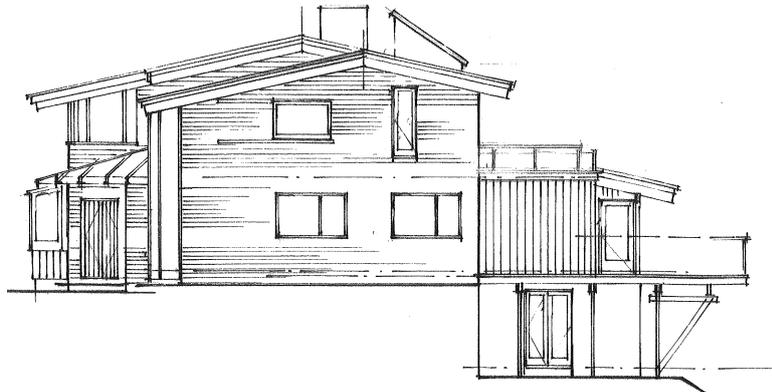




Determination 2009/95

Adequacy of documentation in support of a building consent application for a house at 707 Waikino Road, Kawakawa



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. The applicants are the owners, Mr and Mrs Campbell (“the applicants”), acting through the architect for the house (“the architect”) and the other party is the Far North District Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.2 The application arises from the decision by the authority to refuse to grant a building consent for the construction of a proposed house because it was not satisfied that it complied with certain clauses of the Building Code (Schedule 1, Building Regulations 1992).
- 1.3 Therefore the matter for determination² is whether the authority was correct in declining to issue the building consent based on the documentation that had been

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

² In terms of sections 177(b)(i) and 177(a) of the Act. 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.

supplied in the application. In order to determine this I must consider the following matters:

1.3.1 Matter 1: The external envelope

Whether the external envelope as proposed for the house (“the external envelope”) complies with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The external envelope includes the wall and roof claddings, the windows, the decks and the retaining walls, their configuration, components and junctions with other building elements.

1.3.2 Matter 2: Surface water disposal

Whether the proposed disposal of surface water, including drainage from the retaining walls, complies with Clauses E1 Surface Water, and E2 External moisture of the Building Code.

1.3.3 Matter 3: The reinforced brick masonry walls

Whether the proposed reinforced brick masonry walls to the house comply with Clause B1 Structure of the Building Code, taking into account the polystyrene insulation within the wall.

1.3.4 Matter 4: The insulation

Whether the proposed exterior envelope of the house complies with Clause H1 Energy Efficiency of the Building Code.

1.3.5 Matter 5: The documentation

Whether, other than in respect of the specific matters identified above, the supporting documentation supplied with the consent application was adequate.

1.4 In making my decision, I have considered the submissions from the parties, the report of the peer reviewer engaged by the architect, the report of the expert commissioned by the Department to review the drawings and to advise on this dispute (“the expert”), and the other evidence in this matter.

2. The building work

2.1 The proposed building work consists of a large house, with a partial basement, situated on a coastal site that is presumed to be in a high wind zone and within a sea spray zone for the purposes of NZS 3604³. The split-level house is long and narrow in plan and sits along the top of a steep north-facing slope to the shore of a tidal river.

2.2 The general design

2.2.1 The proposed house is fairly complex in plan and form, with 15° pitch gabled roofs set at varying levels. The eastern half of the building has an upper level floor (“the master bedroom area”), with a lean-to roof against part of the upper north wall and a small basement area beneath the lean-to. The basement then extends the full width of the building beneath the western end of the upper floor area, resulting in a height of three-storeys for that section. The remaining western half is two-storeys high.

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- 2.2.2 Apart from several areas above bay and corner windows, eaves projections are more than 1m overall, with verge projections at about 300 mm. The windows are a mix of timber and aluminium; and are generally unconventional in design, including sliding windows, bay windows and conservatory-style glazing.

