Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2010/122

Determination regarding a notice to fix for remedial work and alterations to a house at 17 Doncaster Terrace, Porirua

1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("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

1.2.1 The parties to this determination are:

- the owners R and V Ives ("the applicants"), acting via a consultant ("the consultant"),
- the Porirua City Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.

1.2.2 I consider that the following are persons with an interest in this matter:

- Home Survey Ltd ("the project manager")
- Pipitea Building Solutions Ltd ("the builder")

[1] The Building Act 2004 is available from the Department's website at www.dbh.govt.nz.

1.3 This determination arises from the decision of the authority to issue three identical notices to fix for new re-cladding and alterations to a house because it was not satisfied that the building work complied with certain clauses[2] of the Building Code (Schedule 1, Building Regulations 1992). The authority's primary concerns about the compliance of the building work relate to the lack of inspections of certain elements during construction.

1.4 The matter to be determined[3] is therefore whether the authority was correct to issue the identical notices to fix ("the notice to fix"). In deciding this, I must consider:

1.4.1 Matter 1: The external envelope

Whether the external claddings to the house ("the claddings") comply with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The claddings include the components of the systems (such as the weatherboards, the windows, the roof cladding and the flashings), as well as the way the components have been installed and work together. (I consider this in paragraph 6.)

1.4.2 Matter 2: Structural requirements

Whether the building work complies with Clause B1 Structure and Clause B2 Durability of the Building Code, taking into account the inspections of the building work which were carried out. (I consider this in paragraph 7.)

1.5 I note that the notice to fix identifies various other items that appear to be in the process of being resolved between the parties. This determination is therefore limited to the matters described above.

1.6 In making my decision, I have considered:

- the submissions of the parties
- the report on the notice to fix by the applicants' building consultant ("the consultant") – see paragraph 3.7
- the report of the expert commissioned by the Department to advise on this dispute ("the expert")
- the photographs taken during construction – see paragraph 3.4.5
- the other evidence in this matter.

2. The building work

2.1 The building work consists of the re-cladding, re-roofing and alterations to a two-storey house in a wind zone requiring specific design for the purposes of NZS 3604[4]. The site is level along the front northeast elevation, with a gentle slope towards the rear. Construction is generally conventional light timber frame with some specifically engineered elements, and has a concrete floor slab to the front and pile foundations to the rear.

[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(b)(iii) of the Act
[4] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

2.2 The original house

2.2.1 The original house was completed in the early 2000's and had two bedrooms and a garage in the ground floor, with the master bedroom and living areas in the upper floor. The house had monolithic cladding, with the exterior walls extended to form roof parapets. The house was complex in plan and form, with an enclosed upper deck, projecting 'bays' on the southwest, southeast and northeast walls and three small flat-roofed canopies above upper level doors and windows.

2.2.2 The enclosed deck had monolithic-clad balustrades and extended around the west corner, supported on monolithic-clad columns on the southwest elevation and situated above ground floor bedrooms on the northwest elevation. On the south corner, the ground floor walls were recessed beneath the master bedroom, with the upper walls supported on monolithic-clad columns.

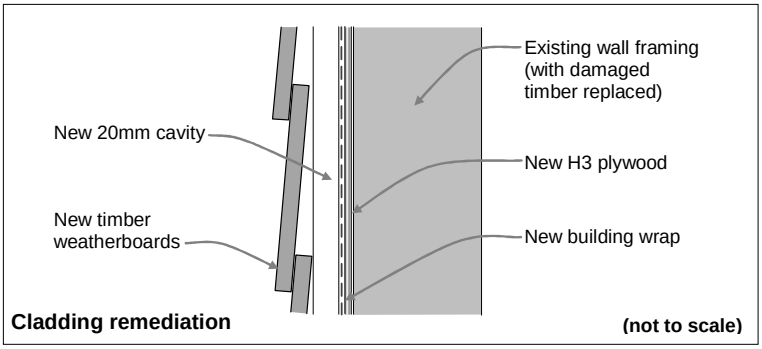
2.3 The altered house

2.3.1 The altered house has timber weatherboard wall cladding, profiled metal roofing and re-used aluminium windows. The upper level canopies and all of the original roof, roof framing and parapets have been removed and replaced with a new trussed roof. The new 20^{o} pitch hipped roof has 600mm eaves, except above the projecting bay to the southeast wall.

