

Solar Mounts, LLC. Solar Shade Structure Installation Manual



The Eclipse Series



Domestic. Economical. Best Delivery. email:
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Introduction

- The **Solar Mounts, LLC Solar Shade Structure** is engineered for simplicity, durability, and performance. With the fewest components and hardware connections in its class, this solution streamlines installation while maintaining structural integrity. No drilling, cutting or welding is required. Bolt-to-design simplifies Post mounts to foundation cage and PV modules to purlins. All steel is pre-drilled, hot-dipped, G235 galvanized and 100% U.S.-sourced, meeting both AISC and BABAA certification standards.
- The system is highly configurable and adaptable to uneven terrain—ideal for sites where other structures can't be installed. PV modules deliver both shade and power, attaching easily with UL 467 & 2703 grounding washers and (proprietary) adaptable bracket for secure, grounded installations.
- Solar Mounts, LLC Shade Structure are engineered to withstand very high wind and snow loads. Waterproofing options include attractive under-decking or top-side water management components, with no impact on solar output.



Features and Benefits

- Four (4) main components and minimal hardware
- Pre-welded tilt angle (7° standard)
- Multiple clearance heights available (14' recommended height clearance)
- Universal brackets fit any PV module ('panel'), industry-wide
- Solar Mounts LLC stocks components to maintain industry-leading lead times
- Solar Mounts provides stamped drawings in all 50 States and beyond

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



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 36" Auger bit if the site has pier footings
 - Bucket for spread footings
- Scissor lift
- Telehandler
- Boom Lift

• Solar Shade Structure System Ratings

- PV Module Orientation : South
- Grounding/Bonding Rating: UL 2703, UL 467
- Mechanical Rating: UL 2703