2.3 The construction

- 2.3.1 The proposed construction is a combination of conventional light timber frame and specifically engineered elements, with concrete floor slabs and foundations, concrete block basement and retaining walls, suspended concrete floors to the ground floor, timber-framed floor to the partial second floor and a profiled metal roof. The main structural walls are generally reinforced brick masonry (“RBM”), with timber framing used for the upper level walls and the eastern end of the north elevation.
- 2.3.2 Most of the exterior walls are shown as RBM and appear to consist of a double-skin of 70mm clay bricks filled with a 100mm thick reinforced concrete core. For the exterior RBM walls, a layer of 20mm polystyrene is to be installed to the inner face of the outer skin of brickwork, making the overall thickness approximately 260mm thick overall. The structural drawings note that brick ties connect the outer brick to the concrete core.
- 2.3.3 The exterior walls to the upper level master bedroom area and the eastern end of the north elevation are timber-framed. The drawings provided to the authority in support of the consent application specify claddings to the timber framed walls variously as ‘vertical shiplap’ or 12mm treated plywood, with tongue-in-groove joints between sheets and decorative 50mm timber battens at 300mm centres to give the appearance of board and batten cladding.

2.4 The decks

- 2.4.1 A series of open timber decks, set at varying levels and linked with timber steps, extend along the north and west elevations, continuing around to the western end of the south elevation. Most of the northern decks are above the basement walls and are supported from diagonal struts back to the exterior wall. Balustrades are noted as a proprietary metal-framed glazed system.
- 2.4.2 An enclosed deck, with a tiled membrane floor and glazed balustrades, extends from the upper level master bedroom and is set into the lower lean-to roof.

3. Background

- 3.1 On behalf of the applicant, the architect lodged an application for a building consent for the building work (No. BC-2009-1237/0) on 3 April 2009.
- 3.2 In a letter to the architect dated 4 May 2009, the authority acknowledged the application and provided a list of 21 areas where further information was required. These areas included (in summary):
- window sizes and lintels
 - wall and roof bracing details and calculations

- cladding clearances and inadequate width of battens to wall cladding
- details of showers, including waterproofing/tiling, adhesive details
- treatment of timber decking
- calculations for H1
- smoke alarm locations
- restrictors to windows less than 760mm from floor
- details of surface water soakage, including discharge from behind retaining walls
- information on RBM as an alternative solution
- engineer to approve all relevant drawings
- inappropriate liquid-applied ‘tanking’ to retaining walls
- additional information required on floor plans
- peer reviews required for architectural and structural drawings.

3.3 The architectural peer review

3.3.1 The architect arranged for a peer review of the design drawings and specification supporting the building consent application by a ‘research architect’ (“the reviewer”). The reviewer provided a report to the authority dated 16 May 2009 that attached details of his professional credentials.

3.3.2 The reviewer covered those areas raised by the authority that related to weathertightness and concluded (in summary):

- In his view the 50 x 25 cedar battens over the vertical plywood joints meet E2 requirements
- The bottom edges of the plywood cladding are free-draining and not in contact with any wet surface, with detailing meeting E2 requirements.
- RBM can be compared to solid-filled concrete block and has been used since the 1970’s, with no known weathertightness problems. A waterproofing agent will be used in the concrete core to protect the reinforcing steel from corrosion.
- The liquid-applied waterproofing is only used to retaining walls that are completely covered by the main floor slab of the house and will not be subject to moisture from rain. It will be therefore adequate for these circumstances.

3.3.3 With reference to the requirement for a peer review, the reviewer concluded that:

The only possibly valid grounds for requesting any “peer review” is on the compliance of the RBM walls with E2 and H1. The whole building, as documented, clearly complies with all the performance requirements of Clause E2 of the NZBC. More specifically, the RBM walls, as an “alternative solution”, quite evidently fully comply with the E2 performance requirements of the NZBC.

