

# ONDURA<sup>®</sup>

Corrugated Asphalt Roofing Sheets

I N S T A L L A T I O N   I N S T R U C T I O N S



Thank you for choosing ONDURA® for your roofing project. ONDURA should be carefully installed. Mistakes in installation can cause roof problems later on. Please take your time and closely follow these installation guidelines.

## CAUTION

Installation of roofing materials can be dangerous. The relative amount of danger is increased by the height from the ground, increasing pitches of the roof slope, inclement weather conditions or other factors. We strongly recommend for anyone installing ONDURA, or working on a roof in any manner, to take all precautions possible to ensure your personal safety at all times.

Be sure that ladders and other such devices are safely positioned and properly secured. OSHA recommends the use of a safety harness when applying roofing. Protective eyewear is recommended when applying fasteners or using power tools. ONDURA may be slippery when wet, dusty, frosty or oily, so please avoid working or walking on the roof if any of these conditions exist. Windy conditions can make the worksite more dangerous, so we recommend that you do not attempt to install ONDURA during windy conditions.

## TOOLS AND MATERIALS

You will need the following tools and materials:

- Fastener Driver (Hammer or Screw Driver)
- Utility Knife
- Saw (Hand Saw or Circular Saw)
- Measuring Tape or Yardstick
- String
- Pencil or Marker
- Protective Eyewear

## ESTIMATING GUIDE FOR ONDURA

Sheet dimensions: 48 inches wide by 79 inches long

### Sheet Coverage

For projects requiring multiple sheets, account for overlaps in calculating roof coverage (see diagram below).

- Sidelap should be at least one corrugation (4 inches per corrugation).
- Headlap should be at least 7 inches.
- The effective sheet coverage is 44 inches wide by 72 inches long.

### Fasteners

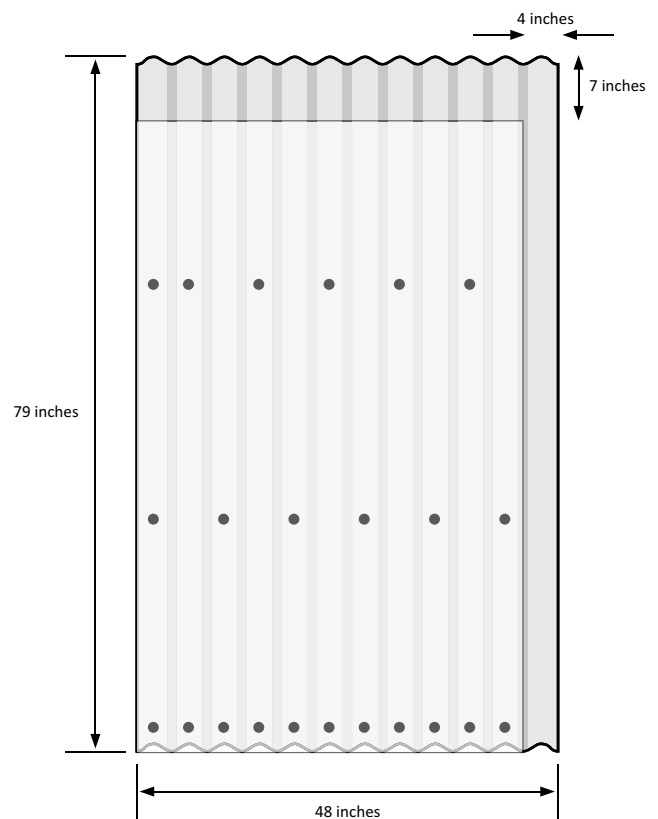
- Fasteners needed per sheet: 23 min./33 max. for 3 rows of fasteners, with rows spaced approximately 24 inches apart.
- Fasteners for roof ridge: 6 fasteners per foot of ridge (3 on each side).
- Fasten sheets on every corrugation at rake edge, eaves, and overlaps. For other fastener rows you may fasten on every corrugation or on every other corrugation. Fastening on every corrugation provides better wind resistance.
- Fasten ridge caps at every corrugation.

### Ridge Caps

Ridge cap sections should overlap by at least 7 inches.

