RAY**TRAY**™

SOLAR WIRE MANAGEMENT SYSTEM

INSTALLATION
MANUAL

FOR INSTALLATION QUESTIONS:

INFO@RAYTRAYSOLAR.COM

ETL LISTED US
Intertek
Conforms to UL Std 870
Control No. 4009754

MADE IN THE U.S.A.

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PRODUCT **INTRODUCTION**

RayTray is a solar wire management system that is designed to maximize wire protection and minimize construction costs. RayTray is manufactured with a durable RPVC polymer to ensure long-lasting protection for your homeruns, jumpers, and equipment-grounding conductors. The product features just three main components, is simple to install, UV rated, and ETL listed for use with PV arrays. RayTray is proudly made in the USA.

TECHNICAL **SPECIFICATIONS**

Product	Solar Wire Management System
Material	Non-metallic RPVC polymer (UV rating: F1)
Listing	ETL Intertek conforms to UL Std 870 Voltage Rating: 2000 VDC
Installation	Flat roofs with pitch < 8 degrees
Conductors	RHW, USE, or PV Wire See Cable Specifications section for conductor capacity
Grounding	Non-metallic RPVC polymer requires no grounding
Maximum Support	4'-0"
Warranty	25-year warranty against defects in materials and workmanship

CABLE **SPECIFICATIONS**

- ■ Not to exceed (30) wires
- ■ For use with PV Wire, RHW, USE, THWN, or similar
- ■ Listed for #12 to #6 AWG wire sizes
- ■ Wire size to not exceed #6 AWG (copper or aluminum)
- ■ Maximum conductor area to not exceed 1.68 square inches (20% of fill area)

  - Max wire area translates to (30) #12, (30) #10, (24) #8, or (18) #6 wires
- ■ EGC may be bare copper, aluminum, or any insulation
- ■ Latest applicable NEC version to be referenced for final fill calculations

LABEL **INFORMATION**

The UL 870 compliant RayTray labels should be prominently displayed on the top surface of cap. One label per eight linear feet is recommended.

RayTray® V3
Sunlight resistant wire management system
Cables permitted: RHW, USE, PV
Max wire size: AWG #6
Max support interval: 4'-0"
Consult manufacturer for proper installation

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Label enlarged for clarity.

COMPONENTS

V3 Tray (8' Sections)

V3 Cap (8' sections)

V3 Base (8" Sections)

V3 End Cap

V3 T Piece

Push In Blind Rivets / McMaster-Carr #90136A682

Deburring Tool / McMaster-Carr #428A15

ADDITIONAL **TOOLS**

RayTray is a simple, largely tool-less, wire management solution, but with a few additional tools it can be customized for almost any array.

CUTTING TOOLS

- Hacksaw
- Chop saw
- Reciprocating saw

- Jig saw
- Bi-metal blades

These tools can be used to easily cut RayTray to any length and change the system's direction as needed.

DRILL WITH

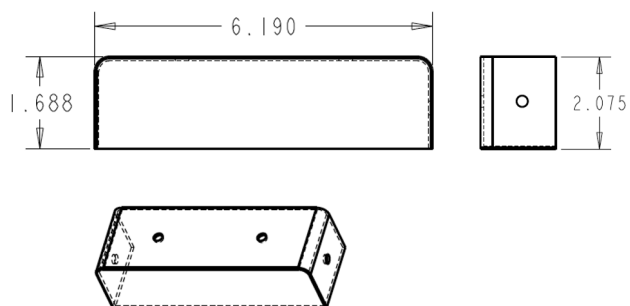- ¼" bit (for use with rivets)
- Twist drill bits

- Hole saw

A drill should be used with a ¼" bit to attach rivets between Base and Tray but can also be used with larger bits for easy wire accessibility into and out of RayTray.
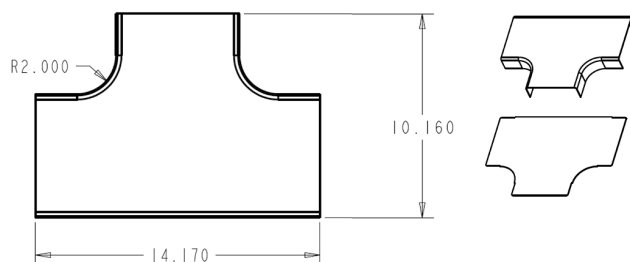
PRODUCT **DIMENSIONS**
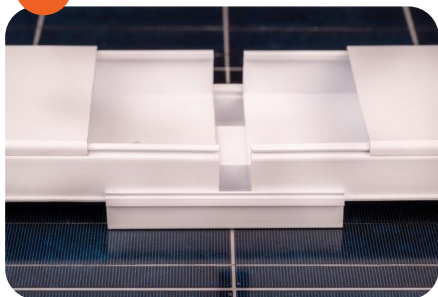
Standard Assembly (NEC 2014, 2017, 2020 Compliant)

