

NZ BUILDING CODE · CLAUSE E3 INTERNAL MOISTURE

Alternative Solution Statement & wet area installation guide.

Kitchens, laundries and bathrooms count as wet areas under clause E3 of the New Zealand Building Code, and timber flooring is not pre-approved for them. This document sets out how our Herringbone and Oak Plank engineered oak ranges meet the clause through the code's Alternative Solution pathway: what the code asks for, how the floor is built and installed to answer it, and the independent testing that backs the claim. We prepare this documentation for your building consent ourselves.

What clause E3 requires

This Alternative Solution addresses the following performance requirements of NZBC clause E3:

- **E3.3.3** · Floor surfaces of any space containing sanitary fixtures or sanitary appliances must be impervious and easily cleaned.
- **E3.3.5** · Surfaces of building elements likely to be splashed, or become contaminated in the course of the intended use of the building, must be impervious and easily cleaned.
- **E3.3.6** · Surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

Definitions, as outlined in E3/VM1 & AS1

- **Impervious** · that which does not allow the passage of moisture.
- **Sanitary appliance** · an appliance intended to be used for sanitation which is not a sanitary fixture; included are machines for washing dishes and clothes.
- **Sanitary fixture** · any fixture intended to be used for sanitation: toilets, urinals, bidets, baths, showers, basins, sinks and tubs.

What that means in practice

- All wet area floors must be impervious, including sealed edges, and easily cleaned.
- Wet areas include kitchens, bathrooms, toilets and laundries.
- The wet area is the floor zone within 1.5 metres of any sanitary fixture or sanitary appliance, where water splash is regarded to occur; refer E3/AS1 clause 3.1.1.

A note from us: although this system covers bathrooms, we generally recommend against timber flooring in bathrooms, where steam and moisture levels run far higher than any other room. We would rather say so here than sell you the wrong floor.

How this document is used

For a building consent application, this statement travels with the project documentation as the Alternative Solution for the flooring within wet areas. The test reports referenced through this document are held in full by ATS Design and are available on request, quoted by report number so they can be verified.

The product

Herringbone and Oak Plank are engineered French oak floors. Each board carries a genuine French oak wear layer over a plantation eucalyptus plywood core, with a reinforcing balancing veneer underneath. The cross laminated construction holds the boards flat through seasonal movement, and every board arrives pre-finished in a moisture resistant lacquer.

The flooring is produced in batches to a specification and is classified **Class 1** for the purpose of compliance with the NZ Building Code. Beyond clause E3, the range carries supporting documentation for durability (structural integrity of at least 25 years indoors, B2.3.1), fire (C3.4 fire test report) and slip resistance (SRV 41, D1.3.3), all held on file.

The ranges this document covers

Herringbone

150 × 600mm blocks, 15mm thick with a 4mm oak wear layer.

Oak Plank

Three board formats: 190mm wide × 12mm thick with a 2mm oak wear layer, 190mm × 15mm with a 4mm wear layer, and 240mm × 15mm with a 4mm wear layer.

Installation method in wet areas

In wet areas both ranges are installed by **direct adhesive fixing only**: a full trowel bed of adhesive bonding every board to the prepared substrate, with every tongue and groove joint glued watertight and the perimeter sealed. Herringbone is adhesive fixed in every installation; the pattern is never floated. This document should be read alongside the maker's detailed installation instructions, held on file.

1. Jobsite conditions

- The building must be at a stage where most other trades have completed their work, providing dry, clean internal conditions.
- Room conditions of 10 to 32°C and relative humidity between 40% and 70% present an acceptable internal climate.
- Store flooring boxes flat, out of direct sunlight, on plastic if over concrete, and do not open them until ready to install.
- Before installation, check thoroughly for any moisture ingress that may affect the floor, including subfloors below ground level and gardens or patios near internal floor level.

