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Inhibiting Efflorescence in Fountain applications

By John Leder GEFCO – April 2008

Foreword:

As many a project suffers from the unsightly presence of white calcium deposits oozing from wall joints or squeeze up from between tile joint on pool floors there have been successful projects in which this creating of artificial stalagmites and/or stalactites does not occur.

This phenomenon is caused by the production of Sodium Hydroxide. Where does it come from? It comes from the conventional setting bed materials used in the mounting of stone, tile or other decorative materials such as marble, granite etc. Discoloration of granite and especially light colored marble is quite often misunderstood, as the root cause is usually the underlying setting bed material bleeding right through the marble.

The conventional materials used normally are mortar/sand mixes preferably mixed semi dry, then the stone is set – usually not even on a solid surface but in piles at the corners of the stone and a blob in the middle (depending on the size of the stone piece).

Regular mortar mixes have water soluble alkali in varying amounts as a % of volume, which can vary from cement plant to cement plant anywhere in the country.

The good (but not perfect) Solution:

1. Specify that all in ground and/ or slab-on-grade pools have a vapor barrier installed before the concrete structure is constructed (yes there will be holes in it as usually fountains have many pipes and things of all kind poking through the floor). Not only on floors but also on walls for in-ground pool systems.
2. Specify that all pool surfaces be water proofed and **TESTED BEFORE** any stone work is started.
3. Specify to force the contractor (usually the General contractor) to wait the specified time period (usually 14-28 days after the last pour) before applying any water proofing. Make them record their last pour date, provide a mechanism to check it.
4. Specify the use of low Alkali Portland cement/sand mixes. The cement shall conform to ASTM C-150 which (in part) specifies that the cement shall contain less than 6/10 of 1% water soluble Alkali or NAO (speak Sodium Oxide – which when mixed with water produces Sodium Hydroxide = THE White stuff). No Alternate accepted (like normal mortar mixes).