



# NATIONAL TERRAZZO & MOSAIC ASSOCIATION

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## TECHNICAL BULLETIN #111

08/09

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### CRACK DETAILING & JOINT TREATMENTS FOR THIN-SET TERRAZZO

#### THIN-SET EPOXY TERRAZZO

Thin-set epoxy terrazzo has many years of successful history dating back to the introduction of epoxies over 40 years ago. Thin-set epoxy was traditionally placed directly onto a prepared structural concrete slab. The crack resistance of the terrazzo was based primarily on two functions. First, the epoxy terrazzo formulations were extremely high in tensile strength and second, they did not contain excess water that leads to shrinkage cracks or volume change during the curing process.

In the 1990s, the major epoxy formulators introduced flexible epoxy membranes that are installed at a nominal 40 mils. Thickness and engineered for high tensile strength and high elongation, relative to the epoxy binder matrix. These membranes have become industry standard for crack detailing and, in some cases, full slab coverage prior to the installation of the thin-set epoxy terrazzo. The combinations of high tensile low shrinkage binder resins with the high performance flexible epoxy membranes allow architects to specify and detail thin-set terrazzo with confidence.

#### CONCRETE JOINTING: SETTLEMENT & CRACK CONTROL

Concrete has been the standard flooring substrate in the commercial construction industry for many years. The concrete industry has developed many industry guidelines and recommendations to minimize cracking.

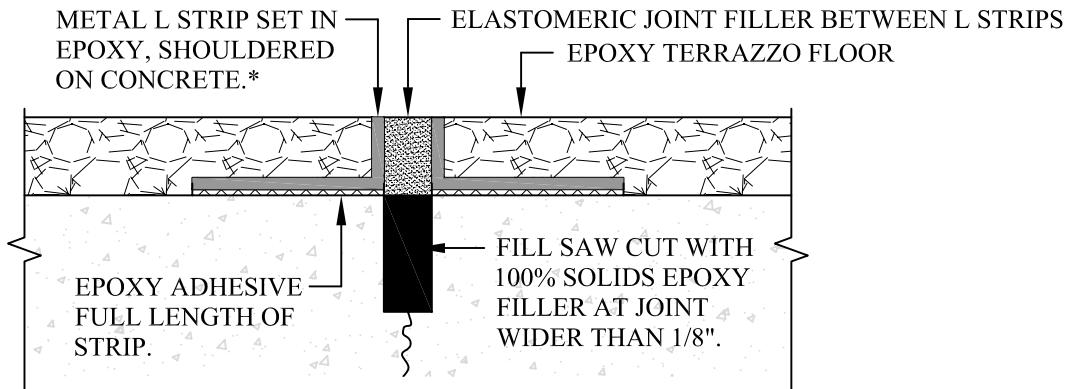
(Continued on next page.)

While there have been many improvements in mix designs, placement techniques and industry standards, the concrete industry has not perfected the placement of slabs without cracks.

Cracks in concrete are a result of any number of issues, including volume change during the curing process, load deflection, settlement cracks and cracks induced from thermal stresses, which are typically due to non-climate controlled environments during the construction process. While shrinkage cracks, which account for most concrete cracking, become static once the volume change from curing is complete, any crack has the potential to become a dynamic, moving crack under thermal and load movement stresses. To accommodate dynamic loading, slabs should be designed for maximum deflection of  $L/360$ .

### Detail 1. Contraction Joint (Also called saw cuts/control joints)

The term "Contraction joint" is taken from ACI 302 document to maintain consistent nomenclature with the concrete and engineering industry.



Scale: Full Scale

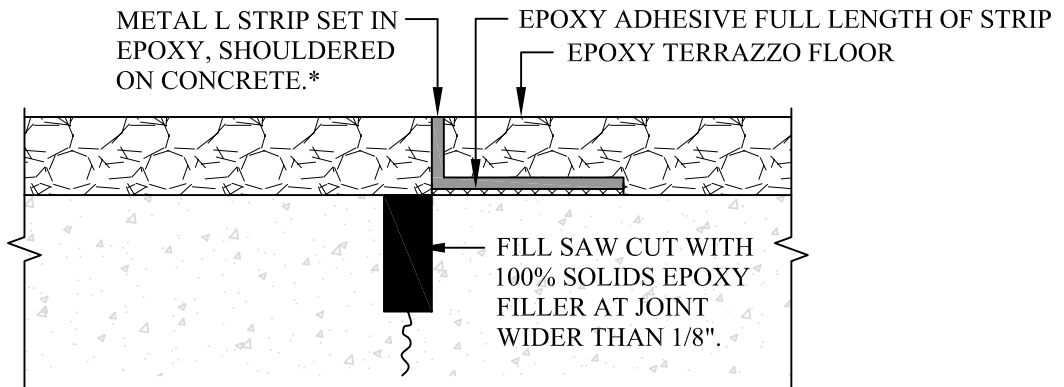
Option: For "art work areas". See buried contraction joint. refer to detail 3.

