

Roofs built to survive the apocalypse It's a no-Brainer

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8400 E Crescent Pkwy, #6-3000, Greenwood Village, CO 80111

May 11, 2024

Re: xxx Snowmass Cir
Superior, CO 80027

Xxxxxxx,

After inspecting the current installation progress and condition of your roof replacement project, it is my professional opinion that the following issues will be problems in the future if not corrected.

In no particular order of importance:

- 1) The plumbing and HVAC vents.
 - a. All of them are flashed incorrectly. Vents should be flashed "shingle style" with the underlayment. There should be a base flashing that sits on top of the Sol-R. Then the top/uphill half (at least) should be covered by a sheet of Sol-R which has the vertical seams taped. Finally, as this sheet will be off horizontal alignment from the rest of the rows, the top/uphill portion of the sheet should be covered by the next upper row of Sol-R. See attachment labeled "Sol-R-Skin-Install Guide."
 - b. Many of the base flashings are damaged or the wrong size.

The preferred fix for this is to:

- a) Replace all damaged flashing.
- b) Remove the battens surrounding each vent, cut the Sol-R back so that the base flashing can be lifted to sit on top of the underlayment as stated above. Continue to flash per manufacturer install instructions.
- c) All HVAC exhaust hoses for non-heating elements, such as hood or bath fans, have hoses that are 4" or 8" in diameter. The base flashing should allow for those sizes and also be either 4" or 8" in diameter as well. Replace all base flashings that are an incorrect size.

- 2) All valleys are installed incorrectly. You have ribbed valley flashing. That consists of a center rib, then 2 more ribs per side—5 ribs in all. ALL debris, tape, membranes, etc should be cleared from inside of inner ribs. There should be ZERO nails, staples, or any other holes inside of outer ribs. Valley joints should overlap at least 6". See attachment labeled "Ribbed Valley Metal Installation." See section labeled INSTALLATION 2. A. c. i.

The preferred fix for this is to:

- a) Remove the battens surrounding each valley, replace all valley flashing following install instructions, and properly re-attach battens.

- 3) The battens are both placed wrong and installed poorly. Many of the battens are crooked and/or curved in their installation. Many edge pieces are bent to the point that they won't hold/support the weight of the tile intended to be installed. The battens are spaced incorrectly.

The preferred fix for this is to:

- a) Many of the plastic battens used at the roof edges, whether it be rakes, roof-to-wall, or valleys, have creased at the last staple, which is several inches from the end. A recommended repair would be simply to fasten them closer to the end of the batten. However, unfortunately, valleys and roof-to-wall areas are required to not have fasteners near the end. My recommendation would be to use a batten made of different material than plastic, either wood or synthetic, for those areas.
- b) For the crooked battens, a sturdier material would have helped prevent this. Using chalk lines would have helped as well. I recommend to remove the battens and use chalk lines for re-installation.
- c) The spacing for the first line of battens is incorrect. The distance from the eave edge to the top of the batten should be 9". See attachment "Bartile Install Guide" page 18 section labeled "when to use batten strips." Your roof is an 8/12 pitch. Unfortunately, that distance is only 8" on your roof. It would be nice to simply remove the first row of battens and move them up 1". While that is a possibility, it will be noticeable when compared to the exposure of the other rows of tile.

- 4) The attic ventilation has more than 1 exhaust type of vent. This will cause ventilation issues, including possible condensation in the attic and ice dams at the eaves. See attachment labeled "Roofing Magazine Re Mixed Vents." Read the 1st paragraph of the intro and 1st paragraph of each of the 2 Problems. The powered vent, which is the round one, will draw air in from the nearby static vents instead of from the vents at/near the soffits. This will not allow enough air to exhaust as the hot air rises from the lower areas of the attic because air will actually be entering the attic at designated exits. The attic will remain hot causing added utility costs. Another concern would be that because the entire roof surface is covered in Ice and Water Shield with another layer of a radiant barrier, this can cause condensation without proper ventilation. See attachment "Roofing Institute Install Guide" page 4-13. The preferred fix for this is to remove the powered vent and close that hole. Another consideration should be taken regarding the amount of ventilation. As the mixing of vent types was not caught, it is likely that a calculation for needed vent units was not performed.

- 5) There is a section of the roof at the front of the house that has a 2/12 pitch. Tile should not be the primary roof system on a slope less than 2.5/12 per the 2018 IRC which Superior uses. However, Bartile restricts the ventilated batten installation method to 3/12 or more. See attachment labeled "Bartile Install Guide" page 5 Option C.

The preferred fix for this is to remove the battens and Sol-R-Skin, install a Modified Bitumen (2 layer membrane) system on that slope, and then install the battens and tiles on top of the Mod Bit—paying close attention to seal the batten fasteners that puncture the primary roofing system. A single-ply membrane may be used in place of the Mod Bit.

- 6) The Sol-R-Skin Blue is installed in a manner that is not watertight. All of the vertical seams should be taped with 6" wide foil tape. See attachment labeled "Sol-R-Skin-Install Guide." They currently have 3" foil tape that is not flush against the underlayment. All edges that end at a valley should be under the valley metal. Currently they are completely exposed and installed above the valley metal. There are rips in the material.

This will lead to the insulation persistently getting wet which defeats the purpose of the underlayment. I have reached out to my Westlake rep who will consult his technical team for specific issues regarding insulation and fire rating under this condition.

The preferred fix for this is to:

- a) Remove the tape and battens above the Sol-R-Skin Blue at the vertical seams, install 6" foil tape directly to the underlayment, then reinstall battens.
- b) Remove all valley metal and everything attached within 24" from the valley center, install a vertical piece of Sol-R, tape the horizontal pieces as shown in the manufacturer install instructions, then correctly re-install valley metal and battens above that.

Ensure that all rips or tears in the Sol-R are foil taped before installing the tiles.

While the above recommended fixes may be accomplished individually, There will most likely be many exposed nail holes after removing so many battens. That will probably need to be addressed by replacing the Sol-R.

** I am not familiar enough with this batten product to know whether it can be re-installed and hold up its integrity. I suspect, due to the end creases already present, that all removed battens for above mentioned corrections may need to be replaced.

In summary, I think all battens and valley metal should be replaced. I recommend a different material for the vented battens. During that process, the vents need to be right-sized and flashed correctly, Sol-R taped correctly and/or replaced, and workmanship issues addressed.

Thank you,

Sincerely,

R Adam Nielsen

Licensed Roofer

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