### Closure Strips

Closure strips are 44 inches long, with four strips per pack. Closure strips should be used at roof ridge, eaves, hips and valleys.

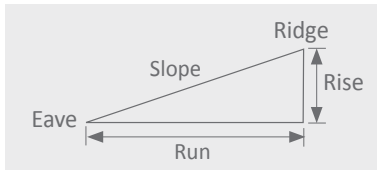


## PLANNING STAGE

### Determine the Slope of the Roof

The slope of the roof can be calculated from measurements of the rise and run of the roof. The rise is the vertical distance of the ridge above the eave. The run is the horizontal distance of the ridge from the eave. A roof slope is often stated as the inches of vertical rise per 12 inches of horizontal run length. The minimum appropriate slope for an ONDURA® roof is a 3-inch rise over a 12-inch run.

Slope = amount of rise per run  
Example: 3-in rise per  
12-in run = 3:12  
Minimum slope required: 3:12



### Roof Sheathing

Roof sheathing is a plywood or OSB (oriented strandboard) layer on top of the roof supports. If your roof has sheathing, we recommend using standard felt paper or an ice water shield over the sheathing.

### Purlins

If your roof has purlins instead of sheathing, then the maximum purlin spacing is 24 inches on center. If your roof may be exposed to heavy snow loads, then the purlin spacing should be reduced to 12 inches on center.

### On-Site Storage

While stored at the job site, ONDURA sheets must be covered to protect from damage that may be caused by rainwater trapped between sheets. Do not allow stacked sheets to get wet while stored.

### Roof Coverage

ONDURA sheets are 48 inches wide and 79 inches long. We recommend an overhang at the roof eave of 1 to 1-3/4 inches (Note: 1-3/4 inches is the maximum overhang relative to the edge of the roof sheathing). Measure the roof from eave to ridge and add the overhang length to determine the total length of coverage.

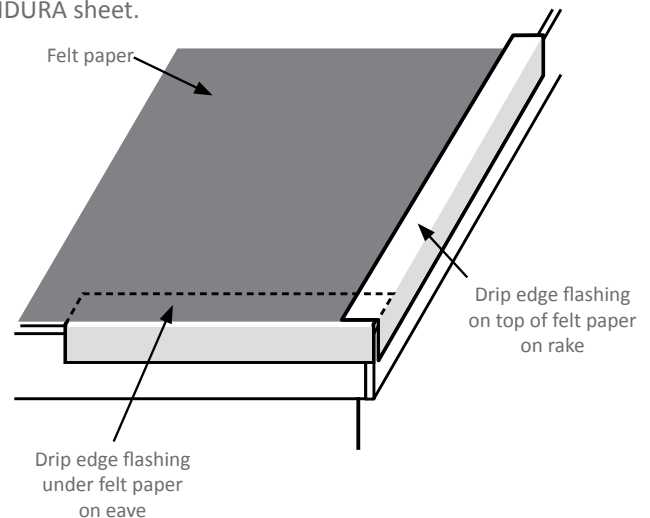
If the total length of coverage is greater than 79 inches, then you will need a second row of ONDURA sheets. The sheet overlap from row to row should be at least 7 inches.

Note: At the ridge of the roof, the gap across the ridge, between the upper ends of the ONDURA sheets on each side of the roof, will be covered by the ridge cap; and the gap should be no more than two inches.

If your roof is wider than 48 inches, then you will need to account for the single corrugation overlap for adjacent ONDURA sheets. The first ONDURA sheet will provide 48 inches of coverage. Each additional ONDURA sheet will provide 44 inches of coverage with one corrugation overlap.

### Rake Edge

The rake edge of the roof should be covered to prevent water intrusion or damage to the sheathing. The rake edge should be covered with drip edge flashing. The drip edge flashing goes over the felt paper on the rake edge and under the ONDURA sheet.

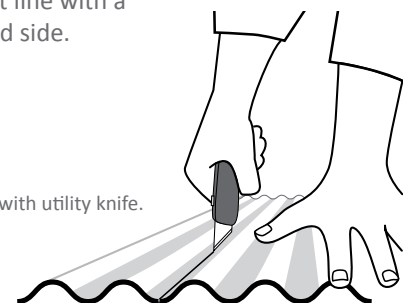


### Cutting ONDURA Sheets

Always wear eye protection when cutting.

