



## Helpful Information for You and Your Pool

# Assessing Pools for Ground Water Issues

## 1 Introduction:

When you come to look at and assess a concrete pool for re coating there are some aspects that you need to take note of apart from the internal surfaces. By doing so you will begin to understand the pool's situation relative to other issues that may impact on your coating and its long-term success. If you ignore these factors, then you run the risk of missing important clues, which may save you and the client much angst.

## 2 Concrete Shell:

When a pool is designed it will be of a compressive strength suitable for its intended use and with sufficient reinforcing steel correctly imbedded. As an example, the engineer may specify 30 Mpa strength and at least 50 mm concrete cover for the steel work. The actual onsite results may not be such. Poor shotcrete application techniques, insufficient compaction, and movement of the steel reinforcing chairs, all lead to porous areas of concrete, insufficient cover and many other factors. This overtime may show up with leaks, failure of the finishes and rusted steel work, staining the surfaces. In addition, the design engineer should have specified a water membrane on the outside of the concrete shell. ( see yellow box in image 1, below) This may NOT have been installed or if installed, damaged at some point.

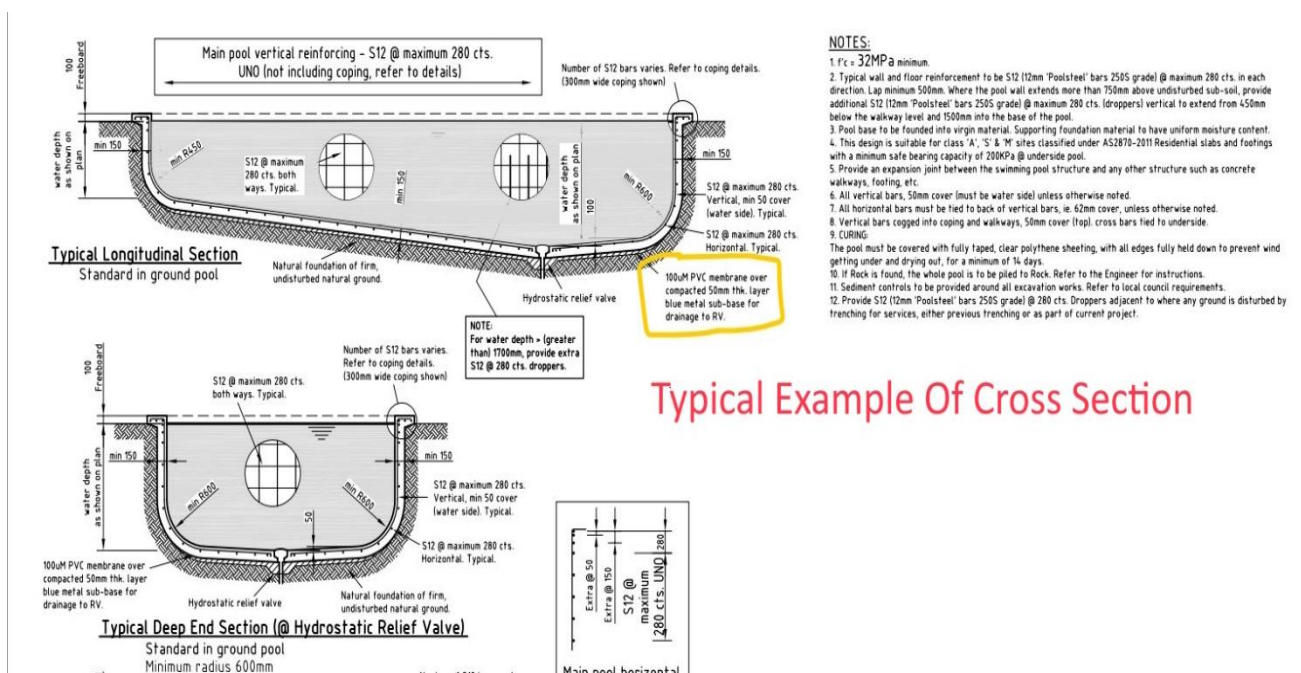


Image 1. Typical well designed concrete pool, showing DPC outside of concrete shell.

## 3 Look out for:

When assessing the pool in question check the following in addition to the normal items:

- Is the pool on a hillside, or is there a nearby bank or hillside, that allows water to run off or flow towards, under or around the pool and its immediate surroundings? (See image 2, below)
- Is the pool near the sea, marina, or river or at the bottom of a valley?
- Does the roof or rain run off flow away from the pool area? If not be aware.
- Are the pavers or coping tiles buckled, with gaps between them or loose?
- Is the pathway or coping tiles, pavers that surround the pool showing any signs of white efflorescence? (Also look at the tile line above the water for the same white efflorescence)
- Are the coping tiles or pavers dark in colour?

