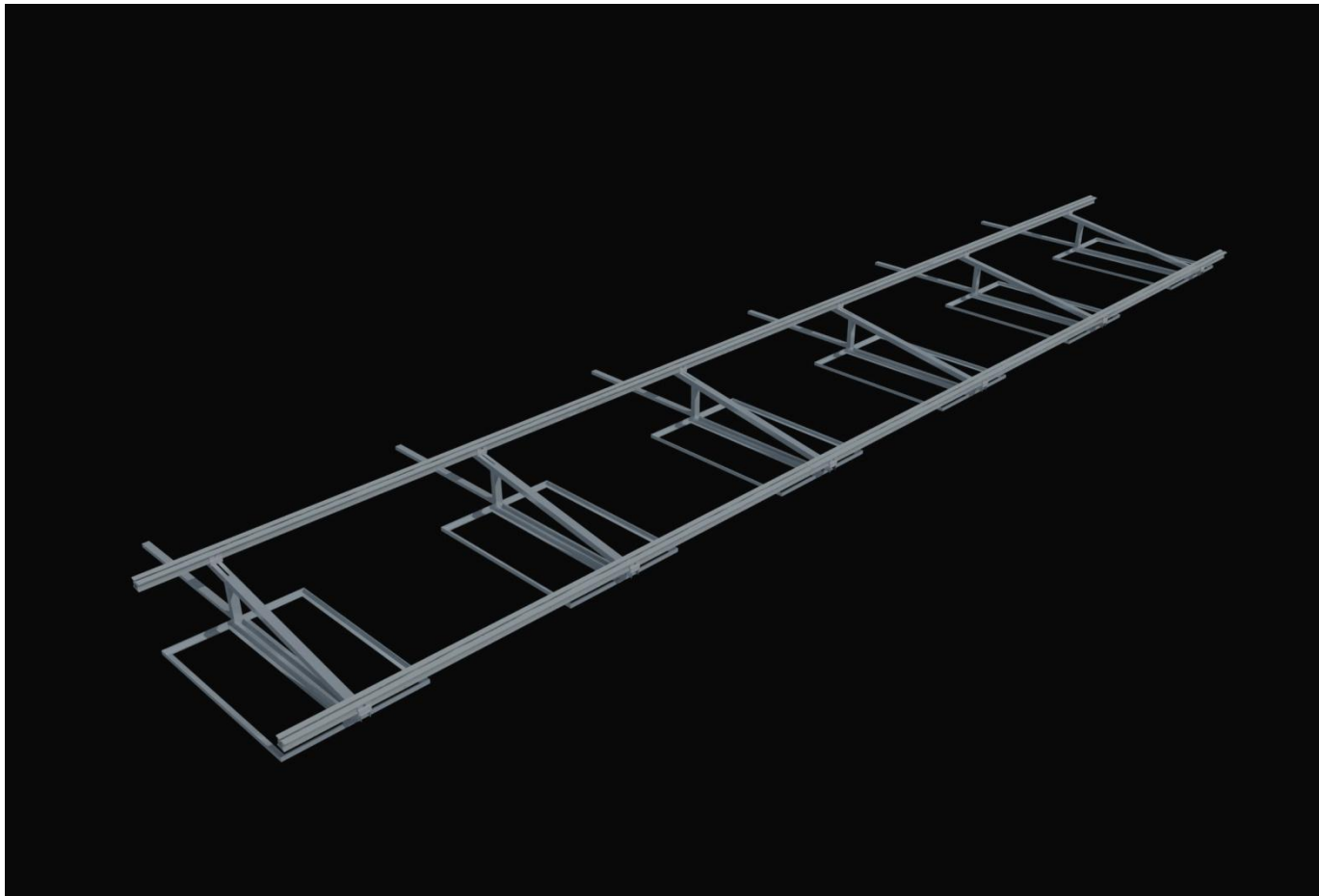


**TOUGH TRAC™**



## Low Angle Ballast Portrait Installation Manual

[www.toughtrac.com](http://www.toughtrac.com)

©Copyright 2009 TOUGH TRAC. Trademark belongs to their respective owners. All rights reserved.



**Installer Responsibilities**

- Inquire and comply with all local and state building codes that apply to this installation.
- Consult with your engineer to inspect and determine that all roofs, rafters, trusses, and all structural support can handle and support the solar array and live load conditions.
- Consult and ensure that this mounting solution is appropriate for your particular installation.
- Consult with engineers to determine weight needed for ballast systems.
- To use only TOUGH TRAC™ supplied parts for your installation. Substituting parts may void the warranty.
- Install temporary ballasts to all unfinished arrays to secure the system to the roof to prevent movement or damage due to wind after work hours.
- Ensure all electrical connections are compliant to local electrical codes.