- To cut an ONDURA sheet parallel to the corrugations, use a utility knife with a sharp blade. Always cut sheets in the valley of a corrugation with the painted side up.
- To cut an ONDURA sheet perpendicular to the corrugations, use a circular saw with a carbide-tipped blade or a hand saw. Apply a lubricating oil on the saw blade to aide in a smoother cut. For best results, work with the painted side down and mark the cut line with a pencil on the unpainted side.

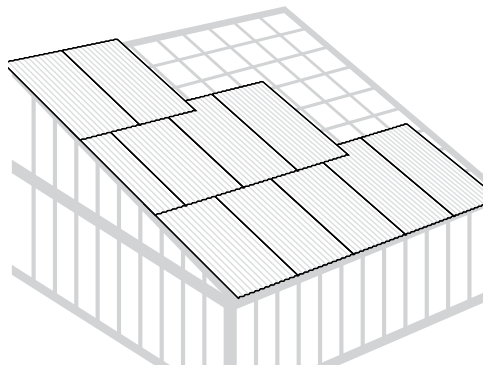
Cut through the valley with utility knife.



## Placement of ONDURA® Sheets

If more than one row of ONDURA sheets is needed, then the sheets must be installed along the eave first. Then additional rows are installed above the previous row.

Each row should be installed with the first sheet at the opposite end of the roof from the prevailing winds. With this orientation, the seam of the overlap will face away from the prevailing winds. This orientation will reduce the possibility of wind-driven rain getting under the corrugation overlap. If wind-driven rain could come from both directions, then we recommend sealing along the overlap with an elastomeric caulk.

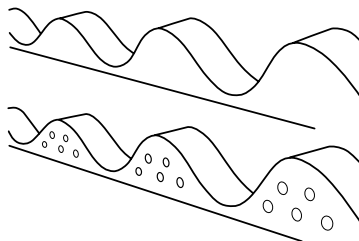


For aesthetic reasons, we recommend staggering the position of the corrugation overlap for each row by starting the second row with a sheet that has fewer corrugations. As a general guide, an ONDURA sheet with 6 corrugations should be used for the first sheet on the second row. Then full-width sheets should be used across the second row. If installing more than 2 rows, the odd numbered rows should start with a full-width sheet and the even numbered rows should start with a 6 corrugation sheet.

If possible, we recommend placing the first row of ONDURA sheets on the roof to confirm coverage with overlaps before the installation of the sheets.

## Closure Strips

ONDURA closure strips fill the space created by the corrugations. Vented closure strips are recommended along the eaves and ridge of the roof to enable airflow under the corrugations. The ventilation holes are small enough to prevent birds and insects from forming nests under the corrugations. Solid ONDURA closure strips are available to completely block the openings under the corrugations, and are recommended for hip and valley transitions on the roof.



**Note:** Each closure strip is 44 inches long.

## INSTALLATION STAGE

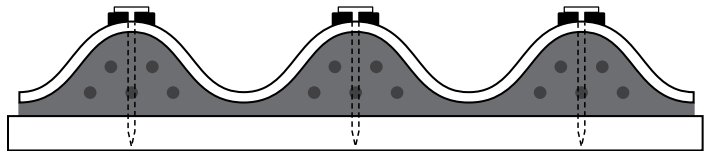
### Sheet Alignment

Place first ONDURA sheet on roof. Align the ONDURA sheet to the rake edge. Align the eave edge of the ONDURA sheet to overhang the eave by 1 to 1-3/4 inches.

Note: Install sheets with painted side up. The paint protects the panel from direct exposure to UV radiation from the sun.

