



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 that have occupied space (interior spaces requiring protection from water infiltration) beneath the installation or are installed on wood-framed decks.

All substrates to receive tile or stone installations must meet the minimum deflection requirements as dictated by the applicable local building codes. For information concerning industry recommendations for deflection, refer to [TDS 123](#) and ANSI A108.01 Section 2.3. Roof construction must also be designed to accommodate an additional dead load of 25–30 lb/ft² (122–147 kg/m²).

Whether the substrate is concrete or a wood-framed deck with exterior glue plywood subfloor and underlayment, current industry standards require a minimum slope of 1/4" per foot (18 mm per m). Refer to [TDS 152](#) for additional information on proper construction and thickness requirements for wood floors.

Currently, there are no provisions for bonding tile or stone directly to exterior roofs or decks over occupied space, or to wood-framed decks. These installations typically require a drainage layer 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, typically asphalt-based or bituminous sheet material, must be installed over the pre-sloped substrate. These membranes are designed to be durable and are generally warranted by the manufacturer to prevent water infiltration into the occupied space below.

Because these installations are exposed to the elements, it is critical that any water that infiltrates the mortar bed be allowed to evacuate from the system, typically through an integrated drainage mat or drainage layer. In addition, the tile or stone surface must be properly sloped to direct water toward drains, gutters, or scuppers. Proper drainage helps minimize the risk of tile or stone delamination caused by freeze/thaw cycling and reduces the potential for efflorescence resulting from soluble salts in Portland cement-based materials migrating to the surface during evaporation.

Industry-recommended installation guidelines for these applications are found in the Tile Council of North America (TCNA) Handbook, Detail F103. Recommendations for movement joint design and placement are provided in TCNA Detail EJ171.

All systems, including framing and sheathing, must comply with the International Residential Code (IRC) for residential applications, the International Building Code (IBC) for commercial applications, or other applicable local codes. Project design must account for anticipated live loads, concentrated loads, impact loads, and dead loads, including the weight of finish materials and the installation system.

In addition to deflection considerations, above-ground installations are more susceptible to vibration. Consult the grout, mortar, and membrane manufacturers to determine appropriate materials for these conditions. Crack isolation and higher-quality setting materials can improve performance; however, these materials cannot compensate for structural deficiencies, including systems that do not meet code requirements or installations subjected to loads beyond their design capacity.

LATICRETE manufactures a proprietary installation system, the Plaza & Deck System ([DS 290.0](#)), which aligns with TCNA Detail F103. The Plaza & Deck System is also covered under the LATICRETE 25-Year Tile & Stone System Warranty ([DS 025.0](#)). For additional information, refer to www.laticrete.com/ag and LATICRETE Execution Statement ES-F103.

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