# Tile Roof Hook Universal Mount

*Installation Manual*

Unirac Installation Manual

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## Step 1: Attach roof hooks to the rafters

- Remove or slide up the roof tile
- Position the roof hook above the roof rafter (for high roof rafters, shim if necessary)
- Place Tile Hook in the middle of the underlying interlocking tile's valley.
- Drill 3/16 inch pilot holes through the underlayment into the center of the rafters. Securely fasten each tile hook to the rafters with two 5/16" x 3½" lag screws. (if spacer boards are used, lag bolts may need to be replaced with longer ones. For proper embedment, refer to Table 2 [page 3] for lag bolt pull out values). (Fig 2)
- Slide down or re-insert the tile

*Figure 1*

*Figure 2*

## Step 2: Attach L Foot to tile roof hook *(Fig 3)*

*Figure 3*

Tile Hook Components:

1 tile hook
1 stainless steel bolt
1 nut

## Table 1. Tile Hook Spacing Chart

| Snow Load | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
|---|---|---|---|---|---|---|---|---|---|
| Basic Wind Speed | | | | | | | | | |
| 85 mph | 54” | 54” | 47” | 40” | 35” | 31” | 28” | 26” | 23” |
| 90 mph | 48” | 48” | 44” | 38” | 33” | 30” | 27” | 25” | 23” |
| 110 mph | 31” | 31” | 31” | 31” | 28” | 25” | 23” | 21” | 20” |
| 120 mph | 26” | 26” | 26” | 26” | 25” | 23” | 21” | 20” | 19” |
| 150 mph | 16” | 16” | 16” | 16” | 16” | 16” | 16” | 16” | 15” |

The table above is subject to the limitations listed below. It is intended as a quick reference guide based on the most common configurations. Please refer to load tables on pages 5, 6 and 7 for design loads.

### Engineering Guide Limitations

- Flush roof installations only
- Roof slope must be 0-45 degrees (0/12 - 12/12 pitch)
- Installation must have at least 4 modules grouped together
- Module dimensions must be less than 42”x65”
- Surrounding ground area must not slope more than 10 degrees
- Location must fall into Exposure Category B or C
- Building height must be less than or equal to 30’0”

Please refer to Technical Support for more information on roof zones

- Span for Roof Zone 2 = 1/2 max span
- Span for Roof Zone 3 = 1/3 max span
- Max Cantilever = 1/3 max span

Please refer to Unirac Technical Support for installations that do not comply with the limitations above.

## Table 2. Lag pull-out (withdrawal) capacities (lbs) in typical roof lumber (ASD)

| | Specific Gravity | Lag screw specifications 5/16” shaft,* per inch thread depth |
|---|---|---|
| Douglas Fir, Larch | 0.50 | 266 |
| Douglas Fir, South | 0.46 | 235 |
| Engelmann Spruce, Lodgepole Pine (MSR 1650 f & higher) | 0.46 | 235 |
| Hem, Fir, Redwood (Close Grain) | 0.43 | 212 |
| Southern Pine | 0.55 | 307 |
| Spruce, Pine, Fir | 0.42 | 205 |
| Spruce, Pine, Fir (E of 2 million psi & higher grades of MSR & MEL) | 0.50 | 266 |

Use Table 2 to select a lag bolt embedment depth to satisfy your Uplift Point Load Force (lbs), requirements.

It is the installer’s responsibility to verify that the substructure and attachment method is strong enough to support the maximum point loads calculated.

*Sources: American Wood Council, NDS 2005, Table 1*

*Notes:*
*(1) Thread must be embedded in the side grain of a rafter or other structural member intergral with the building structure.*
*(2) Lag bolts must be located in the middle third of the structural member.*
*(3) These values are not valid for wet service.*
*(4) This table does not include shear capacities. If necessary, contact a local engineer to specify lag bolt size with regard to shear forces.*
*(5) Install lag bolts with head and washer flush to surface (no gap). Do not over-torque.*
*(6) Withdrawal design values for lag screw connections shall be multiplied by applicable adjustment factors if necessary. See table 10.3 in the American Wood Council NDS for Wood Construction*

## Tile Modifications that may be required:

**How do I make modifications on tile retaining lip profiles that interfere with the tile resting flat against the tile hook (figure 4)?**

Tile retaining lip removal may be needed to allow for clearance of the hook.
To do so, there are two options:

Option A (figure 5): Use a hammer to remove the lip or obstruction.
Option B (figure 6): Using a grinder, remove the lip or obstruction.

