

Forté Alternative Solution Guidance for Timber Flooring (E3 Installations)

FOR USE WITH THE FORTÉ TIMBER OVERLAY FLOORING SYSTEM



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Law Residence
Dravitzki Brown Architecture

1. Scope of Use

This document should summarise the documentation and supporting evidence to satisfy the relevant clauses (ESPECIALLY E3) set out in Schedule 1 of New Zealand Building Code for the nominated Floor Covering in both single-level and multi-level buildings.

THIS ALTERNATIVE SOLUTION APPLIES TO

Single-dwelling kitchens / Laundries / WC (Excludes bathrooms – Refer to 5.1.3 of [Timber Overlay Flooring System Design Guide](#))

Multi-dwelling kitchens / Laundries
(Excludes bathrooms* and WC**)

*A wet-area membrane is required for the installation of timber flooring in a Powder Room/WC in a multi-dwelling building.



Lake Rotoiti House
Evelyn McNamara Architects

2. Composition of Forté Engineered Flooring Products

MULTILAYER PREFINISHED ENGINEERED PLANK WITH TONGUE & GROOVE OR LOCKING JOINTS

- a) Polyurethane Coating
4-7 Coats of Factory Roller-Applied, UV-Cured Lacquer

- b) Top Layer
2-6mm of European Oak Hardwood

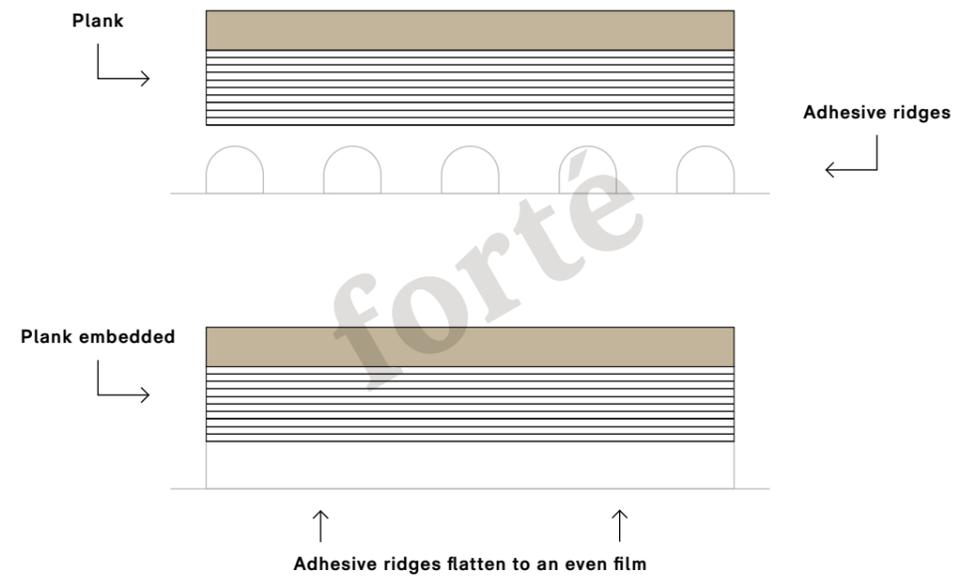
- c) Bottom Layer
10-15mm layer of flooring-grade Plywood



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3. Installation Method

Planks are installed using a direct-fix method (not floating). The planks are glued down to the substrate using trowel-applied flexible urethane timber flooring adhesive on top of approved substrates.



High water and heat resistant D3 aliphatic Poly Vinyl Acetate (PVA) adhesive is applied to seal along the sides and ends of joint profiles within 1.5m around sanitary fixings/appliances.

All Forte Timber Flooring Installations to be in accordance with [Forte Timber Overlay Flooring Installation Guide](#).

4. B2 Durability



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4.1 DURABILITY REQUIREMENT

4.1.1 B2/AS1 — TABLE 1

The durability Requirement for “Floor Coverings - Protective or Acoustic Coverings” is 5 years. Refer to B2 Durability for more information.

Note 1: The durability requirement applies to the nominated building element (Any structural and non-structural component or assembly incorporated into or associated with a building). In the case of Timber Flooring, this would mean the flooring plank assembly in its entirety rather than just the topcoat surface of the flooring product.

Note 2: Wet Areas containing Baths/Showers are outside the scope of this Alternative Solution, therefore there is unlikely to be frequent water- splash in the area of installation (Refer to Timber and timber-based flooring in wet areas for more information).

