

# **SOLAR MOUNTS LLC SOLAR CARPORT INSTALLATION MANUAL**



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# SAFETY INFORMATION

## General Safety Guidelines

- Only trained personnel should perform installations.
- Always follow OSHA guidelines for fall protection and workplace safety.
- Wear appropriate PPE, including hard hats, safety glasses, gloves, steel-toed boots, and harnesses where applicable.



## Equipment Safety

- Inspect tools and equipment before use.
- Use caution when operating heavy machinery like skid steers and post drivers.
- Use licensed operators to ensure skilled operation of equipment



WARNING  
FALLING OBJECTS

## Hazard Warnings

- Be mindful of overhead power lines when lifting materials.
- Secure all materials properly to prevent tipping or falling.



## TOOLS & EQUIPMENT REQUIRED

### Hand Tools

- Impact Driver
- Torque Wrench
- Solar Mounts V-Clamp, or Needle Nose Pliers
- 15/16" Socket for 5/8" Bolt
- 1/2" Socket for 5/16" Bolt
- 3/4" Socket for 1/2" Bolt
- 15/16" Combination Wrench
- 3/4" Combination Wrench
- 1/2" Combination Wrench

### Equipment

- Excavator (with Auger bit if the site has pier footings)
- Skid Steer
- Scissor lift
- Telehandler
- Boom Lift



## PRE-INSTALLATION GUIDANCE

### Working with Miss Dig (Public Locate)



Contractors must call (811, Miss Dig) before they dig . This is typically a free service provided by the local utility company. More detailed surveys of underground utility lines, phone lines, fiber optics, water lines, etc. can be conducted using GPR devices.

### GPR and LiDAR Data (Private Locate)

Underground detail can be gained by deploying ground penetrating radar (GPR) devices. GPR devices (e.g., US Radar, GSSI) can provide detailed information about shallow and deep obstructions, as well as accurate tracing of utility lines, water lines, fiber optics, telephone lines and more. GPR can provide up to 1 cm of accuracy although 5 cm is common with the addition of GPS (GNSS).

LiDAR devices are getting smaller and more accurate. These devices can be carried by drones and provide contractors with very accurate elevations and identification of above-ground contours, as well as detailed locating capabilities that can be transferred to construction drawings for the site.

## Solar-Construction Carport Footings

Solar-Construction offers two different types of foundations:

1. Pier Footings, and
2. Spread Footings are standard
3. Hybrid, spread footings with Helical posts

### Why Spread Footings Are Preferred

1. **Cost-Effective** – Uses less concrete / requires less excavation compared to pier footings. Savings are realized as there's less exposure to change-orders due to cave-ins, water, obstructions, etc..
2. **Faster Installation** – Easier to form and pour, reducing labor costs and project timelines.
3. **Better Load Distribution** – Spreads the weight over a larger surface area, minimizing settlement and improving stability.
4. **Ideal for Solar Carports** – Since solar carports distribute loads over a wide area, spread footings provide the necessary support without requiring deep drilling.
5. **Works Well in Most Soils** – As long as the soil is compacted and stable, spread footings provide excellent support with minimal ground disturbance.

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## Solar-Construction Carport Optional Modifications

**Snow Guards:** Low profile and functional. Snow guards will prevent sudden avalanches of snow coming off the solar panels and they heat up in the morning. There is no impact on solar performance.

**Waterproofing:** Solar Mounts LLC has developed new solar carport waterproofing strategies. If the carport needs to function both as a shade cover as well as a protective cover from rain, ask your Solar Mounts LLC representative about this optional modification.

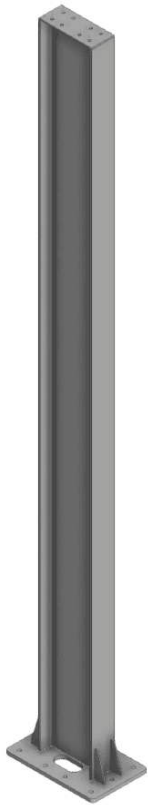
**Gutters and Downspouts:** whether you choose to install Solar-Construction waterproofing strategies, or not, the addition of gutters and downspouts can enhance water management around the carport, distributing most of the water away from the vehicles below and into drains to the side of the carport.

