TECHNICAL BULLETIN – TB198

POOL COPING AND WATER LINE TILING – FIBREGLASS AND CONCRETE SWIMMING POOLS

Date, Friday, 11 December 2009

INTRODUCTION & SCOPE

A typical construction method for swimming pools is to install a pre-formed fibreglass liner into the ground, usually with a concrete surface or Compressed Fibre-Cement (CFC) sheet surround deck. This liner has a visible horizontal top edge around 100-150mm wide where the coping tiles are to be laid. It is a common request made to Ardex to supply an adhesive that will bond a coping tile to the top edge of the pool, and often the inquirer wants to span the joint between the liner and the surround.

In this bulletin we will examine why such a course of action is not a sound practice, and some suggested ways to install tiles or 'pavers' in this situation. We will also briefly look at bonding waterline tiles within the pool as well.

Note: If the pool liner is concrete rather than fibreglass, the same rules about joints in this discussion still apply.

THE REQUESTED DETAIL

The usual request made is, 'what adhesive would you recommend for the installation of coping tiles on a fibreglass pool edge?' A bit of further inquiry to the customer reveals that it is intended to bond the tiles across the boundary between the liner and onto the surround. Usually these tiles are large format and both overhang the water and extend on the surrounds. In other words, the tile covers over the joint to create an homogenous tile appearance to the finished job.

WHAT IS THE PROBLEM?

What is the problem with this scenario? Well, the problem with having a solidly fixed tile across the pool surround boundary in this way, is that it spans what is in effect a movement joint. The definition of a movement joint in this particular case can be found in the tiling standard AS3958.1-2007,

> *'Clause 5.4.5.3 Movement joints should be installed at the following locations:*
>
> *c) At junctions between different background materials, when cladding is continuous across varying types of background'*

and

> 'E2.10 Movement joints
>
> *...Movement joints should be inserted to coincide with the structural junction of the pool shell and the surrounding slab..'*

What are the consequences of ignoring this requirement and tiling straight across the boundary? The pool shell and surround are made from two different materials with different expansion and movement characteristics creating unbalanced movements either side of the joint.

Also the pool fill and substrate below the surround create differences in movement due to their thermal properties, expansion and contraction during water absorption of the soil, structural movement of decks and in the case of the pool water itself, movements and seiching due to winds or pressure loading due weight falling into the pool (i.e. diving). These factors mean that anything rigidly bonded across the joint will very likely crack as shown in Fig.1 below.

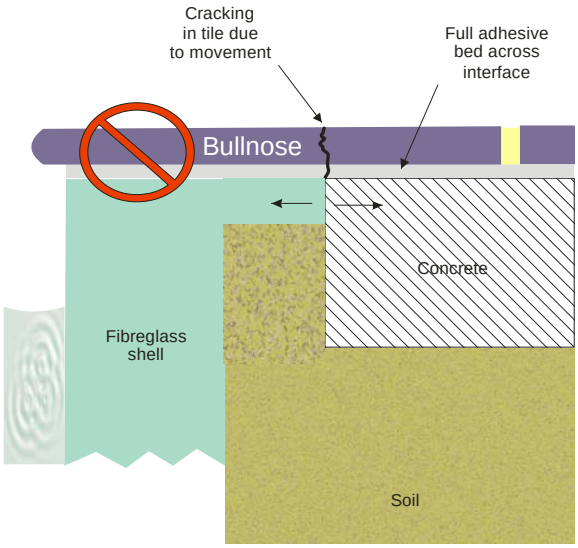

Figure 1. Schematic showing the situation where tiles have been bonded across the pool shell and surround junction.

A second option occasionally suggested is to only adhere the tile one side of the joint or the other. Usually this is the concrete side since the width of the fibreglass edge is usually less than 150mm and therefore the concrete provides a larger and ultimately more compatible surface to bond to. However, this leaves the edge of the tile cantilevered and subject to breakage due to lever arm moments from swimmers climbing out of the pools, or flexural compressive forces from being stood on. This situation is shown in Fig.2.