6.000

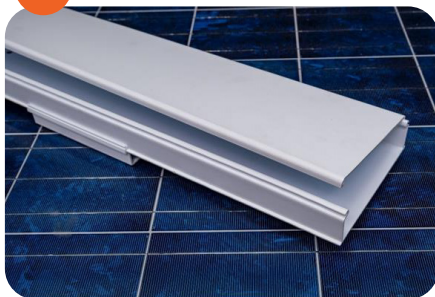8.80 sq. in.

2.540

.960

End Cap

6.190

1.688

2.075

T-Piece

R2.000

10.160

14.170

# INSTALLATION **OVERVIEW**

1 SNAP AND CONNECT

2 CAP AND PROTECT

3 CHANGE DIRECTION

1 Snap a Base onto one end of a Tray; add a Base in the middle of the Tray, and another at the opposite end. Before adding a second Tray, be sure to leave a one inch gap between sections to allow for expansion and contraction. Add a rivet between one Tray and the Base to keep everything fixed in place.

2 After wiring is complete, simply snap on the Cap to protect. Caps should span the expansion gap left between Trays.

3 Most runs will go in one direction, either N/S or E/W, but if needed, RayTray can accommodate both 1 change and 2 changes in direction either with a few cuts and modifications to the Tray and/or using the newly designed T-Piece.
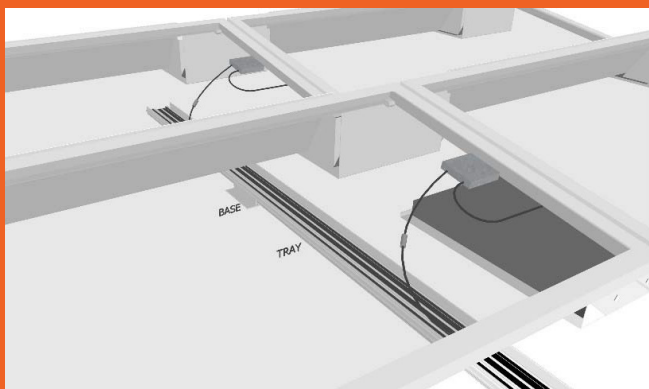

KEEP THOSE HOME RUNS IN LINE
RayTray keeps your home runs organized, secure, and protected. No more worries about home runs getting stepped on or rubbing and abrading on racking. Simply pick your route, snap together, and drop in your home runs. RayTray can be laid out before modules are installed for an even easier installation. Array cabling is neat and organized. Your crew will thank you. Your inspector will be pleased. And your client will be thrilled at how professional everything looks.

INSTALLATION
OVERVIEW (CONTINUED)
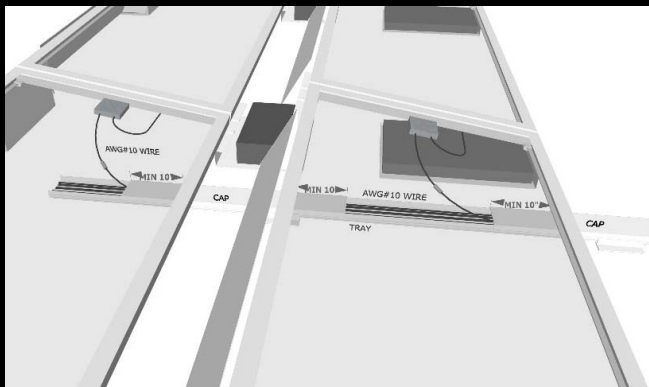
PROTECTION ENHANCED
Your home runs are in, your connections are made, and now you want to protect the wires and tidy things up. If you begin with RayTray™, you're already there. No unsightly bundles. No haphazard wires. Organize as you build. When the build is done and tested, finish up by snapping on the protective caps, which will not only protect and enhance your work but also prolong the life of your client's investment.

A STELLAR TRANSITION
You have been there before and you're not excited about being there again. Use RayTray™ to organize the chaos. Aggregate your home runs into RayTray™ and they're ready to transition into pipe when you are. Home runs will be organized and accessible.

