



Deflection Reflection: 2007 Handbook Language Simplifies Substrate Load Considerations

To some the approach looks a bit odd; to others it makes perfect sense. Nevertheless, both camps agree the 2007 Handbook Committee's decision to literally cross out existing deflection language appears to have quelled industry-wide disagreement over the meaning and relevance of the "1/360" rule. Not only does this strikethrough appear in the body of individual floor methods, the Handbook Committee also replaced similar text in the Notes/Definitions section (titled "Maximum Allowable Deflection for Substrates Installed by Other Trades," on Handbook page 12) with a reference to building codes and expected loads as the factors influencing floor system suitability for ceramic tile installations.

Q: Does the crossed out language mean that deflection requirements have changed?

A: No. The strikethrough of existing deflection language is meant to empha-

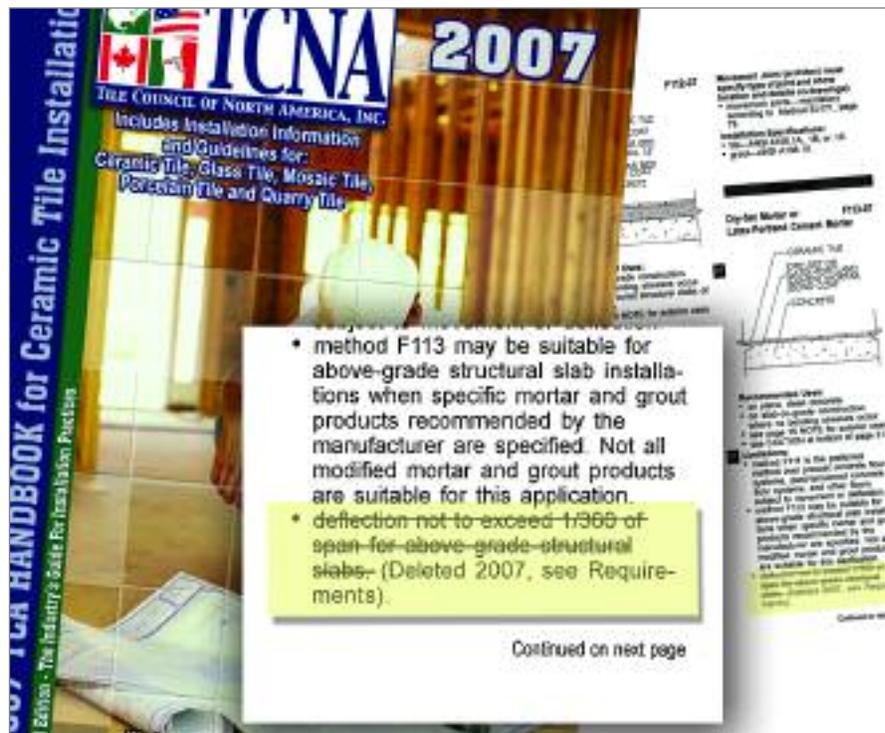
size the deflection clarifications introduced in 2005 by the ANSI Accredited Standards Committee (ASC) A108.

While the 1/360 rule has appeared in Handbook methods for years, adherence to the rule required understanding of the rule on the part of the Handbook end-user, as there was no additional explanatory language. As newer building practices resulted in increased subfloor movement, clarification was needed on how to apply the

deflection criteria of 1/360 under a 300 lb. concentrated load, which was stated as a requirement in individual Handbook floor methods. Though the industry responded heartily with educational seminars and technical committee recommendations, confusion remained, especially regarding subfloor deflection under uniform load versus point load and what to do about it.