- If the pool is already painted, then are there any blisters on the existing paint (above or below the water line)

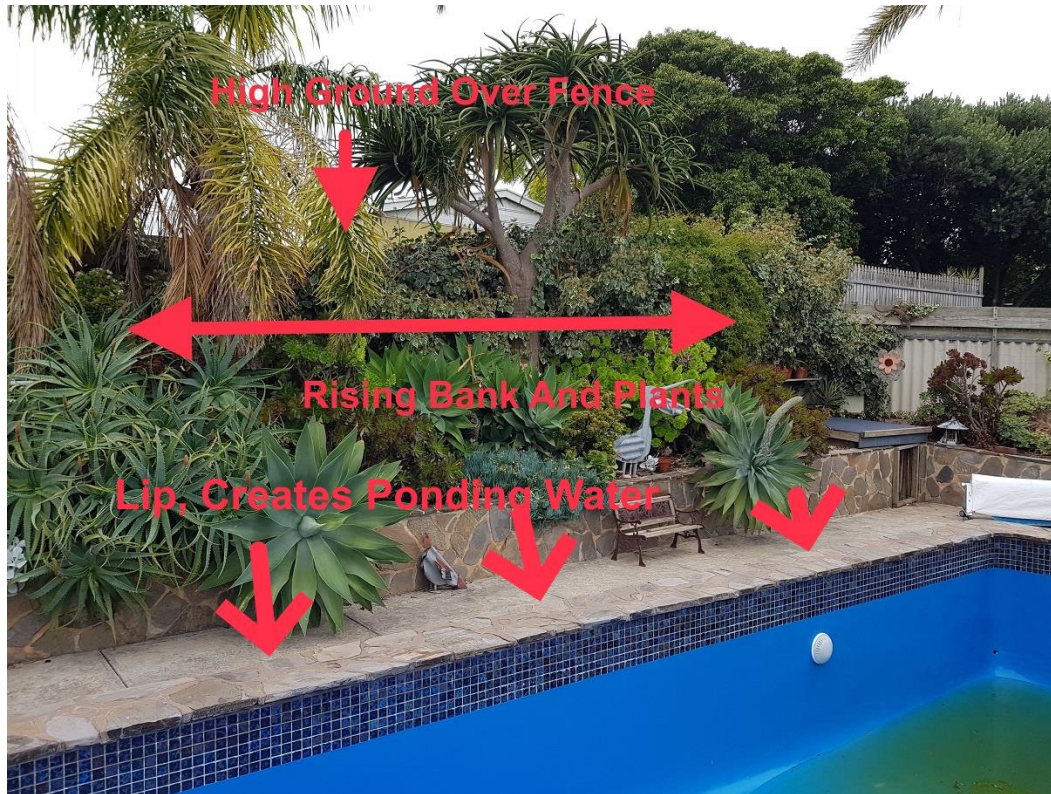


Image 2 Here is a pool with rising ground along one side (rises higher on neighbour's land) and combined with the rising bank and garden, is a great trap for rainwater and resultant seepage. (Into or under pool)

If you see any of the above factors then it's highly indicative of water being in, around or under the pool and this may impact on the success of the coating, now or many years later on.

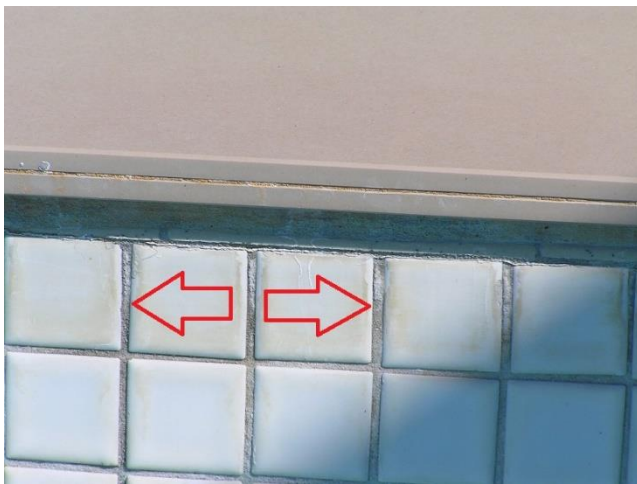
- Efflorescence is a very good indicator of water being in the concrete (or in the ground surrounding the pool) and as the water moves in and out of the substrate, leaving behind the white powder (efflorescence) as the liquid evaporates.
- Dark colour pavers or coping tiles on the tops of pool walls can heat up on summer days. Due the thermal differential with the bottom of the wall (being buried and much cooler) creates a wicking effect with ground moisture. The moisture rises up the walls and leaves near the top, often leaving telltale white efflorescence too.
- Any blisters in the existing pool coating will indicate moisture passing through the concrete shell into the pool (hydrostatic pressure). Note: A well-worn, thin pool coating may not show any effects as the water and vapour can pass readily through it. A worn coating is one key reason to recoat a pool. Also porous surfaces like Marblesheen and Pebblecrete usually show no issues with moisture issues.



