GAF ENERGY

Timberline Solar™
Solar Roofing System

Quick Start Guide

TLS-1

For Trained Personnel Only

Inventory

TIMBERLINE SOLAR
INVENTORY CHART

0497504MV

SHINGLE , TIMBERLINE SOLAR HDZ, PEWTER GRAY PLUS

0497588MV

SHINGLE, TIMBERLINE SOLAR HDZ, WEATHERED WOOD PLUS

0497097MV

SHINGLE, TIMBERLINE SOLAR HDZ, BIRCHWOOD PLUS

0497180MV

SHINGLE, TIMBERLINE SOLAR HDZ, CHARCOAL

294000337

INVERTER, M4-TL-US, RGM, WIFI/CELL ENABLED

294000434

INVERTER, M5-TL-US, RGM, WIFI/CELL ENABLED

294000435

INVERTER, M6-TL-US, RGM, WIFI/CELL ENABLED

294000436

INVERTER, M8-TL-US, RGM, WIFI/CELL ENABLED

294000436

INVERTER, M10-TL-US

294000400

ASSEMBLY, MODULE, 46W

294000417

ASSEMBLY, JUMPER MODULE

294000257

ASSEMBLY, TRANSITION BOX

294000280

JIG, MODULE ALIGNMENT

0497504MV

FLAP, STEP

294000437

TOOL, DISCONNECT, EVO2

294000300

ASSEMBLY, TOP FLASHING

294000278

CAP, WIRE COVER, BOTTOM

294000204

COVER, WIRE, 2X

294000140

BOX, SPLICE, SPELSBERG
TK PC 1111-7-O

294000163

GLAND, CABLE, SEALCON,
PN CD07AA

294000470

SNAP-IN PIPE & TUBING GROMMET
FOR 1-3/4" HOLE DIAMETER

294000336

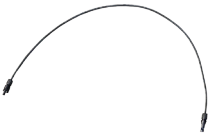
PV CABLE ASSEMBLY, COLUMN
RETURN, POSITIVE (12-16)

294000436

RAPID SHUTDOWN DEVICE, DELTA

294000200

ASSEMBLY, PASS THRU DEVICE, POLYMER, SINGLE STRING



294000273

PV CABLE ASSEMBLY, COLUMN RETURN, NEGATIVE (SHORT)

294000482

PV CABLE ASSEMBLY, COLUMN RETURN MCI RETURN

0857504MV

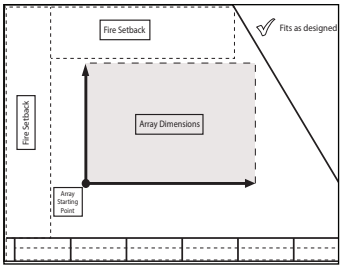
HIP & RIDGE CAP, SEAL-A-RIDGE, PEWTER GRAY PLUS

1122000ST

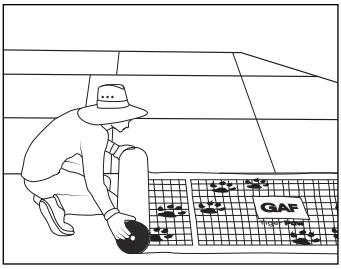
QUICKSTART

Install

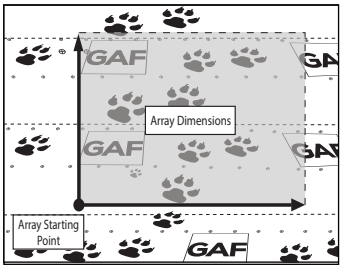
Step 1
Array Layout



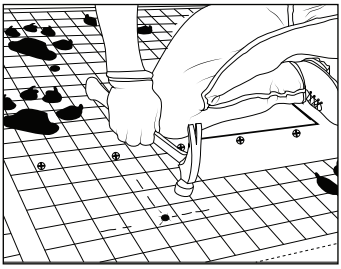
a Measure to verify array fit. If needed, remove and/or relocate any obstructions



b Prep the roof deck and install underlayment



c Using the provided plan set, determine the array starting point and mark it



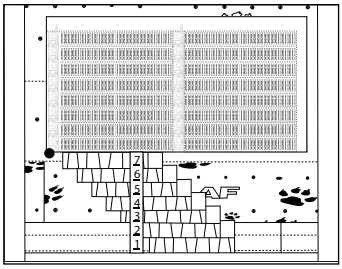
d Confirm no rafters or trusses below first and second columns - i) If needed, adjust array starting point to avoid rafters or trusses - ii) Be sure to maintain required fire setback

NOTE: The Timberline Solar™ system is designed for installation with GAF-approved roofing shingles only. These roofing shingles have a 7 9/16 inch (192.1mm) exposure to match the Solar Shingles with in the array. Allow room for a minimum of one row of GAF-approved roofing shingles to be installed up from the eave, prior to starting the solar array.