**Parts supplied in your system (Stainless Steel Hardware not shown)**

	<p>FRONT &amp; REAR SUPPORTS</p>		<p>BALLAST FRAME TRAY</p>
	<p>C-RAIL</p>		<p>JOINING BRACE</p>
	<p>STANDARD RAIL</p>		<p>CLICK MOUNT</p>
	<p>MID CLAMP      END CLAMP</p>		<p>CONNECTOR TUBE</p>

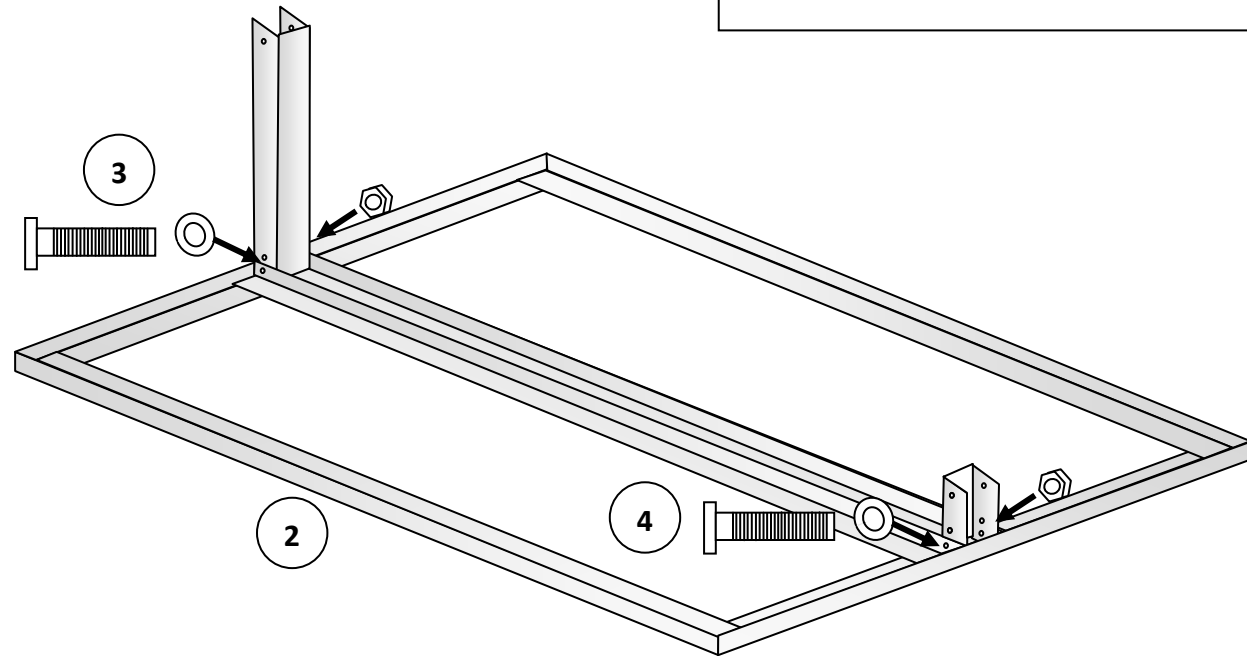
1. Determine location on the roof.
2. Layout Low Angle flat roof ballast trays.
3. Slide each Rear Vertical Support into each Ballast Tray and fasten with  $\frac{1}{4}$ " x 3" bolt, washers, and nut.
4. Slide each Front Vertical Support into each Ballast Tray and fasten with  $\frac{1}{4}$ " x 3" bolt, washers, and nut.