\*Care should be taken by concrete contractor to provide a straight joint, placed in coordination with design teams consideration of final grid pattern. square edges encouraged. Tooled edges discouraged.

\*\*This detail must be used for radiant heated floors.

### Detail 2. Optional Joint Detail for Contraction Joints

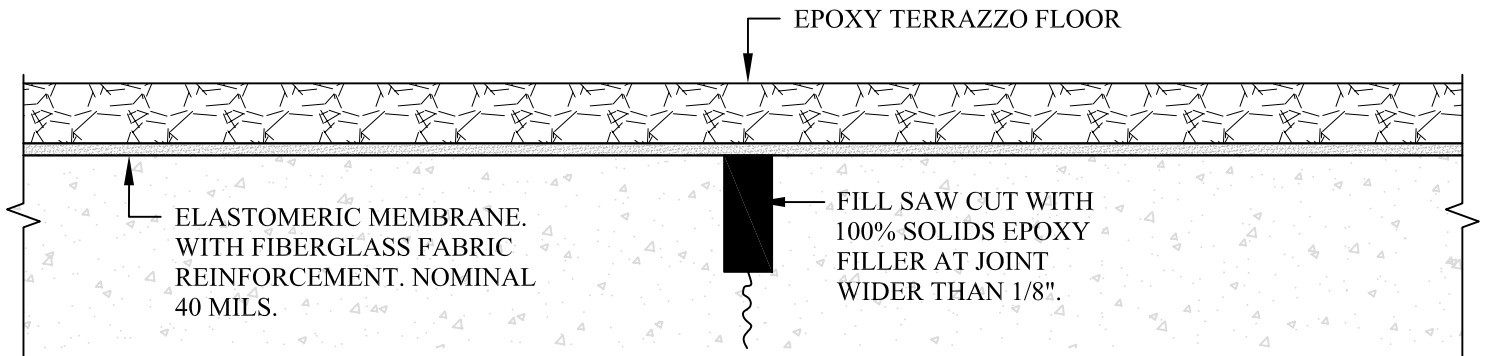
This detail provides the designer the option of installing a low profile 16 gauge divider strip, in lieu of the filled back to back strip in detail 1. This detail does provide limited movement compared to detail 1.



Scale: Full Scale

\*Care should be taken by concrete contractor to provide a straight joint, placed in coordination with design teams consideration of final grid pattern. Square edges are encouraged. Tooled edges are discouraged.

### Detail 3. Option in Art Work (Movement from substrate may show through.)



Scale: Full Scale

Treatment of cracks is in anticipation of horizontal movement.

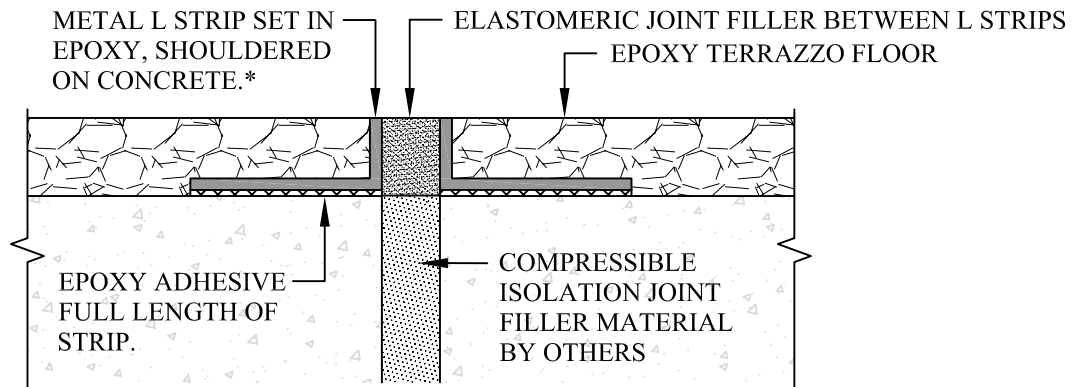
Vertical movement will reflect through epoxy terrazzo.