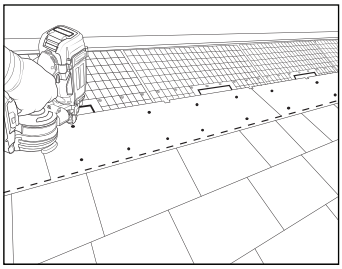
DON'T

- Install 1st & 2nd column junction boxes (J-Box) over a rafter

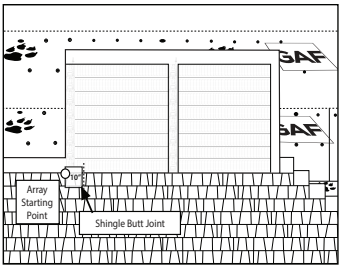
Step 1
Array Layout



e Calculate distance between eave and bottom edge of array to determine number of courses below the array starting point

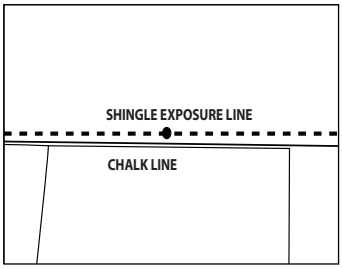


g High-nail shingles that will be overlapped by Energy Shingles

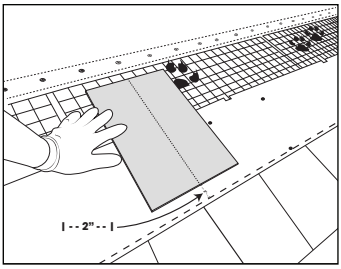


f Install roofing shingle courses up to array starting point - i) Maintain 10″ shingle offset - ii) Shingle buttjoint in course below array should be 10″ to the right of the array starting point

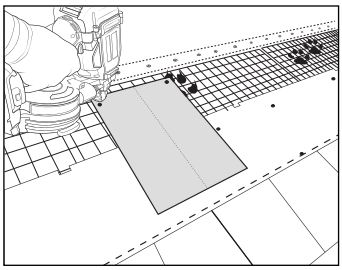
Step 2
First Energy Shingle



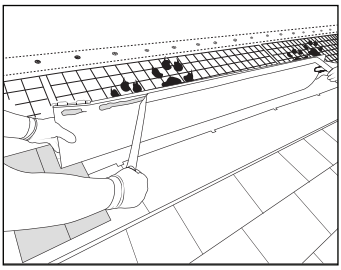
a Snap horizontal chalk line along array bottom edge and verify it lands at or below the shingle exposure line



b Position Step Flap at the array starting point then shift up 2" from the shingle exposure line



c Nail Step Flap in place (top right / left)



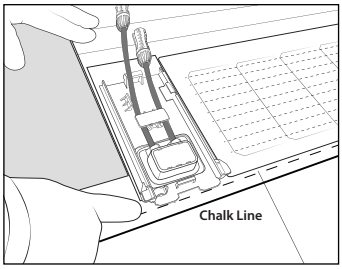
d Flip over Energy Shingle and remove adhesive liner

NOTE: Step Flaps are only needed on left side of the array. Always nail Energy Shingles within nail zone only.

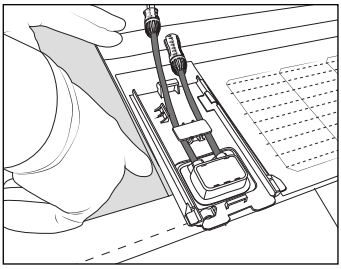
DON'T

- Touch adhesive on Energy Shingle after removing liner
- Drag Energy Shingle after put in place

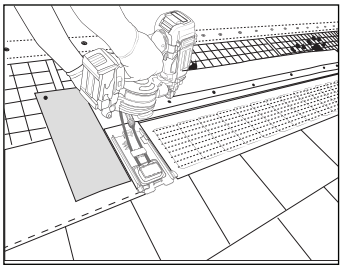
Step 2
First Energy Shingle



e Align the front edge of the Energy Shingle with the previously snapped chalk line

