1219	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Part Numbers of Replacement Parts



ASSEMBLY PART	PART NUMBER	ITEM DESCRIPTION	QTY
88-2046		RETAINING CLAMPS FOR ASPHALT SHINGLES (SET OF 6)	1
	88-2051	FLASHING - GALVANIZED STEEL, BLACK	6
	88-2052	BASE PLATE - GALVANIZED STEEL	6
	88-2053	DOUBLE STUD - ZINC PLATED STEEL	6
	88-2054	SILICONE WASHER FOR DOUBLE STUD	12
	88-2055	STAND OFF BASE 2-1/2" M8 X 20, ALUMINUM	6
	88-2056	LAG BOLT 5/16" X 3.5" ZINC PLATED STEEL	12
	88-2057	M8X20 RAISED CHEESE HEAD SCREWS	6
88-2045		RETAINING CLAMPS FOR ASPHALT SHINGLES (SET OF 4)	1
	88-2051	FLASHING - GALVANIZED STEEL, BLACK	4
	88-2052	BASE PLATE - GALVANIZED STEEL	4
	88-2053	DOUBLE STUD - ZINC PLATED STEEL	4
	88-2054	SILICONE WASHER FOR DOUBLE STUD	8
	88-2055	STAND OFF BASE 2-1/2" M8 X 20, ALUMINUM	4
	88-2056	LAG BOLT 5/16" X 3.5" ZINC PLATED STEEL	8
	88-2057	M8X20 RAISED CHEESE HEAD SCREWS	4



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