



# Exterior Installations of Tile and Stone Over Occupied Space and Wood Decks TDS 157

Special consideration must be given to exterior installations of tile and stone which have occupied space (interior spaces requiring protection from water infiltration) beneath the installation, or, are on wood framed decks.

First, all substrates to receive a tile or stone installation must meet the minimum deflection guidelines as dictated by the applicable building code in the local area. For information concerning industry recommendations for deflection, reference [TDS 123](#) and American National Standards Institute (ANSI) A108.01 2.3. The roof construction must also be designed for and able to handle an additional dead load of 25 - 30 lbs/ft<sup>2</sup> (or 122 – 147 kg/m<sup>2</sup>).

Whether the substrate is concrete or a wood framed deck with exterior glue plywood subfloor and underlayment layers, current industry standards require the substrate to have a minimum pitch of ¼” per foot (18 mm per m). See [TDS 152](#) for more information on the proper construct and thickness requirements of wood floors.

Currently, there are no provisions for bonding tile or stone directly to exterior roofs or decks over occupied space, or a wooden deck (over occupied space or not). These installations typically require that a drainage layer be placed between a non-bonded mortar bed and a pre-sloped substrate which must be covered with a primary roofing type waterproofing membrane.

The primary roofing type waterproofing membrane, usually asphalt based or bituminous sheet materials, must first be installed over the pre-sloped substrate. These types of membranes are typically very durable and are usually warranted, by the manufacturer, to keep water from entering occupied space beneath the tile or stone installation.

Since these installations are exposed to the elements, it is particularly important that any water that may potentially infiltrate the mortar setting bed be allowed to evacuate the system from the bottom side, usually through an integrated drain mat or drainage layer. In addition, the tile or stone surface should be properly pitched to allow surface water to run to drains, gutters or scuppers. This helps to minimize potential issues with tile or stone delaminating due to the expansion of freezing water within the mortar bed. It also helps to somewhat reduce the occurrence of efflorescence that may come from soluble salts in portland cement based materials being carried to the surface of the installation through the evaporation process.

The industry recommended installation guidelines for these installations may be found in the Tile Council of North America (TCNA) Handbook detail F103. Industry recommendations on movement joint design and placement may be found in TCNA Detail EJ171. Systems, including the framing system and panels, over which tile or stone will be installed shall be in conformance with the International Residential Code (IRC) for residential applications, the International Building Code (IBC) for commercial applications, or applicable building codes. The project design should include the intended use and necessary allowances for the expected live load, concentrated load, impact load, and dead load including the weight of the finish and installation materials. In addition to deflection considerations, above-ground installations are inherently more susceptible to vibration. Consult grout, mortar, and membrane manufacturer to determine appropriate installation materials for above-ground installations. A crack isolation and higher quality setting materials can increase the performance capabilities of above-ground applications. However, the upgraded materials cannot mitigate structural deficiencies including floors not meeting code requirements and/or over loading or other abuse of the installation in excess of design parameters.

LATICRETE manufactures a proprietary installation system, Plaza and Deck System ([DS 290.0](#)) which correlates with TCNA detail F103. Plaza and Deck System is also part of the LATICRETE 25-Year Tile & Stone System Warranty ([DS 025.0](#)). Please visit [www.laticrete.com/ag](http://www.laticrete.com/ag) for the LATICRETE execution statement and detail ES-F103 for more in-depth information.

Technical Data Sheets are subject to change without notice. For latest revision, check our website at <https://laticrete.com>  
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