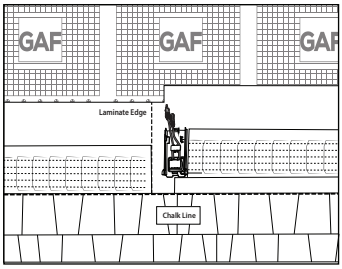


f Align the left edge of the Energy Shingle with the vertical line located on the Step Flap

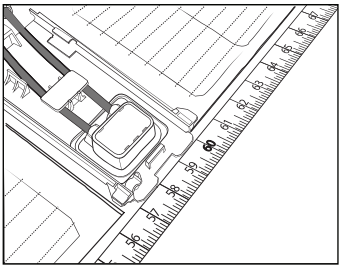


g Secure Energy Shingle with 6 evenly spaced nails

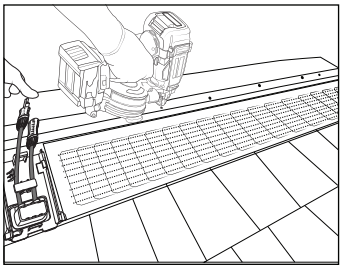
Step 3
Bottom Row



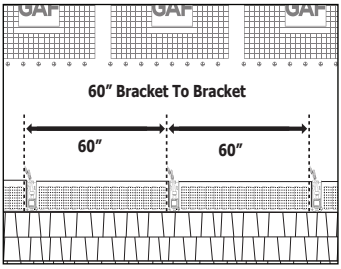
a Remove adhesive liner of the second Energy Shingle and align front edge with chalk line and laminate edge



b Verify 60″ horizontal measurement from J-Box bracket to J-Box bracket



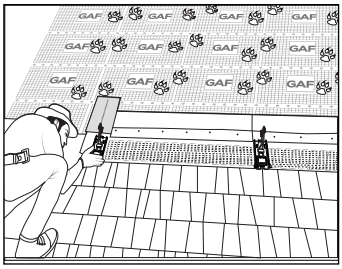
c Secure in place using 6 evenly spaced nails



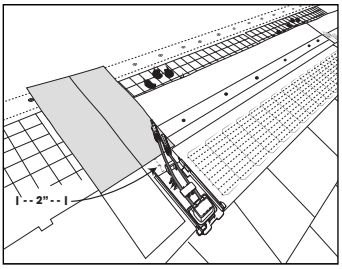
d Continue Energy Shingle installation across front row from left to right

NOTE: The J-Box flap on next Energy Shingle should cover the right-side Flap of the Energy Shingle

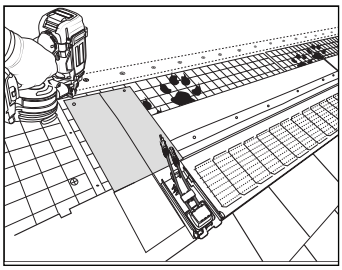
Step 4
Remaining Energy Shingles



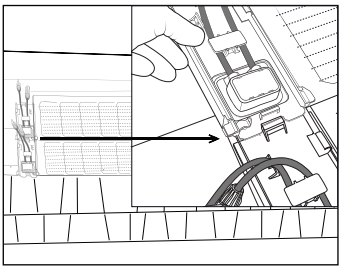
a Confirm first row of Energy Shingles is straight



b On the first column, align bottom edge of the Step Flap with the J-Box bracket below and the Step Flap center lines, then shift up 2”



c Nail top right / left corners



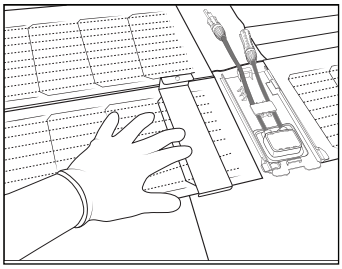
d Install adjoining Energy Shingles, ensuring the J-Box bracket above is fully seated on the bracket below

NOTE: Step Flaps are to be used on left side of array only. It is critical to check and re-check that the array is perfectly straight.