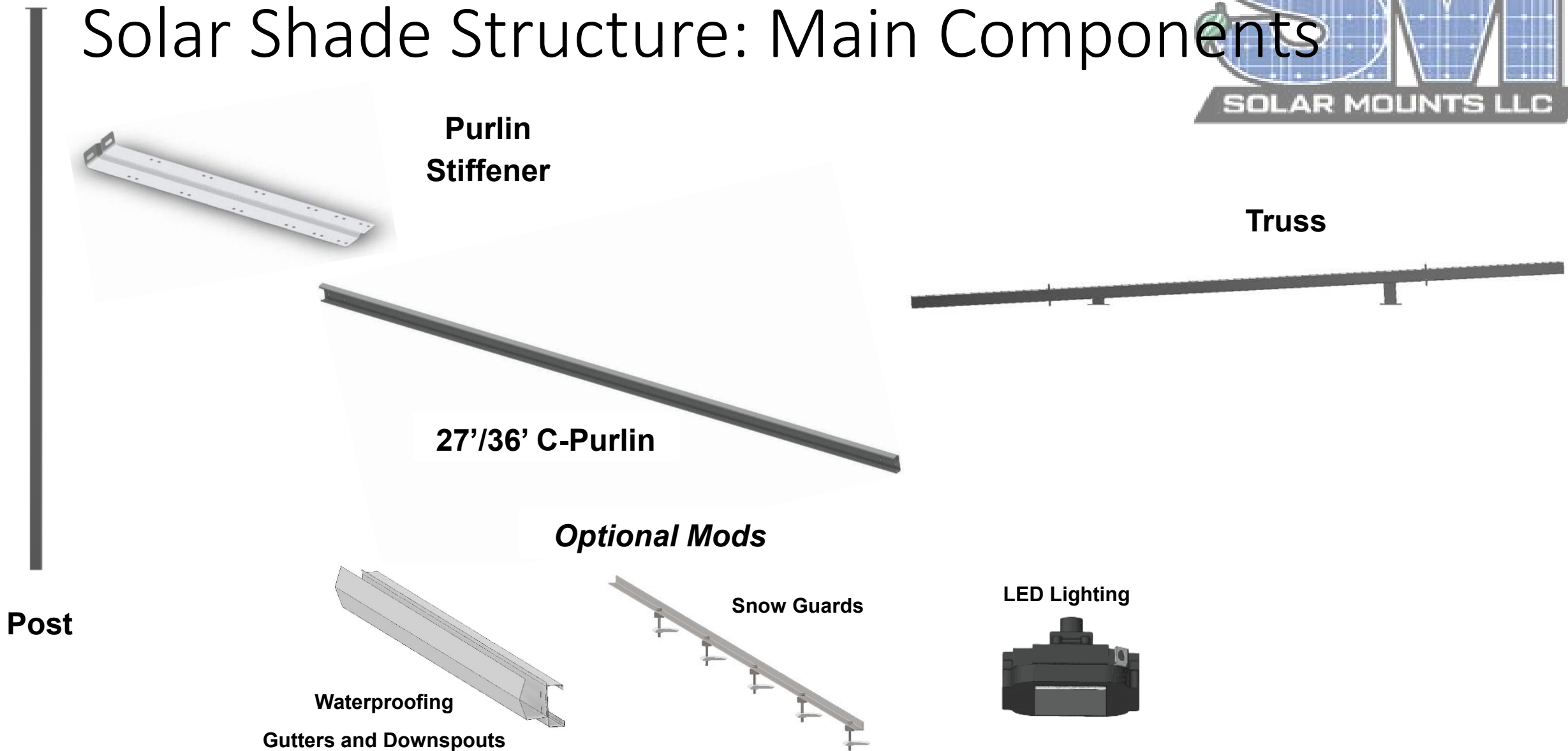
Required Pre-Installation Guidance

- 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, and give you detailed locating capabilities that can be transferred to construction drawings for the site.



**Know what's below.
Call before you dig.**

Solar Shade Structure: Main Components



Pier Foundation Installation

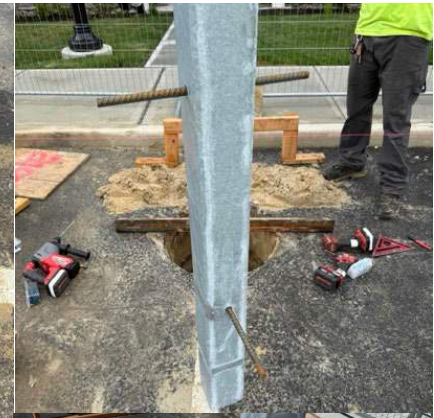
- Saw Cutting and Excavating
 - Mark out pier foundation size and location according to SMLLC drawings and specs, along with the customer-provided licensed survey to confirm specific locations on the site plan
 - Cut out existing asphalt or concrete
 - Using necessary sized auger, drill to a depth called out in Solar Mounts LLC stamped drawings and calculations (see SMLLC images below)
 - Fill bottom 3" with stone and compact
- Rebar and Concrete
 - Place Sonotube commercial concrete form and rebar cage into hole
 - Set post assembly with 2 pieces of rebar through the post into augured hole
 - Using wood fixturing brace the post
 - Fill forming tube with concrete

• Pier Footing Images

Augured Hole



Placing Rebar



Bolt Template Form



Complete



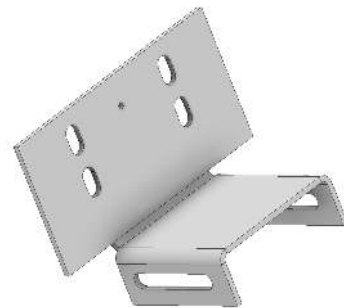
Adjusting for Grade

- The main goal when placing the posts, is to have the top of posts in that array be consistent.
- The posts are able to float inside the augured hole to accommodate this