### Closure Strip Position

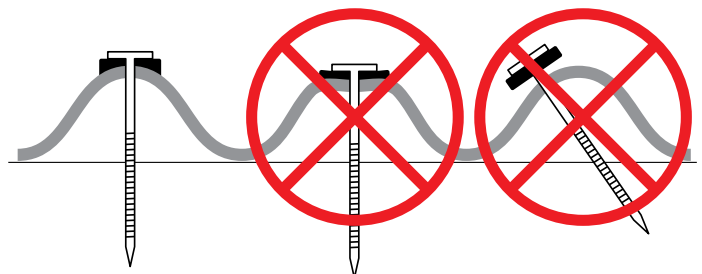
Along the roof eave, place closure strips under the ONDURA sheet with the curved side up to fill the corrugations. The closure strips must be placed where the fasteners will be located so that the fasteners will securely hold the closure strips in place during the life of the roof.



### Fastener Position

Note: We recommend genuine ONDURA fasteners for installing ONDURA sheets. Genuine ONDURA fasteners are available as nails or screws with an attached rubber washer to improve sealing around the fastener. Other types of fasteners may not provide sufficient hold-down strength.

Drive each ONDURA fastener only through the crown of a corrugation and perpendicular to the roof surface. Be careful not to overdrive or underdrive the fastener. The rubber washer on the fastener should be snugly in contact with the sheet. Slight hand pressure on a fastenered-down corrugation should not separate the sheet from washer contact.

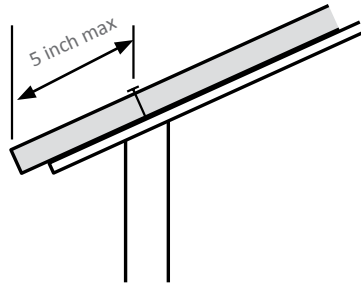


Correct

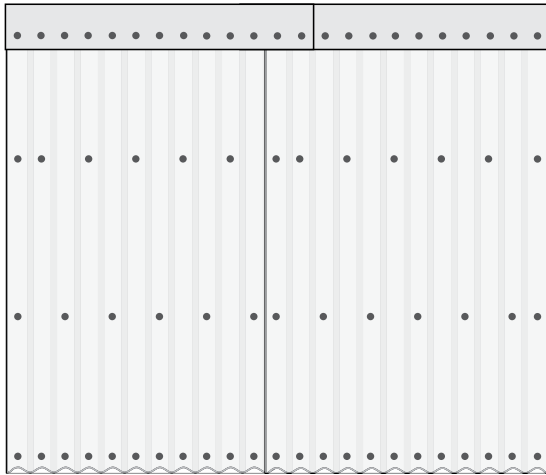
Incorrect

Incorrect

Measure distance along the sheet corrugation from eave edge of sheet to outer wall of structure. The lower line of fasteners should be installed high enough on the sheet to be on or inside the wall support. The typical distance from the eave edge of a sheet to the outer wall is 2 to 3 inches. For resistance to wind uplift, the maximum distance from the eave edge of a sheet to the first row of fasteners is 5 inches.



Install fasteners on the first sheet along the eave and rake edges.



Example roof with two sheets and two ridge caps

**Tip:** For each row of fasteners, install the first two fasteners at opposite sides of the sheet and attach a string line between them—across the corrugations—as a guide for the position of the other fasteners. Mark the position of the string on the crown of each corrugation with a pencil. Repeat for each row of fasteners.

Install fasteners at remaining positions, but do not fasten areas which will be overlapped by other sheets.

Place next ONDURA sheet into position on roof.

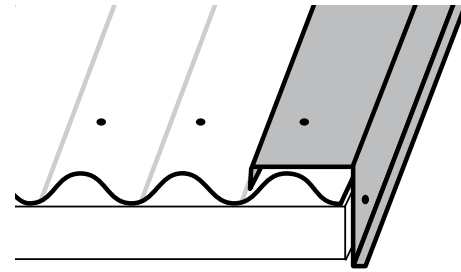
- The sheets must overlap by at least one corrugation side to side
- The sheets should overlap by at least 7 inches end to end. If installing over purlins, the overlap must be over a purlin so that the fastener can be secured into the purlin.

Install fasteners on sheet in the same manner as the first sheet.

