

## TECHNICAL BULLETIN – TB251

### CONSIDERATIONS AROUND WATERPROOFING AND TILING OVER EXISTING TILED SURFACES - EXTERNALLY

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#### INTRODUCTION & SCOPE

A quite common inquiry concerns the application of a waterproof membrane and normally new tiles, over an existing tiled surface, normally with its own membrane and possibly screed as well.

Whilst there is a methodology for doing this for an internal installation such as a shower recess, there are more complex considerations involved in an external application. This bulletin discusses the issues and explains why ARDEX does not have a standard system for this application.

The premise of wanting to install a new membrane is normally associated with leaks that need to be corrected for a deck, or where a deck or trafficable roof covers a habitable space underneath. It can also be an economic one where the cost is perceived to be too high, or the area cannot be out of service for a full re-instatement and a cheaper quick fix is needed.

#### PROBLEMS TO BE CONSIDERED

The following sections describe the issues that need to be thought about seriously when considering a 'makeover' rather than a re-instatement.

##### EXISTING DAMAGE - SUBSTRATE

The primary consideration with simply covering up the existing installation by a new one is that there is no chance to examine the underlying surface for damage or defects.

Whilst there is unlikely to be damage to a concrete substrate, problems such as re-bar corrosion and spalling cannot be excluded, and if not inspected, such damage can become a structural liability.

The same applies to timber surfaces (i.e. plywood decks) and timber framing which have been subjected to longer moisture penetration with warping, decomposition and rot all taking their toll. Steel framing elements can have suffered from corrosion.

Where the installation is removed and replaced, the surface is opened up and any damage can then be identified and corrected. Yes, this increases the upfront cost, but also is a form of cost reduction and complies with duty of care where the building is not losing its value as a result of progressive damage which ultimately could be catastrophic.

##### ISSUES WITH THE UNDERLYING SURFACE

The usual reason for re-installation is related to moisture issues, but by leaving the existing system in place, ignores problems that can be present, not restricted to, but including the following;

- Drummy or de-bonding tiles, that are still in place
- Sheared and compromised adhesive
- Damaged grout lines
- Degraded membrane

Any of these problems means that the effective substrate for the new system may not be sound and then subsequently cause a problem.

## TRAPPED MOISTURE

Where there is a moisture leak, there will usually be trapped moisture residue in the substrate and also any mortar and adhesive bed under the tiles. When the new membrane is applied this moisture then becomes trapped underneath it and can then cause further mayhem. Where does the warranty and responsibility lie when new work fails due to the original system?

Specifically the trapped moisture;

- Produces an immediate problem with the cure and drying of liquid applied membranes
- Produces a more delayed problem with the membrane where moisture becomes vapour leading to blistering
- Can turn the adhesive bed into an effectively permanently immersed one, rather than episodically wet, which destabilises adhesives not intended for constant wet
- Continues to affect the underlying areas till it dissipates.

## DETAILING ISSUES

A common problem concerns the detailing at turn ups, joints and penetrations, which may not have been done correctly in the first place. With the second installation, there may be insufficient space or clearance to do the detailing in accordance with AS4654 and the product manufacturer's recommendations. The most problematic piece of the installation is creating the correct turn downs and detailing into floor wastes, especially those within the tiled field as opposed to edge drains.

## STEP DOWNS

In recent times, there has been a trend to reduce or eliminate step downs onto decks or verandahs. This can create enough problems with original installations, but with the extra height associated with the new installation compounds the problem. Reduced step down makes detailing turn ups at doorways more difficult as noted in the previous section, but also reduces the amount of height that water can build up in extreme rainfall events. Even worse, where there was no step down to start with, the external area can end up higher than the internal area with the result of water back flowing inside the building. This then becomes a building defect.

## ADHESION ISSUES

The process for bonding the membrane to existing tiles requires the use of a bonding bridge for the material, not simply a primer. The tile surface has to be cleaned down and preferably mechanically prepared. This process can de-stabilise the existing tiles by shear stress. Any tiles removed, then complicates the repair because there are different substrates to be dealt with.

## WEATHERING

Whilst the lower layer is somewhat isolated from the weather by the upper, the situation still exists for differential movements between the two layers. In particular this can be a problem in hot weather with direct solar exposure, and is worsened by dark coloured tiles heating faster at the surface than tiles lower down. Tiles with different sizes and compositions have different movement properties and hence can display varying expansion and contraction. Whilst the new membrane can act as a stress relief layer, the worst cause would be where the underlying tiles expand more than the overlying and leads to shearing of the membrane and adhesive. Where the overlying tiles move, the main risk is peaking and cracking.