INSTALLATION **INSTRUCTIONS**

■ RayTray should be run under or directly adjacent PV arrays.

■ Do not install RayTray across open roofs.

■ RayTray can be used to jump wires between arrays but should be limited to a single 8' section of Tray to avoid shifting.

■ RayTray is to be installed by qualified, trained technicians. Installers must wear appropriate work clothing and eye protection while installing RayTray.

■ RayTray should be specified on wiring schematics, and installed per drawings.

INSTALLATION STEPS

1 Preparing the initial anchor section

2 Building the runs

3 Changing direction

4 Adding home runs

5 Capping RayTray and checking expansion gaps

6 Building transitions

STEP 1. PREPARING THE INITIAL ANCHOR SECTION

A)   Snap three 8" RayTray Bases onto one 8' length of Tray;
Position one Base at each end with the third Base in the middle of the Tray.
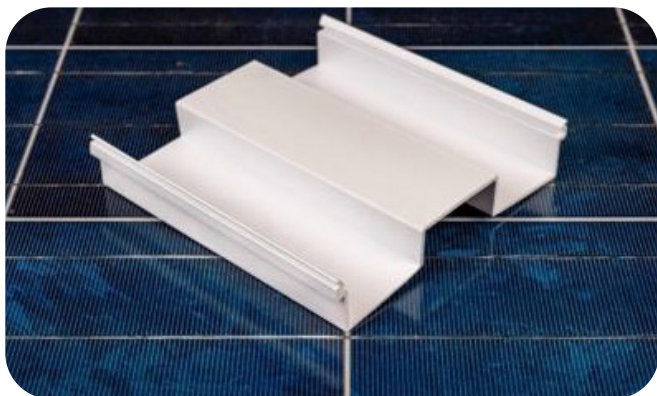
Pre-drilled holes in Tray are for drainage – avoid covering with Bases


B)   On one end, align the Tray with the center of the Base and drill a hole through both.
Attach the Base to Tray with provided rivets.
Each 8' Tray should only be riveted to one Base for expansion.

Not using rivets or using multiple rivets per Tray may cause Caps to separate

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STEP 2. BUILDING THE RUNS

A) By sharing Bases, subsequent Trays require only two Bases each. Snap one Base onto the middle of the Tray and attach the other Base to the end of the Tray, adding a rivet similar to Step 1B.

B) Snap the end of this Tray without a Base onto the shared Base of the previous section.

C) Leave a 1" gap for thermal expansion between each Tray.
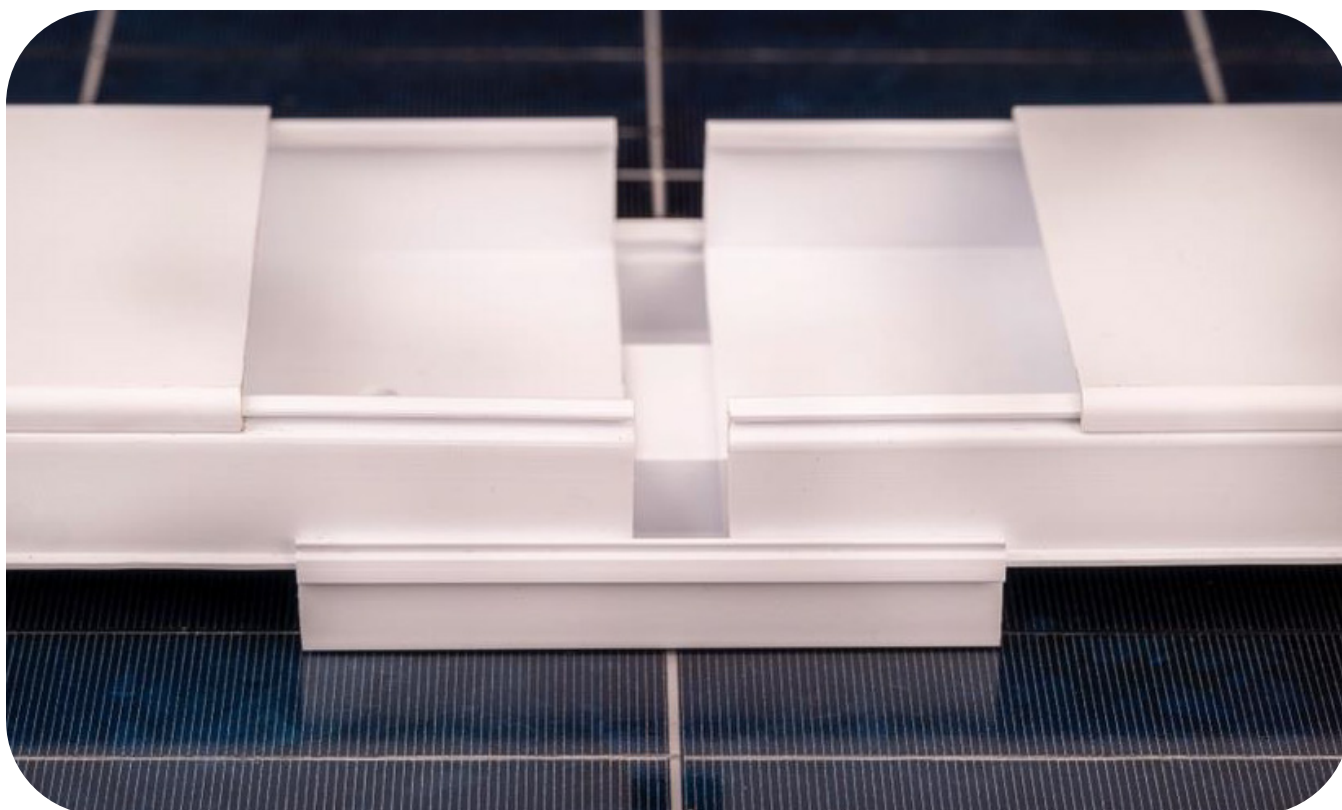
STEP 3. CHANGING DIRECTION