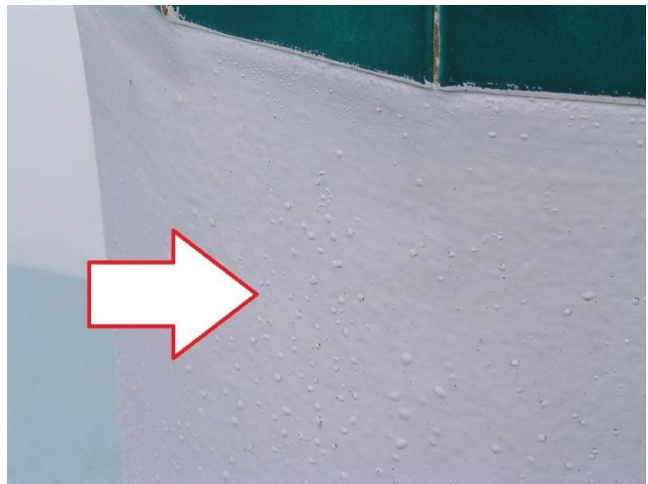
**Figure 3** Dark pavers and coping with efflorescence present, with drainage. Resulted in blisters on pool walls.



**Figure 4** So many water related issues resulting in tiles being pushed off. Note area below tiles seems fine, as being porous.



**Figure 5** Water from leaking pathway above, causing efflorescence on tiles below.



**Figure 6** Hydrostatic blisters in painted surface, due to water (leakage, building up) behind pool shell.



**Figure 7** Extensive issues due to water trapped behind wall.

## 4 Checking:

It's best to satisfy yourself that no water issues are present or likely. The use of a moisture meter is a good place to start. Bunnings stock a Crommelin Moisture Meter currently for \$50 I/N 0911078. Should be less than 12% moisture content everywhere.

Also, a quick way to check is to use some black plastic sheets. Use several heavy-duty black plastic sheets about 400 mm sq, well-sealed at each edge with "duck" tape and left for 18 – 24 hrs. Do at least 8 - 12 around the pool inc deep end, shallow end, and walls top and bottom and inc areas with little sunshine on them. Any moisture droplets on the underside mean there is a water issue and needs to be carefully considered.

**If in doubt, ask us.**

## 5 Solutions:

The best coating to use in a concrete pool is one that is both water and vapour proof as it's going to keep the pool (salty) water away from the reinforcing steel and save the pool owner issues to do with concrete cancer.

The Coating ( PnF or E4115) System, (often being a high build coating system) fits this requirement well.

However, if there are issues with moisture within or under the concrete surface, there is a chance that in time it will cause the coating to blister. This can be hard to forecast, unless you see signs as indicated on page one.

If you have seen these signs or have concerns, then you should:

- As a contractor, advise the pool owner (in writing) of what you see and that there may be issues later on. As it's not something you can be absolute about it's best to err on the side of caution.
- Consider the use of a waterproofing coating first, namely Ardex WPM 300 (Ardex 02 9851 9199) or Vandex water proofing (Fosroc 1800 812 864) This may be a good insurance policy. It can then be over coated once cured with PnF /E4115 system in the normal manner.

As an alternative you may want to suggest the use of a porous finishing system, such as a trowel on finish which generally lets water in and out of the pool surfaces. However, these being "open", collect stains, dirt, algae and also let calcium nodules form.

## 6 Summary:

Water is insidious and can make one's life difficult. More so if these aspects above are not noted and then considered. Most times there are no issues, and the project goes well, as does the performance of the coating. However, every now and then, situations arise, which are quite easy to detect beforehand. When noted and the issues discussed with the pool owner a resolution can be forthcoming or at least the situation monitored so that if matters arise later on, there are no surprises to argue over.