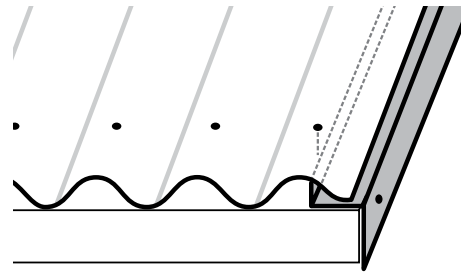
For the last sheet in a row, install fasteners in the same pattern as previous sheets and in the final corrugation along the rake edge.

## Rake Trim

Finish your rake edge with metal flashing, either over or under the last corrugation edge of the ONDURA sheet. When using metal flashing under the last corrugation, be careful to avoid fastening through your flashing.

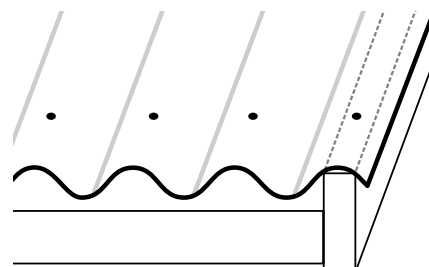
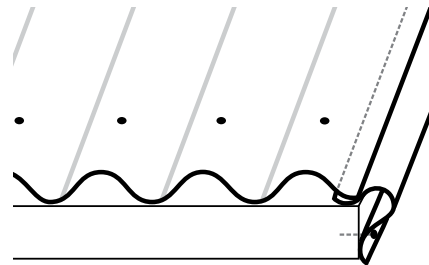


Metal flashing over



Metal flashing under

Alternatively, you could use a one corrugation strip from an ONDURA sheet under the last corrugation edge, or secure the last corrugation directly to a raised rake edge.



Corrugation over raised fascia board edge

## Pipe Flashing

### Small Pipeflashing Accessory (12 x 12 Inch Flat Center)

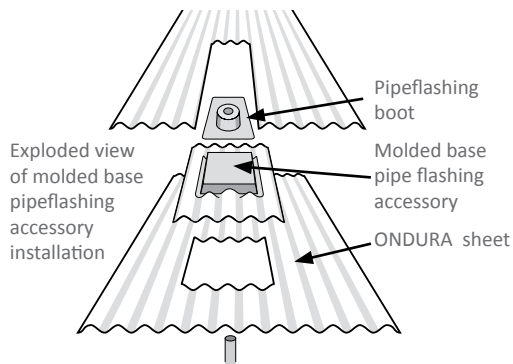
The small pipeflashing accessory can be used for cold pipes up to 10 inches in outside diameter or for hot pipes with a maximum of 6 inches in outside diameter. To install, line up the corrugations of the accessory with those of the ONDURA sheet so the pipe to be flashed will come through near the center of the accessory. Cut a 15 x 15 inch square hole in the ONDURA sheet so the accessory will nest well. Apply two beads of rubberized elastomeric flashing cement/caulk around the square hole before placing the accessory.

**Cold Pipes:** Cut a hole in the center area of the accessory to fit the pipe. Insert the pipe. Slip a pipe flashing boot with a rubber collar over the pipe, caulk the boot to the flashing accessory and then fasten it to the accessory with sheet metal screws.

**Hot pipes:** Cut a hole in the center area of the accessory that is 2 inches bigger all around than the hot pipe. Install the hot pipe boot with caulk and sheet metal screws. Then install a storm collar per the instructions from the storm collar's manufacturer.

#### Finishing up:

Cut a full-sized ONDURA sheet to a seven-corrugation width. Cut an opening 20 inches deep from the bottom edge of the sheet and three corrugations wide.



Fit the sheet over the flashing accessory so that it will cover the top and both side corrugations. This sheet should fit directly over the sheet to which the accessory is applied, be caulked to the accessory, and its upper end should be under the lap of the next higher row of ONDURA sheets. Fasten with ONDURA fasteners.

### Large Pipeflashing Accessory (20 x 20 Inch Flat Center)

The large pipeflashing accessory can be used for cold pipes up to 18 inches in outside diameter or for hot pipes with a maximum of 14 inches in outside diameter. To install, line up the corrugations of the accessory with those of the ONDURA sheet so the pipe to be flashed will come through near the center of the accessory. Cut a 23 x 23 inch square hole in the ONDURA sheet so the accessory will nest well. Apply two beads of rubberized elastomeric flashing cement/caulk around the square hole before placing the accessory.

