TECHNICAL BRIEF I #2022-001

Post Storm Event - Considerations For Repairing Damaged Concrete and Clay Roofing Tiles

The **Tile Roofing Industry Alliance** (TRIA) is an industry trade association comprised of roof tile manufacturers, roofing contractors and suppliers dedicated to the advancement of tile roofing. Properly installed tile roofs last longer than most comparable roof systems, and are repairable in most cases if exposed to flying debris and other natural disaster related activities.

In addition to curb appeal, permanence, and energy savings versus virtually all other roof systems, one of the greatest advantages that tile roofing offers versus comparable roof systems is its inherent repairability. A typical tile roof system is comprised of thousands of individual tiles, all of which may be safely removed and replaced without impacting the integrity of the roof system.

The guidelines included herein are designed to assist the user with the evaluation of a storm damaged tile roof and to help the user determine whether to repair or replace the roof.

The TRI Alliance strongly recommends having a trained professional evaluate the condition of the underlayment and roof decking when considering repairing or replacing a roof to identify all of the concerns, including the discussions of coverage for workmanship in affected areas for both repair and harvesting.

Post-Storm Frequently Asked Questions:

How do I know if my roof tiles received storm related damage?
Roof tile damage is typically visible to the naked eye. Broken roof tiles often result from large hailstones and flying debris such as tree limbs, yard décor, etc. Broken tiles rarely occur as a result of wind exposure. In order to ensure the integrity of your tile roof, broken roof tiles must be properly repaired or replaced.

Who should I trust to evaluate my damaged tile roof?
The TRI Alliance recommends consulting with a credible roofing contractor that has experience with the regional code requirements.

How do I know that my roof can be repaired?
This document contains industry endorsed procedures that help insurance representatives, roof consultants and roofing contractors determine whether a damaged tile roof should be considered for repair or replacement. It should be left to a trained professional to properly evaluate repair options.

My neighbor received a new “free roof”, how do I get one?
Too often, the promise of a free replacement tile roof is propagated by individuals motivated by significant compensation that may occur in a post-storm environment. The guidelines herein may assist in determining whether a tile roof may be repaired or replaced, but the cost is dependent upon many factors that will be specific to each case.

What if the roof tiles on my home are not currently produced? Are there other tiles that will "fit"?
Every damaged tile roof must be evaluated on a case-by-case basis. Over the past 50 plus years, hundreds of tile colors and shapes have been produced and marketed throughout North America. If the exact shape and color of tile on your roof is not actively produced or readily available, third-party producers that may be able to supply reasonable facsimiles. Another alternative may be the "Harvest and Repair" method outlined in this document.

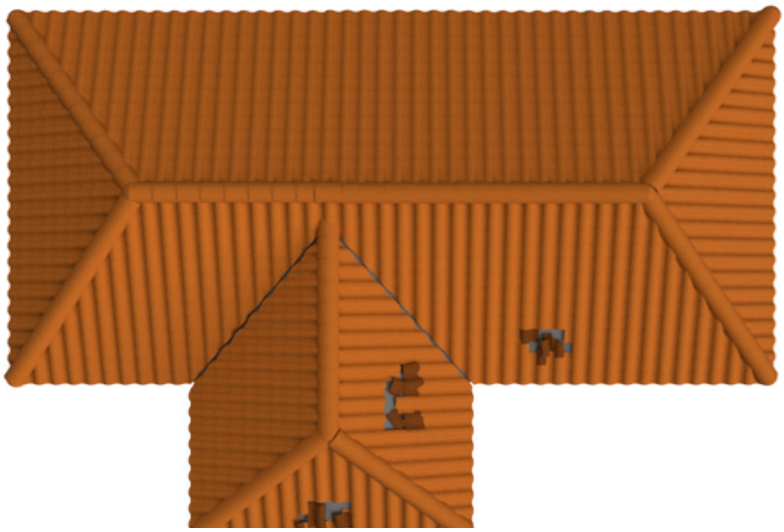
What is the difference between a repair and a harvest and repair?
A tile roof may be easily repaired if the existing roof tiles are available from the original manufacturer, a vendor that inventories older tiles, or a specialty manufacturer of replica tiles that can fit and interlock with the existing roof tiles.