**HARDWARE:** $\frac{1}{4}$ " X 2" – CONNECTOR TUBES $\frac{1}{4}$ " X 3" – VERTICALS AND JOINING BRACE

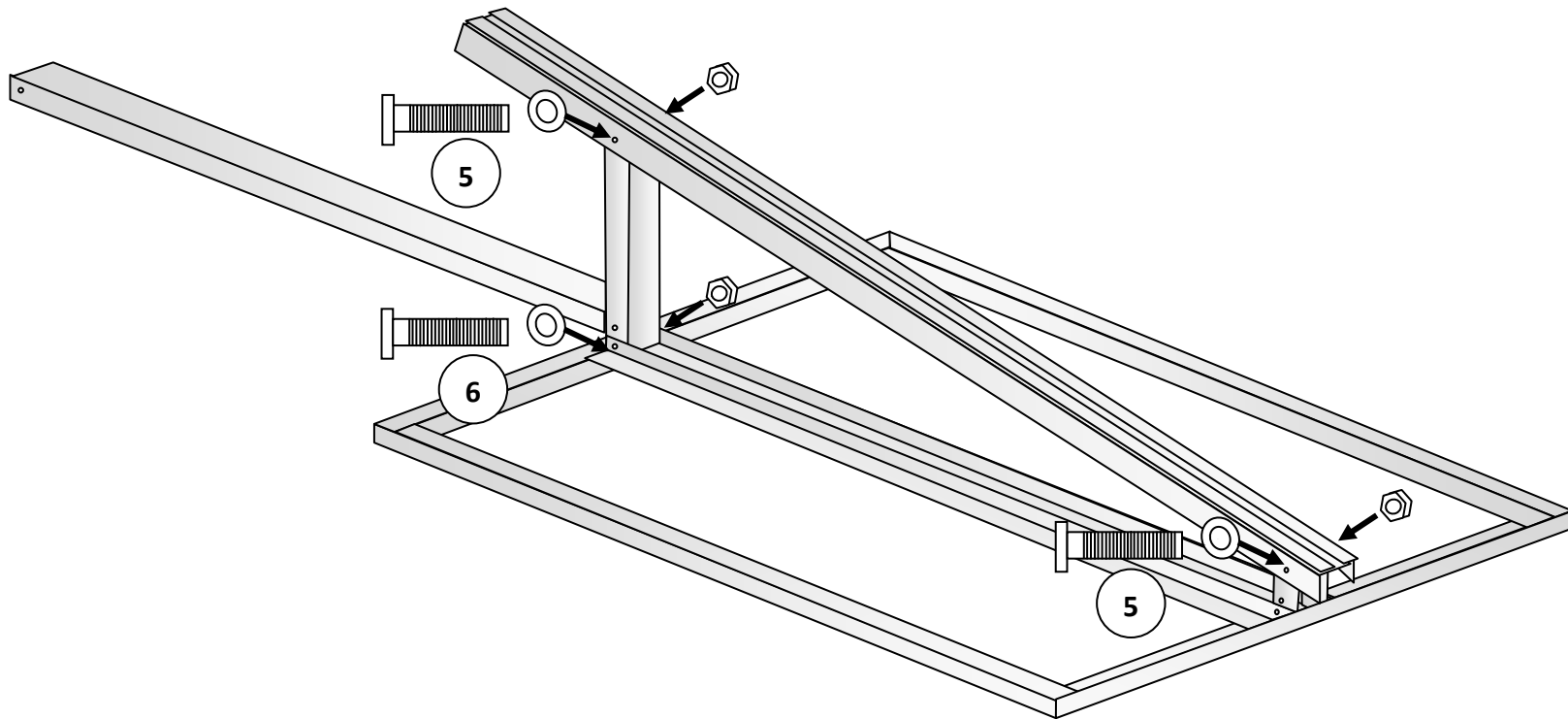
#14 X 1.5" SELF TAPPER – CLICK MOUNT

5/16" X 1.625" - T BOLT RAIL

3/8" X 1" SQ BOLT SMALL FOR C-RAIL

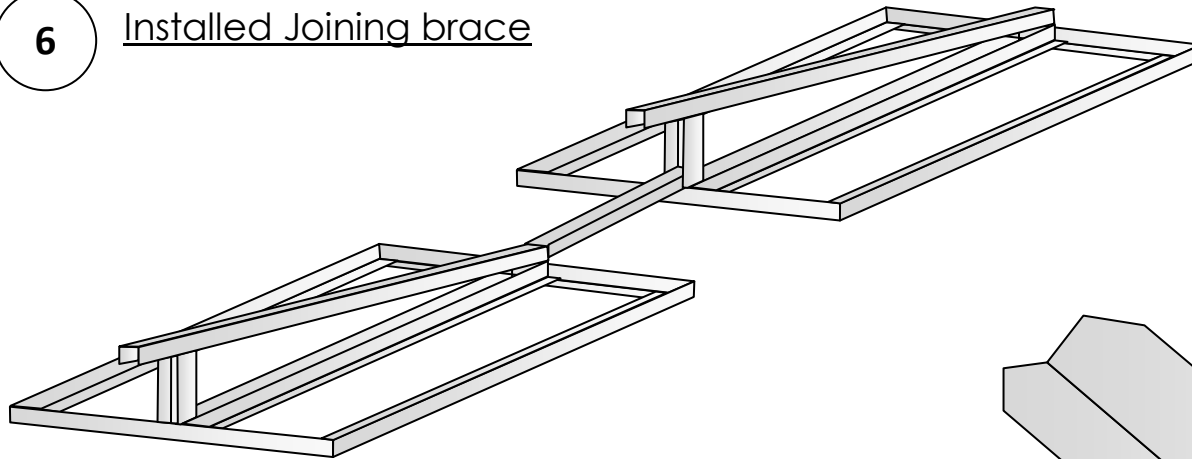


5. Attach C-Rail (USA) to Front & Rear Supports using  $\frac{1}{4}$ " x 3" bolts, washers, and nuts.
6. If this is a row to be installed behind another row, attach the Joining Brace now. The Joining Brace is attached on one end, to the Front Stand and the previous row, to the Rear Stand, See next page for close up view.