3.4 Under cover of a letter to the authority dated 22 May 2009, the architect provided a drawing showing proposed surface water soakage, a window schedule, an engineer’s

statement on the wall and roof bracing, a calculation of the thermal insulation values for the house, and various other information. The architect also commented on the other items raised by the authority.

3.5 The authority responded in a letter to the architect dated 2 June 2009; and did not accept the following items (in summary):

- the width of battens to the plywood cladding
- the unclear details showing cladding clearances
- the assessment of the RBM system, including the submitted H1 calculations
- the liquid-applied ‘tanking’ to the retaining wall
- the lack of a producer statement from the E2 peer reviewer
- the lack of a peer review of the H1 calculations
- the need for producer statements from all waterproofing applicators
- the lack of window restrictors
- the lack of detail on the site plan of discharge from retaining walls.

3.6 I note that the architect subsequently specified the window restrictors and has changed the plywood cladding to shiplap avoid the need for joint battens.

3.7 Despite further detailed explanations in discussions, correspondence and a meeting between the architect and the authority, the remaining issues remained unresolved and the Department received an application for a determination on 17 June 2009.

4. The submissions

4.1 The architect provided a detailed submission that outlined the background to the situation, described the construction of the house, and stated that he believed that the original drawings supplied in support of the building consent application provided enough information to show compliance with Clause E2. The architect believed that many of the authority’s concerns regarding the adequacy of the details in the drawings and the weathertightness and thermal insulation of the RBM walls were ‘inappropriate and unnecessary’, noting that he had designed RBM houses since 1975, and his details had been developed and adapted successfully over the past 40 years.

4.2 The applicants forwarded copies of:

- the consent application drawings and specification
- the correspondence with the authority
- the architectural peer review dated 16 May 2009
- various other statements, photographs and information.

4.3 The authority made a submission in a letter to the Department dated 8 July 2009, which outlined the background to the dispute and the areas of concern, and noted that additional information and clarification was needed to support the various alternative solutions in order to be:

...satisfied on reasonable grounds with the provisions, objective, function, performance criteria of the NZBC E2 External Moisture, E1 Surface Water, B1 Structure, B2 Durability and H1 Energy Efficiency.

5. The expert's report

5.1 As mentioned in paragraph 1.4, I engaged an independent expert to review the documents provided in support of the consent application ("the original documents") and provide an assessment of the adequacy of the drawings for consent purposes. The expert is a registered architect and a member of the New Zealand Institute of Architects. The expert reviewed the drawings and provided a report dated 31 July 2009.

5.2 Compliance requirements

5.2.1 The expert noted that his review of the drawings was limited to compliance with Clauses E2 and B2, which he interpreted as whether the authority could 'be satisfied, on reasonable grounds, that the provisions of Clauses E2 and B2 would be met if the building work were properly built in accordance with the plans and specifications submitted'.

5.2.2 The expert described the means by which an authority can be satisfied and explained that his review of the documents had taken the following into account:

- the credentials of the designer and builder (if known)
- achievement of the stated means of compliance
- the completeness or certainty of information
- any errors, conflicts and/or omissions apparent in the documentation.

5.2.3 As no specific builder is identified in the documentation, the expert assumed that the builder is expected to be a 'competent residential house builder'. The documents should therefore provide 'instruction and certainty' on those areas of the building that are specifically designed elements or alternative solutions, with fewer details necessary for areas that a builder can be expected to be familiar with.

5.2.4 The expert noted that the documents specified compliance with B2/AS1, E2/AS1, and various standards as means of compliance with Clauses B2 and E2. This requires the provision of certain information that appeared to be missing, including:

- the risk matrix assessment for the building
- the wind and corrosion zone for the site
- the bracing calculations and locations of bracing elements
- a clear definition of which elements are specifically designed, and how these comply with the requirements of Clause E2.