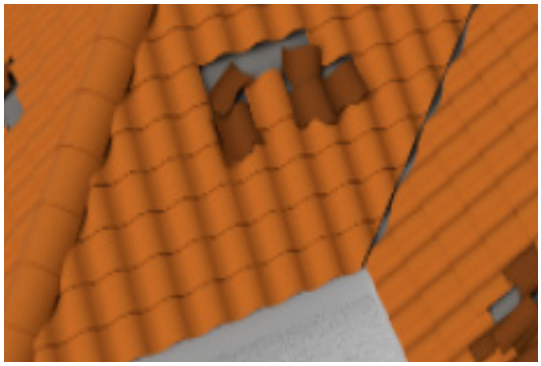
The Harvest and Repair method may be utilized when existing tiles are no longer produced and/or suitable interlocking alternative tiles are not available. In this instance, roof tiles may be removed from inconspicuous areas of the roof (non-street facing) for the purpose of replacing the street facing visible damaged tiles. Harvested tiles may be replaced with tiles of similar shape, and where possible, a similar color. *See diagrams on following pages*

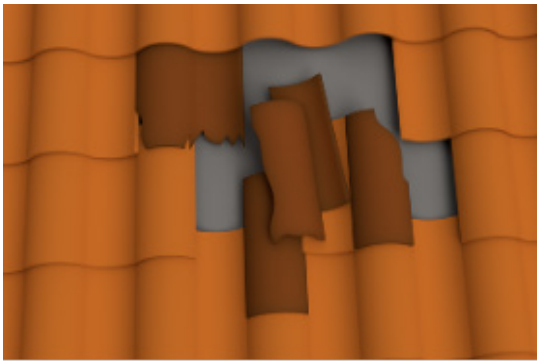
What role does the underlayment play in the watertightness of my tile roof?
In most cases, the underlayment acts as a secondary water barrier. Regardless of its age, underlayment that has not been exposed to the elements will likely continue to shed water if needed. The TRI Alliance strongly recommends a qualified roofing contractor inspect the condition of the underlayment prior to conducting a tile roof repair. New or harvested roof tiles should not be installed over compromised underlayment regardless of the age of the roof system.

For more information on conducting tile roof repairs and evaluating the condition of underlayments, please **see the TRIA's You Tube Channel:** https://www.youtube.com/c/tileroofingorg1

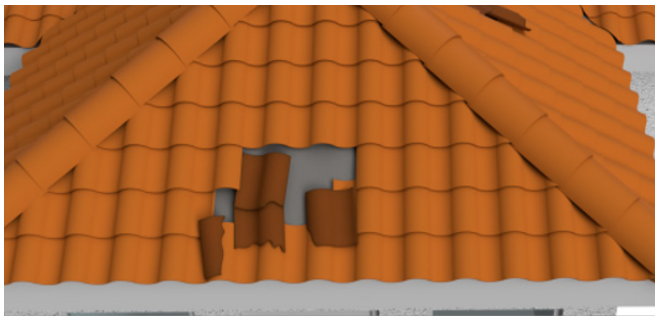
Example of tile roof damage created by wind-borne debris:
A roof as illustrated below that experiences minimal damage may be repaired or the Harvest and Repair method may be used in accordance with the Florida building code, which states,"not more *than 25 percent of the total roof area or roof section of any existing building or structure shall be repaired, replaced or recovered in any 12-month period unless the entire roofing system or roof section conforms to requirements of this code*. Total roof area may be determined via field measurement, or via commonly available aerial measurement programs. *(see footnote 1)*



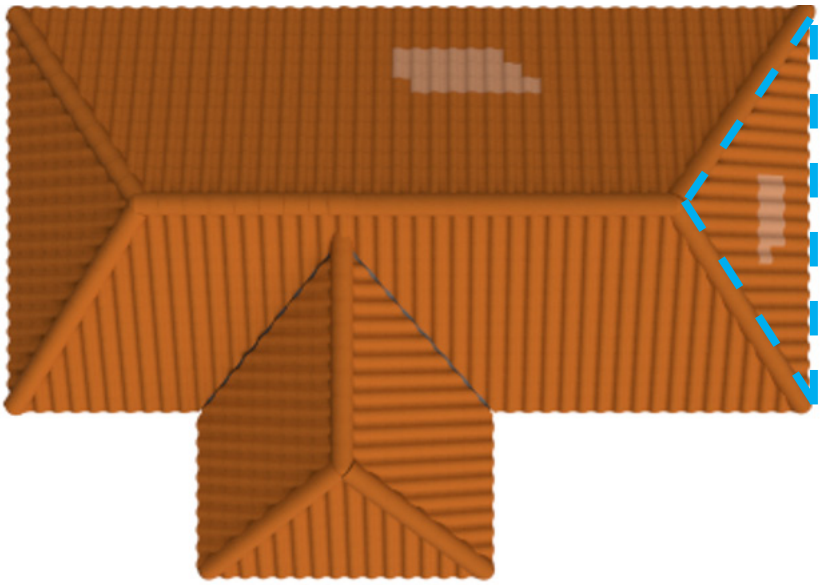




Example of a “Harvest Area”:
When tiles of exact fit and finish are not available for necessary repairs, however tiles of similar shape and finish are available **AND** the roof design possesses an area where hip and ridge tiles provide a natural break between roof planes, the roof tiles may be harvested from “hip to hip” or “gable to gable” and used to facilitate street visible repairs. Hip & ridge tiles cover the cut edges of field tiles, so they don’t require interlocking with original tiles and can be used with similar, but different field tiles. Spare tiles may be stored by owner for future repairs.