4.2 DURABILITY EVIDENCE OF COMPLIANCE

4.2.1 B2/VM1.1.1 — IN-SERVICE HISTORY

Timber Flooring has been installed in Residential homes for longer than any other building materials, and Forte’s prefinished engineered flooring collections have been installed in New Zealand buildings for over 15 years.

COMMERCIAL CASE STUDY

Location: [Rodd & Gun Lodge Store, Westfield Chartwell, Hamilton](#)

Products Used: [Ultra Champagne Oak by Forté](#)

Installation Date: 2010



RESIDENTIAL CASE STUDY

Location: [McEntyres Fairway, 11 McEntyres Lane, Millbrook, Arrowtown](#)

Products Used: [Smartfloor Lignite Oak by Forté](#)

Installation Date: 2012



4.3

BRANZ GUIDANCE

BRANZ published a bulletin in 2021 titled “E3/AS1 and wet area flooring”. This was in response to a change to the E3 building code clause which was causing issues with in industry. Refer to Figure 1 on the first page with the subtitle Matai timber flooring that has stood up well to splashes and occasional floods over 25 years. This is a generic-product example showing a solid Matai flooring with evidence of Durability for over 25 years.

Source: [Build Magazine](#)

4.4

B2/VM 1.2.1 LABORATORY TESTING

Forté engaged SGS New Zealand Ltd (An IANZ accredited laboratory) to carry out topical moisture resistance on assembled flooring samples in accordance with ISO 4760:2022

All products achieved the highest qualitative possible, being a qualitative rating of 1 (*No Change*).

4.5

TIMBER SUBFLOORS AND ASSURED MAINTENANCE

Point 3.2.2.3 of B2/AS1 States that “Where maintenance of an impervious coating cannot be assured in wet areas, plywood flooring treated to minimum H3, or solid Pinus species or Douglas fir flooring treated to minimum H1.2, shall be used.”

Timber is hygroscopic and experiences some dimensional movement in response to climatic conditions. Engineered Flooring that is Direct-stuck will minimize the movement; however, we recommend H3-treated plywood or another of the above substrates should be used when installing over a timber Substrate as per the above statement.

Note 1: We do not recommend installing over the top of Particleboard or Oriental Strand Board under this Alternative Solution. These subfloors should be covered with a Wet-Area Membrane as per E3/AS2.

Note 2: Installing over top of existing solid NZ Native timber subfloors is common practice (i.e., in a villa renovation). For added protection, it is recommended to coat the timber with a 2-component epoxy Moisture Barrier to the Native timber subfloor before installing the timber.



Tairua Insitu House
Neu Architecture

5. E3 — Impervious (E3.3.3 & E3.3.5)



Impervious is defined in the E3/AS1 Acceptable solution as "Impervious – that which does not allow the passage of moisture". While performance clauses E3.3.3 and E3.3.5 require impervious surfaces around sanitary fixtures/ appliances, there are no verification methods provided. Refer to page 11 of E3/AS1 which states "No specific methods have been adopted for verifying compliance with the Performance of NZBC E3"

The Objective (E3.1) and Functional (E3.2) requirement of E3 is to prevent illness/injury or damage through accumulation of moisture, or damage caused by free water penetration.

As there are no verification methods provided to test for an impervious surface, Forté engaged SGS New Zealand Ltd (An IANZ accredited laboratory) to carry out topical moisture resistance on assembled flooring samples in accordance with ISO 4760:2022.

ISO 4760:2022 helps demonstrate over a period of 24 hours that the sample joints tested did not allow water penetration through to the substrate.

All products achieved the highest qualitative possible, being a qualitative rating of 1 (No Change).

SUMMARY OF ISO 4760:2022 TEST METHOD:

Three boards are assembled with PVA adhesive (tested to EN204) applied to the joints. PVA D3 adhesive is a well-known adhesive used in Kitchen and Bathroom cabinetry that requires heat and moisture resistant bonds. A 100mm diameter plastic ring glued over the inverted "T-Joint".

100ml of water with coloured food dye is exposed to the sealed area and allowed to stand for 24 hours. The water is then removed and the samples are assessed for their performance.

ADDITIONAL EVIDENCE

Further to the above, the Acceptable Solution as per Comment under 3.1.1 of E3/AS1 states, "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 water splash, and/or if the surface is sealed with a suitable durable coating."