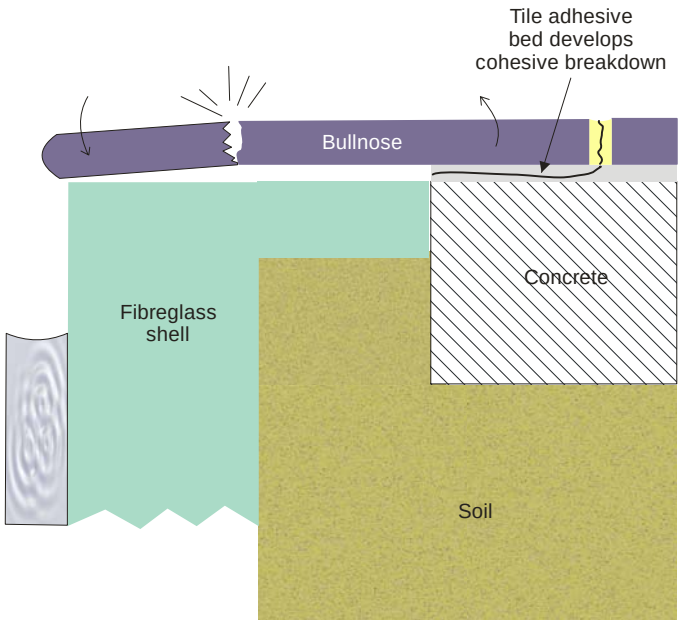

Figure 2. Effect of cantilever tiles subjected to either bending moments from swimmers exiting the pool, or compressive flexure from being stood on.

DESIGN SOLUTIONS

The preferred solution as specified in the standard is to create a movement joint around the edge of the pool that corresponds to the shell-surround boundary. The general design is shown in Fig.3. The major point with this detail is that it might require the tiles or pavers be cut to create the joint which adds an extra process, but also affects the aesthetics of the finished job.

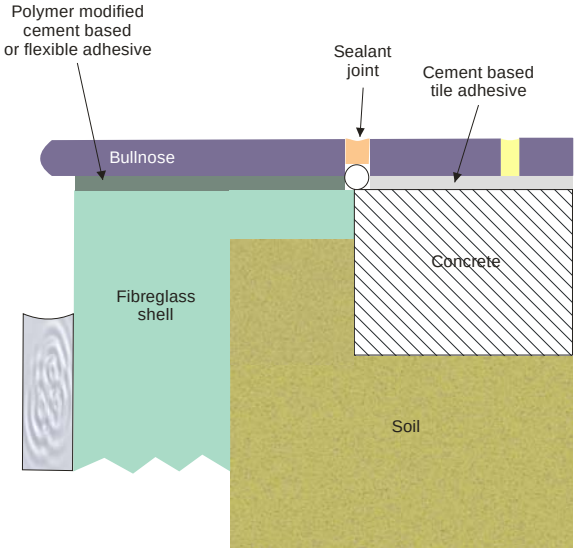

Figure 3. A typical detail showing the presence of the movement joint, and the cut that may be required in the bull-nose tile.

Another solution is to bond the tile to the surround side with a modified cement based tile adhesive, and to the pool rim with either a flexible sealant or sealant adhesive. For example, the pool side bond could be performed with a well spread polyurethane, epoxide, silane-urethane, or even suitable silicone sealants (>75% coverage is required rather than a few thin beads). This design is more diifcult to do because it uses two separate products on the same tile, but effectively eliminates the flexing of an unsupported tile, and allows the system to move because of the low E-modulus of the sealant. Caution may be required with CFC decks as they may move more than concrete (the framing) and possibly even exceed the capabilities of the sealant. This design is shown in Fig.4 for a concrete surround.

