



AIR SEALS AND BACKING RODS

Two of the most commonly asked questions by builders on site concerns window detailing. The first is why are air seals necessary under E2/AS1, and the second is why do I need a backing rod behind the air seal?

By Trevor Pringle, BRANZ Principal Writer

To answer the first question: when wind acts on a building the pressure outside is generally higher than that inside. This means that if there are any gaps linking the outside and the inside, air can flow through them. If there is water present then this air flow can carry that water into the building. Air seals block the air flow.

Air barrier sometimes needed as well

Some cladding materials, and drained and vented cavities, are also relatively air leaky. For these, the wall construction must also incorporate an air barrier to prevent air flow through the cladding, or within the cavity, from getting inside the building. In most New Zealand domestic buildings, the internal plasterboard linings provide this general air barrier. It can also be provided by a rigid underlay, such as plywood or fibre-cement, fixed to the outer face of the framing or by a flexible wall underlay meeting the specific requirements for an air barrier given in Table 23 of E2/AS1.

There is also a risk of this airflow occurring wherever a hole or penetration through the external envelope occurs. These are typically windows, doors, pipe penetrations and meter boxes. Hence the need for an air seal fitted between the framed opening and the reveal of the window, door, pipe or meter box.

Equalise the air pressures and stop the airflow

The aim of the detailing is to try and get the air pressure within the drained and vented cavity, and in the voids around the window,

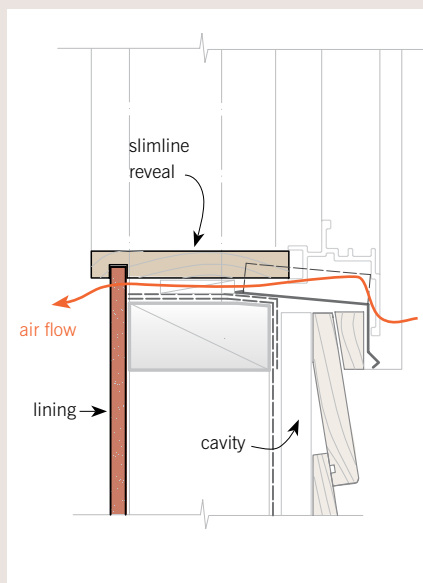


Figure 1: The potential air flow through a window with no air seal from higher outside pressure to lower inside pressure.

as close as possible to the outside pressure. Then there is no path to the inside for the air and therefore no driving force to carry water into the building.

To do this requires the installation of an air seal between the rough opening and the window reveal/frame. The air seal must not completely fill the gap around the window or door joinery. The backing rod (a number of different diameters will need to be available on site) is necessary to ensure that the gap is not overfilled. It needs to provide a complete seal around the opening. Packers for the window need to be installed so that they will allow a continuous bead of air seal (the backing rod can be fitted between packers).

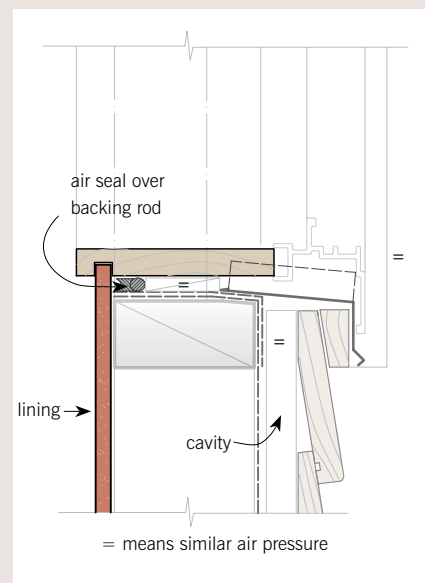


Figure 2: Window with air seal. (Drawing from BRANZ *Weathertight Solutions Volume 1 – Horizontal weatherboards*. New edition.)

Weathertightness tests have shown that when a wall is under pressure from wind, water will flow in around the window when a small portion of the air seal is removed.

While a number of builders have said that they have sufficient control over the depth of the foam (when not using a backing rod) we don't believe this is always the case. We have seen instances where the foam is billowing out behind the window flange on the outside of the building. In these cases not only is the gap around the window completely filled, and negating the pressure moderation, but the foam could wick, or move, water from the outside to the inside of the building. ◀