*Figure 4*

*Figure 5*

*Figure 6*

**How do I adjust upper and lower tile profiles that do not allow the tile to rest flat above the hook?**

In some cases, the upper or lower tile may need to be modified; follow these steps for either situation *(for illustrative purposes, we'll show the upper tile modification)*

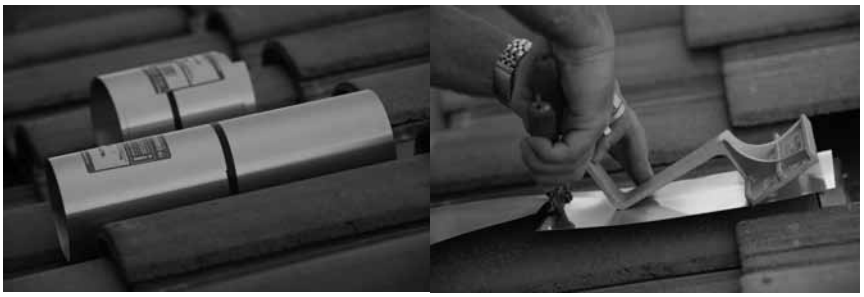


*Figure 7*

**Step 1** (figure 7)
Using rolled aluminum or sheet metal flashing, cut enough material to fit the exposed area.

*Figure 8*

**Step 2** (figure 8)
Modify the tile with a slot to allow for the tile hook to pass through.

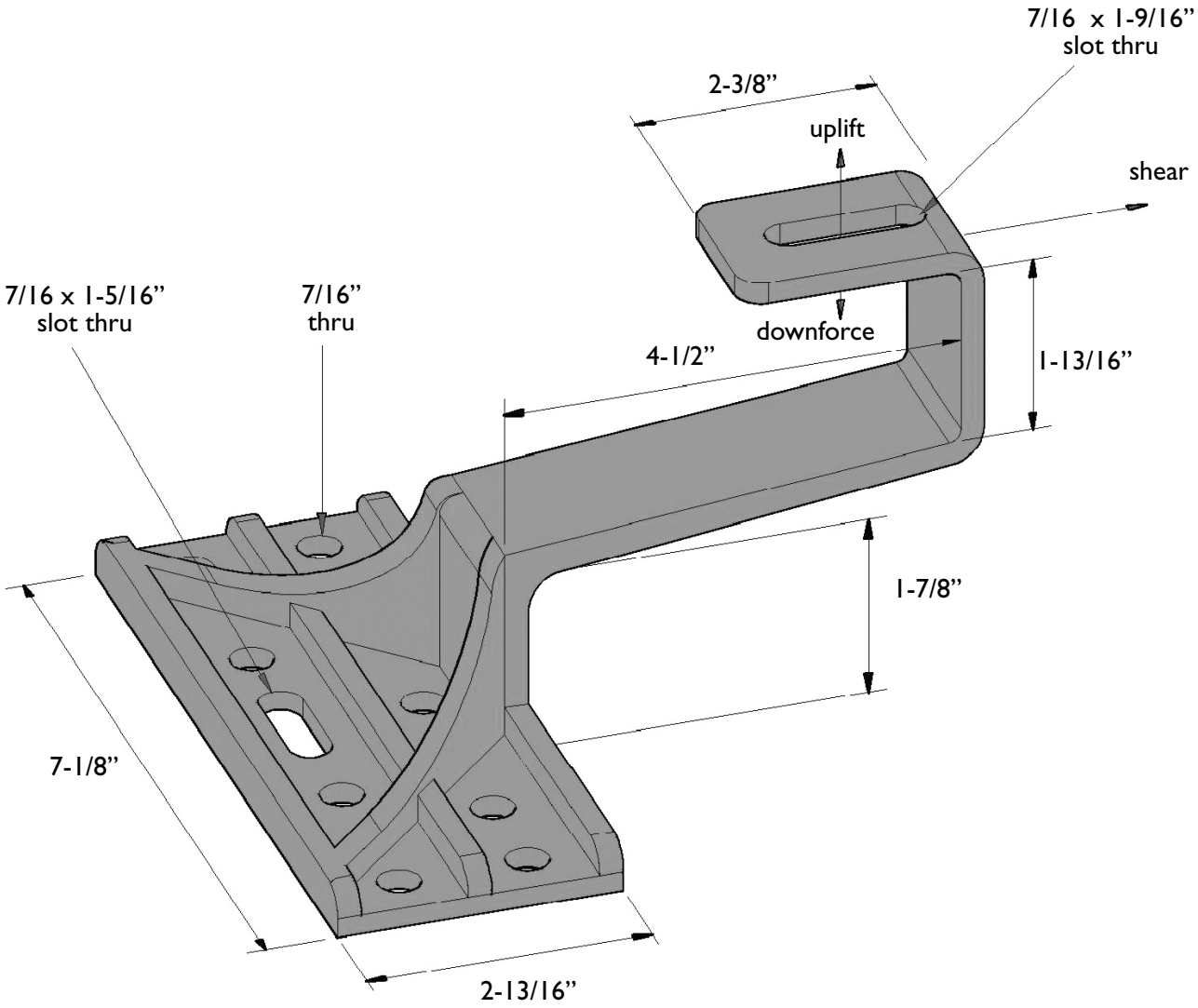
*Figure 9*

**Step 3** (figure 9)
Insert the cut flashing under the tile hook base and over the lower tile. Complete the tile hook installation as described on page 2.