Most runs will go in one direction, either N/S or E/W, but if needed, RayTray can accommodate both 1 change and 2 changes in direction with the T-Piece.

A) Cut Tray sections in a way that allow overlap and rivet two sections together.

Bottom Tray was trimmed of both side-walls, top Tray was notched on one side

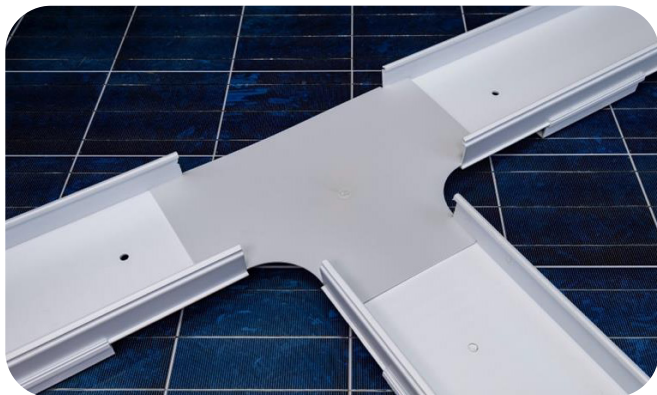**B)** Caps can similarly be notched for changes of direction.

C) Any field-cut edges should be smoothed using included deburring tool to avoid damage to wires.

CHANGES IN DIRECTION:
T-PIECE INSTALLATION

A) Align the Trays you'd like to connect using the T-Piece Guide.

B) Then slide the top of the T-Piece onto the Trays. Make sure the Trays are secured in the grooves of the T-Piece.

C) Slide the Caps to close the Tray and conceal the conductors.

STEP 4. ADDING HOME RUNS

A) Place home runs into RayTray.

B) Do not exceed the RayTray fill rating.
See Cable Specifications section, NEC, and confirm with electrical engineer

**C)** If you have more conductors than the fill rating allows, add an additional RayTray alongside.

STEP 5. CAPPING RAYTRAY AND CHECKING EXPANSION GAPS

After all home runs have been placed in the RayTray:

A) Before capping, double check that a 1" expansion gap is still present at each Base where two Tray sections meet.
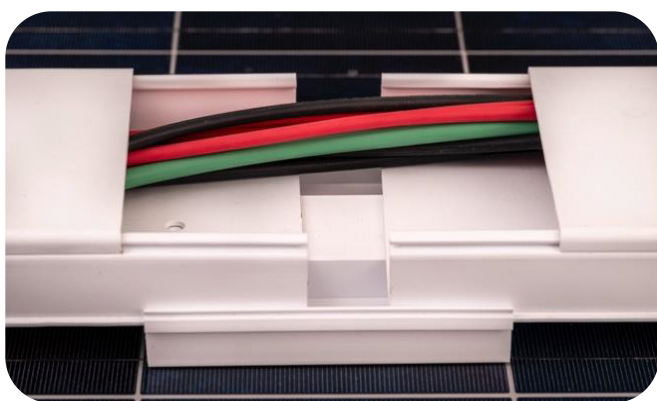
B) Begin at the end of the run (the portion of RayTray with the fewest home runs) and work your way towards the heavier filled sections snapping on Cap pieces.
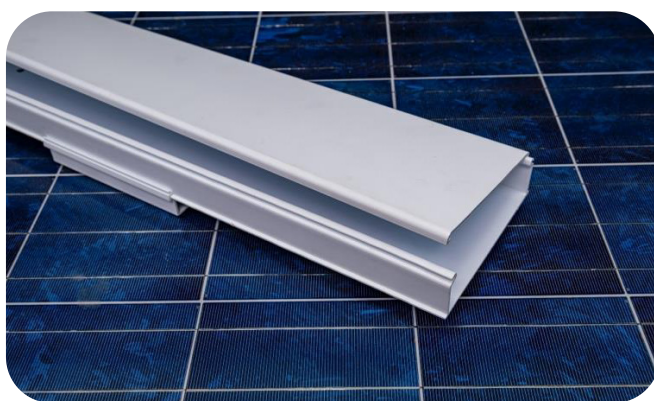
C) Make sure both sides of Cap are fully secured before moving to the next piece.

D) Place Cap over expansion gaps to further ensure the gap will remain in place.

E) RayTray allows for notches in the Cap to accommodate home run transitioning from module to RayTray.


Use deburring tool to smooth all notched edges

INSTALL THE END CAPS

The End Caps provide a sleek and professional termination that prevents pest intrusion and keeps the runs secure.

A) Before capping, double check that a 1" expansion gap is still present at each Base where two Tray sections meet.

B) While the cap is placed over the RayTray assembly, Drill ¼ " holes through the top and sides of the End Cap and directly through the Cap.

