

## RECOMMENDATIONS FOR MONOLITHIC TERRAZZO

### A REMINDER ABOUT CONCRETE:

The strength of concrete is largely determined by the amount of water mixed in it before pouring. If too much water is present, that is, if the concrete is too "sloppy," it will be porous and weakened. In addition, some of the water rises to the surface bringing with it laitance or scum (the impurities in the cement and aggregates) and this must be removed or broomed off the surface before the surface has set-up.

On the other hand, concrete that is too stiff is not readily placed due to the lack of plasticity. It doesn't flow properly together unless vibrated or tamped. Also, concrete that is too stiff does not flow under reinforcing steel, and does not adhere to it readily. Still another problem encountered is "honeycomb", especially where steel mesh or reinforcing bars are pulled up after the concrete is placed over them. The pulling-up of the reinforcing in too-stiff concrete will leave voids or air pockets in concrete, weakening the slab and creating a condition that can cause trouble when the terrazzo is poured.

Slabs that have been made weak and porous by the excess use of water in the concrete or honeycombed by the use of too-stiff concrete present a possible danger to the terrazzo system.

Any concrete slab to which monolithic terrazzo is to be applied should be thoroughly saturated with water several hours prior to the pouring of the terrazzo. If when flooded, bubbles arise, this indicates that water is going down and air is coming up. If the terrazzo is poured at this time it would be possible for large areas of the terrazzo to be separated by air (the air being forced out of the porous or honeycombed concrete by water going down as the new terrazzo floor is being rolled.)

Therefore, it is important to place concrete with the proper slump. A 5-1/3 to 6 inch slump is good, a 4 to 4-1/2 inch slump is better if the concrete is to be vibrated in place.

We suggest that all concrete be specified in strict accordance with the recommendations of the American Concrete Institute.

### JOINTS FOR CONCRETE SLABS:

Why use joints.....

As indicated above, all plastic concrete contains more water than is needed for hydration of the cement. When this extra water starts to evaporate, drying-shrinkage of the slab begins creating tensile stresses in the concrete. The tensile stresses must be relieved by providing joints in the slab.

Also, slabs of different shapes expand and shrink by different amounts. The larger the slab, the greater will be the movement. At the junction of adjoining slabs, therefore, provisions must be made to provide controlled cracking of the terrazzo adjacent to the metal strips. Slabs may experience some vertical movement due to heaving or settling of the subgrade.

There are three basic types of joints that will provide the necessary control for these characteristics. The CONTROL JOINT allows differential movement only in the plane of the floor. The ISOLATION JOINT allows differential movement in all directions. Third, the CONSTRUCTION JOINT, which allows no movement in the completed floor. Since this is difficult to achieve, construction joints should be made to act as control joints. (See details.)

The sawed control joint should be made as early as possible prior to drying shrinkage and preferably during rising temperature. Sawing during a dropping temperature may result in random diagonal cracking directly ahead of the saw. Therefore, it is generally done the morning after the concrete has been placed. Provisions for isolation joints should ordinarily be made at exterior walls and at all columns. These provisions should always follow throughout the terrazzo topping.

SUMMARY: Elimination of random cracking in slabs is a matter of investigating all the possible causes of stress to the floor. Once these are known, a control or isolation joint can reduce or eliminate the effects of stress. Limits of concrete placement per day can usually be planned to coincide with control joints, thus reducing the overall number of joints and making the placement of concrete easy. Structural slabs should control the limits on the placing of concrete so that they stop and start over beams. To ensure adequate follow-through of joint position of the job, joints should be planned in advance and indicated on the drawings.

CAUTION: THE USE OF THE LIQUID CURING COMPOUNDS FOR THE CURING OF CONCRETE SHOULD NEVER BE USED ON SLABS TO RECEIVE TERRAZZO AS IT WILL ACT DETRIMENTALLY TO THE BONDING OF THE TERRAZZO.

CONCRETE SLAB SURFACE: The slab should be level and of uniform thickness; the finished surface should not vary over 1.4 inch. All laitance shall be removed from the slab and left with a roughened or broomed finish.

Much has been said about the time element for letting concrete slabs stand before the terrazzo is applied. It is required that sufficient time be allowed for the surface of the concrete to be firmly set and prepared. On slabs that are not newly poured, experience terrazzo contractors have found no difficulty in bonding to concrete slabs that are years old, provided: 1. that the slab is thoroughly cleaned, 2. that the slab has a roughened surface, and 3. that the slab is thoroughly and completely saturated with water before the terrazzo is poured. A bonding agent may be used where the slab has a smooth finish.

NOTE: CRACKS IN OLD CONCRETE SLABS WILL USUALLY SHOW UP IN THE TERRAZZO AND WHERE POSSIBLE, DIVIDERS SHOULD BE USED AND PLACED DIRECTLY OVER THEM.

### MONOLITHIC TERRAZZO:

There has never been a system developed that will control concrete expansion and contraction with 100 percent effectiveness. But, as noted above, proper consideration and anticipation of structural movement should minimize any damage to the finished floor.

Since monolithic terrazzo is an economy form of terrazzo and bonded directly to the base slab, the following recommendations are extended to ensure further satisfaction: 1. The fill dirt, (for on-grade slabs) under the concrete slab, must be puddled and tamped to create a good foundation. 2. The concrete slabs should be tamped with a concrete screeder to bring the cement to the surface; thereby closing the pores. 3. It is desirous to have all plumbing and electrical conduits placed neatly and rising at right angles through the slab. 4. When the concrete slab is set enough to walk on (approximately 45 minutes) it should be broomed to roughen it to assist and ensure a good bond. 5. In large areas, the concrete should be poured in alternating slabs, extending more control over expansion and contraction.

### DIVIDER STRIPS:

There are two basic types of strips available: those that are grouted into openings prepared in the base slab (standard 1-1/4" strips), and those that are cemented or nailed on the surface ("k" or angle). They are available in half hard brass, white alloy zinc and plastic. In addition to these, there is available an expansion joint strip, the use of which is recommended over all such provisions in the base slab.

When installing the standard (1-1/4") type divider strips, the narrow, sawed joint as shown in figure 4 is preferable to the wood strip method. The likelihood of the crack occurring away from the strip is greatly reduced. A strip installed in a narrow, sawed joint (sawed to no less than one third the depth of the slab) will nearly always produce a controlled crack adjacent to the strip, where it is not noticeable.

"K" or "L" strips should not have a base (the horizontal flange) larger than 1/2 inch and shall have adequate holes to allow bonding on the terrazzo to the slab.

NOTE: THE STANDARD SOLID BASE TYPE "K" OR "L" SHOULD NOT BE USED OVER A JOINT IN THE BASE OR STRUCTURAL SLAB.  
(SEE DETAILS)

It is recommended that strips generally be installed according to the following plans. Areas of a given floor should be separated into rectangles not more than 50% longer than wide; small areas ordinarily need not be cut into lesser areas. Floors can be successfully protected by dividing them into areas to a maximum of 20' x 20' 0". Dividers should be specified and placed in or over all saw cuts. When K or angles are used to form smaller panels or design (and not located over saw cuts) it should be clearly understood that these are for aesthetic reasons only and do not perform any functional purpose.

SLAB-ON-GRADE: Pipe trenches create a weak structural slab and will crack. Dividers or expansion strips should be placed directly above each side. Also, since you cannot bridge expansion provisions with terrazzo, you must follow the provisions through to the finish floor line.