*Standard C Shaped Top Mounting Hook*

## Allowable Loading

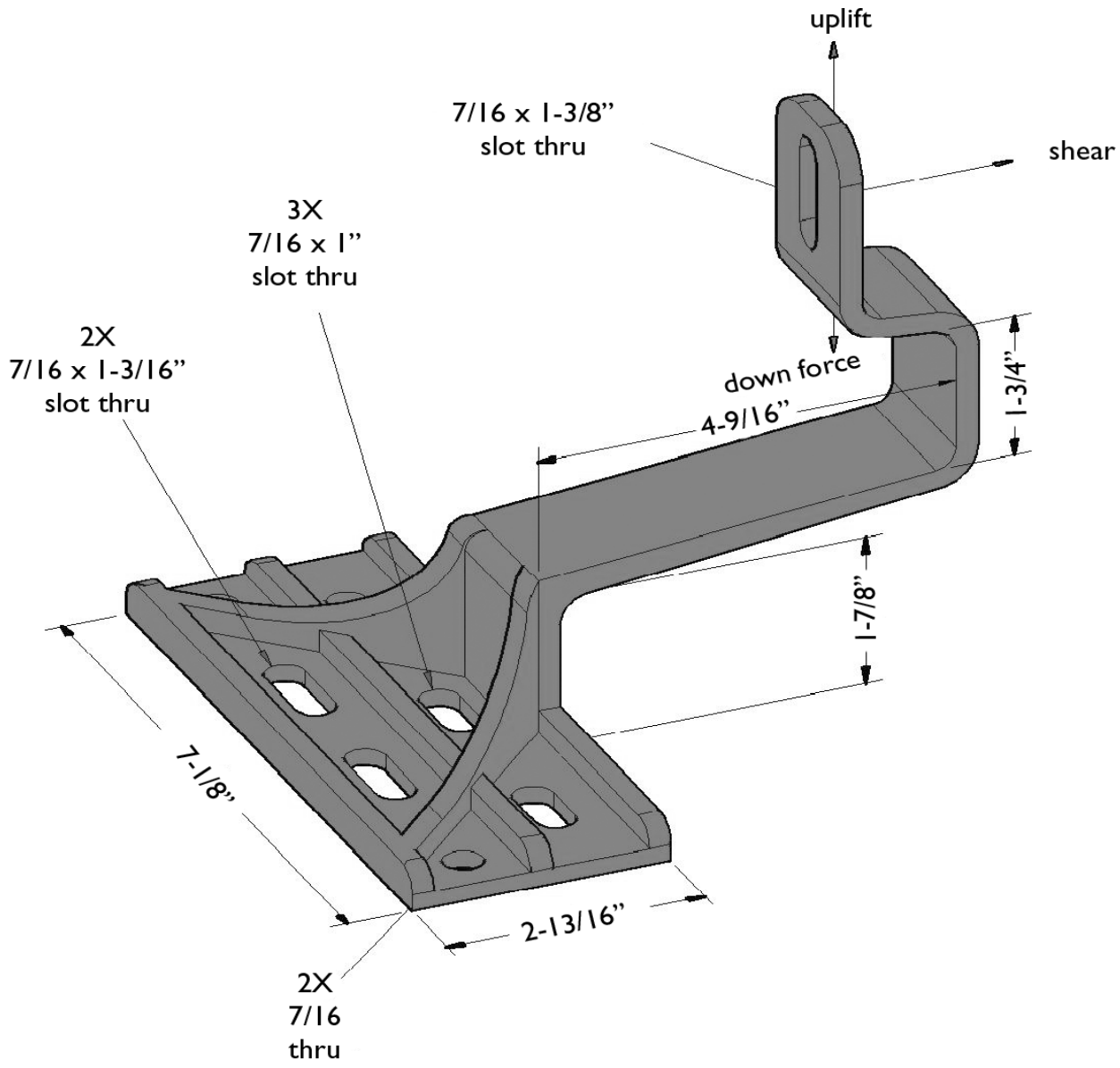
| Allowable Load (lbs) (1.9 Safety Factor) | |
|---|---|
| Downforce | 236 |
| Uplift | 191 |
| Shear | 214 |