**Cold Pipes:** Install the same as the small pipeflashing accessory.

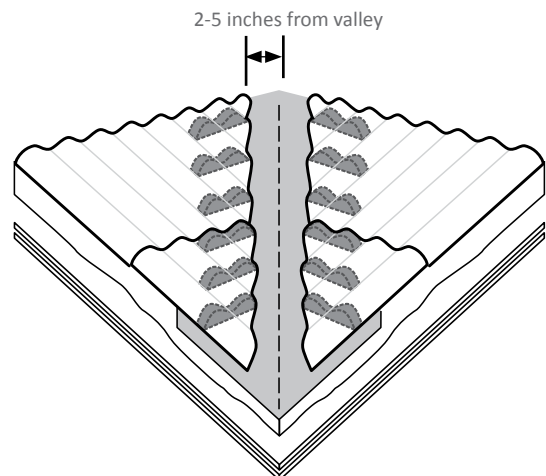
**Hot pipes:** Install the same as the small pipeflashing accessory.

**Finishing up:** Cut a full-sized ONDURA sheet to a nine-

corrugation width. Cut an opening 27 inches deep from the bottom edge of the sheet and five corrugations wide. Place the sheet over the flashing accessory so that it will cover the top and both side corrugations. This sheet should fit directly over the sheet to which the accessory is applied, be caulked to the accessory, and its upper end should be under the lap of the next higher row of ONDURA sheets. Fasten with ONDURA fasteners.

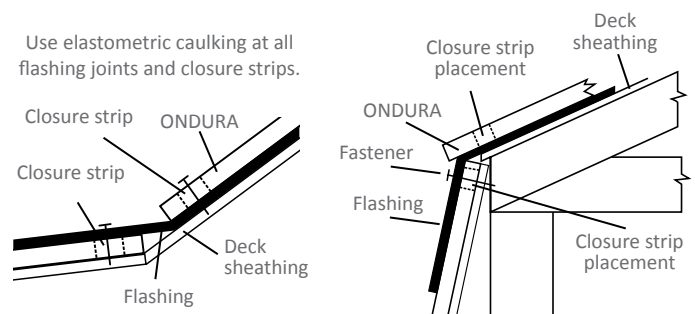
## Valley Flashings

For valleys, install a minimum 18-inch wide metal valley flashing. Cut sheets at an angle to fit the valley; then turn over, and on the undersides along the valley edge, caulk two corrugations of the ONDURA solid closure strip, and place into the corrugation. Then put a ½-inch bead of caulking on the flat side of the solid closure strips and along the corrugation of the sheet between the solid closure strips. Turn sheets right side up, carefully lay in place so caulked closures seat on flashing, and fastener in place at least 12 inches up from the center of valley without puncturing the metal flashing.



## Slope Changes

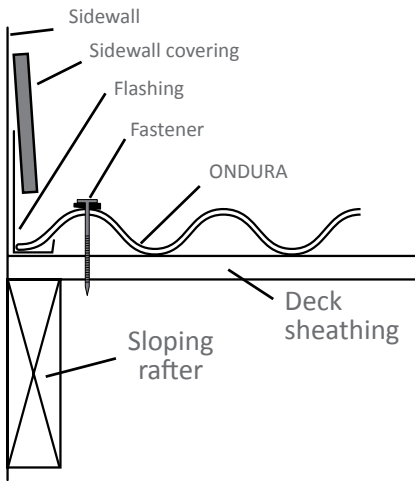
Flashing width should be increased as slope differences increase or whenever water build-up on the lower slope can be substantial.



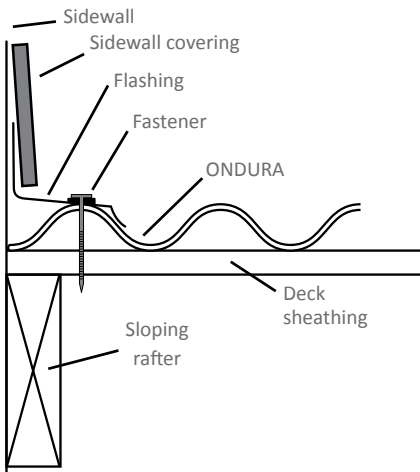
## Wall Flashing

See below examples on how to flash when ONDURA roofing meets a wall.