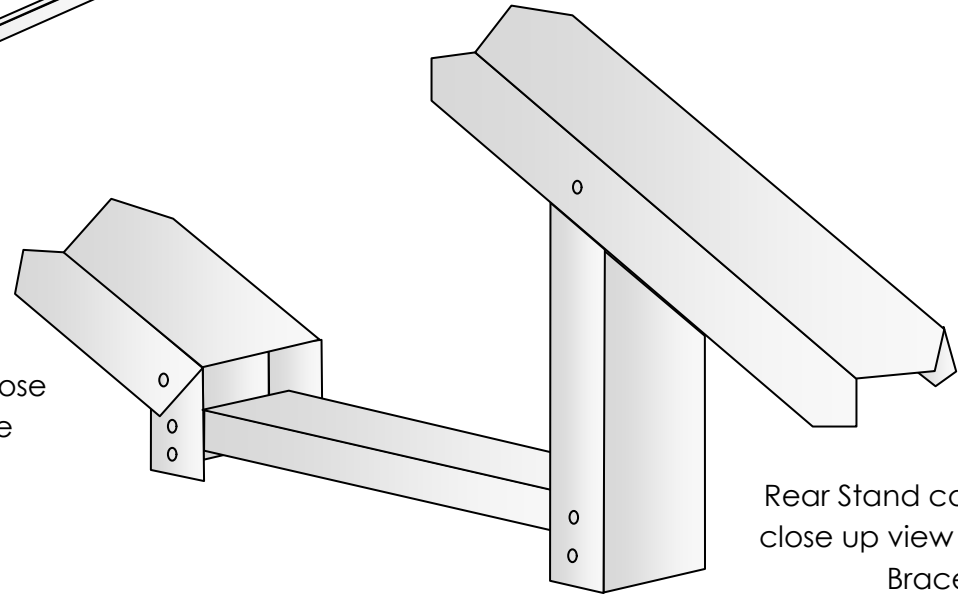


6

Installed Joining brace

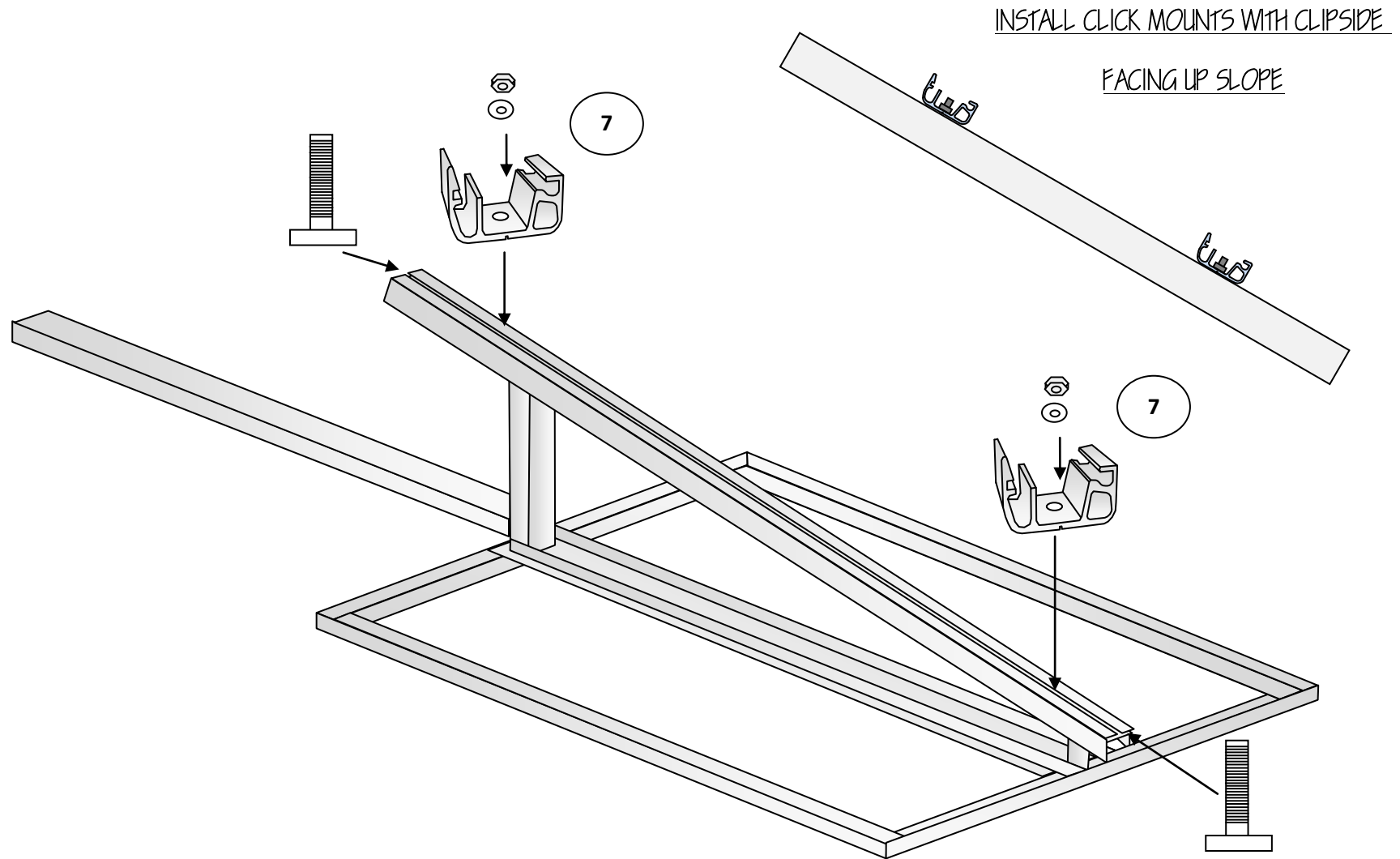


Front Stand connection close up view of Joining Brace

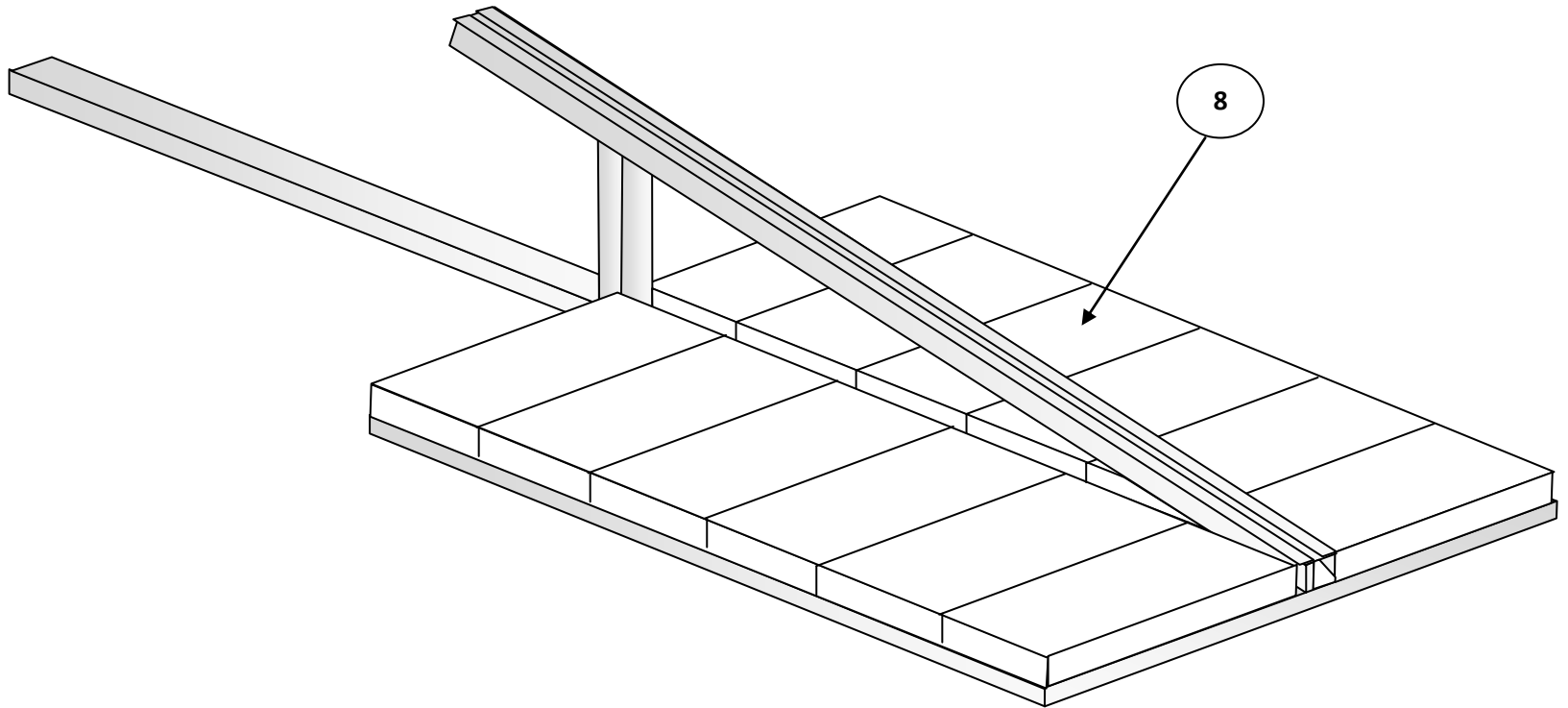