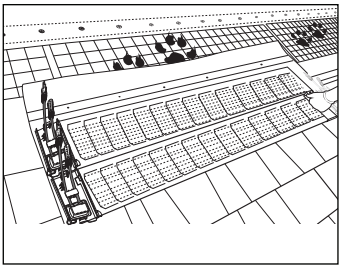
DON'T

- Leave any space between brackets
- Make any adjustment to any Energy Shingle greater that 1/16”

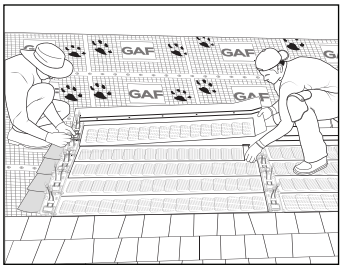
Step 4
Remaining Energy Shingles



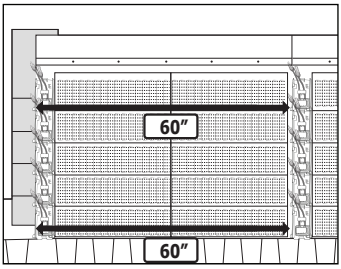
e Use alignment jig to align right side of Energy Shingle



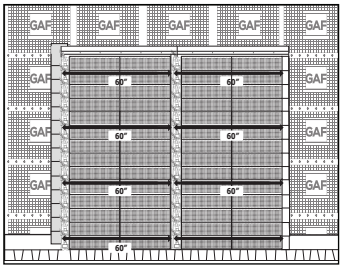
f Secure in place using 6 evenly spaced nails



g Continue installing Energy Shingles across the row using the J-Box brackets and the Alignment Jig to maintain the row alignment

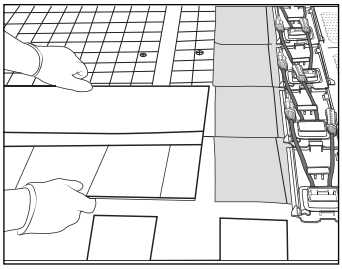


h Repeat this process for the first 4 rows of Energy Shingles, then measure from J-Box bracket to J-Box bracket to confirm 60″ spacing between columns

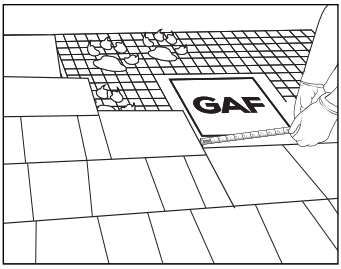


i Continue installing the rest of the array, making repeated checks (on every other row and as needed) ensuring 60″ spacing throughout rows

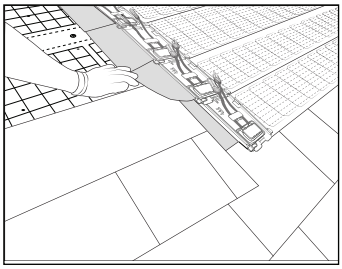
Step 5
Left Side of Array



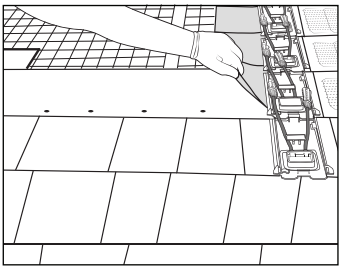
a Install roofing shingles starting at bottom left of array



b Trim shingle to maintain 10" offset



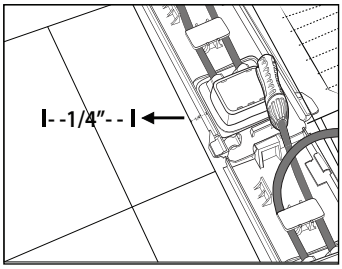
c Slide roofing shingle over first Step Flap but underneath the Step Flap above it



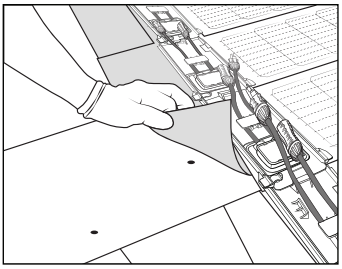
d Align bottom edge of roofing shingles with the glass front edge of the adjacent Energy Shingles

NOTE: Wiring always takes place on the left side of any column. The Step Flap position at the top of each wire channel will be centered, making it different than all other Step Flaps in the array.