**LED Carport Lighting:** Solar Construction does not do electrical work; however Solar Mounts LLC can supply excellent LED carport lighting. We recommend carport lighting to enhance the aesthetics of the carport, but also provide excellent functionality, security and safety for carport users.

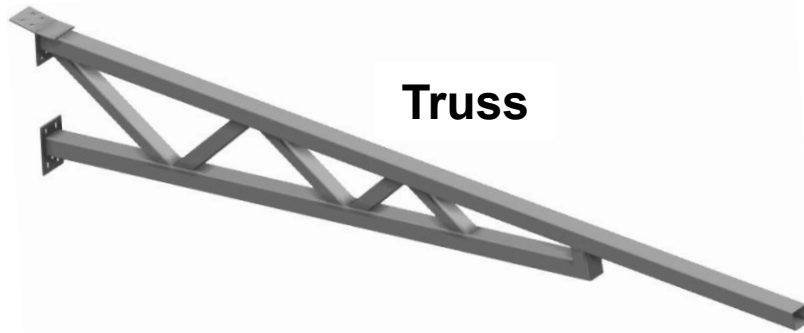
**Powder Coating:** Solar Mounts LLC can powder coat your posts and struts (we do not powder coat the purlins that support the PV modules). Although Solar Mounts Blue is our “go-to” color, customers can order from a broad palette of colors to meet their customer’s aesthetic tastes (Yellows, Reds, Blues, Greens, Grays, Browns, White or Black).

**Helical Posts:** If there is a lot of water in the soil, or the soil is weak / unstable and won’t support the weight of a ballasted post, contractors can specify large Helical Posts. Helical posts can be driven to reach strong, stable soil at greater depths. Helical posts can be installed in any weather, rain, snow, freezing temperatures. A skid steer or other compact hydraulic machinery can handle the installation to drive down to more solid soil. If the pier is installed in the wrong location, it can simply be unscrewed and re-installed. Finally, Helical Posts can be part of a hybrid solution where Solar-Construction can install helical posts with spread footings.

## CARPORT: MAIN COMPONENTS



**Post**



**Truss**



**Purlin  
Stiffener**

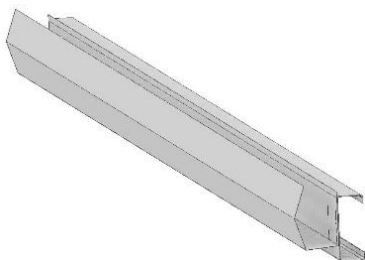


**27'-0" Purlin**

### *Optional Mods*

**Waterproofing**

**Gutters and Downspouts**



**Snow Guards**



**LED Lighting**





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## INSTALLATION STEPS

First step is the Post installation. Solar Mounts LLC offers two (2) different types of foundations for the Carport Post/Pier(s); Pier Footings and Spread Footings (please contact Solar Mounts for information on Hybrid footings with Helicals).

### Pier Footings

#### **Saw Cutting and Excavating**

- Mark out pier foundation size and location according to SMLLC drawings and specs, along with the customer-provided licensed survey to confirm specific locations on the site plan
- Cut out existing asphalt or concrete
- Using a 36” auger, drill to a depth called out in Solar Mounts LLC stamped drawings and calculations (see SMLLC images below)
- Fill bottom 2” with stone and compact

#### **Rebar and Concrete**

- Place Sonotube commercial concrete form and rebar cage into hole
- Set bolt frame over concrete forming tube
- Use template to hang anchor bolts down pier upright
- Fill forming tube with concrete



