DETAILING SHOWER WATERPROOFING

by Barry L. Schafer (Chair of Standards Australia Committees on Waterproofing)

Leaking from shower recesses is still the main cost claim on defects in buildings even though they need to comply with specific clauses within the Building Code of Australia (BCA). There is a clause in both Volume 1 (FP1.7) and Volume 2 (P2.4.1) to which shower recess construction needs to comply which states the following:

To protect the structure of the building and to maintain the amenity of the occupants, water must be prevented from penetrating-

(a) behind fittings and linings; or

(b) into concealed spaces,

of sanitary facilities, bathrooms, laundries and the like.

One way of meeting this requirement for residential buildings is to comply with Australian Standard AS 3740. A revision to this Standard making improvements in confining water within the designated shower area is about to be published. The other major change in the revised Standard is that it will specify bond-breaker types relating to the elastic properties of the membrane. I will outline some the changes in the Standard regarding water confinement and the three types of bond-breakers.

There is no real need to state the obvious that the best way of confining water within the shower compartment is to make it a fully enclosed shower. There is however considerable confusion in the industry in what constitutes a 'fully enclosed shower'. The revised Standard will require it to have a base that will trap the water from the rose draining it to the shower waste outlet, and screening that will contain water splash and drain it into the shower base. To best construct a shower to meet this requirement means that the shower needs to have one of the following types of construction:

a) preformed and finished shower base,

b) be of a hobbed construction,

c) have a step down.

All three result in there being a base to the shower in the form of a shallow trough. While the Standard gives details for the construction of an enclosed shower without the formation of the shallow trough, the detailing of the waterproofing to confine water within the shower compartment becomes more difficult and will be discussed at another time.

With both the hobbed and step down construction the position of the shower screen and door is now required to be so that they will drain into the shower base. This is a change for hobbed construction where it has been the practice to install the screening so that it finished flush with the outside of the hob. The revised detail is shown in **Figure 1**. The waterproofing needs to finish on the walls at least 25 mm above the water retention height of the shower screen door track. **Figure 1** is for an insitu applied membrane installed on the inside face of the wall lining and extends over the top of the hob and onto the floor. The reason the membrane extends over the top of the hob and onto the bathroom floor is to minimize any hob movement that may result in a fracture of the membrane. For a preformed membrane tray both the wall-lining sheet and the hob would be installed behind the membrane.

Where the shower is only partially screened, including the use of frameless glass screens, then there is a need to determine the extent of the shower area. The current Standard gives the splash area of an unconfined shower as an arc of 1500 mm from the shower rose. The committee could not find any evidence of where this distance was derived having been in the Standard since its first publication in 1989. Testing was undertaken on a variety of shower roses and positions that confirmed that the 1500 mm distance was the expected splash distance. However water can flow outside the splash zone if the slope on the shower floor to the waste is inadequate and/or the waste size is too small. The flow rate delivered by the shower rose is, of course, also a critical factor in obtaining adequate drainage. The Standard gives as a guide that a minimum waste diameter of 150 mm should be used in showers, especially where large format tiles are used making it difficult to obtain falls with change in slope around the waste. Where falls on the shower floor are low, the periphery circumference of the waste is a major factor in the water height retained on the shower floor during operation. The greater the weir length for water to flow over into the waste, the lower the water level retained on the shower floor. There are wastes on the market that have a square drainage slot that allows the positioning of a tile in the center of the waste. These wastes, in my view, are an ideal solution to getting a long weir length to minimize water height where large format tiles are used on the shower floor.

I mentioned before that frameless glass screens were considered as an unenclosed shower. These type of screens are very popular, especially in on-suite bathrooms where their use tends to give the bathroom a more open appearance. There is an installation requirement for a gap between the panels of glass to prevent them from chipping, especially around the door panel. Thus it is impossible to prevent water splash from exiting though these openings. Therefore, while they can contain most of the water splash within the shower area, their gap design requirements around glass panels means they cannot be considered an enclosed shower and thus the shower area waterproofing must extend to the distance required for an unenclosed shower.

Now a few words about bond-breakers. While there are three types of bond-breakers given in the 1994 version of AS 3730, there was no guide to which one was suitable to a given membrane. This anomaly was due to there being no classification of membranes to correlate to bond-breaker types. In conjunction with the release of AS 3740 there will be a testing standard AS 4858 for membranes so this anomaly can be rectified in the revised Standard. Basically there are to be three types of membranes based on their elastic properties as follows:

a) TYPE 1 with an elongation at break of less than 60%,

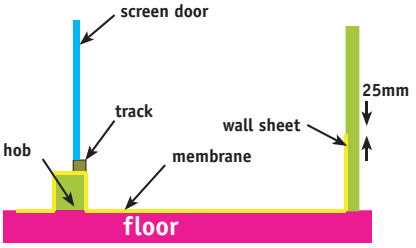
b) TYPE 2 with an elongation at break of between 60 and 300 %, and

c) TYPE 3 with an elongation at break of over 300 %.

The TYPE 1 requires a bond-breaker that enables the membrane to take up the movements at changes in substrates by flexing rather than stretching. This requires the use of a backing rod to induce a bend in the membrane. The membrane, by straightening this curve (bending of the membrane) can then accommodate the movement at floor wall junctions, rather than a direct tensile elongation of the membrane as is done with the other two types of bond-breakers. A typical example of this type of bond-breaker is shown in **Figure 2**.

The TYPE 2 & 3, shown in **Figure 3** and **4** respectively, both take up the movement by direct tensile elongation of the membrane.

The TYPE 2 gives a length of unbonded membrane to the substrate over the width of the tape. With this type of bond-breaker it is important that the membrane does not bond to the tape or, if it does bond, then the tape has compatible elastic properties to the membrane and will not bond rigidly to the substrates. If neither of these



conditions is fulfilled then the tape will fail in providing the required bond relief to the membrane.

Where a TYPE 3 is required, often the membrane if it has an elongation at break of over 600%, may be able to take up the movement without the use of a bond-breaker. However the small fillet of sealant results in considerably less stress in the membrane at a critical point, so it is well worth the little time it takes to install. It is very important however that the sealant and the membrane are compatible, for example, polyurethane membranes will not cure as a rule over a silicon sealant.

These are some of the changes being made to AS 3740 that will improve the performance of shower recesses in the future. ❖