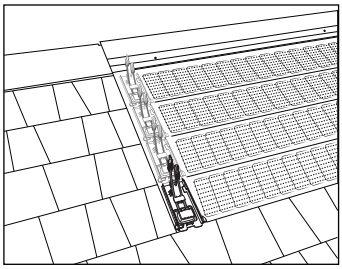
Step 5
Left Side of Array



e Shingle should be separated about ¼" from the alignment bracket

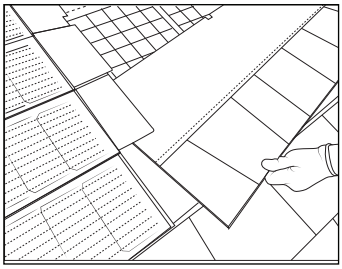


f Nail in place. Right most nail goes 2" above the roofing shingle nail zone and under the Step Flap

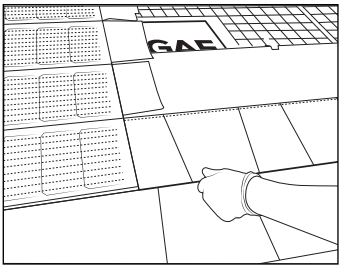


g Continue installing roofing shingles up to the top row of Energy Shingles

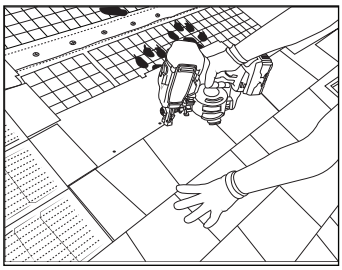
Step 6
Right Side of Array



a Interweave Energy Shingle Right-Side Flap with roofing shingles, making sure to maintain the 10" offset



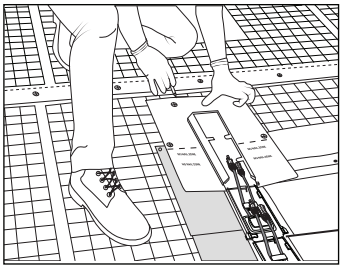
b Align roofing shingle exposures to match Energy Shingle



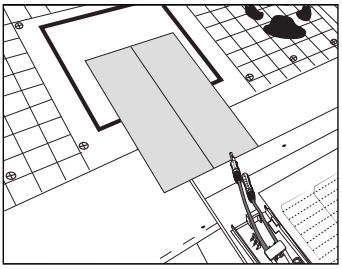
c Nail in place. High nail required for asphalt shingles underneath each Energy Shingle right side flap.

NOTE: Roofing Shingle should always sit flush with edge of a J-Box Flap

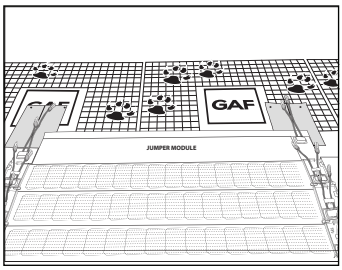
Step 7
Jumper Module



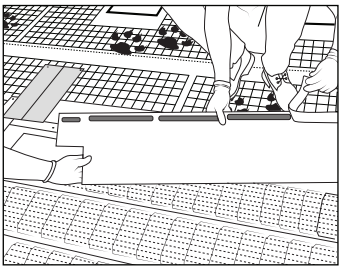
a Install a Step Flap at the top of each vertical wireway. Mock-up Top Flashing, mark the roof and set-aside



b Center Step Flap with the J-Box bracket in the column and align to marks



c Install a Jumper Module at the top of each column where required



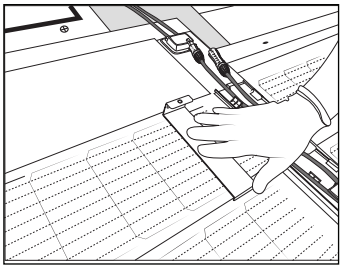
d Prep the Jumper Module by flipping it over and removing the adhesive liner

NOTE: All left side Energy and Roofing Shingles must be installed before installing Top Flashing. Always make sure no wires are being pinched during install.

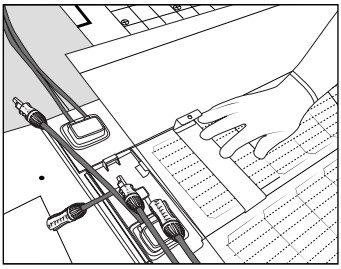
DON'T

- Nail below nail line on Top Flashing

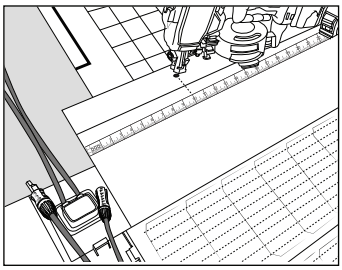
Step 7
Jumper Module



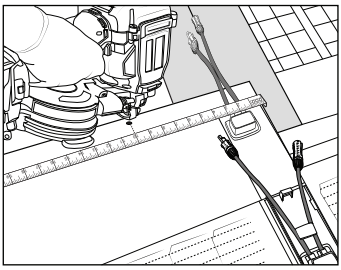
e Using the Alignment Jig, place Jumper Module over the head lap of the top-most Energy Shingle in column