*Standard S Shaped Front Mounting Hook*

## Allowable Loading

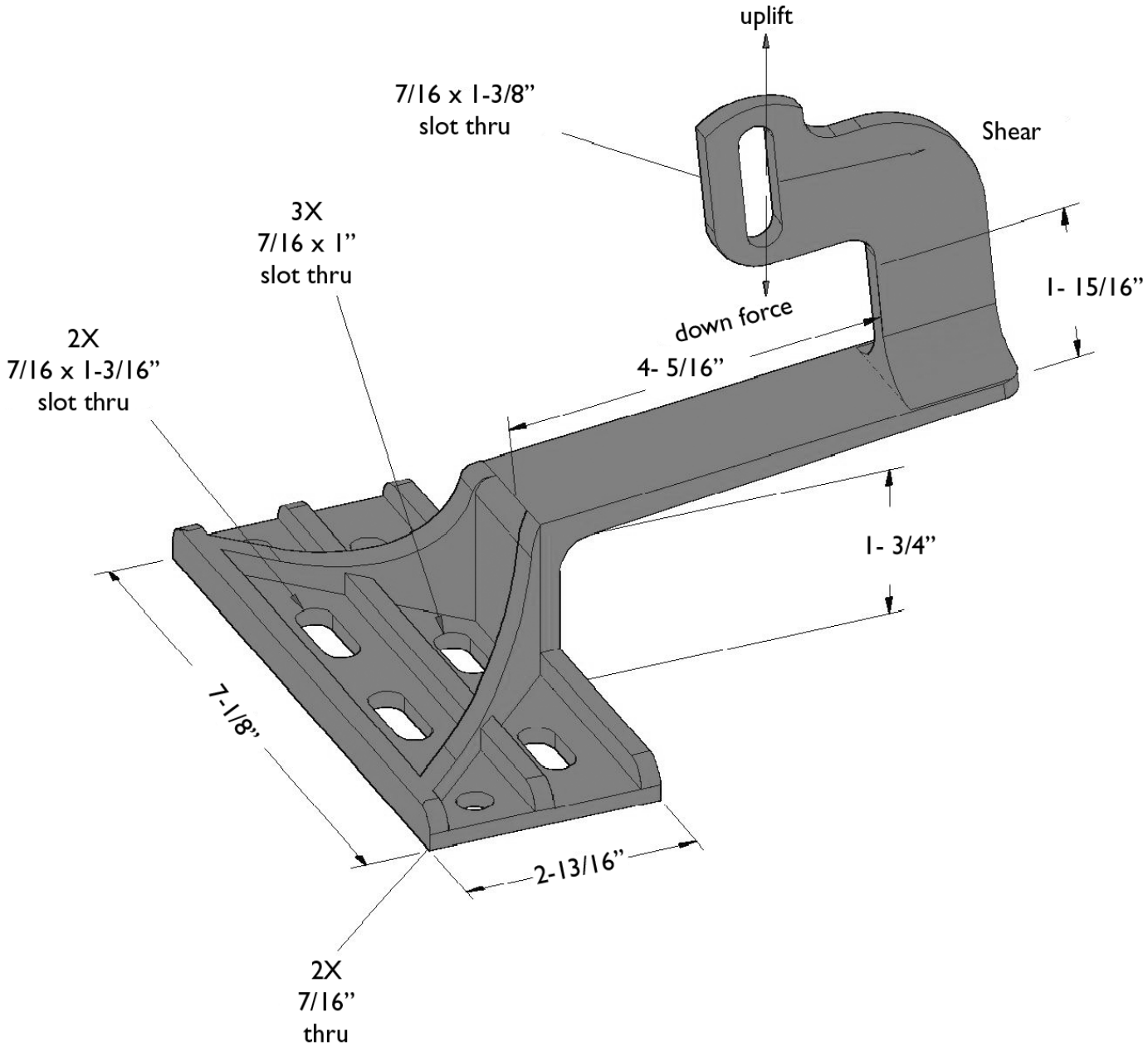
| Allowable Load (lbs) (1.9 Safety Factor) | |
|---|---|
| Downforce | 303 |
| Uplift | 303 |
| Shear | 348 |



*Standard S Shaped Side Mounting Hook*

## Allowable Loading

| Allowable Load (lbs) (1.9 Safety Factor) | |
|---|---|
| Downforce | 337 |
| Uplift | 225 |
| Shear | 259 |



## Product and Finish Limited Warranty

For the most current warranty information, please see
our website at http://www.unirac.com



UNIRAC®
1411 Broadway Boulevard NE
Albuquerque NM 87102-1545 USA