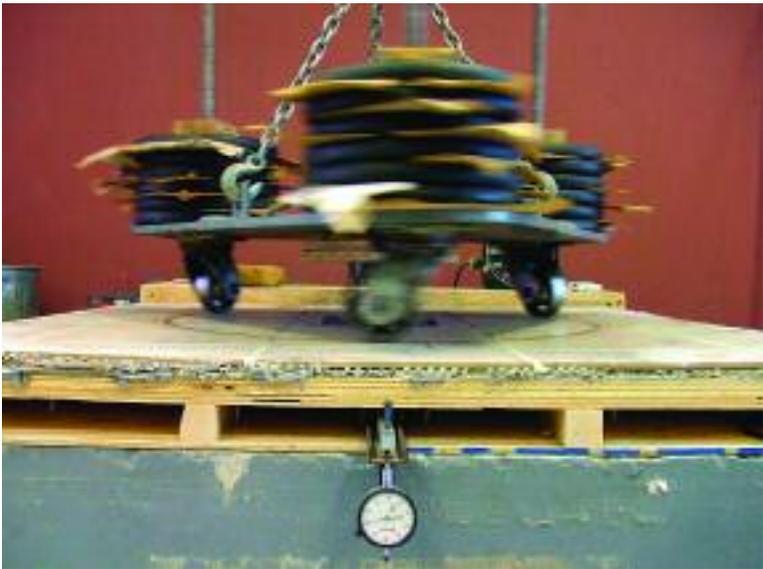
This prompted an explanatory paragraph in the Notes/Definitions section in 2005, stating: "floor areas over which tile is to be applied to have a deflection not greater than 1/360 of the span when measured under a 300 lb. concentrated load (see ASTM C627). This deflection limitation differs from the L/360 deflection limit under uniform load prescribed by building codes."

Simply stated, a tile installation has an additional, industry-prescribed support requirement beyond that required by building codes. Our additional support requirement aims to limit the amount of deflec-



Deflection language has been struck through in the 2007 TCA Handbook. (Text highlighted for illustration purposes only.)

Photo courtesy of Tile Council of North America's Testing Laboratory



The Robinson Floor Tester in operation. The dial gauge measures the amount of deflection at the weakest point, between the floor joists.

tion, or “bounce,” in the finished floor, which typically occurs to the greatest extent between joists when subjected to concentrated loads.

Other language, added in 2005, protected the tile installer from guaranteeing the strength or suitability of the subfloor: “It is the responsibility of the project owner...not the tile installer, to ensure

“...a tile installation has an additional, industry-prescribed support requirement beyond that required by building codes.”

the substructure does not deflect more than this maximum allowable deflection criteria...In many cases, problems in the substructure may not be obvious and the tile installer cannot be expected to discover such.” This aimed to make clear the notion that support considerations must be included in the design/engineering phase and by the individual with knowledge of a finished floor’s expected use, including loads that will be applied. However, some project owners, superintendents, inspectors, etc., still expected contractors to measure subfloor deflection and ensure adequate

support for an installation, despite the lack of a uniform and accepted test method for taking such a measurement.

Q: What is the current language and how should it be interpreted?

A: In addition to the strikethrough language in individual methods, the explanatory paragraph (found in Notes/Definitions on page 12) has been changed to the following: “Floor systems, including the framing system and subfloor panels, over which the tile will be installed using the appropriate TCNA method shall be in conformance with the IRC for residential applications and the IBC for commercial applications, or applicable building codes. Note: The owner should communicate in writing to the project design professional and general contractor the intended use of the tile installation, in order to enable the project design professional and general contractor to make necessary allowances for the expected live load, concentrated loads, impact loads, and dead loads including the weight of the tile and setting bed.”

In short, this paragraph requires design professionals to build to code and to account for the weight of the floor method being specified. For example, use of Method F141, with up to a 2” mortar bed, would introduce a much greater dead load than use of F175, which employs a foam core underlayment.

Incidentally, these two methods fall into the same “LIGHT” performance category, which is established by the Robinson Type Floor Tester, a machine that subjects the total flooring assembly to a rolling, 300-lb. concentrated load. The number of cycles that a floor assembly “survives” dictates that assembly’s performance level, provided that the weight of the assembly has been factored into the dead load of the structure.

All floor methods are required to pass at least 3 cycles of the Robinson Floor Test in order to be included in the TCA Handbook. (See the Floor Tiling Installation Guide on Handbook page 16 for the performance ratings of all Handbook methods.) For methods not in the Handbook, design professionals are encouraged to research or commission Robinson Floor Test data to ensure floor performance. **TILE**

About the Author



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