



Determination 2011/108

The code compliance of a plywood joint to a house at 25 State Highway 25, Kopu, Thames



1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department.
- 1.2 The parties to the determination are
- the applicant, who is the owner and builder of the subject house M Hutt (“the builder”)
 - Thames-Coromandel District Council (“the authority”), carrying out its duties as a building consent authority.
- 1.3 I consider the manufacturer of the plywood cladding as a person with an interest in this matter (“the manufacturer”).
- 1.4 The application for this determination arises from a dispute between the parties regarding the compliance of a specific horizontal joint detail to plywood cladding (“the joint detail”), including for houses already completed. The authority has issued a building consent and subsequent code compliance for a four year old house

¹ The Building Act, Building Code, Compliance documents, past determinations and guidance documents issued by the Department are all available at www.dbh.govt.nz or by contacting the Department on 0800 242 243.

constructed using the joint detail but has subsequently refused to accept the joint detail as an alternative solution because it is not satisfied that the joint will comply with certain clauses of the Building Code².

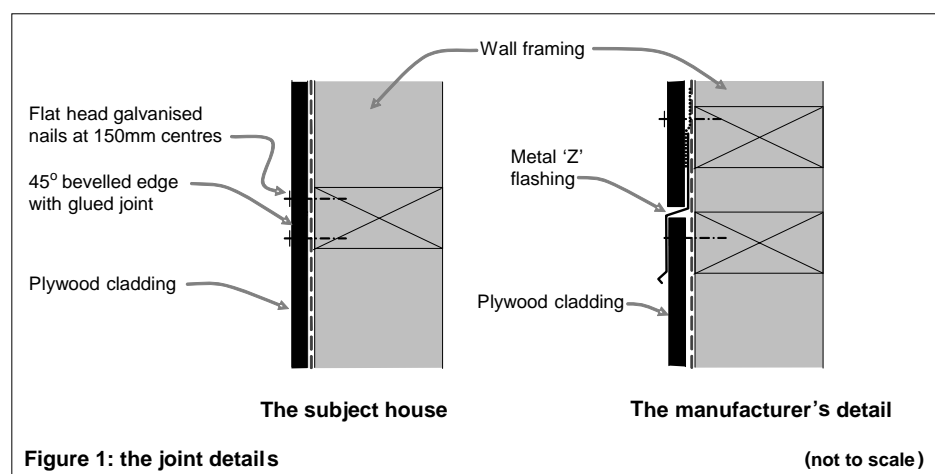
- 1.5 The matter to be determined³ is therefore whether the plywood cladding joint detail as constructed in the subject house complies with Clause E2 External Moisture and Clause B2 Durability of the Building Code (First Schedule, Building Regulations 1992).
- 1.6 In making my decision, I have considered the applicant's submission, the report of the expert commissioned by the Department to advise on this dispute ("the expert"), and the other evidence in this matter.

2. The building work

- 2.1 The building work considered in this determination consists of the horizontal joint to the plywood cladding on the walls of an existing single-storey house situated on a level site. The house is assessed as having a low weathertightness risk.
- 2.2 Construction is conventional light timber frame, with pile foundations, direct-fixed plywood cladding, aluminium joinery, and profiled metal gable roofing with roof projections of more than 600mm overall. The wall cladding is H3.1 treated 12mm thick plywood, with 9mm wide x 5mm deep grooves at 150mm centres.

2.3 The joint detail

- 2.3.1 The joint detail is to the horizontal joint in the gable-end walls of the subject house. The plywood sheet edges are bevel-cut on site and edges are treated and primed. When the upper sheet is installed, glue is applied to both surfaces of the cut edges.
- 2.3.2 Based on the builder's sketches and the expert's description, the joint detail to the subject house and the applicable manufacturer's detail at the time appear to be as shown in Figure 1:



² In this determination, unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

³ Under section 177(1)(a)

3. Background

3.1 The builder is also the builder of other houses with similar cladding details. In about 1999, the manufacturer apparently agreed on a proposed alternative detail for horizontal joints and a letter of confirmation was provided to the authority.

3.2 In 2004, the authority required a review of the detail and the builder approached the manufacturer. In a letter to the builder dated 5 May 2004, the manufacturer stated:

We have had an engineer look at the details you have provided to [the manufacturer] in relation to joining [the plywood] sheets on site.

Their assessment based on the information provided is that details appear to be sound and based on good building practice.

We have no immediate concerns about this particular detail.

However, on-site workmanship is a key element to this detail being successful. We have no influence over this, therefore this remains [the builder's] and your local building inspector's responsibility to monitor each instance it is used.

3.3 The builder continued to use the joint detail:

...on the clear understanding between ourselves and the council that the key element was the workmanship on the job. This was to be inspected by the building inspectors and form part of the Code of Compliance. The Council continued to accept this detail as an alternative solution and granted permits on that basis.

3.4 Building consents were issued, with the joint detail included in specifications; and code compliance certificates were issued for about 40 completed houses. From mid-2008, the builder's specifications reverted to the manufacturer's 'published detail'. There now appears to be some dispute between the parties regarding the compliance of the earlier joint detail, including for houses already completed.

3.5 On 2 May 2011, the Department received an initial application for a determination, the validity of which was queried by the authority as the builder did not qualify as a party under the Act. The application was not accepted until 17 June 2011, when the builder elected to refer the application to a show home owned by the builder which was constructed in 2007 under building consent No. ABA 2007/191.