5.3 The expert provided some notable examples of weathertightness-related issues, rather than an exhaustive list. As examples, the expert noted that:

Fasteners

- there are no specific references to the materials required for fasteners
- in the concrete section of the specification, bolts are incorrectly nominated as galvanised, where stainless steel would be required in the sea spray zone

The cladding to the timber framed walls

- the drawings note the cladding to the timber-framed walls as ‘shiplap’ or ‘ply and battens’, while the specification refers to a ‘cavity batten system’, although the drawings do not show or detail a drained cavity
- the elevations do not clearly show the varying claddings
- it is unclear what cladding system is intended for the timber-framed walls, or how it will be constructed and finished to comply with the code

The flashings

- the roof design incorporates apron flashings, ridge flashings and barge flashings, which are generally neither dimensioned nor annotated
- where flashings are dimensioned, they do not comply with E2/AS1
- some dimensions depend on the unidentified wind zone of the building

The windows

- the drawings do not clearly show which windows are timber and which are aluminium
- the timber joinery appears to be dry-glazed to the architect’s specific design, but it is not clear how the timber joinery is fabricated, fixed, flashed and finished
- it is unclear whether the aluminium sash sections are specifically designed or a proprietary product, and it is not clear how the aluminium joinery is fabricated, fixed, flashed and finished

5.4 The expert also made the following general comments on the documentation:

- The above examples do not cover all the errors, omissions, conflicts, lack of information and uncertainty regarding design intentions and construction requirements.
- There appears to be an unrealistic reliance on the builder’s judgement in regard to code compliance matters.
- There are too many basic decisions that would need to be made on site, requiring additional construction information and details that would also need the authority’s assessment.

5.5 The expert concluded that there ‘is inadequate information contained within the submitted documents to satisfy the requirements of s49 of the Building Act’ and the authority was therefore, in his view, ‘correct in refusing to issue a building consent

on the grounds that the house may not comply with Clauses B2 and E2 of the building code’.

5.6 A copy of the expert’s report was provided to the parties on 3 August 2009.

5.7 The architect’s response to the expert’s report

5.7.1 The architect responded to the expert’s report in a letter to the Department dated 14 August 2009, which addressed some issues raised in the report and attached the following:

- details of the aluminium joinery and specification of the proprietary profiles
- additional details of the timber windows
- a weathertightness risk assessment (“the risk matrix”) for the house
- a statement from the engineer clarifying bracing elements
- other revised sheets of details.

6. The draft determination

6.1 The draft determination was issued to the parties for comment on 24 August 2009. The authority accepted the draft saying it had received limited information and invited ‘the applicant to a meeting ... to ensure all further technical information that is required to be supplied is clearly understood by the [architect]’.

6.2 The architect responded to the draft determination in a fax to the Department dated 16 September 2009. The architect detailed his response to the technical matters raised in the determination including proposed changes to the consent documentation. In summary architect noted that:

- engineering producer statements would be supplied for the RBM walls, foundation footings, and structural work
- errors in the insulation calculations have been rectified
- cladding to the timber walls was confirmed as shiplap
- the risk matrix has been revised
- the windows were now all to be aluminium
- the errors, cross-referencing, and labelling in the consent documentation have been rectified and other matters clarified.

The architect also pointed out errors in the draft determination. I have amended the determination accordingly.

6.3 Subsequent to the issue of the draft determination, additional revised details were submitted by the architect to the authority. The parties could not reach agreement on some of the details and these were submitted to the Department for comment. I note that the majority of the items that required attention at the time the draft determination was issued have been satisfactorily resolved. The remaining matters

are of a minor nature which in my opinion are matters that can be settled by the applicant and the authority as a normal part of the consenting process.

Matter 1: The building envelope

7. Weathertightness

7.1 Weathertightness of the plywood exterior walls

7.1.1 The authority had concerns regarding the weathertightness of the proposed plywood exterior walls specified in the original documents, given the size of the battens over the plywood joints. The architect subsequently proposed to change the type of plywood to that incorporates a tongue-in-groove joint, with the battens used as a decorative element to provide the appearance of board and batten cladding.