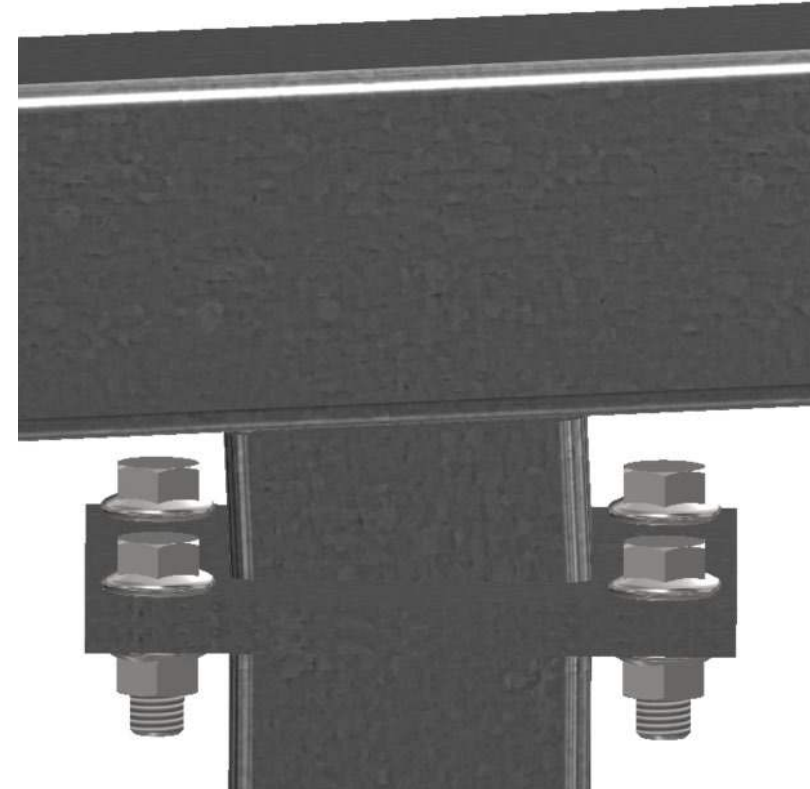
Bolting Adjustable L-Bracket to Truss

- On SMLLC drawing set, a side view is arranged showing the distances necessary to place all L-Brackets onto each truss
- On the ground, Bolt L-Brackets onto truss using 1/2" X 7" bolt
- Tightening to 70-80 ft-lbs
- Also included:
 - 1/2" Flat Washer
 - 1/2" Lock Washer
 - 1/2" Nut



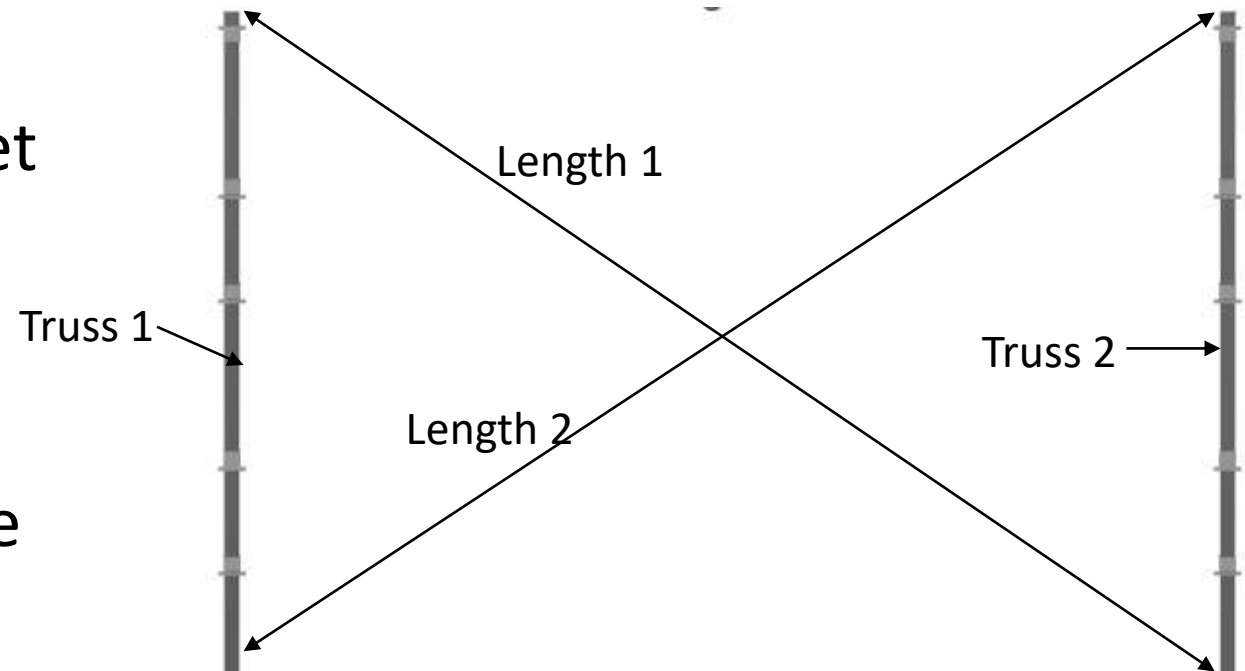
Attaching Truss to Post

- Each truss will connect to the (2) posts using a total of (8) $\frac{3}{4}$ " x 2.50" Bolts
- Torque specs: AISC Snug Tight + $\frac{1}{4}$ Turn
- Also included:
 - $\frac{3}{4}$ " Flat Washer
 - $\frac{3}{4}$ " Lock Washer
 - $\frac{3}{4}$ " Nut