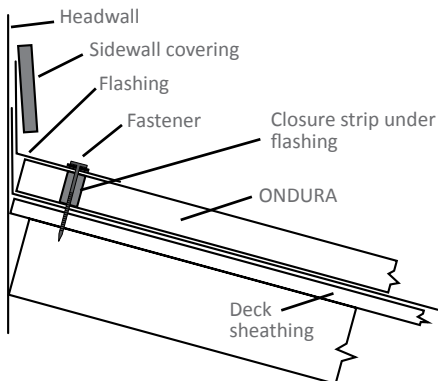
Option 1



Option 2

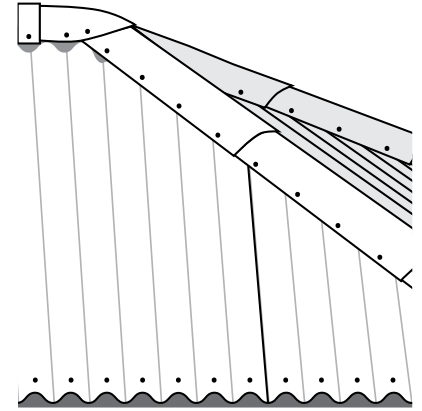


Option 3



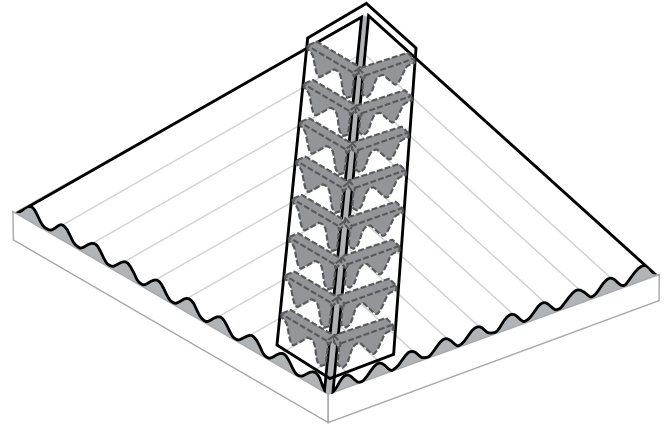
## Roof Hips

For hips, sheets from both sides must meet to support hip cover (an ONDURA ridge cap). Framing should also be in place beneath and near enough to the upper ends to receive fasteners securing the hip cover. Snap chalk lines on each side of hip to mark area of hip cover.



### Hip Cover with Closure Strips

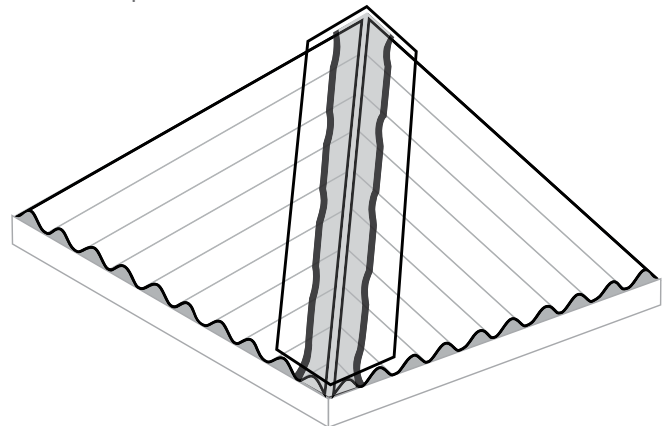
Cut two corrugations of ONDURA solid closure strip, and attach to top side of ONDURA sheet with rubberized elastomeric flashing cement/caulk. Then install hip cover with 7-inch end laps.



With ONDURA closure strips

### Hip Cover with Ondulair Slim

Seal the hip with Ondulair Slim. Then install hip cover with 7-inch end laps.

