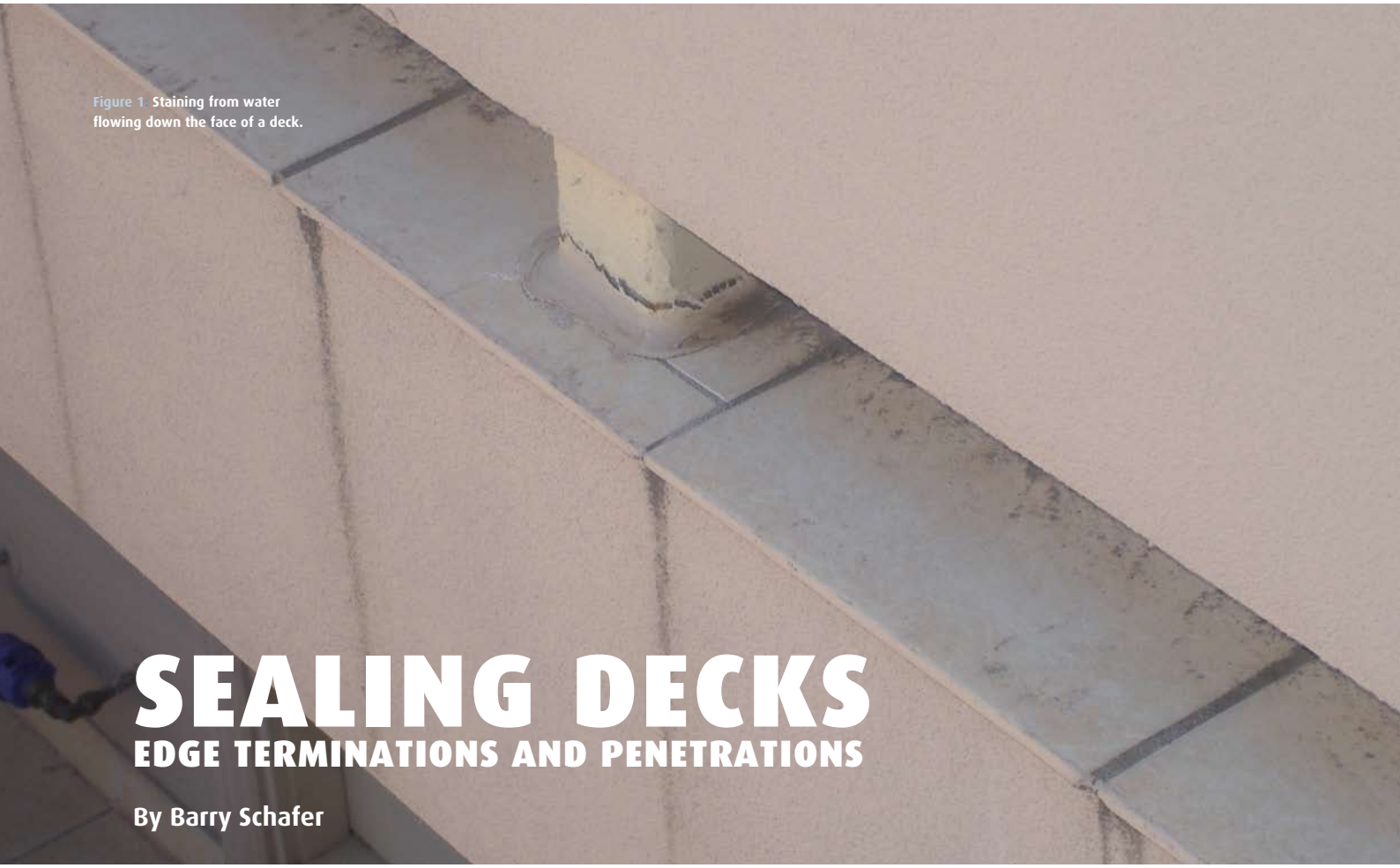

Figure 1: Staining from water flowing down the face of a deck.

SEALING DECKS

EDGE TERMINATIONS AND PENETRATIONS

By Barry Schafer

Most failures of waterproofing of decks are the result of inadequate detailing at the terminations of the waterproofing system and of the penetrations through it.

This applies to decks built with both lightweight and heavy construction of the substrate.

These decks are often drained over the external edge. This requires a detail to ensure that the water flowing over the edge falls free of the actual edge of the deck. If it doesn't, staining of the vertical face of the deck can occur as shown in **Figure 1**.

Not only can staining occur, but the water draining over the edge can flow back under the deck by water surface tension. The correct termination at the edge of a deck is shown in **Figure 2**. The angle section is sealed onto the membrane that is returned under the substrate sheeting using a sealant.

Often attempts are made to seal deck penetrations around the actual penetration using a sealant. **Figure 3** illustrates where this type of sealing has been used around a pipe penetration through a deck. **Figure 4** shows the result of water leakage in the soffit lining where a sealant was used around a downpipe penetration through a deck.

The correct way of dealing with a deck pipe penetration is shown in **Figure 5**. This method allows the pipe to move vertically without compromising the waterproofing. The over flashing sealed onto the pipe moves with the pipe and the flanged up-stand is fixed to the deck substrate. It is important that there is clearance between the over flashing and the deck to allow for the vertical movement that is to be accommodated between the surface of the deck and the pipe.