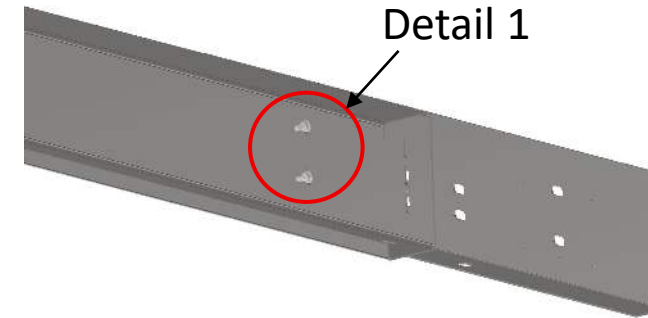
Squaring of Trusses

- Square the system before installing purlins, SMLLC recommends using two ratchet strap to make an “X”.
- Length 1 should be the same measurement as Length 2
- Leave these installed until the installation of purlins is complete.



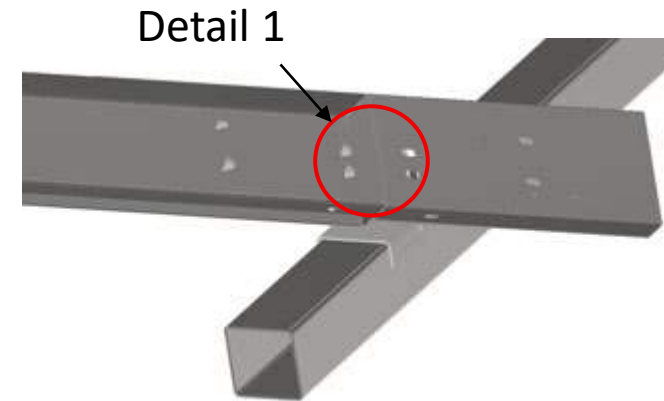
Attaching Overlap Plates and Purlins

- On the ground, Assemble 40" Overlaps to one end of the C-Purlins with (2) ½" x 1.25" Bolts (1/2" nut). Use the slots called out on Detail 1
- For ONLY the first section in each Array, put the overlaps on both sides of the purlins. Still only putting bolts shown on detail 1