2.3.2 The alterations included the addition of a ground floor bedroom to infill the recessed south corner and an extension of the upper level lounge to replace the deck area that was originally above the bedrooms. The remaining upper deck area has been completely re-constructed, with a new membrane floor, new timber framing and posts, and timber balustrades.

2.4 The new cladding

2.4.1 The general construction of the re-clad exterior walls is shown in the following simplified sketch:



2.4.2 A sheathing of 7mm H3-treated plywood bracing covered with a layer of building wrap is fixed to the outside face of the original repaired wall framing. Bevel-backed timber weatherboards are fixed through timber battens, the building wrap and the plywood to the framing, with the battens forming a 20mm cavity between the cladding and the wrap. Timber facings and scribers are used at corners and around re-used windows and doors. The entry canopy columns have been re-clad in weatherboards.

3. Background

3.1 The original house was the subject of a WHRS[5] inspection and report, which apparently identified areas of decay and damage to the framing, much of which related to the parapets. The applicants elected to re-clad and alter the house; and engaged the project manager to manage the technical and consent aspects on their behalf, which included the documentation, building consent processes and undertaking quality assurance during construction to ensure code compliance.

3.2 The authority issued a building consent for the re-cladding work (No. BCA0589/08) on 4 April 2008. A subsequent amendment to the consent was approved on 8 July 2008 for the 'addition of lower floor bedroom to south corner of dwelling'.

3.3 The conditions attached to the original building consent contained a list of required inspections, which included inspections at pre-wrap, cavity, pre-clad, window wrap and flashing, and building pre-line stages. The consent also required an engineer to 'inspect the works covered by their design and provide a progressive inspection history and PS4 statement on completion of the works'.

3.4 The general repair process

3.4.1 According to the project manager, the builder met the authority on-site on 7 April 2008 to agree on the process to manage the remediation; which was to be undertaken progressively, with sections of cladding removed to identify and replace decayed timber, to add the required structural fixings and to install the plywood bracing.

3.4.2 According to the builder, the first section of framing exposed and remediated was at mid-floor level adjacent to the main entry, which was inspected and recorded on 11 April 2008. The criteria for the remedial work were apparently agreed and the remaining wall areas were completed to that level.

3.4.3 However, there are no records of any meetings or site visits by the authority during April or May 2008, although I note that email correspondence between the builder and the authority indicates at least one unrecorded meeting onsite on 23 May 2008 regarding the position of some doors.

3.4.4 Although the authority states that no pre-wrap inspections were carried out and there are no records of any inspections of the exposed framing; the builder claims that the authority's inspector:

> ...made visits at least once per week to inspect all exposed wall sections around the home as the existing wall cladding was removed to inspect the condition of the framing timber, to view areas where framing timber had been replaced, to check the application of timber preservative to existing framing and to check the installation of 25 x 1mm straps at bottom plates, window lintels and mid floor junction before they were concealed with the plywood cladding.

3.4.5 Photographs were taken during the construction, with some of these showing work in progress and some showing the completed work. Those photographs which are undated are assumed to have been taken in April 2008. The photographs show:

- severe decay in the original parapet framing (April 2008)

[5] Weathertight Homes Resolution Service

- new timber installed below the projecting bay beside the entry (April 2008)
- foundations, straps to repaired framing at bottom plates and mid-floor levels, and connections of new deck joists to repaired floor joists (April 2008)
- north view, showing wrap and battens in place to north corner and plywood to other walls and on new extension to living room (6 May 2008)
- decayed boundary joists to the ensuite/wardrobe bay, with plywood installed to the surrounding walls (19 May 2008)
- northeast elevation, with weatherboards and windows to north corner, wrap and battens to bay and ply elsewhere (19 and 22 May 2008)
- northeast elevation, with unfinished weatherboards and windows (6 June 2008)
- new roof trusses and ceiling framing, insulation, fixings (18 June 2008).