Rear Stand connection close up view of Joining Brace

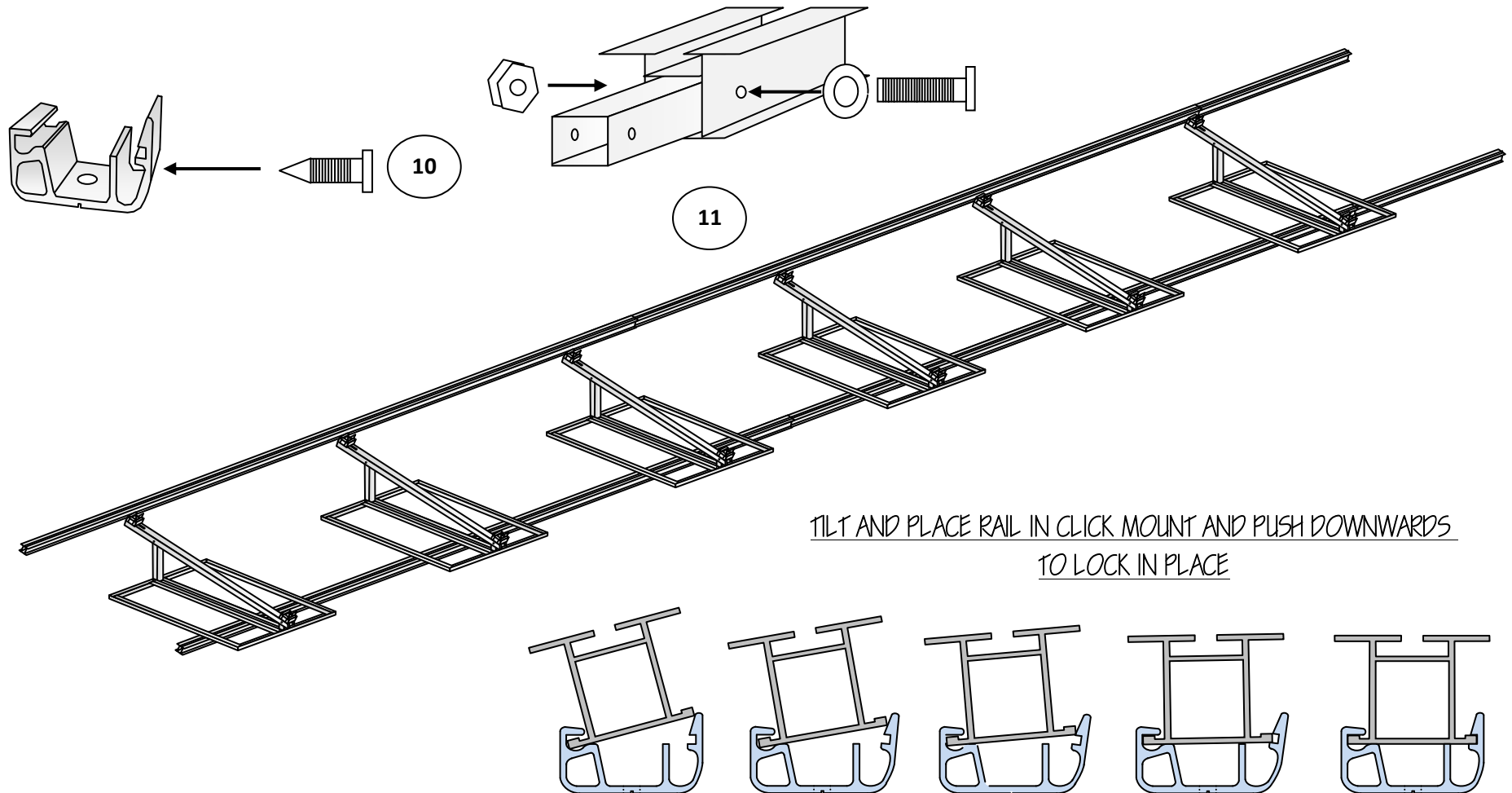
7. Slide Square Bolt (7/8" x 7/8") 3/8" x 1" into C-Rail and attach 2 Click Mounts. Space Click Mounts to the mounting hole locations on your module.