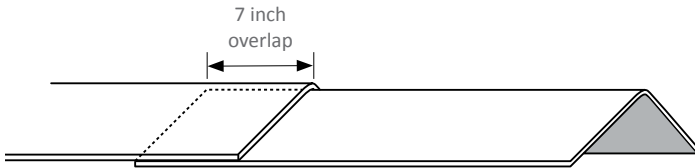


With Ondulair Slim

## Ridge Cap

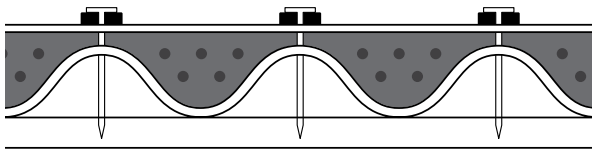
**Note:** Install all sheets on both sides of the roof before installing the ridge cap.

Measure the ridge to determine the required coverage. If more than one ridge cap is needed, they must be installed with a 7 inch overlap. Allow for 3 or 4 inches of material at end of ridge to overhang ridge end. This material will be used to cover the end of the ridge.



Place the first ridge cap at the end of the ridge away from the prevailing wind, allowing it to project out 3 to 4 inches from the ridge end.

Insert closure strip above ONDURA sheet and below ridge cap. The closure strips must be placed where the fasteners will be located so that the fasteners will securely hold the closure strips in place during the life of the roof.

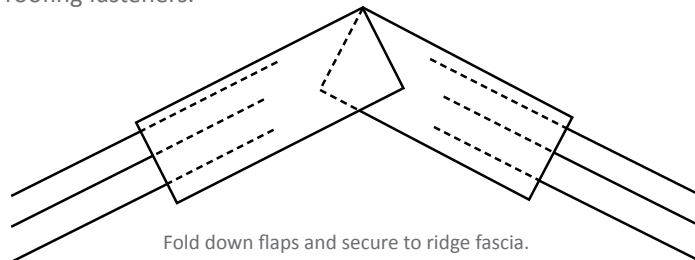


Install fasteners through the ridge cap and closure strip at every crown of the underlying ONDURA sheets. The row of fasteners should be 1 inch above the lower edge of the ridge cap. If more than one ridge cap is needed, overlap the next ridge cap before fastening through the overlap.

Place next ridge cap with 7 inch overlap. Insert closure strip and install fasteners.

Install final ridge cap with 7 inch overlap and 3 to 4 inch overhang. Insert closure strip and install fasteners.

At each end of the ridge, cut the overhang portion of the ridge cap along the crown with a utility knife. Fold down resulting flaps for a weather guard. Secure flaps to ridge fascia with roofing fasteners.

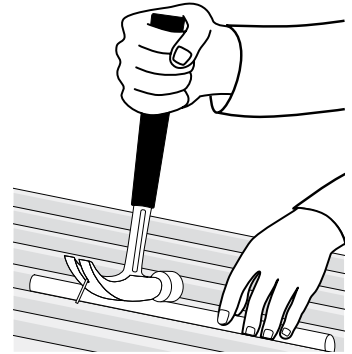


**Congratulations! You have completed the installation of your ONDURA roof.**

## ADDITIONAL TIPS

### Pulling Nails

To pull a nail from an ONDURA sheet, use a claw hammer and a 1-1/2 inch wood dowel or pipe. This technique minimizes the chance of damaging the sheet. Put the dowel or pipe in the valley next to the crown where the nail will be pulled. Then use the dowel or pipe as a leverage point for pulling the nail.



### Walking on an ONDURA Roof

When walking on fastened-down ONDURA sheets, wear soft-soled shoes and walk on areas that have structural support from sheathing or purlins. Always place feet across corrugations to distribute your weight and prevent damage to corrugations. ONDURA is more pliable in hot weather and less pliable in cold weather. Always use care when walking on any roof.

### Easy Maintenance

ONDURA sheets are easy to maintain. Over a period of years, weathering will age your ONDURA roof's coating. So you'll want to give your ONDURA roof new life by repainting. First, sweep dirt and loose debris off your roof. Then either brush or spray with top quality 100% acrylic latex exterior paint.

**CAUTION:** Do not steam clean or use pressurized cleaning equipment on ONDURA roofing.



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