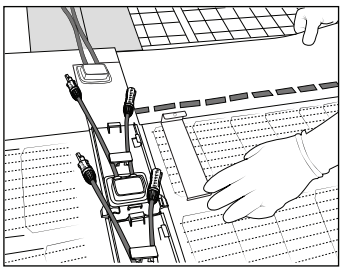
f Align the J-box on the left of the Jumper Module with the J-Box bracket of the Energy Shingle below



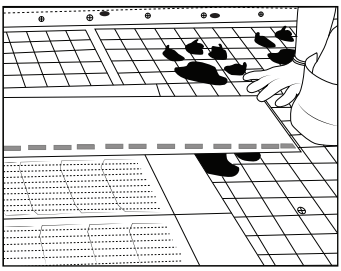
g Place nail in Jumper Module nailing zone, 10” in from upper left corner



h Place nail in Jumper Module nailing zone, 10” in from right corner

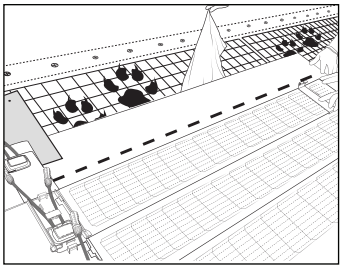


i Use the Alignment Jig to install QuickStart® at the top of columns without Jumper Modules



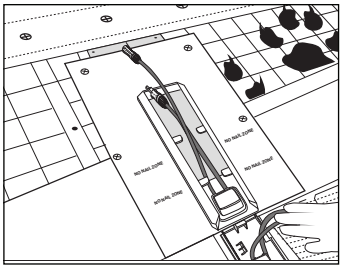
j At the right side of the array, make sure to extend the QuickStart 5" over the asphalt shingle

Step 7
Jumper Module

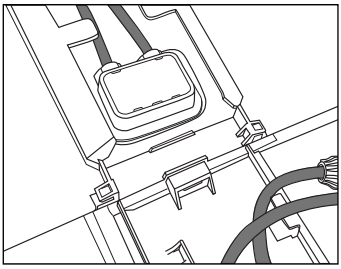


k After placing the QuickStart at the top of the array, remove the liner at the back to adhere in place and set it with 6 evenly spaced nails

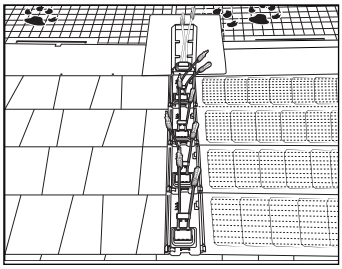
Step 8
Top Flashing



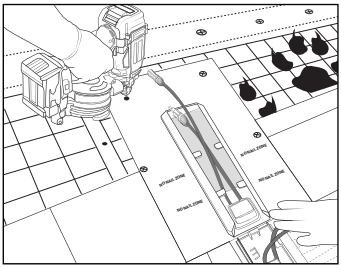
a Position Top Flashing at the top of every column.



b Align bottom engagement feature with J-Box bracket of the top-most Energy Shingle



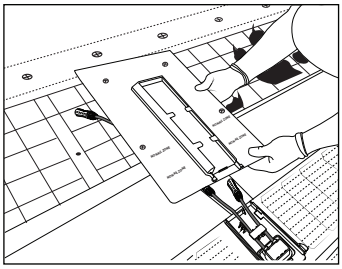
c Ensure Top Flashing is straight and aligned with the column