C) Secure the End Cap with the same Rivets used to connect the bases to the Tray.
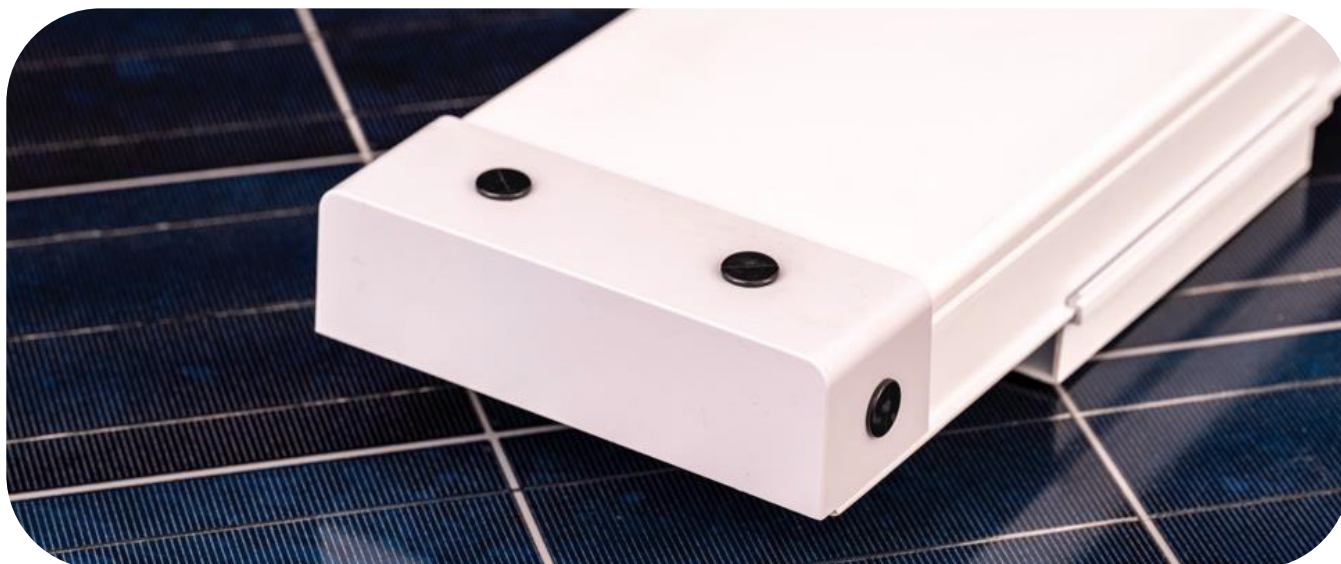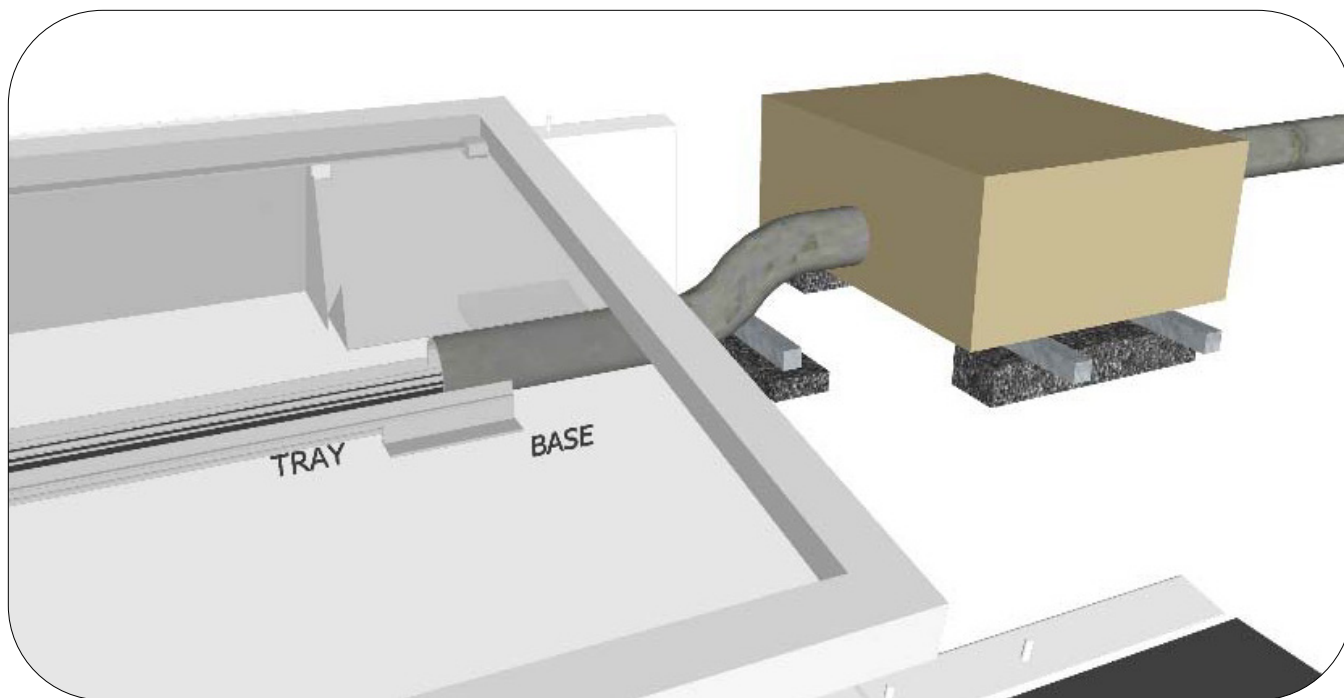
STEP 6.
BUILDING THE TRANSITIONS

After all home runs have been placed in the RayTray:

A)   When transitioning home runs from the end of RayTray into an enclosure such as a combiner box or inverter, flex conduit is recommended.

The transition should take place in a protected space such as under a module.

INSTALLATION GUIDELINES
(THE DO'S AND DON'TS OF RAYTRAY)

DO

- Do run RayTray under or directly adjacent the PV array
- Do use RayTray between nearby isolated arrays (limit 8' distance)
- Do consult a licensed electrical engineer for acceptable wire fill calculations based on your geographic location and applicable codes
- Do customize RayTray for turns, wire entrances and exits
- Do add expansion gaps at each section to prevent thermal buckling
- Do add rivets to one end of each Tray section to prevent thermal buckling
- Do protect the roof between the Base component and roof per manufacturer suggestions
- Do properly tie-down and secure RayTray material before installation
- Do use the included deburring tool to smooth any rough edges

DON'T

- Don't install long lengths of RayTray (8'<) across open roofs
- Don't overfill RayTray
- Don't step directly on RayTray
- Don't double-rivet two Trays to their shared Base

RayTray should be run under or directly adjacent to the PV array as much as possible.

RayTray is not meant to replace conduit runs extending long lengths outside the array.

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