3.5 The inspection records

3.5.1 The first record, a 'PreClad' and 'Piles' inspection passed on 3 June 2008, noted:

- Building wrap in place
- [window flashing tape] in place
- Cavity battens in place
- Cavity closers in place
- Head & sill flashings in place
- Piles in place to extension & deck

3.5.2 The authority carried out a pre-line inspection on 28 August, which was recorded as a 'part pass'; with walls and ground floor ceiling 'ready to line' but roof insulation and air seals to windows incomplete. When the inspector returned, the pre-line inspection was not completed as the required consent documents were not onsite.

3.5.3 The engineer's first site inspection was on 10 November 2008 and the record ("SR 001") notes that 'much work is covered over or obscured' and pile holes had not been inspected. Various detail changes were identified, with implications on bracing and fixings subsequently considered.

3.5.4 The authority carried out a 'site visit only' on 19 November, and the meeting record notes the lack of a pre-wrap inspection and identified requirements for structural reports and 'detailed drawings and photos' of changes to head flashings.

3.5.5 The engineer inspected and commented on construction photos in a report dated 8 December 2008 ("SR 002"). Photographs had been taken prior to work being closed in; and showed post foundations, pile foundations, hold down straps to bottom plates and mid-floor levels, deck to floor joist fixings, and nailing of the plywood bracing. The engineer noted that:

> Foundations were not inspected before pouring concrete. No hold down fixings were inspected prior to cladding/lining. Nailing pattern to ply cladding was not inspected on site.

3.5.6 The authority carried out post-line inspections on 17 and 23 December 2008. The latter excluded the garage and the inspection is recorded as a 'pass':

> All plasterboard bracing elements appear to be fixed as per engineer's design & manufacturers spec.
>
> Plumbing in downstairs bathroom complete and water turned on – approved.

3.5.7 A site visit was made on 29 January 2009 to view air seals, and an architrave was removed from one window. A section of foam was also removed from the garage to view the backing rod, confirming 'on reasonable grounds, airseals are compliant'.

3.5.8 The engineer inspected the deck construction and the garage door portal on 10 February 2009 ("SR 003"), with re-inspections of the deck on 17 April ("SR 004") and19 May 2009 ("SR 005"). The engineer issued a 'PS4 – Construction Review' dated 28 October 2009 for 'Part only' of the building work. This was subsequently clarified in an email to the consultant dated 18 November 2009 (see paragraph 3.9.1).

3.6 The notices to fix

3.6.1 The authority wrote to the project manager on 13 January 2009, attaching a notice to fix dated 14 January 2009. The authority stated that it had not been provided with the opportunity to undertake the required inspections and the photographs and engineer's reports were not sufficient to confirm code compliance.

3.6.2 The notice to fix required the builder to:

> Either remove all cladding and roofing material from the building.... ...or
>
> Engage a suitably qualified independent person to assess and report on the entire building...

3.6.3 The notice to fix also listed areas that required confirmation of code compliance, including (in summary):

- fixings to framing and bracing
- installation and fixing of bracing materials
- window and door flashings
- the deck structure
- the removal and replacement of all deteriorated timber
- the appropriate treatment and grading of all new timber
- the insulation
- the air seals to windows and doors
- various producer statements and warranties required.