d Fasten Top Flashing in place using 4 nails in the nailing zones

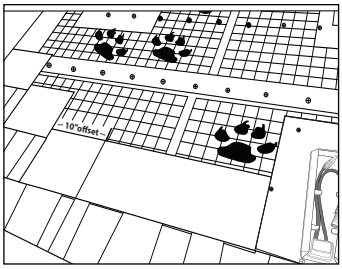
NOTE: Always use full shingles

Step 8
Top Flashing

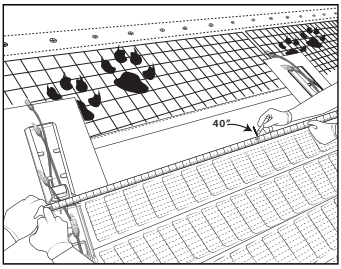


Continue left to right

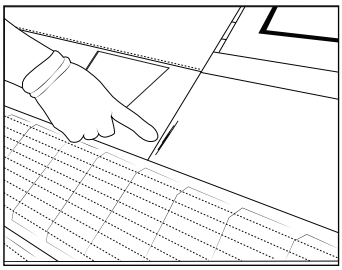
Step 9
Roof Shingles Over Array



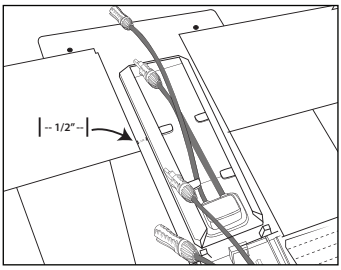
a Maintain 10″ horizontal offset



b Beginning at the left side of the array from the last roofing shingle buttjoint, measure across the top of the array marking every 40″



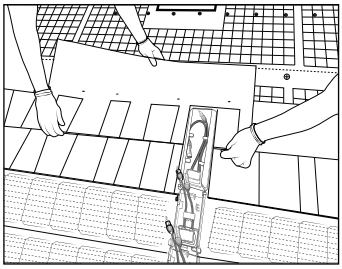
c Align roofing shingle buttjoints using the 40″ marks



d Cut shingles into Top Flashings as needed being sure to leave a ½″ water channel

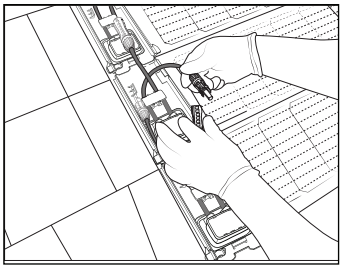
NOTE: No Step Flap is needed on right side of array.

Step 9
Roof Shingles Over Array

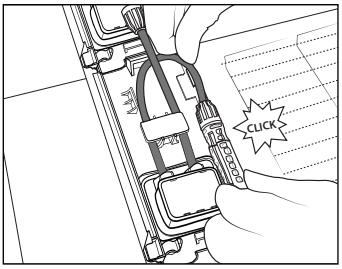


e Repeat across array

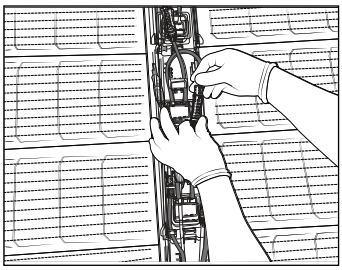
Step 10
Column Wiring



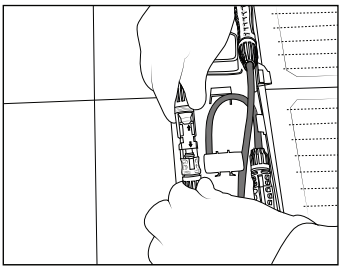
a Connect module leads (positive to negative)



b Listen for an audible click. Slight tug to test connection



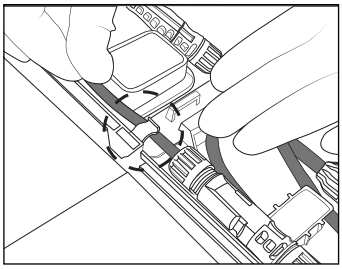
c Route positive connector under negative



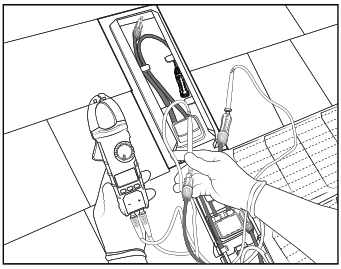
d Route Column Return Wire to the top of column

NOTE: Unseated connectors lead to system failure so always test as you go. Energy Shingles should show roughly 10 volts each. Completed sections should result in positive connector at bottom and negative at top.

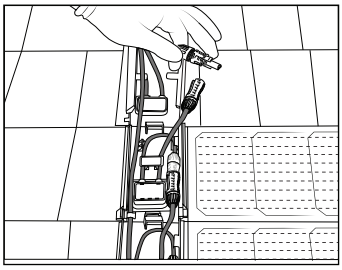
Step 10
Column Wiring



e Secure wires using Energy Shingle J-Box wire clip feature

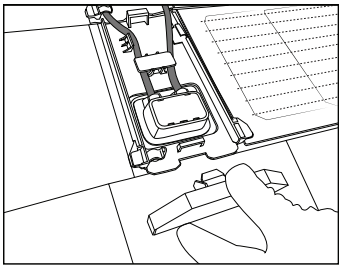


f Conduct DC voltage check ~10V per module (Capture picture of the reading for required photos)

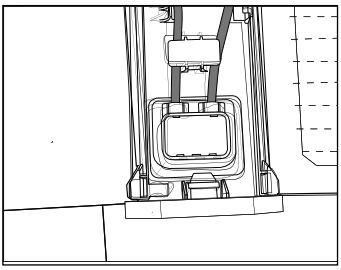


g You should be left with one positive and one negative connector at the top of column.