## **Pier Footing Images**

**Augured  
Hole**



**Placing  
Rebar  
Cages**



**Bolt  
Template  
Form**



**Complete**



## **Spread Footings**

### **Saw Cutting and Excavating**

- Mark out pier foundation size and location according to SMLLC drawings and specs, along with the customer-provided licensed survey to confirm specific locations on the site plan
- Cut out existing asphalt or concrete
- Excavate to depth called out in SMLLC drawings (see images below)
- Fill the bottom 2" (confirm on SMLLC drawings) with crushed stone and compact

### **Rebar and Concrete**

- Tie rebar matts together with pier uprights in the center. See SMLLC drawings for appropriate rebar sizing and quantity
- Drop rebar cage into hole
- Set framing over Sonotube commercial concrete forming tube

- Use bolt template to hang anchor bolts down pier upright
- Fill spread footing and Sonotube commercial concrete forming tube with concrete

### **Spread Footing Images**



### **Tied Mats with Uprights**

#### **Set Cage**

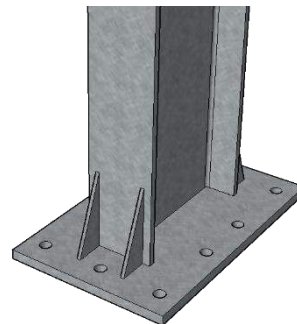


### **Forms**



## Placing the Post on the Foundation

1. Sling and grab post from top using I-Beam clamps
2. Make sure placement is level on anchor bolts
3. Tighten top nuts snug

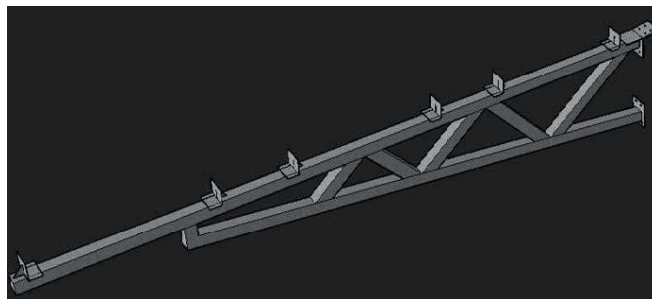


## Bolting the Adjustable L-Bracket in Place

- On SMLLC drawing set, a side view is arranged showing the distances needed between L-Brackets
- Bolt L-Brackets onto truss using 1/2" X 7" bolt
- Tightening to AISC snug (+ 1/4 turn)

ALSO INCLUDED:

- 1/2" Flat Washer
- 1/2" Lock Washer
- 1/2" Nut

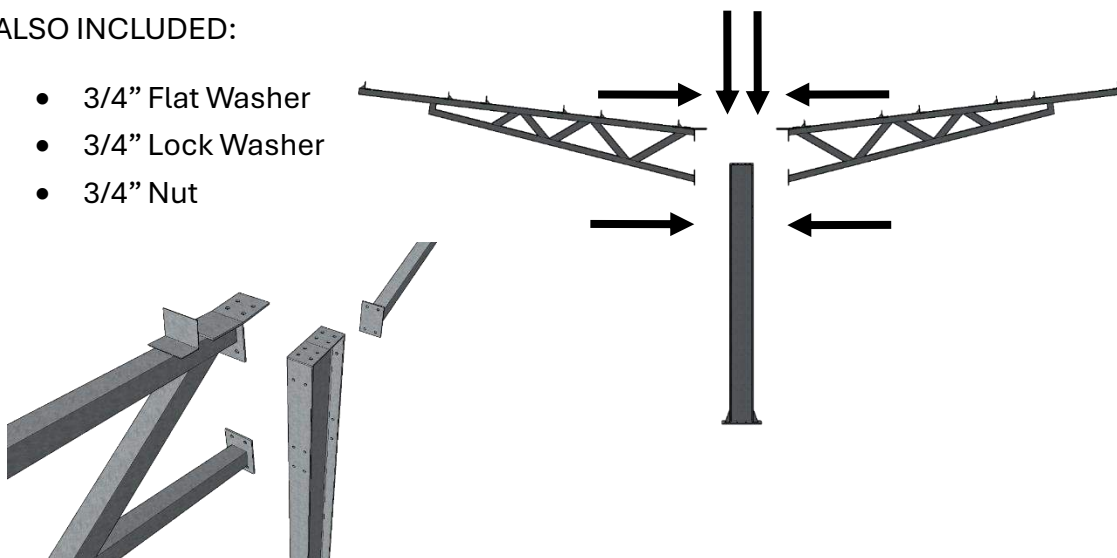


## Attaching the Truss to the Post

- Use 3/4" X 2 1/2" bolts
- Tighten to AISC snug (+ 1/4 turn)

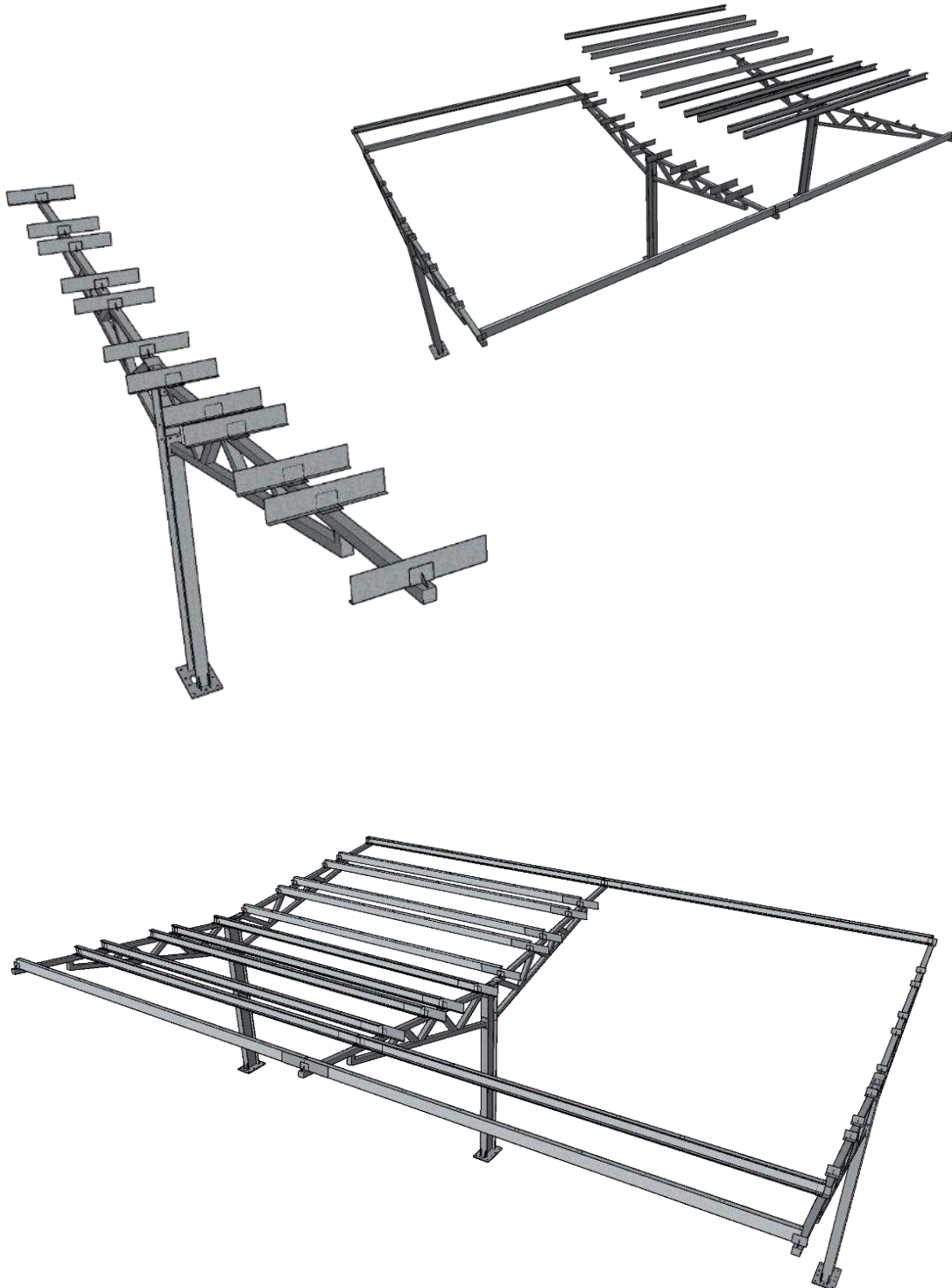
ALSO INCLUDED:

- 3/4" Flat Washer
- 3/4" Lock Washer
- 3/4" Nut



## Attaching Overlap Plates and Purlins

- Secure the Overlap Plate to the Purlin with 5/16" fasteners (x4)
- Secure the L-Plate to the Overlap Plate with 5/16" fasteners (x4)



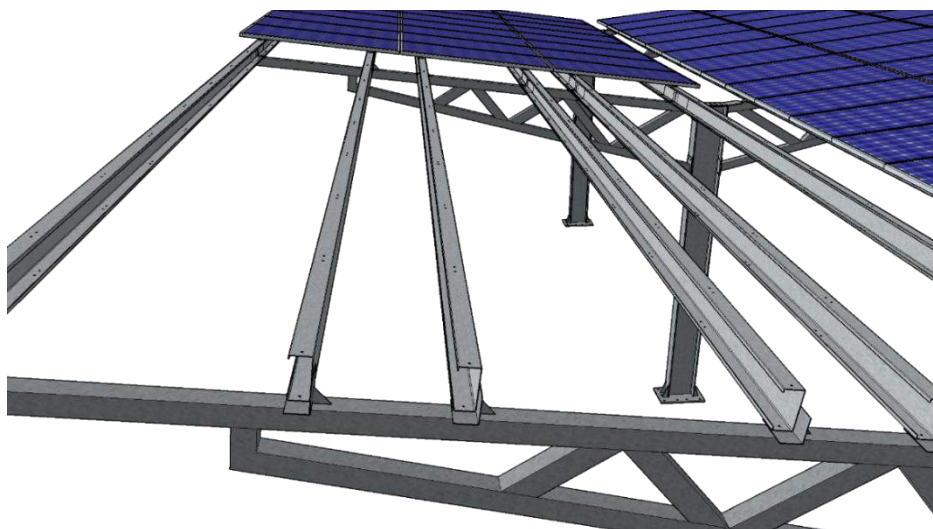
## Purlin Stiffener Attachment

- See SMLLC drawings for appropriate spacing
- Compress the V-Clamp with SMLLC V-Clamp pliers (or needle nose pliers) and release into position
- **NOTE:** many contractors fabricate a jig and build the Purlin stiffeners on the ground
- Attach the stiffener to purlins with 5/16" serrated flanged bolt and nut



## PV Module (“PV Panel”) Attachment and Installation

- Self-tap the mounting bracket onto the Purlin
- Secure the PV module onto the mounting bracket using the 5/16" bolt



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## FINAL INSPECTION & MAINTENANCE

- Check all Carport Post, Strut and Purlin bolts and nuts for tightness.
- Check PV array to ensure all PV modules are clean and unbroken.
- Check all PV module mid-clamps and end clamps are tightened to specification.
- Ensure all cement foundations are covered from weather and prepared for proper curing.
- Check optional modification components to ensure they are secured at each light and/or fastened along their entire length (canopy lights, snow guards, gutters and downspouts)
- Periodically inspect the structure for signs of wear or loosening.

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## CONTACT INFORMATION

For questions or support, contact:

Solar Mounts LLC

Website: <https://solarmounts.com>

Phone: (844) 757-7225

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