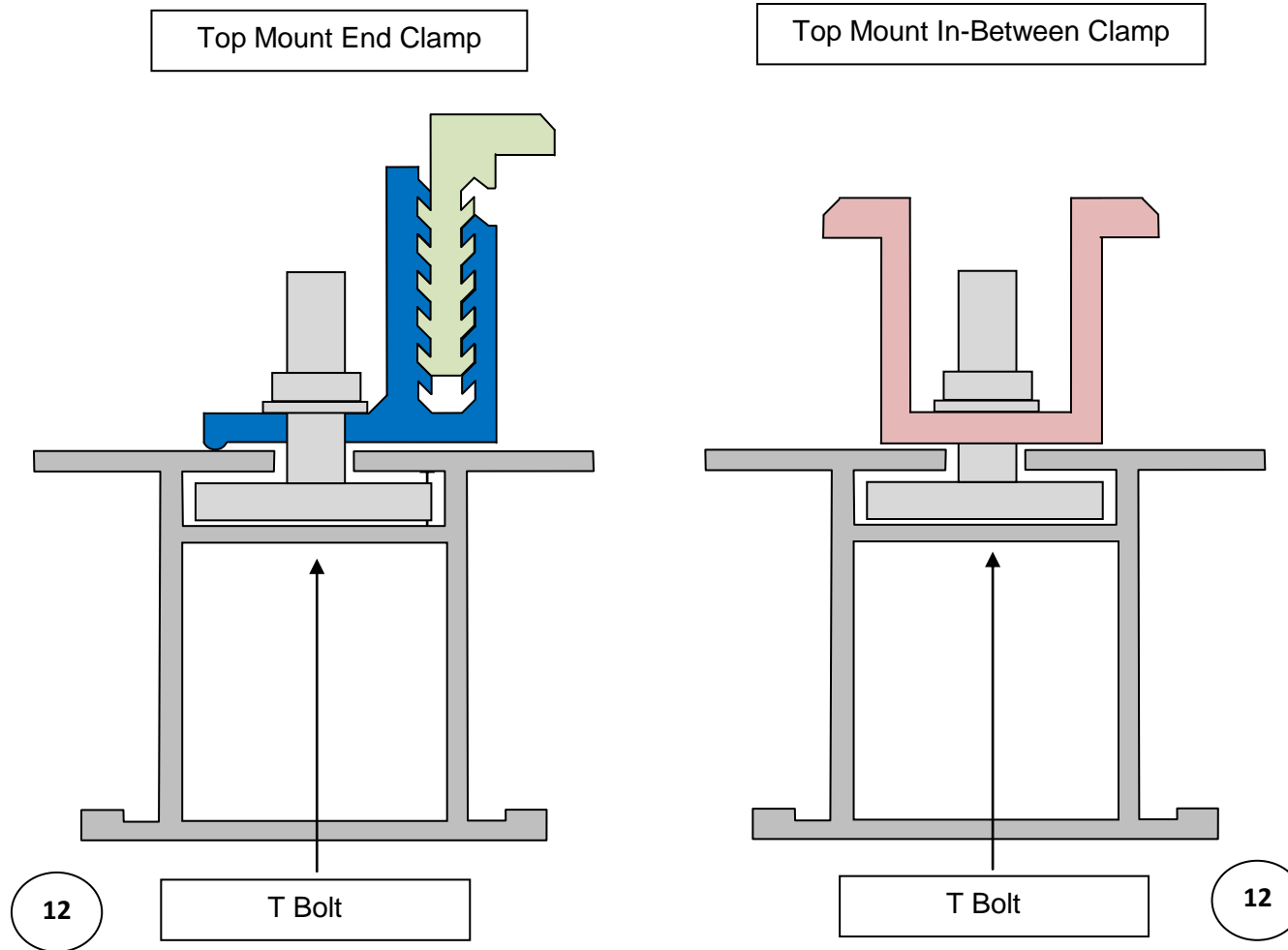
8. Add blocks to tray as needed. Use Concrete (CMU) Cap Blocks 16" x 4" x 8". Actual size is 15.625" x 7.75" x 3.75". Follow the weight requirement needed according to your wind zone.