4. The submissions

4.1 In his initial submission dated 28 April 2011, the builder outlined the background to the current situation. Subsequent emails in response to queries clarified the following points in regard to the builder's position (in summary):

- The joint detail was prepared as 'an acceptable alternative solution' (sic), which was approved by the manufacturer in 1999 and 2004, on condition that the as-built detail should be inspected and approved by the authority.
- The joint detail formed part of the specifications for houses consented up until 2008, and was accepted and approved when building consents were issued. As consent documents form 'the accepted details', these must include any such alternative solutions within those documents.

- About 40 houses have been built using the joint detail and have received code compliance certificates. However, the authority and the manufacturer 'have now tried to distance themselves' from acceptance of the detail at that time.

4.2 The builder provided copies of:

- the manufacturer's letter dated 5 May 2004
- a specification extract, including a sketch detail of the joint
- some emails to the authority and the manufacturer.

4.3 In an email to the Department dated 9 May 2011, the authority stated that it would delay its response to the application until the parties were resolved. I received no further submission from the authority.

4.4 A draft determination was issued to the parties for comment on 18 November 2011.

4.5 The applicant responded on 24 November 2011, accepting the draft but noting that the detail was no longer used by the builder and that, with the exception of one house, all of the houses constructed by the builder using the detail received code compliance certificates.

4.6 The manufacturer responded to the draft determination in a letter dated 12 December 2011. The manufacturer noted that

- it was not clear whether the letter written by the manufacturer in 2004 referred to the joint detail in dispute
- the detailing for the joint does not describe treating and priming edges or how to apply adhesive
- the adhesives used in this instance are, in the manufacturer's opinion, unsuitable for an external situation
- the detail was dependant on onsite workmanship which was key to performance.

4.7 The authority accepted the draft without comment in a response received on 19 December 2011.

4.8 I have taken account of the submissions received and have amended the determination as I consider to be appropriate.

5. The expert's report

5.1 As discussed in paragraph 1.6, I engaged an independent expert to provide an assessment of the condition of the joint detail on the subject house. The expert is a member of the New Zealand Institute of Building Surveyors, and visited the house on 4 November 2011, providing a report on 10 November 2011.

5.2 The joint detail

5.2.1 The expert noted that the plywood cladding is painted with a dark colour and has been well maintained. The direct-fixed cladding includes the joint detail for the horizontal joint under the verge projections on the northwest elevation.

5.2.2 In regard to the joint detail as constructed, the expert noted the following:

- Sheets are nailed with 40mm flathead nails at 150mm centres and overlap at a 45° saw cut, which is bonded with water-resistant adhesive. According to the builder, all cut edges are treated with site-applied timber preservative and excess glue is removed with a knife once it is set.
- Close scrutiny reveals that the joint has been ‘well executed’, with ‘no signs of failure or premature deterioration’. The joint is a tight fit and has been nailed at 150mm centres. Glue residue visible within the grooves indicates that adhesive had been ‘generously applied’
- The success of the detail relies heavily on workmanship, which needs to be closely monitored to ensure the joint is executed correctly.
- Comprehensive invasive moisture readings were taken, which indicated that the joint is performing satisfactorily and moisture is not entering the framing.

5.2.3 The expert concluded that the joint was performing satisfactorily and, given ‘routine maintenance’, should continue to do so.

5.3 A copy of the expert’s report was provided to the parties on 11 November 2011.

6. Discussion

6.1 An Acceptable Solution is a prescriptive design solution that provides only one way of complying with the Building Code. The joint detail does not comply with E2/AS1 and with the manufacturer’s instructions at the time of construction; and must therefore be considered as an alternative solution, entailing an assessment of the joint’s performance within the context of this particular house.

6.2 In this instance the weathertightness of the joint detail is dependent on the features in this house that protect the joint from the weather, features included in the joint detail, the workmanship of the installed joint and the likelihood of failure on the underlying construction. These features can be considered on their merits and independently of the joint detail as a general jointing system.

6.3 Taking account of the expert’s report, I make the following observations on the joint detail as installed in this particular house:

- The jointing system appears to have been approved in principal by the manufacturer in 2004 and it was accepted by the authority until some time after the builder reverted to the manufacturer’s standard detail in 2008.
- The joint in this particular house:
 - was installed using good workmanship
 - was inspected and approved by the authority at the time of construction

- is sheltered by a generous roof overhang, limiting exposure to rain and direct sunlight
 - has been well maintained and after four years there is no sign of deterioration or movement despite the dark colour and orientation.
- 6.4 Taking account of the above, I am satisfied that the joint detail as installed to this particular house is satisfactory in the circumstances and that the joint complies with Clauses B2 and E2 of the Building Code.
- 6.5 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that this joint detail has been established as being code-compliant in this particular house, does not of itself mean that the same joint detail will be code-compliant in other situations.
- 6.6 I am of the view, in general, that a manufacturer's advice and agreement should be sought before altering a recommended detail or product. I note that the builder has advised that he ceased using this joint detail in 2008.

7. The decision

- 7.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the plywood cladding joint detail as constructed in the subject house built under building consent ABA 2007/191 complies with Building Code Clauses B2 and E2.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 20 December 2011.

John Gardiner
Manager Determinations