



WIND AND AIR BARRIERS

The number of calls to the BRANZ Helpline suggest there is still a lot of confusion around when wind and air barriers are needed under the New Zealand Building Code.

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Over the years, various terms have been used to describe the building components required to act as barriers to the passage of air and/or wind. It is important to understand the difference.

Wind barriers

Wind barriers were a requirement of the Second Edition of the Building Code Clause E2/AS1 introduced in February 1998. They were also included in NZS 3604: 1999 *Timber framed buildings*, Section 11.

Wind barriers could be of two quite different materials:

- 'Non-rigid' type, like heavy-duty or heavy-weight building papers with a wet burst strength of no less than 500 kN/m² when tested in accordance with BS 3137.
- 'Rigid' type described in E2/AS1 Second Edition as 'solid wind barriers' and under NZS 3604: 1999 as 'rigid wall cladding underlay or sheathing' such as plywood and fibre-cement sheet.

Air barriers

Air barriers came into prominence with the introduction of E2/AS1 Third Edition in 2005. Their function is to minimise the pressure difference across the wall construction to reduce the potential for water getting into the building with the air.

Air barriers are detailed in E2/AS1 Third Edition Section 9.1.4 *Barriers to airflow*. When using the Acceptable Solution, this says buildings are required to have barriers to airflow in the form of:

- a) interior linings with all joints stopped, or
- b) where walls are not lined, such as attic spaces at gable ends, a rigid sheathing or

an air barrier, complying with Table 23, fixed to framing prior to fixing cladding or cavity battens.

Sections 9.1.5 and 9.1.6 are about the preparation of wall openings and the installation of flashing tapes and air seals, and 9.1.7 is about the installation of the building wrap.

Building wrap

The definition of building wrap is important here. In E2/AS1, it is defined as 'a building paper, synthetic wrap or sheathing used as part of the wall cladding system to assist the control of moisture by ensuring moisture which occasionally penetrates the wall cladding is directed back to the exterior of the building'. BRANZ uses the term wall underlay to describe the range of materials that can be used.

The required properties of building wraps are in E2/AS1 Table 23. For walls, Table 23 provides two options for wall underlays:

- a) Wall wrap (includes building papers and synthetic wall wraps).
- b) Rigid sheathing (includes plywood and fibre-cement sheet).

Table 23 also includes the performance criteria for air barriers where no internal linings are being installed or internal linings do not form an air barrier.

Confusion over which to use

Much of the confusion over the need or otherwise for wind barriers arises from having two key compliance documents – NZS 3604: 1999 and E2/AS1 Third Edition – out of sync. Under E2/AS1, air barriers are *in* and wind barriers are *out*.

The requirement for wind barriers in NZS 3604: 1999 was introduced some

6 years before the publication of E2/AS1 Third Edition. E2/AS1 Third Edition makes no reference to wind barriers. It refers to air barriers, for example, for unlined gable ends, but not wind barriers.

Under E2/AS1, air barriers are in and wind barriers are out.

The second line of defence against water entry, on which the need for wind barriers was based, has been replaced with drained and vented cavities, air barriers and air seals. Where the direct-fix option is permitted under E2/AS1, it is always in a low-risk situation where a wind barrier, other than a building paper underlay or wall wrap, is deemed unnecessary.

Choose either E2/AS1 or NZS 3604

E2/AS1 is a stand-alone compliance document. It is an Acceptable Solution to the Building Code Clause E2 *External moisture* and, as such, is a 'deemed to comply' method. If you comply with it, no part of NZS 3604: 1999 Section 11 can be imposed on you as well. So, if you specify fibre-cement sheet as a wind barrier under NZS 3604 (see Table 11.1), it needs to be sealed with two coats of acrylic paint including edges (edges may be sealed with a bead of sealant in the gaps between sheets). Under E2/AS1, there is no requirement for such sheet materials to be treated or edge sealed.

If you don't want to be locked into Section 11 of NZS 3604 (and the requirement for a wind barrier), don't reference it. Instead, specify E2/AS1. Use one compliance document or the other, *not* a bit of both. ♦