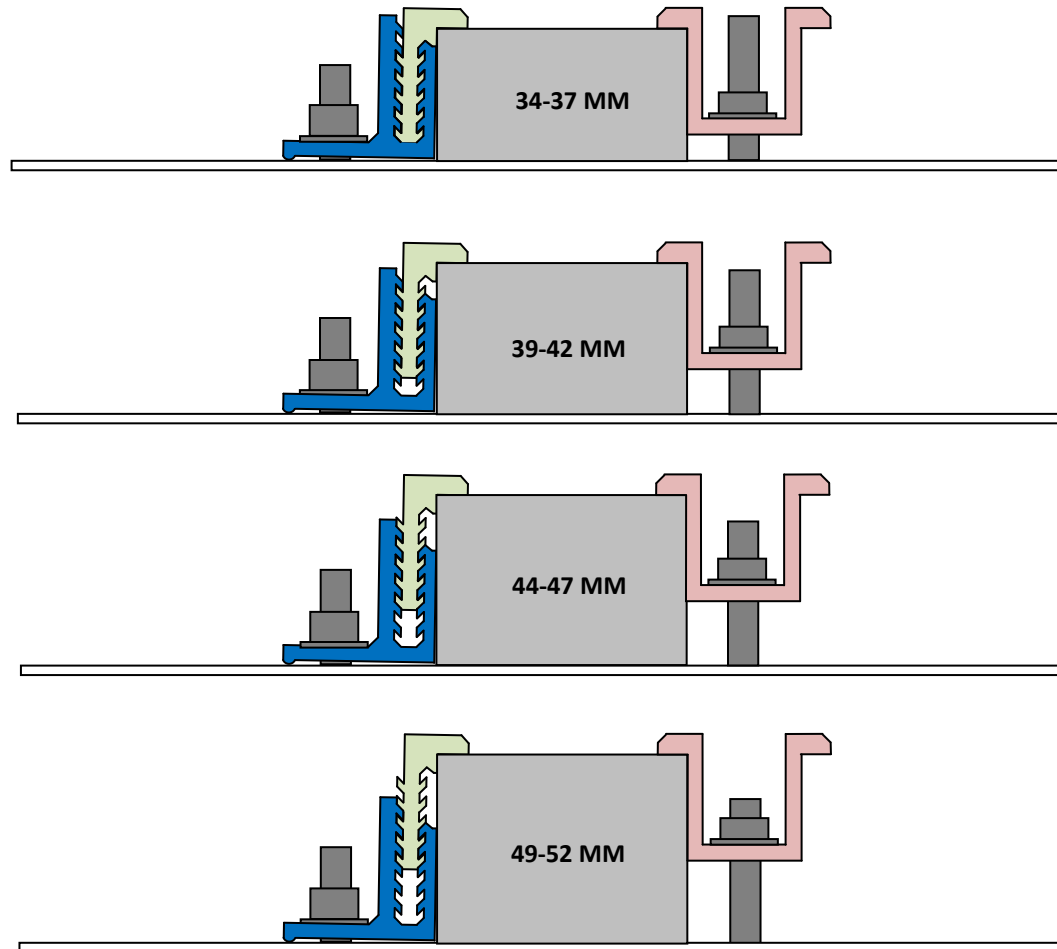
9. It is recommended that the Ballast Trays to be spaced out under every other panel. If a layout was provided, follow the tray locations in the drawing.
10. Click TOUGH TRAC Rail through Click Mounts. Lock Click Mounts to rail using set screws (#14 x 1.5" Self Tapper).
11. Use Connector Tubes to connect and extend rails using 1/4" x 2" bolts, washers, and nuts.