Example of completed repair:



Plane or roof area that was removed and installed with new tiles. (when similar tiles)

If new tile design, then remove entire roof plane (hip to hip)

New tile may appear different in color when viewed up close, but will blend into the roof when viewed from a distance.

In most instances the repaired tiles will not match the existing tiles due to naturally occurring aging. Your roofing contractor may recommend color coating the repair roof tiles to assimilate with the majority roof tiles to the best of his/her ability. Color coating repaired roof tiles does not affect the integrity of the tile roof.

As a non-profit industry association, the TRI Alliance does not perform formal field evaluations/assessments of roof installations for building owners. Trained and licensed roofing professionals can provide the required forensic inspections to determine the actual condition of a roof after a weather or wind event. The trained professional will need to perform a full assessment after the weather or wind event to determine if the roof's condition is in compliance with any and all applicable codes.

Code Development

The development of and updates to building codes in order to meet wind uplift design requirements has been an ongoing process, in which the TRI Alliance has reviewed these updates after each code cycle to address the new revisions that might impact concrete and clay roofing tiles. TRI Alliance's code approved installation guides include the necessary information for meeting these code requirements.

Unfortunately, misinterpretations of codes typically as a result of insufficient information or misunderstanding in some cases, has led to confusion in the marketplace. One example is a claim that if the nose of the tile is lifted over 2" the entire roof is not code compliant and must be replaced. This is not representative of testing protocols in the code language. To better understand, a brief history on the code development for fastener uplift resistance is provided. It should be noted that broken tiles on the roof does not necessarily indicate evidence of wind uplift of tiles. Rather, in a high wind event, tiles are typically broken by impact from airborne debris.

The TRI Alliance worked collaboratively with building officials to establish minimum requirements for installation of concrete and clay roofing tiles to comply with the various codes. These minimum requirements and additional code and product information are included in TRI Alliance's code approved installation guides adopted by all TRI Alliance producing members. Please download a copy at https://tileroofing.org/industry/installation-guides/

TRI Alliance Industry Research

After Hurricane Andrew in 1992, the tile roofing industry worked in partnership with various building officials to develop new building codes and test protocols to help improve performance of roofing tiles in high wind designated areas such as Florida. Those efforts led to the formal building codes in place today. TRI Alliance's industry-based and code approved installation guides summarize these efforts in the various tables to provide the engineered wind uplift forces and resistance values for various tested fastening options. This information helps the design professional and roofing community meet the required codes for specific design wind speeds. All this information was based upon extensive research performed in 1988 at the Redland Research Centre in the UK, one of the few full-scale wind tunnel research centers in the world capable of achieving wind speeds in excess of 130 MPH for roofing materials.

This research quantified actual wind performance of roofing tiles on a steep slope roof design resulting in specific uplift resistance values for various fastening options. In addition, the TRI Alliance performed product specific uplift resistance testing in laboratory controlled testing facilities on newly constructed plywood roof decks to generate the full table of values for mechanical fastening methods utilizing specific nails, screws and/or clips.

The laboratory wind tunnel testing conducted by the TRI Alliance concluded that sustained wind forces that lift of the nose-end of an individual tile up to 2" would perform to our fastener recommendations. The mechanical fastening values found in the TRI Alliance's installation manuals are in accordance with the code referenced test standards.

Summary

The code standards provide specific installation conditions and uplift load application at specific attachment points on a roof tile. Our roofing tiles, when installed correctly have been able to withstanding or exceed code design wind speeds where the tiles are not lifted more than 2" by the sustained wind forces. Other field applied mechanical maneuvers such as prying, or pulling of tiles do not accurately represent the permanence of the tile when subjected to sustained wind events.

Individuals with a damaged or thought to be damaged roof, should contact either the Manufacturer first, if they are still in business, or a registered Roof Consultant or finally a TRIA trained Roofing Contractor. Our Contractors can be found at https://tileroofing.org/find-a-contractor/

For more information on this topic, or any other topics, please visit our website at www.tileroofing.org or email us at info@tileroofing.org

Footnotes:

1) In accordance with the definition of "Roof Section" in Section 202, Florida Building Code, Existing Building 7th Edition (2020) related work which involves removal and installation of components for the purpose of connecting repaired areas to unrepaired areas (roof areas required for a proper tie-off) shall not be considered part of the roof repair in question and therefore such related work shall not be counted toward the 25 percent threshold stated in Section 706.1.1 Florida Building Code, Existing Building, 7th Edition (2020).

ROOF SECTION. A separating or division of a roof area by existing expansion joints, parapet walls, flashing (excluding valley), difference of elevation (excluding hips and ridges), roof type or legal description; not including the roof area required for a proper tie-off with an existing system.

TRI ALLIANCE
2150 N 107th Street Suite 205 Seattle, WA 98133
P: 206-209-5300. E: info@tileroofing.org website: http:/tileroofing.org