This sentence can be broken into three parts to aid in demonstrating compliance:

- 1. INSTALLED IN A MANNER THAT PREVENTS GAPS OR CRACKS WITHIN THE FINISH**

We recommend a minimum D3 durability class of PVA. The D3 durability class rating means "Interior areas with frequent long-term exposure to running or condensed water. Exterior areas not exposed to weather." Refer to EN204 for more information

To ensure the flooring is installed in a manner that prevents gaps or cracks within the finish, the [Timber Flooring Overlay System Installation Guide](#) must be followed. This system requires using a water-resistant PVA adhesive in all joints (both along the length of the plank and at the ends of planks) during installation in areas containing sanitary fixtures or sanitary appliances.
- 2. INSTALLED IN A MANNER THAT PREVENTS GAPS OR CRACKS AT ANY PARTS OF ITS PERIMETER THAT ARE EXPOSED TO WATER-SPLASH**

To ensure the flooring is installed in a manner that prevents gaps or cracks at any parts of its perimeter that are exposed to water-splash, the [Timber Flooring Overlay System Installation Guide](#) must be followed. This system requires using an acrylic-based flexible joint filler specialised for use with timber flooring. This is to be used to seal any parts of the perimeter and any fixed items within the area (ie floor to wall junction, kitchen waste pipes) that are exposed to water splash (including a minimum of 1.5m from all sanitary fixtures and sanitary appliances in open-plan rooms as per 3.1.1 of E3/AS1).
- 3. SURFACE SEALED WITH A SUITABLE DURABLE COATING**

All timber flooring from Forté comes factory-finished with durable polyurethane (not oil) coatings with at least four layers of coating. Refer to the relevant product specification sheet for information on the number of coatings for individual products. Polyurethane finishes have had over 50 years of in-service history in kitchens and bathrooms in New Zealand residential and commercial buildings, and provided it is maintained as per 'normal maintenance' requirements of B2/AS1 2.1, a quality polyurethane finish would be classified as "a suitable, durable coating".



Ryan House
Arthouse Architects

6. E3 — Overflow (E3.3.2)

E3/AS1 2.0.1 states that overflow is required when "...accidental overflow could damage an adjoining household unit or other property". When in effect, the overflow clause in E3/AS1 requires containment (coving of 75mm), as well as floor wastes (complying with NZBC G13).

As there are complications around the detailing of containment and floor wastes with Timber Flooring, we recommend the specifier adhere to the exemption under E3/AS1 2.0.2, which states "Household kitchen sinks and laundry tubs that have an integrated overflow with a minimum flow rate of 0.25 l/s do not require additional overflow provision..."

To satisfy this exemption, the specifier should ensure that:

- a. The maximum flow rate from the inlet tap(s) is less than the flow rate of the integrated overflow for that sink or tub, or
- b. The water supplies to the inlet tap(s) for that sink or tub are fitted with proprietary flow restrictors (such as cartridges) to limit the tap flow rate to less than the flow rate of the integrated overflow for the sink or tub.

Note: The overflow clause does not apply to detached dwellings.

7. E3 — Constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces (E3.3.6)

Forté has developed the [Timber Overlay Flooring System Installation Guide](#), which requires the flooring to be glued to the substrate rather than 'floated' on top of the substrate and minimizes the natural movement of the timber. This, combined with the joint filling requirements (as mentioned under the 'Impervious' point above), creates a well-designed system that is constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

8. F2 — Hazardous Building Materials (F2.3.1)

All Forté Timber Flooring collections are low-formaldehyde and meet at least an E1 rating when tested in accordance with AS/NZS 2098.11.

The [Forté Timber Overlay Flooring System Installation Guide](#) advises the installer that cutting of timber is to be done in a well-ventilated area and for a suitable dust mask, eye protection, and ear protection to be worn, as some fine wood dust can cause nasal cancer.

9. C3 — Critical Radiant Flux for Flooring

Wood products equal to or greater than 12mm thick with a density of 400kg/m³ will meet a rating of 2.2 kW/m² (see C/VM2 Appendix B Table B1).

This means all Forté wood flooring materials are acceptable in all spaces, with the one exception of buildings with a risk group of S1 (Aged Care & Detention) that are un-sprinklered, which requires a 4.4 kW/m² rating. Some Forté products meet this rating, please enquire for specific test results.

10. D1 — Slip Resistant Stair Nosing

As per 2.1.5b of D1/AS1, Handbook HB197 can be used to advise on minimum slip resistance values for various areas based on the Wet Pendulum test conducted as per AS4586 using a slider 96 rubber. The required result for Staircases (provided handrails are present) is Classification X.

All Forté collections achieve a Classification X or W and therefore are suitable for use on staircases (both residential and commercial) without slip-resistant nosings provided handrails are present. If handrails are not present, or if you would like additional slip-resistance, it is possible to create slip-resistant nosing – refer to the [Forté Timber Overlay Flooring System Design Guide](#) for more information.

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