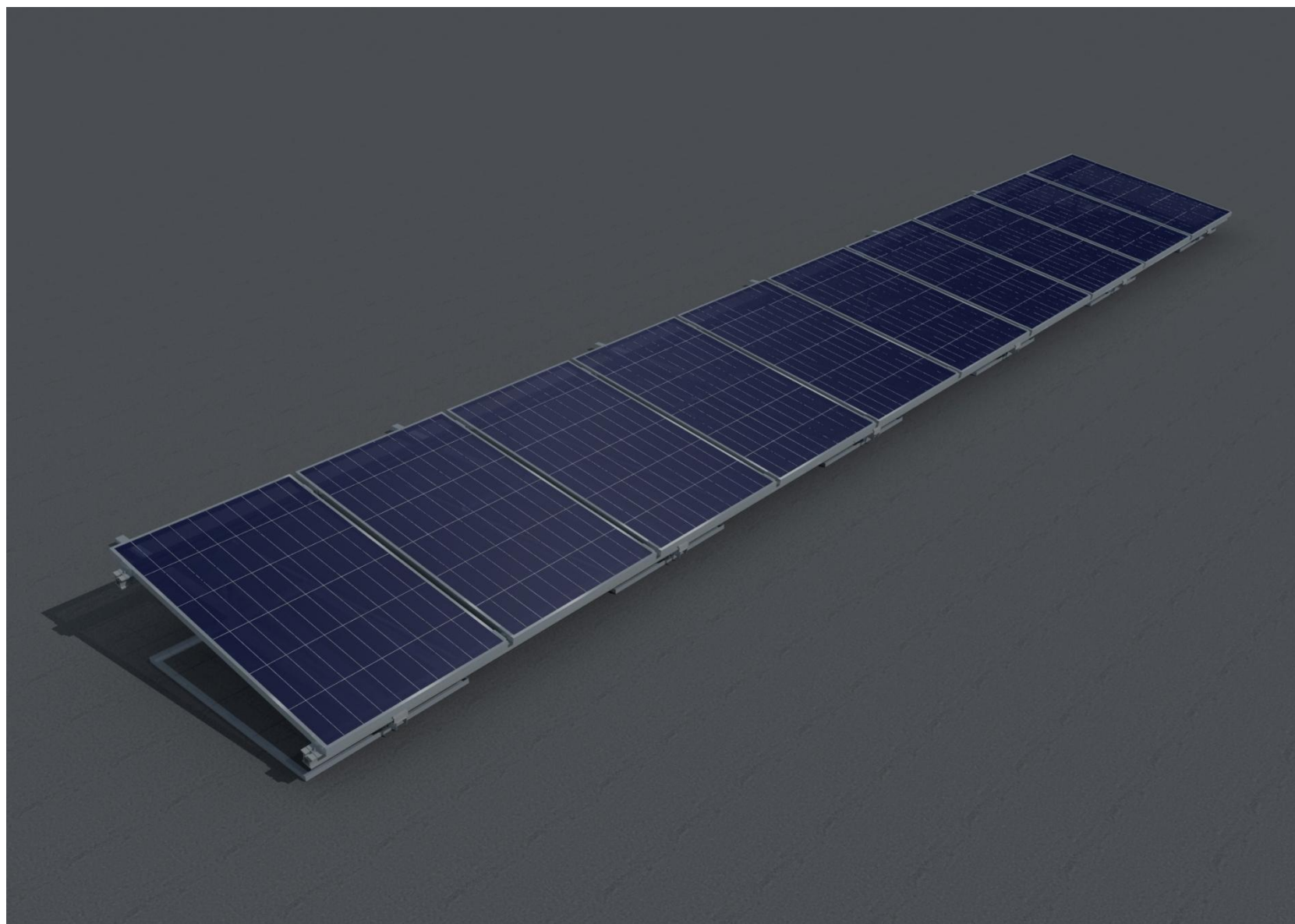


12. Insert 5/16" x 1.625" T Bolts into rail.
13. Place solar panel on Rail and attach Top Mount Clamps and tighten nuts on bolts. Nuts should be tightening to 15 lbs of pressure.



14. Adjust Universal End Clamps as shown below to your size panel.





## 20-year Limited Warranty

TOUGH TRAC™ warrants the original purchaser that each Solar Panel Mounting System ("Units") to be free from defects in materials and workmanship for a period of 20 years from the date of first purchase except for the anodized finish.

The Limited Warranty is considered VOID if TOUGH TRAC™ Units are not installed properly and not used for the purpose for which it is designed. TOUGH TRAC™ Limited Warranty does not cover Units that are damaged resulting from shipping, storage, and misuse or abuse during installation.

The Limited Warranty covers the cost of parts to repair or replace the Units to a proper working condition. Transportation and incidental costs associated with warranty items are not reimbursable. TOUGH TRAC™ Limited Warranty only covers its Units and under no circumstances be liable for indirect or consequential damages resulting from or related use by the original purchaser of the Unit.

*All parts supplied for this system is made of 6000 series aluminum. All hardware including all bolts, nuts, and washers are made of Stainless Steel.*