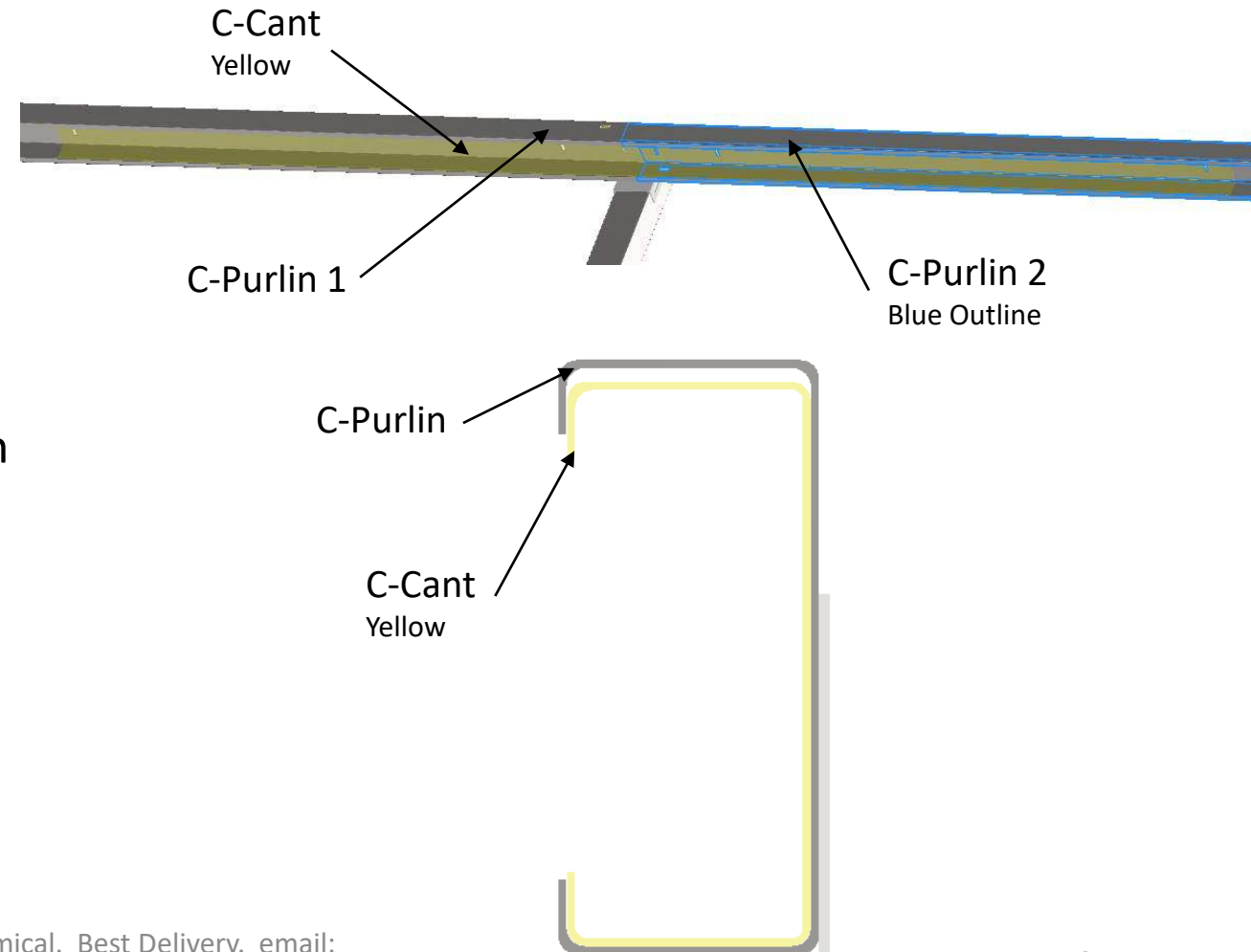
Attaching Overlap Plates and Purlins

- Lift purlin onto each L-Plate (which should already be fastened and measured in accordance with page 14), **Overlap and Purlin together using (2) ½" x 1.25" Bolts (1/2" Nut) See Detail 1**
- Upon completion, every purlin should have (4) ½" fasteners on each end torqued to 70-80 ft-lbs



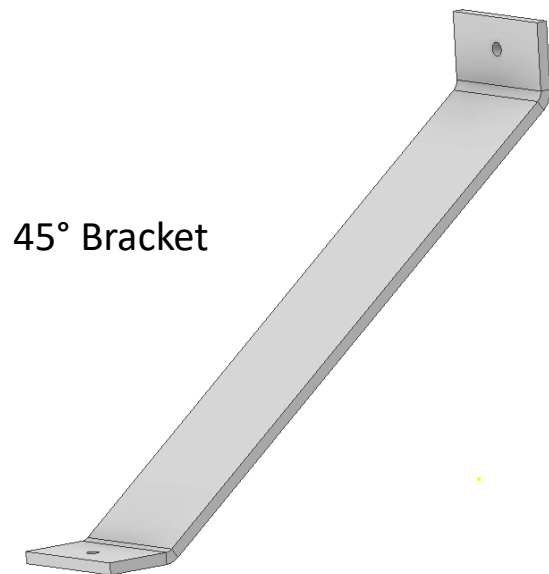
Attaching C-Cantilevers –

- Reference SMLLC Drawings for each length of cantilever
 - NOTE: Lengths will vary per array
- Extra C-purlins will be supplied.
- Cut the C-purlin to the stated dimension in SMLLC drawing
- Slide C-Cantilever 4' into previous purlin, with 6' sticking out
- Slide C-Purlin over the extruding C-Cantilever
 - Fasten components same as previously mentioned
 - Holes in C-Cantilever will need to be drilled