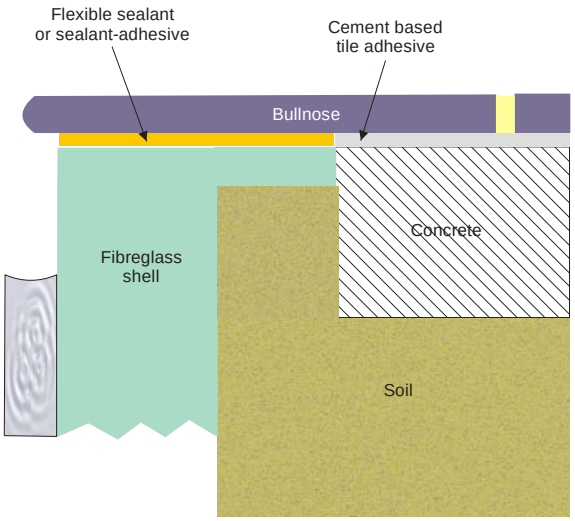

Figure 4. An installation using the sealant/adhesive and normal tile adhesive combination rather than cutting the tile for a visible joint.

WATERLINE TILES

The final part of this installation is usually the installation of water line tiles. Ardex has a recommendation for bonding tiles above, on, and just below the waterline for fibreglass pools, but not at depth. There are no such restrictions on concrete pools where the correct adhesive is used. Figure 5 shows the general arrangement.

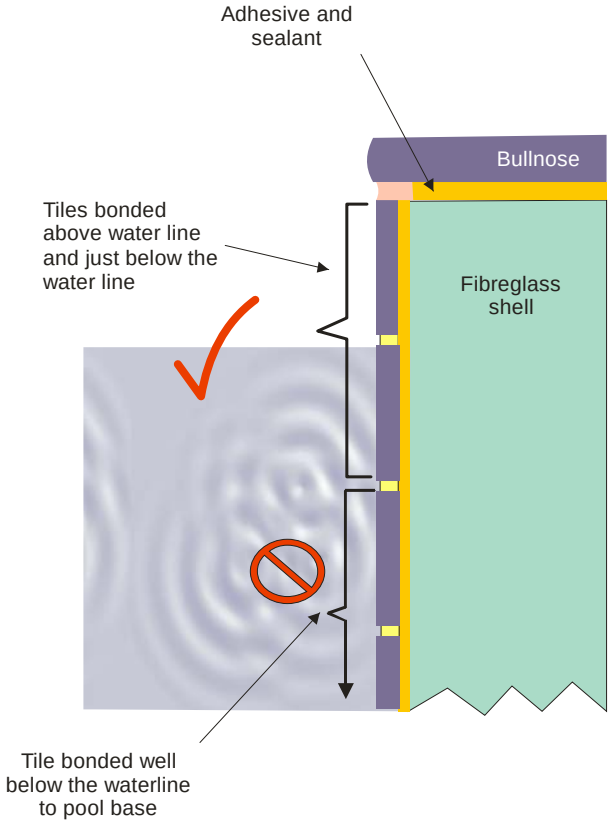

Figure 5. The bonding of tiles to the upper edge of the fibreglass pool liner and to just below the waterline is acceptable, but not at depth below the waterline.

RECOMMENDED ADHESIVE SYSTEMS

The following Ardex tiling and accessory products are recommended for this type of installation.

Bonding tiles to the concrete or compressed fibre-cement pool surrounds or inside concrete pools shells (not fibreglass)

Ardex X77 (+/-Ardex E90)

Ardex STS8 White + Ardex E90

Ardex Optima

Bonding tiles to the fibreglass for waterline tiles – the fibreglass gelcoat surface needs to be roughened which may compromise the integrity of the liner if done excessively

Ardex Optima

Ardex WA epoxy

Ardex WA100 epoxy

Ardex Abapoxy (mixed to a suitable consistency to non-slump)

Sealant/adhesive suitable for bonding to the fibreglass top edge under the coping tiles

Ardex CA20-P

Grouts

Ardex FG8 plus Ardex Grout Booster

Ardex Widejoint plus Ardex Grout Booster

Ardex FSDD plus Ardex Grout Booster

Ardex WA epoxy (waterline)

It is strongly recommended that for the cement based grouts only white or off-white colours are used to avoid bleaching of the colourants by chlorine in the pool water.

IMPORTANT
This Technical Bulletin provides guideline information only and is not intended to be interpreted as a general specification for the application/installation of the products described. Since each project potentially differs in exposure/condition specific recommendations may vary from the information contained herein. For recommendations for specific applications/installations contact your nearest Ardex Australia Ofiice.

DISCLAIMER
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