Moving cracks may reflect through terrazzo.

\*Care should be taken by concrete contractor to provide a straight joint, placed in coordination with design teams consideration of final grid pattern. Square edges are encouraged. Tooled edges are discouraged.

### Detail 4. Isolation Joint

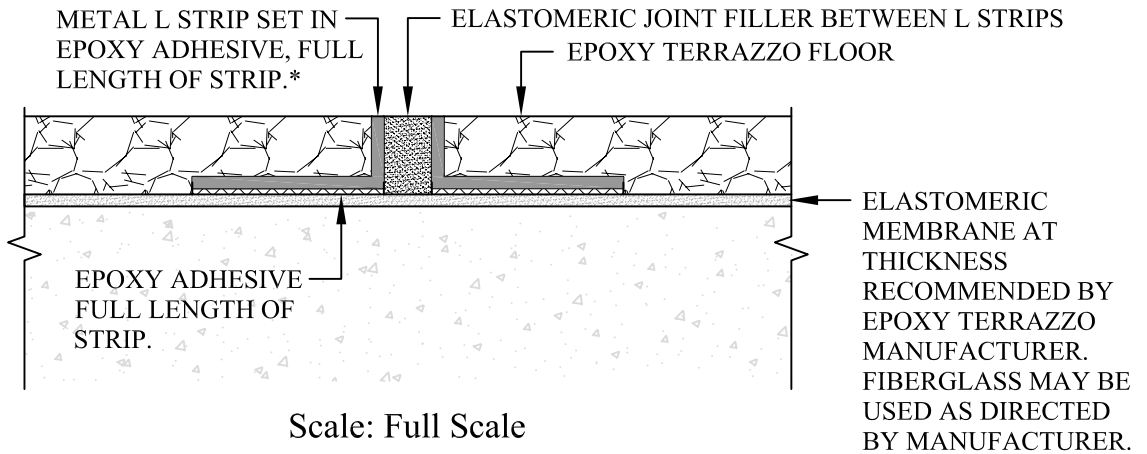
The flexible epoxy membranes are engineered to handle movement in the horizontal plane. They are not engineered to accommodate movement in the vertical plane, as a result of vertical shear due to substrate settlement or excessive deflection. Slabs to receive terrazzo flooring should accommodate Isolation Joints where the slab is separated from the load bearing columns or walls for this specific purpose.



Scale: Full Scale

\*Care should be taken by concrete contractor to provide a straight joint, placed in coordination with design teams consideration of final grid pattern. Square edges are encouraged. Tooled edges are discouraged.

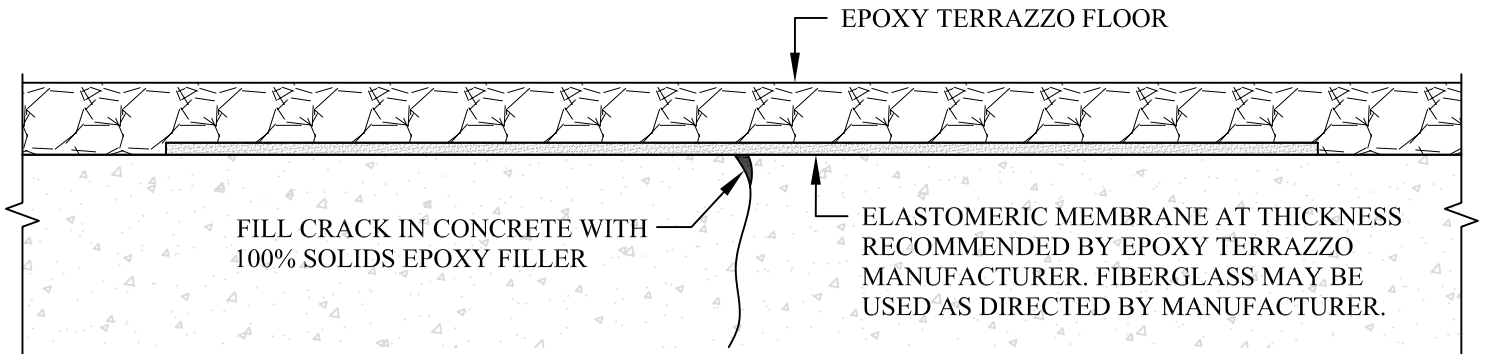
**Detail 5. Terrazzo Control Jointing Over Full Elastomeric Membrane**



The use of divider strips (L strips) should be considered in areas where floor temperature changes may occur. Such as glass walls and or sky lights, if joints are to be used, the design teams must determine spacing. Spacing not to exceed 30 feet.