7.1.2 Providing tongue-in-groove jointed plywood is included in the documentation, I consider that the 50mm width of the battens will be adequate in these circumstances.

7.2 Weathertightness of the RBM exterior walls

7.2.1 The authority has concerns regarding the weathertightness of the proposed reinforced brick masonry exterior walls, given the addition of a layer of polystyrene against the outer brick layer. The architect maintains that the polystyrene will assist in limiting moisture from migrating into the concrete core and the concrete is also intended to have a specified waterproofing agent added to provide additional protection for the reinforcing steel.

7.2.2 I note that the proposed eaves projections to this house are generally greater than one metre overall, which will limit the amount of rainwater falling onto the brick. Providing the proposed waterproofing additive is clearly specified, I consider that the durability of the reinforcing in the concrete core will be protected and the weathertightness of the RBM exterior walls will be adequate in these circumstances.

7.3 Watertightness of the retaining walls

7.3.1 The authority has concerns regarding the possibility of water leaking through the proposed liquid-applied 'tanking' to the basement retaining walls. The architect maintains that this is not intended to be tanking, as the position of the retaining walls in relation to the floor slabs and to the original ground contours means that there will be no water pressure against the walls. The product is intended only to protect against water staining of the blocks when the area is open to weather during construction.

7.3.2 I have assessed the positions of the retaining walls in the basement areas and the ground contours, which fall away from the walls. Taking these into account, I accept that the proposed liquid-applied waterproofing will not be exposed to general ground moisture and will therefore be adequate in the circumstances.

7.4 I have assessed the adequacy of the documentation in regard to weathertightness of the remaining building elements in paragraph 11.2.

Matter 2: Surface water disposal

8. Discussion

- 8.1 The authority had concerns about the lack of detail in the original application documents regarding surface water disposal. I note that the architect subsequently provided a site plan showing surface water disposal and the authority appears to have limited its concerns to the disposal of discharge water from the retaining walls.
- 8.2 As outlined in paragraph 7.3.1, the architect maintains that the position of the retaining walls in relation to the floor slabs and to the original ground contours means that the walls are protected from ground water accumulation. There will therefore be a negligible quantity of water to be drained from behind these walls and no special provisions for disposal are needed.
- 8.3 I have assessed the positions of the retaining walls in the basement areas and the ground contours, which fall away from the walls. Taking these into account, I accept that the lack of disposal provision is adequate in these circumstances.

Matter 3: The reinforced brick masonry walls

9. Discussion

- 9.1 The authority has concerns about the lack of information regarding structural aspects of the reinforced brick masonry walls, despite the structural information included in the documentation, and has requested that a peer review of the structural engineering be undertaken.
- 9.2 I accept that RBM construction has been used for more than 30 years. I consider that, while the walls in question are specifically designed structural elements, RBM cannot be described as a particularly unusual form of construction, but rather one that can be compared with concrete masonry construction. I am therefore of the opinion that a peer review of the structural aspects is not justified.
- 9.3 Providing various shortcomings in the documentation are rectified and the structural engineer provides a “Producer Statement – Design” for the specifically engineered elements of the building, I consider that the reinforced brick masonry walls will comply with Clause B1.
- 9.4 I also consider that the specifically engineered elements of the building need to be observed by the structural engineer during construction, with a ‘Producer Statement – Construction Review’ to be provided on completion
- 9.5 I have assessed the adequacy of the documentation in regard to the structure in paragraph 11.3.

Matter 4: The insulation

10. Discussion

- 10.1 The authority has concerns about the compliance of the proposed building with Clause H1, and did not accept the calculations submitted for the design in the original documents.
- 10.2 The submitted calculations for the building envelope have been checked and I consider that the method used was incorrect. Despite this, when the correct method is used, the result indicates that building envelope will comply with Clause H1.
- 10.3 Providing the shortcomings in the documentation are rectified and the thermal insulation compliance assessment is recalculated using the correct method, I consider that the proposed building work will comply with Clause H1.