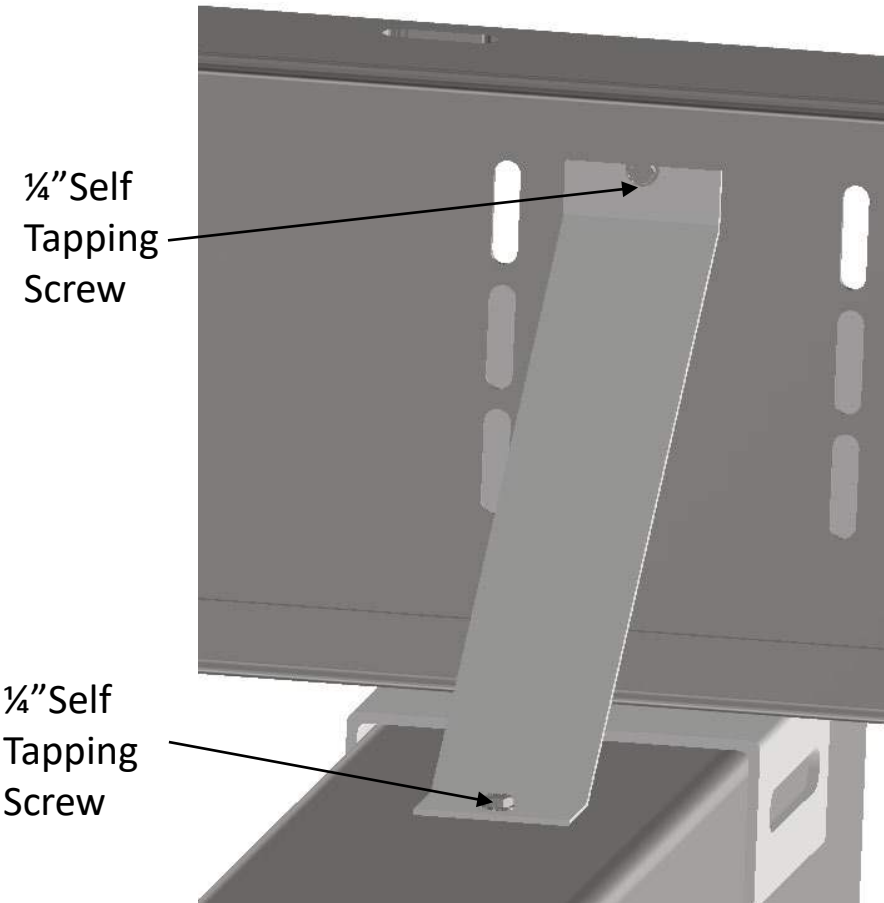


Installation of 45° Brackets

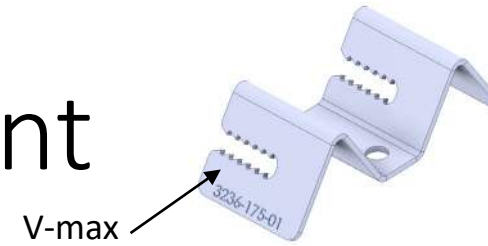
- 45° Designed to stiffen the C-Purlin
- Using ¼" Self Tapping Screw, fasten 45° Bracket to C-Purlin
- Using ¼" Self Tapping Screw, fasten 45° Bracket to Truss



