

AP DESIGN

PO Box 281
Christchurch 8140
Ph: (03)942 1977
admin@apdesign.co.nz



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To whom it may concern,

The following statement has been prepared to demonstrate compliance with the Building Code through the comparison with other compliance practices, comparison with products previously accepted by Building Consent Authorities, in-service history, and expert evidence.

Vertical Weatherboard - An Alternative Solution

Vertical weatherboards or shiplap has seen an increase in popularity over the last 10 years and the specification of vertical weatherboards has highlighted a gap in the Acceptable Solution E2/AS1. While vertical weatherboards have been more popular over this time period the need for good weathertightness detailing, and thermal performance has also been at the forefront of a designers cladding selection process.

The gap in E2/AS2 is simply clause *9.4.1.2 Vertical weatherboards* which states: "This Acceptable Solution E2/AS1 is limited to the use of direct fixed vertical weatherboards in risk categories as shown in Table 3." This effectively limits the use of vertical weatherboards or shiplap to the any design with a risk factor of 6 or less. The industry is very aware that 20mm cavity construction has now been accepted as the norm, and anything less will expose all parties to undo risk, however the Acceptable Solution does not provide a compliance pathway for vertical weatherboards over a cavity.

Simply specifying a 20mm castellated cavity batten does not in and of itself resolve the issues for vertical weatherboards and E2/AS1. The Acceptable Solution has not considered the impact that dwangs will have on the thermal performance of the wall. The vertical weatherboard can be installed over a castellated cavity and fixed with longer nails back to the dwangs but then the designer will need to show how the building now meets or exceeds the thermal performance as required by Acceptable Solution H1/AS1. Therefore AP Design would always recommend that vertical weatherboards be specified over a 40mm castellated cavity batten to increase weathertightness resilience, and thermal performance.

The Building Code provides a compliance pathway through the use of an Alternative Solution whenever the design deviates completely or partially from the Acceptable Solution. The team at AP Design have completed numerous projects utilising a castellated structural cavity batten up and down the country without concern or failure. They have all be accepted by the respective building consent authority.

The specification of vertical shiplap over a 40x40mm horizontal castellated cavity batten is in accordance with Building Code E2/AS1 compliance path. The variation from the compliance path relates to the following code clauses:

9.4.1.1 – Weatherboard profiles. The HT51 shiplap profile produced by Health Based Building directly matches *figure 5* from NZS 3617 for board width, board cover, lap width, warp control, and weather groove. The variation is only for an increase in the board thickness from 19mm to 21mm, and this is to provide more stability.

9.4.1.2 – Vertical weatherboards. Health Based Building has engaged a structural engineer to provide an assessment on the 40x40mm horizontal castellated cavity batten. A Structural Engineer's design statement has been completed covering off the batten design and batten fixing. The statement supports wind zones up to and including Extra High wind zones. The fixing type and capacity has been included in the table below. The capacity of the fixings can be cross referenced to Table 2.2 of NZS3604.

Wind Zone	Fixing type and capacity
Very High Wind Zone or Less	1 / 90 x 3.15 nail or 0.55kN capacity equivalent (screws)
Extra High Wind Zone	2 / 90 x 3.15 nail or 0.80kN capacity equivalent (screws)

9.4.4.3 – Fixings. The primary fixing for the HT51 profile directly matches Table 24 of E2/AS1. The primary fixing is a single face fixed silicon bronze rose head 65x3.25 annular grooved, fixed off 40mm from the edge of the board.

The variation which has been introduced to the market by Herman Pacific with BRANZ and Code Mark support, and similarly adopted by Health Based Building as best practice, is an under the lap clinch nail. Health Based Building include in their specification an under lap fixing for vertical shiplap to ensure best practice in reducing movement, gaps, and cupping of the boards over time. The fixing to be used is a 50x2mm stainless steel clinch nail supplied by Herman Pacific. Refer to BRANZ appraisal 650, and CodeMark 30036.

Just briefly I would like to comment that the durability of the HT51 cladding system is not in question, and meets the compliance requirements of B2/AS1.

The cavity battens are H3.2 treated Pinus Radiata, and the batten fixings are stainless steel in compliance with Table 21 and 22 of E2/AS1. The HT51 shiplap stock is either H3.2 treated Pinus Radiata, or New Zealand Beech and both comply with NZS3602. The fixings are either stainless steel when used with H3.2 treated Pinus Radiata or Silicon Bronze when used with NZ Beech, in accordance with Table 21 and 22 of E2/AS1.

If there are any questions please contact me to discuss the matter.

Kind Regards,



Adam Cooper
Associate – LBP Design 2
AP Design Limited
021 229 4426
adam@apdesign.co.nz