2. Substrate preparation

i. Concrete

- New slabs shall be at least 60 days old. Impedance readings shall be below 4.0%, or in-slab relative humidity below 85%. Slabs above 5.0% impedance or 90% in-slab RH are not suitable for installation.
- An applied moisture vapour barrier is used with all slab-on-ground installations.
- Grind as necessary to address surface weakness and achieve a clean, sound surface.
- The slab shall be flat to within 3mm under a 3m straight edge: grind high spots, and level low spots with a levelling compound over the appropriate primer. Moisture barrier, levelling compound and adhesive come from the same manufacturer's system, or an agreed compatibility between manufacturers.
- The surface must be dust free and dry prior to installation.

ii. Timber

- Plywood, particleboard and existing timber floors shall be sound and stable, dry (below 13% moisture content), with any movement or noise addressed before installation.
- Rough sand to remove swollen joints, contaminants and any wax layer, leaving a clean surface.
- Flatness as per concrete: within 3mm under a 3m straight edge.

3. Adhesive fixing

We specify **Mapei Ultrabond ECO 995**: a premium, 100% solids, one component moisture curing urethane adhesive for wood flooring, providing moisture vapour emission control and sound reduction in a single coat. It is also the adhesive used in the independent moisture testing referenced on page 4.

- Apply a full trowel bed with the trowel the adhesive manufacturer specifies, held at 45 degrees, working in areas small enough that spread adhesive is never left exposed longer than 35 to 45 minutes.
- Seat boards into the adhesive with a tilt and drop action. Never slide a board through the adhesive: adhesive has memory, and will work a slid board back toward its first point of contact.
- Keep foot traffic off newly laid boards, and weight any areas that need help achieving full contact while the adhesive cures.

4. Laying the floor

1. Plan the layout before any adhesive is spread. End joints stagger by at least 300mm, no board at a wall finishes shorter than 300mm, and boards ripped lengthwise at walls stay as wide as the set-out allows.
2. Never install over existing floor coverings; remove them back to the structural substrate first.
3. Maintain a perimeter expansion gap of at least 5mm to every vertical surface: walls, door frames, pipework and cabinetry fixed to the substrate. Set the gap with spacers, and cover it with skirting or scotia at completion. Skirtings fix to the wall, never to the floor.
4. **Seal every tongue and groove joint.** In wet areas, apply a continuous bead of D3 rated PVA adhesive into the groove of each joint as it is laid: enough to achieve a water seal along the full length of the joint, without excess squeezing onto the face. We specify Bostik PVA Indoor Outdoor. This is the step that makes the joints impervious, and it is not optional.
5. **Herringbone.** Blocks are laid individually into the adhesive bed, tongue to groove, every joint glued as above. Set the pattern out from a centreline so the field arrives at each wall evenly, and check alignment against a string line every few rows; the pattern cannot be corrected once the adhesive cures.

6. Oak Plank. Install parallel to the longest exterior wall where possible. Cut the final board of each row to length and start the next row with the offcut where it is 300mm or longer.

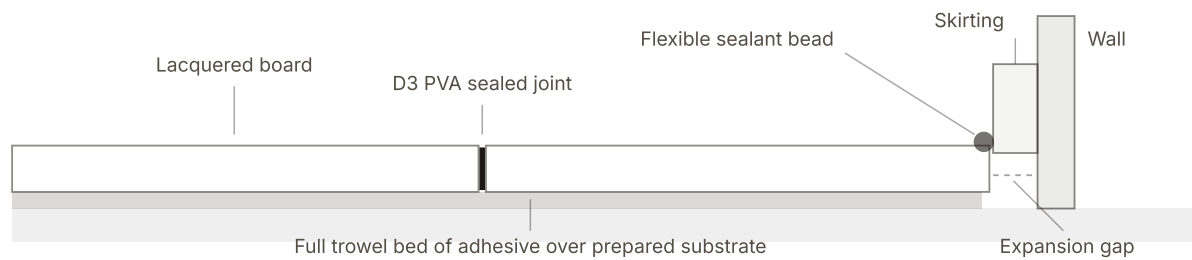
7. Close joints with a tapping block. No major force should be needed; a board with a damaged joint is replaced, not forced.

8. Provide an expansion joint at doorways, remove all spacers at completion, and protect the finished floor from the trades that follow.

5. Edge detailing

Within the wet area, the junction between the floor and every wall, cabinet, fixture and penetration is sealed with a thin bead of **waterproof flexible sealant**, colour matched where it meets cabinetry. We specify an MS polymer sealant, Bostik Seal N Flex Advance. Silicone is avoided, as silicone residue interferes with any future recoating of the boards.