This over flashing is not needed with a balustrade fixed directly onto the surface of the deck substrate as there will be limited vertical

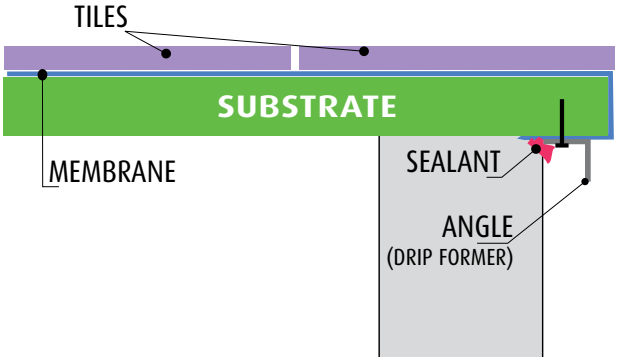

Figure 2: Correct termination at the edge of a deck using a drip former.

temperature movement. Surface-fixed balustrades are often fitted after the membrane is in place. The bolts used for the fixing of the posts must, by necessity, penetrate the membrane. To prevent leaking through these boltholes, two details are required. One, is the installation of a flexible gasket between the post baseplate and the membrane. The second is the use of a durable sealant covering the top of the bolts and around the baseplate onto the gasket, as shown in **Figure 6.**

The use of the sealant over the bolts prevents water at the top of the baseplate. The seal around the edge prevents water entry under the baseplate to the holes through the gasket. The Australian Standard for external waterproofing above ground level is currently being drafted and will incorporate water entry between the gasket and the membrane.

Figure 1 also shows a post penetration through the deck where the sealant around the post has failed. The posts were fixed onto the sides of the joists supporting the deck. The lower fixing results in vertical

Figure 3: Downpipe penetration through a deck sealed with sealant.

Figure 4: Water damage on the underside of a soffit where downpipe penetration is sealed by a sealant.

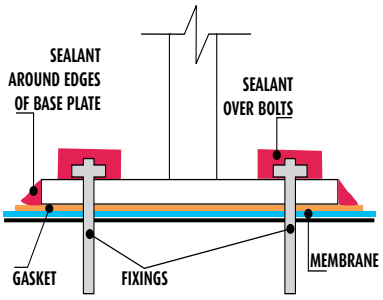

Figure 6: Waterproofing of balustrade post fixings.

Figure 7: Vertical termination with a sealant.

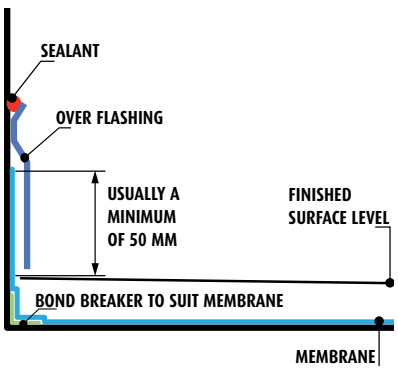

Figure 8: Typical edge termination at a vertical surface.

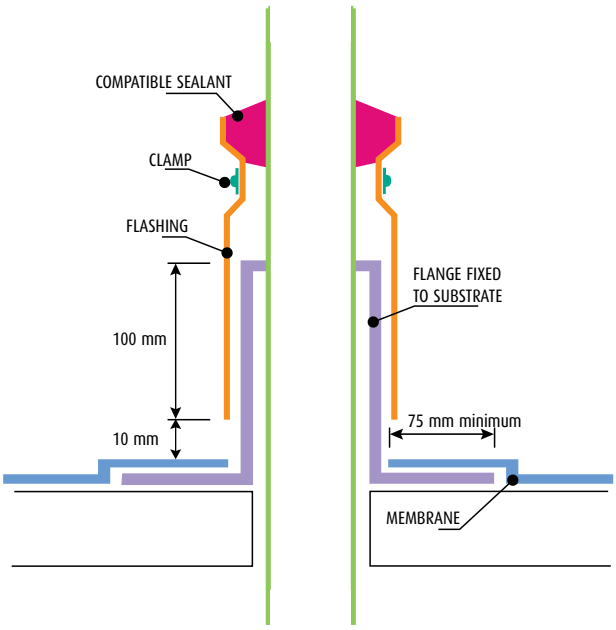

Figure 5: Correct termination for a pipe penetration through a deck.

movement between the post and the deck surface, which has caused visible fracturing of the sealant allowing water entry down the sides of the post around the surface of the deck. With lower-fixed posts the over flashing method as described for pipe penetrations is the best solution, as these deeper-fixed posts will always suffer from vertical temperature movements at the surface of the deck.

The last membrane termination to be discussed is the up-stand required against vertical surfaces. All too frequently this is created by applying a sealant onto the vertical surface.

The sealant fails due to the different temperature movements experienced on the horizontal surface in contrast to the vertical surface. The sealant fractures, as it cannot accommodate the longitudinal differential movement caused by different temperature movements at the junction. A typical example of the fracturing that occurs is shown in **Figure 7**.

I discussed temperature movement in Issue 52 of *Tile Today* (page 128) in regard to the waterproofing of lightweight decks. The best way to terminate at these surfaces is to turn up the membrane above the finished surface level of the deck. With solid construction this membrane turn-up can be bonded onto the horizontal and vertical surfaces with the use of a suitable bond breaker at the junction. With lightweight construction the membrane is bonded onto the horizontal surface and supported by an angle on the vertical surface. The extent of turn-up required depends on the exposure of the deck to wind-driven rain. In very sheltered conditions it can be as low as 30 mm. In extreme conditions it can be over 200 mm. In most low-rise residential construction a minimum of 50 mm is required. A typical termination of this type is shown in **Figure 8**.

The over flashing is mechanically fixed to the wall and sealed at the top with a sealant. This seal is not subjected to differential temperature movements, as it is between two vertically-placed materials. The up-stand of the membrane needs to allow for the thickness of any tile bed and finishing surface covering. If the membrane is on top of any tile bed then of course allowance only needs to be made for the thickness of the finishing surface materials.

If the basic principles outlined in this article are followed in the installation of waterproofing systems of decks, then many of the current failures being reported due to water entry could be avoided.