Matter 5: The documentation

11. Discussion

11.1 The legislation

- 11.1.1 In regard to the documentation, the relevant section of the Act is:

45 How to apply for building consent

- (1) An application for a building consent must-
- a) be in the prescribed form; and
 - b) be accompanied by plans and specifications that are-
 - (i) required by regulations made under section 402; or
 - (ii) if the regulations do not so require, required by a building consent authority; and
 - c) contain or be accompanied by any other information that the building consent authority reasonably requires...

- 11.1.2 The authority considers that the documentation supplied in support of the consent application was not sufficient to allow it to be satisfied, on reasonable grounds, that the building would comply with the Building Code if built in accordance with the plans and specifications submitted.

11.2 Weathertightness documentation

- 11.2.1 The architect submitted an extensive set of drawings for this house. However, taking account of the expert's report, I conclude that the documentation for weathertightness is inadequate in a number of areas, including (but not limited to):
- the lack of detail and confusion regarding:
 - the cladding system to the timber framed walls
 - the flashings

- the windows
- the lack of clear definition and information regarding:
 - the weathertightness risk (risk matrix)
 - the wind and corrosion zone for the site
 - clear definition of which elements are specific design, and how these comply with the requirements of Clause E2
- the lack of general clarity and errors regarding:
 - clear labelling of spaces, materials etc to plans, elevations and sections
 - cross references in a number of drawings
 - various other errors, omission, conflicts, lack of information and uncertainty as to design intentions and construction requirements.

11.3 Structural documentation

11.3.1 Taking into account the expert's report, I consider that the following areas in the documentation require further information and clarification:

- the lack of bracing calculations and clear identification of extent and position of the bracing elements in the timber-framed areas
- the lack of clear information on the brick ties to the reinforced concrete core of the RBM exterior walls (the structural drawings refer to the architectural drawings, which do cover this)
- the lack of cross referencing and conflicts between the architectural and structural drawings (for example, the dimensions of RBM walls)
- the provision by the engineer of a 'Producer Statement – Design' to cover all of the specifically engineered elements of the building
- confirmation that the specifically engineered elements of the building will be observed by the structural engineer during construction, with a 'Producer Statement – Construction Review' to be provided on completion.

11.4 Conclusion

11.4.1 After examination of the documentation together with the expert's report I consider that the documentation provided to the authority in support of the building application is inadequate in regard to demonstrating the compliance of the proposed building with the Building Code in a number of respects.

11.4.2 As referred to in paragraph 11.1.1, the Act allows the authority to set reasonable requirements for the documentation that accompanies applications for building consents. The authority is entitled to set minimum requirements to ensure that the proposed building work is clearly documented and to require the applicant to clearly demonstrate and document how compliance is to be achieved for those areas it considers are unclear.

- 11.4.3 Until the shortcomings in the documentation are satisfactorily resolved, the authority is entitled to refuse to issue a building consent on the basis that, without adequate documentation, it cannot be satisfied on reasonable grounds that the provisions of the Building Code will be met if the proposed building work is completed in accordance with the plans and specifications that accompanied the application for the consent (see section 49 of the Act).
- 11.4.4 Additional and revised details subsequently provided can be resolved between the authority and the architect.

12. The decision

- 12.1 In accordance with section 188 of the Act, I hereby determine that the authority's decision to refuse to issue a building consent was correct based on inadequate information supplied to the authority with the building consent application to establish that:
- the proposed external envelope would comply with Building Code Clauses B2 and E2
 - the proposed reinforced brick masonry walls would comply with Building Code Clauses B1
 - the proposed exterior envelope of the house would comply with Building Code Clause H1
- 12.2 I find that there was adequate information supplied to the authority with the building consent application to establish that the surface water disposal complies with Building Code Clause E1.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 30 October 2009.

John Gardiner
Manager Determinations