The sealant closes the splash path at the perimeter while the skirting conceals the expansion gap behind it. The sealant is never applied into the expansion gap at board ends, where the floor must stay free to move.



WET AREA EDGE DETAIL · PROPORTIONS EXAGGERATED FOR THE DIAGRAM

The solution

Clause 3.1.1 of E3/AS1 carries the comment this Alternative Solution is built on:

"Other floor finishes may also be capable of satisfying the performance for impervious and easily cleaned, if installed in a manner that prevents gaps or cracks within the finish and at any parts of its perimeter that are exposed to watersplash, and/or if the surface is sealed with a suitable durable coating. However, such other finishes are outside the scope of this Acceptable Solution."

Installed as this document describes, the flooring system answers each stated condition:

i. Impervious

- **No gaps or cracks within the finish.** The machined tongue and groove, closed over a continuous bead of D3 PVA adhesive, forms a tight glued joint that does not let moisture pass.
- **No gaps or cracks at the perimeter.** Every edge of the floor within the wet area is sealed with flexible sealant against skirtings, walls, toe kicks, cabinetry, pipes and penetrations.
- **A sealed surface.** The factory lacquer is a durable, moisture resistant coating, maintained by ordinary cleaning.

Independently tested in New Zealand.

An IANZ accredited laboratory tested this exact system: assembled boards, joints sealed with D3 PVA, fixed with Mapei Ultrabond ECO 995, with 100ml of dyed water ponded over the sealed joint for 24 hours to ISO 4760:2022 (modified). The laboratory verified that the product's assembled joint over a 24 hour period did not allow water penetration through to the substrate. Edge swell measured 0.14mm or less wet, recovering to 0.10mm or less.

NZ WOOL TESTING AUTHORITY MATERIALS LAB ·
REPORT 1466298.5 · JULY 2023 · FULL REPORT ON
REQUEST

ii. Easily cleaned

The lacquered floor is cleaned by conventional methods, as the situation requires:

- Broom or soft brush
- Standard vacuum system
- Well wrung sponge or microfibre mop with proprietary timber floor cleaning products

Never use bleach, abrasive cleaners, or products containing wax or oil. A steam mop shall not be used: it forces heat and moisture into the joints. Keep rubber backed mats off the lacquer, as they can mark it irreversibly.

Underfloor heating

Both ranges may be adhesive fixed over hydronic underfloor heating, provided:

- The slab is preheated for two weeks before installation, then switched off and allowed to cool before laying.
- Temperature changes ramp at no more than 2°C per day, in and out of the heating season.
- The temperature at the underside of the boards is never held above 27°C, and the slab surface never exceeds 28°C in service.
- Minor seasonal gapping between boards while the heating runs is normal and accepted. Rugs come off while the heating operates; they trap heat the slab limit assumes is escaping.

Exclusions

- The flooring system may not be used within a shower enclosure, or in any application where the floor is immersed in water.
- The flooring is not suitable for exterior use.
- The system is designed for splash and topical moisture, not standing water. Spills are wiped up within a reasonable time, as they would be on any timber floor.

A note on the wording

Water resistant in this document means exactly what the testing shows: water held over the sealed joints for 24 hours without penetration. It does not mean waterproof. No timber floor is waterproof, and we will not tell you otherwise. Installed and maintained as described here, the floor delivers the wet area performance the Building Code asks for, with the timber floor you actually wanted.

Specified products

Role	Product
Flooring adhesive, with moisture vapour control	Mapei Ultrabond ECO 995
Tongue & groove joint sealer	Bostik PVA Indoor Outdoor (D3 rated)
Perimeter flexible sealant	Bostik Seal N Flex Advance
Waterproofing membrane, where the project specifies one	Bostik DAMPFIX GOLD system
Primers & levelling compounds	Per the adhesive manufacturer's system

The file behind this document

The product disclosure, the maker's installation guide, the fire and slip test reports and the full NZWTA moisture test report are all held by ATS Design and available on request. For wet area building consent applications, we prepare the supporting documentation for your project ourselves; ask us and it is handled.