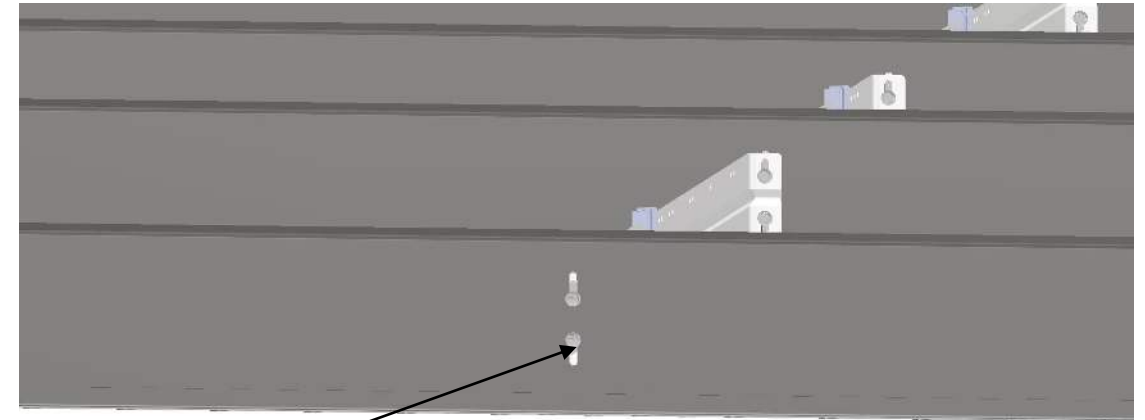
45° Bracket



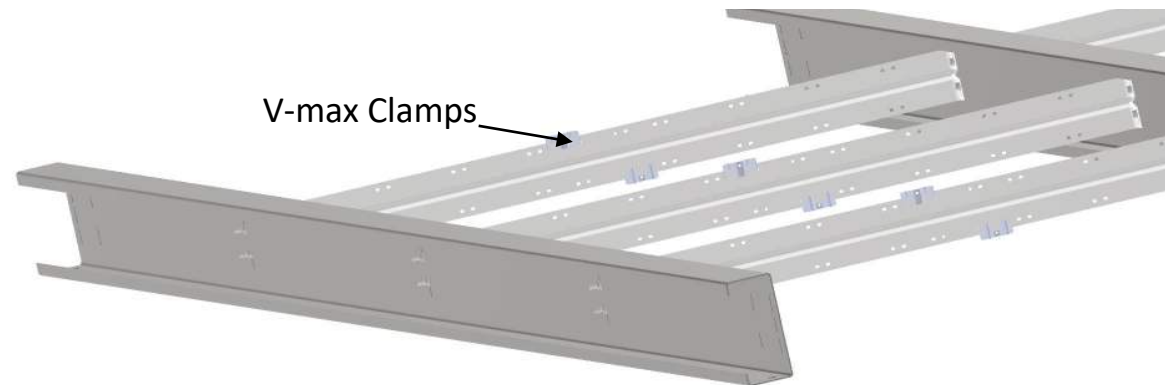
Purlin Stiffener Attachment



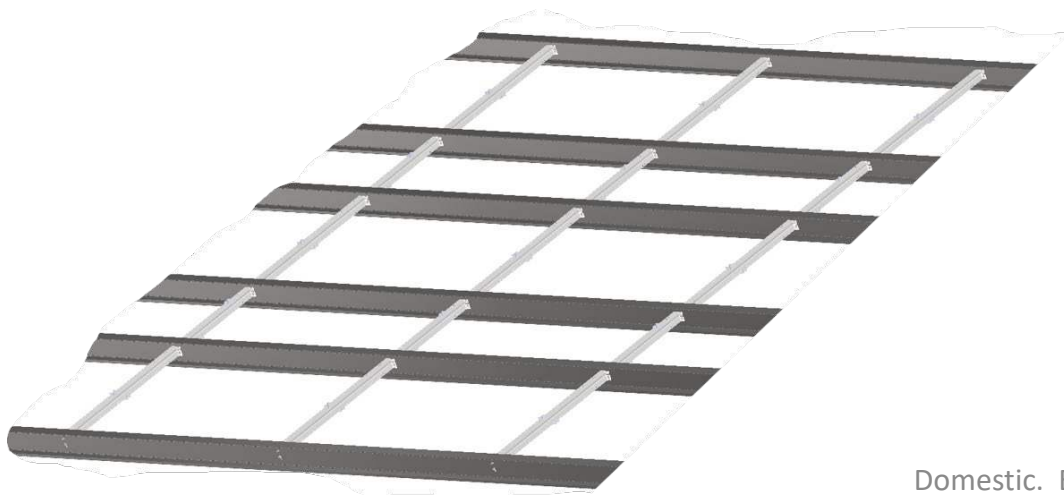
- See SMLLC drawings for appropriate spacing
- Compress the Vmax-Clamp with SMLLC V-Clamp pliers (or needle nose pliers) and release into position (Detail 1)
- **NOTE:** many contractors fabricate a jig and build the Purlin stiffeners on the ground
- Attach the stiffener to purlins with (2) 5/16" serrated flanged bolt and nut (Detail 2)
- Torque 5/16" to 17-20 ft-lbs



