



# Waterproofing of external above ground building elements

**A common building complaint received by the Building Commission relates to the failure of waterproofing systems installed in external above ground situations. In a number of these cases, it is common to find water penetrating into the building around the sill of doors and windows at floor level. This technical note focuses on one aspect of moisture ingress and should not be considered in isolation of all areas where moisture can penetrate into a building.**

In the past, building practitioners have had to rely on the manufacturer's guidelines as to how to install their products to achieve waterproofing to various externally located building elements/materials. Building elements located in wet areas within a building have been well specified in the Building Code of Australia (BCA) and referenced standard AS 3740-2010 *Waterproofing of domestic wet areas*.

**There is now an Australian Standard referenced in the National Construction Code (NCC) that deals with the installation of external above ground waterproofing membrane systems.**

Since 1 May 2013, the NCC Volumes One and Two have included deemed-to-satisfy references to Australian Standard 4654-2012 Parts 1 & 2 *Waterproofing membranes for external above-ground use* (AS 4654).

These standards were developed to provide a consistent and reliable approach to the design and installation of external waterproofing membrane systems, specifically relating to the treatment to roofs, decks, balconies, external door openings, planter boxes and penetrations. The deemed-to-satisfy provisions of NCC Volume One Clause F1.4 and Volume Two Clause 3.8.1.3 state that waterproofing membranes for external above ground use must comply with AS 4654 Parts 1 & 2.

The NCC deemed-to-satisfy provisions do not clearly specify locations where the application of the external waterproof membranes are to be used. Building designers, certifiers and practitioners need to determine the application of the relevant performance requirements on a case-by-case basis. AS 4654 will provide a deemed-to-satisfy building solution that can demonstrate compliance with the relevant performance requirements of the NCC.

Performance requirements in both Volume One and Two of the NCC state that: A roof and external wall (including any openings around windows and doors) must prevent the penetration of water that could cause:

- a) unhealthy or dangerous conditions, or loss of amenity for occupants; and
- b) undue dampness or deterioration of building elements.

**Note:** There are limitations on these provisions that may apply to some classes of buildings, which are detailed in the applicable Volume of the NCC.

## Water penetration around door and window openings fitted onto external waterproofed areas

Water penetration around doors and windows generally occurs due to poor sealing of the membrane to the sill, allowing wind-driven rain to be pushed back or soak through into the internal parts of the building. Building designers and practitioners need to be aware of the requirements that are specified in AS 4654.2-2012 in regards to typical details of membrane termination for doors and windows onto external waterproofed areas. This may be in addition to water resistance requirements for certain external glazed assemblies set out in AS 2047 - 1999 *Windows in buildings – Selection and installation*.

Where the membrane termination is to prevent water entry, the finished height of the membrane above the finished surface level shall be sufficient to prevent water, including wind-driven water, flowing over the top of the membrane. Where doors and windows are fitted onto an external waterproof area, they require a sub sill flashing to be included as part of the membrane system and the external finished floor level must finish below the termination height of the membrane. These vertical upward termination heights are specified in Table A1 of AS 4654.2-2012. Where circumstances do not permit the inclusion of a set-down or hob (e.g. for wheelchair access), a gutter should be formed into the substrate immediately in front of the opening.

Although specific detailing will be influenced by the type of membrane to be installed, there are some key design concepts that should be incorporated irrespective of the type of membrane used. In addition to considering these best practice concepts, it is important to follow the manufacturer's instructions specific to the system being installed.

Typical details are provided in AS 4654.2-2012 which should assist building designers and practitioners in ensuring the performance provisions of the NCC are met and the instance of moisture ingress into buildings is reduced. Complaints received by the Building Commission will be evaluated for compliance using this standard unless alternative solutions have been approved through the building permit process.

It is important that building practitioners monitor the various stages of the water proofing membrane installation so they can confirm that the provisions of the NCC and this standard have been complied with.

### Disclaimer

The information in this technical note cannot be relied upon with respect to the application of all regulations, standards and codes relevant to this topic. The information is of general application only. Registered building service providers must ensure that they consider the specific circumstances of each installation and ensure that it complies with all relevant regulations and standards.

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