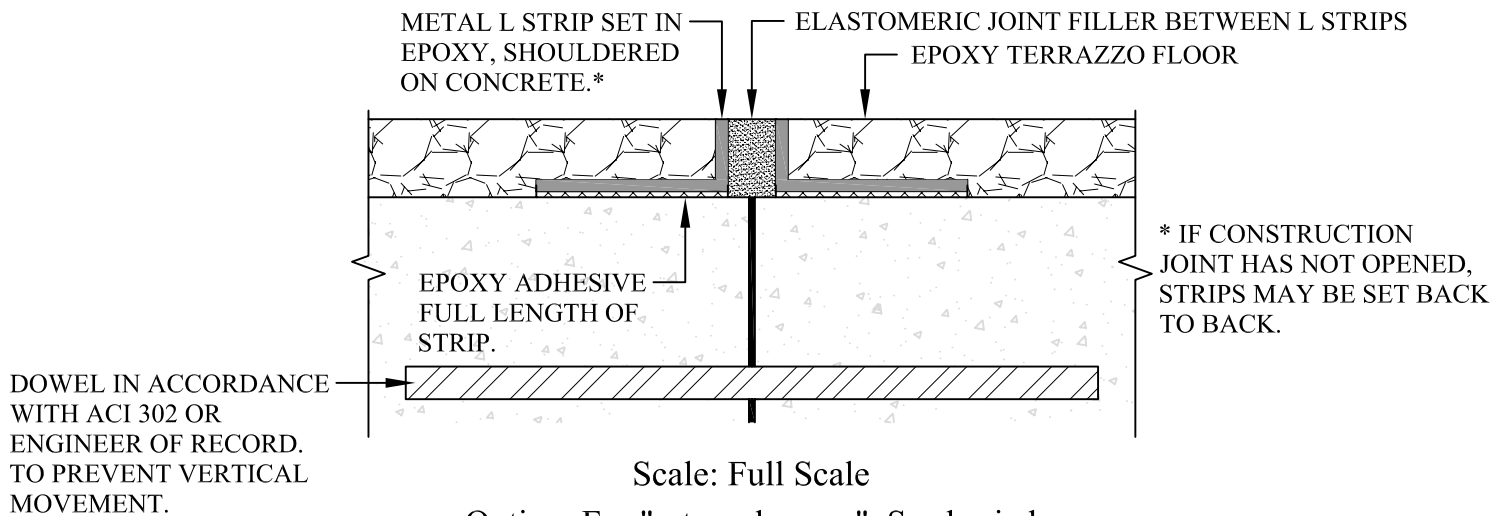
**Detail 6. Random Crack Detail: For Cracks Over 1/16" Width Before Surface Preparation**

At minimum, any large cracks over 1/16" require appropriate detailing. In some building and slab designs, excessive temperature cycling or load transfer may necessitate the detailing of all cracks.



Treatment of cracks is in anticipation of horizontal movement. Vertical movement will reflect through epoxy terrazzo. Moving cracks may reflect through terrazzo, often seen under critical lighting as *micro-crease* or *mini-mole trail*, even though no actual fissure has opened, the membrane has performed as intended.

## Detail 7. Construction Joint (Next Day Pour Where Joint Has Eased Shoulders or Has Opened.)



Option: For "art work areas". See buried contraction joint. Refer to detail 3.

\*Care should be taken by concrete contractor to provide a straight joint, placed in coordination with design teams consideration of final grid pattern. Square edges encouraged. Tooled edges discouraged.

## Disclaimer

The details contained herein provide general information to use as a starting point for detailing site conditions that frequently occur on epoxy terrazzo projects.

They represent generally accepted practices of terrazzo contractors and suppliers across the United States under typical circumstances. These details do not replace the direction or advise of an architect or engineer regarding a specific project or for specific project conditions. Architect or engineer must specify movement joints and show location and details on drawings.

It is not the intent of this guide to make movement joint recommendations for a specific project. For your particular project(s) you should consider contacting an NTMA Member - Contractor/Associate - in your area to discuss details that may be most applicable for a given circumstance/location.