5/16" Bolt

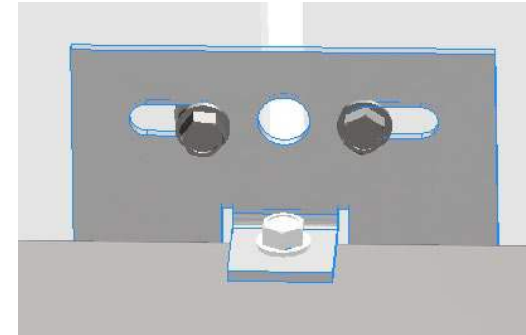


V-max Clamps

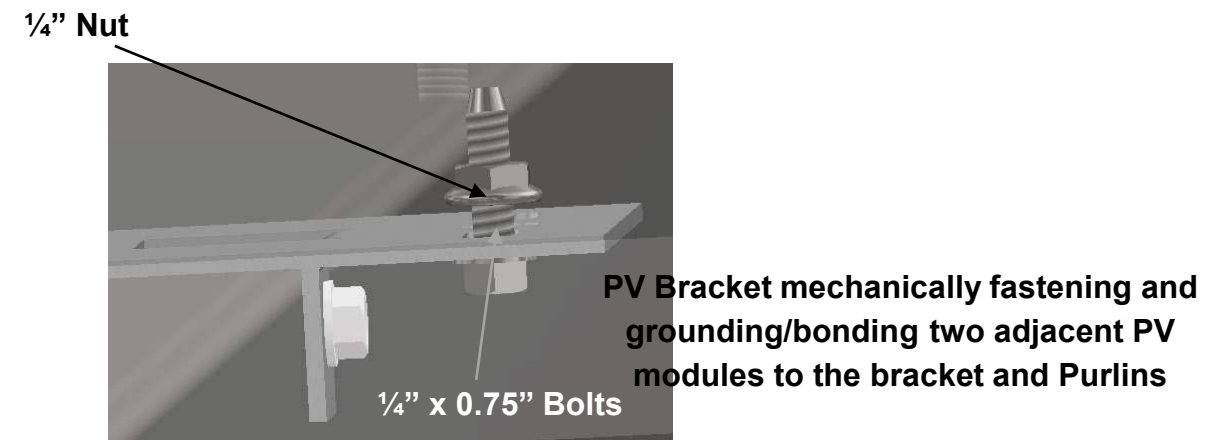
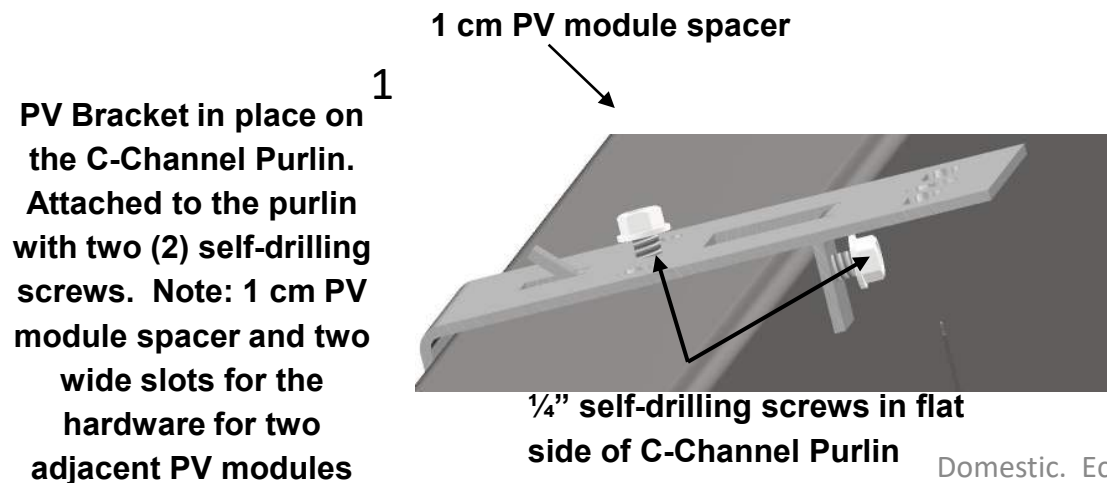


PV Module Attachment & Installation

- Attach bracket to one side of module using $\frac{1}{4}$ " x 1" bolt and $\frac{1}{4}$ " nut
- Secure the bracket to the purlin using two (2) $\frac{1}{4}$ " self-drilling screws into (Detail 1)
- Secure the second PV module onto the bracket using $\frac{1}{4}$ " x 1" bolt and $\frac{1}{4}$ " nut. The PV bracket will accommodate two PV module bolts/nuts/washer sets for the two adjacent PV modules. (Detail 2)
- Torque to 10-12 ft-lbs **NOTE:** Avoid over torquing!



3
Two PV Brackets on two purlins. Each bracket supports two adjacent PV modules





FINAL INSPECTION & MAINTENANCE

- Check all Shade Structure Post, Truss and Purlin bolts and nuts for tightness. Any loose components or fastener shall be re-tightened in accordance with these instructions.
- 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 properly installed and functional. Ensure each canopy light is wired properly (and programmed per customers specifications) and that all components are physically secure (canopy lights, snow guards, gutters and downspouts)
- Periodically inspect the structure for signs of wear or loosening. If any components of the Solar Shade Structure show signs of damage that compromises safety, these components shall be replaced immediately.
- Annual Inspection required of warranty