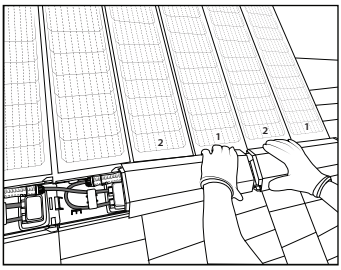
Step 11
Wire Covers



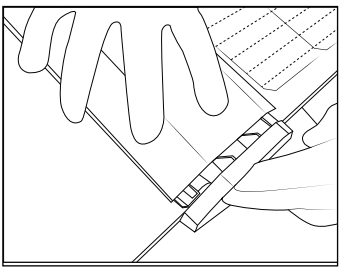
a Start at the bottom of the wire column. Wire covers must be installed up-column



b Begin by installing the Bottom Cap. Insert tab located on the back of the Bottom Cap into bottom of the J-Box bracket



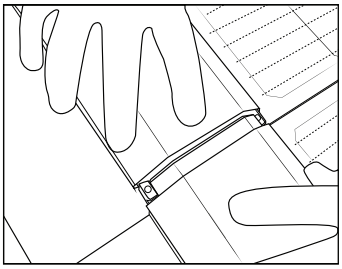
c Each wire cover is designed to cover 2 Energy Shingles



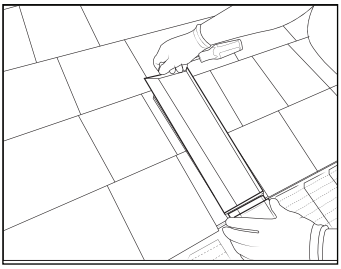
d Slide the Wire Cover in place using the J-Box bracket engagement features

NOTE: Always engage three points of connection: 1) Uproof end of wire cover to downroof end; 2) Left wire cover to left J-Box wing; 3) Right wire cover to right J-Box wing

Step 11
Wire Covers



e Continue installation of the Wire Covers up to the top most Energy Shingle ensuring each cover is fully engaged. Perform a slight tug-test to confirm proper engagement

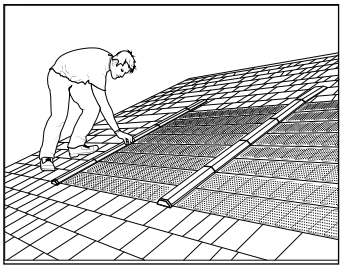


f Install Top Flashing Lid using the same process as the other Wire Covers. Fasten in place using the provided screw

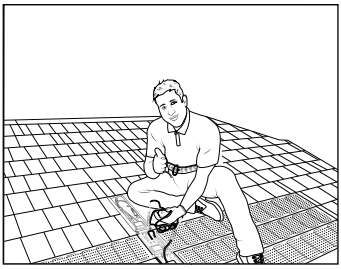
DON'T

- Over drive screw into Top Flashing
- Use electric screwdriver

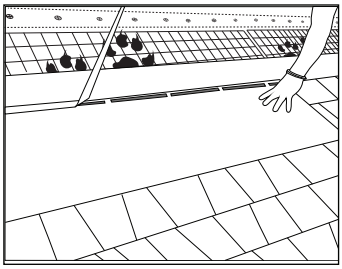
Step 12
Final Check



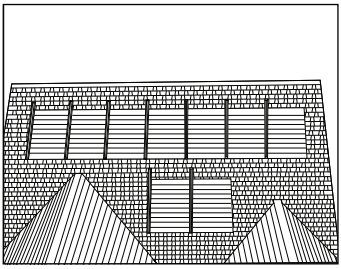
a Ensure all Wire Covers & Top Flashings are properly installed



b Inspect the arrays to confirm all system components are properly installed



c Confirm all release liners are removed



d Take all required photos and submit through either Typeform or Partner Portal (Inverter serial number, every column voltage reading, interweaving at the left side of each array, straight edge at the bottom of each array, and a pull back view of each array)

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