## JOINTS

Any existing movement and expansion joints would have to be carried through the second tile layer. This can create difficulties where the tiles are different sizes, and creates an

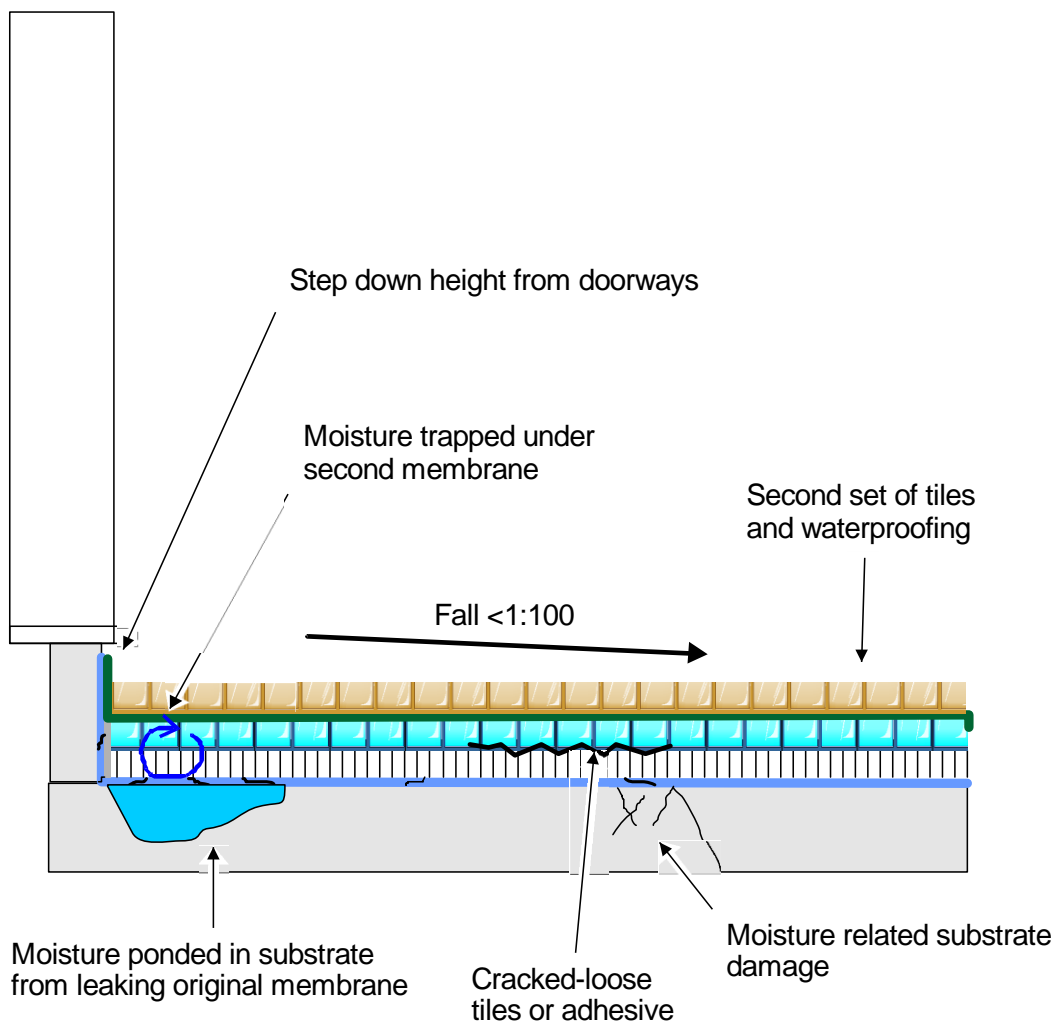


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irregular appearance which may not be aesthetically pleasing. Failure to carry joints through risks movement related failures.

This diagram shows some of the problems that can be expected from this sort of installation.



### POSSIBLE WORKAROUNDS

There are several ways that this problem can be worked around without removal and reinstallation, however it is necessary to have sufficient height to work with (a minimum fall of not less than 1:100 from walls to drainage), and a method of dealing with the detailing at the drainage points.

Where detailing is not done correctly there is the possibility of water getting in underneath the sheet membrane or slip sheet and then sitting on the underlying tiles and problems continuing.

There is also the legalistic issue concerning insurance and duty of care to building owners/occupiers to investigate collateral damage problems.

As a consequence ARDEX is not in favour of this process and recommends a complete reinstallation. As a result we are not offering a standardised system, and it falls back to the persons investigating or doing the rectification to examine all the issues and then see if a viable system can be worked.

**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 or Ardex New Zealand Office.

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The information presented in this Technical Bulletin is to the best of our knowledge true and accurate. No warranty is implied or given as to its completeness or accuracy in describing the performance or suitability of a product for a particular application. Users are asked to check that the literature in their possession is the latest issue.

**REASON FOR REVISION - ISSUER**

New document

**DOCUMENT REVIEW REQUIRED**

5 years from issue

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