3.6.4 The project manager responded to the notice on 17 February 2009, explaining that remediation work required protection of the existing structure and inspections that were therefore different from those for a new building. The project manager noted the change in the authority's inspection personnel, as the initial inspector had appreciated the process and had:

> ...met with the builders and arranged for a sample window opening to be prepared for his inspection. This window opening was passed by the inspector and the decision was made by the inspector to allow the builder to carry on with the replacement of rotten timber and cladding of the building with the inspectors carrying

> out further inspections on the basis of call in or when passing. As part of this procedure the builder was required to maintain a file of photographic evidence of the work in progress should it be required later, this has been done.

3.6.5 The authority did not accept the project manager's explanations and, despite further correspondence, engineer's inspection reports and a site visit by the authority to verify air seals, the authority re-issued identical notices (No. 2 and No. 3) on 11 March 2009 and on 16 June 2009 respectively.

3.7 The consultant's report on the notice to fix

3.7.1 The applicants engaged the consultant, who inspected the house and provided a draft report dated June 2009 which commented in detail on the inspections carried out and photographs taken during construction in relation to some of the matters identified in the notice to fix.

3.7.2 The report also attached copies of:

- photographs of the roof structure
- the truss manufacturer's detailed drawings
- invoices from the timber suppliers
- various producer statements, certificates and warranties.

3.7.3 Commenting on the roof/wall framing, the consultant noted that:

- the roof structure is in accordance with the truss manufacturers details
- purlin spacing is at the maximum to suit the lightweight metal roofing
- where parapet framing has been removed, there is no evidence of damaged timber remaining and existing sound timber was treated with preservative
- invoices from the timber supplier showing the treated timber supplied.

3.7.4 The consultant concluded 'there is sufficient definitive information to demonstrate compliance with the NZ Building Code.'

3.8 The authority's response to the consultant's report

3.8.1 The authority responded to the consultant's report in a letter dated 9 November 2009, commenting in detail on inspection records and stating that the 'first formal inspection' was requested after framing was closed in, with no approval of the repaired timber framing.

3.8.2 The authority considered that the project manager and builder had 'failed to follow their own specifications and statutory obligations' and the information provided by the consultant was insufficient to verify compliance.

3.8.3 The authority also questioned in detail the extent of the engineer's inspections and the producer statement, noting that the statement needed to cover all designed structural elements and stating:

> Unfortunately we are unable to accept the final PS4 from the engineer until we are provided with unequivocal verification that all of the building work that was designed by them complies with their design and the requirements of the building code.

3.8.4 The authority concluded that as it had not been given the opportunity to carry out the inspections nominated in the Building Consent, and could not be satisfied on reasonable grounds that the work complied with the consented drawings or the Building Code.

3.9 The engineer's clarification to the consultant

3.9.1 The consultant sought clarification from the engineer in regard to some of the authority's questions (see paragraph 3.8.3) and the engineer responded in an email dated 18 November 2009. The engineer noted that monitoring involved 'reviewing a random sample of important work' and explained the extent of work covered by the producer statement 'PS4 – Construction Review' dated 28 October 2009 as follows:

> ...our PS4 covers "Part only" of the building work, excluding issues relating to other professionals, limiting our PS4 to structural elements [*my emphasis*].

3.9.2 The engineer also expanded on matters identified within his site reports:

- Site Report 001
  - Bolts have been provided along bearers, with additional fixings between bearers and posts to provide adequate hold-down fixings.
  - More concrete added to deck post foundations for hold down mass.
  - Piles to bedroom extension have been strapped.
  - Calculations and bracing plans were completed for the amended building consent and 'PS1 – Design' dated 8 December 2008 (I note that this similarly covered 'Part only' of the proposed design work).
  - The blocking between joists was subsequently provided.
- Site Report 003
  - More concrete added to deck post foundations for hold down mass.
- Site Reports 004 and 005
  - Deck fixings have been resolved and are considered satisfactory.

3.9.3 The engineer also noted that bracing walls are not specific design elements, and would therefore not normally be expected to be inspected by an engineer.

3.10 Despite further correspondence between the parties, the situation remained unresolved and the Department received an application for a determination from the consultant on behalf of the applicants on 15 March 2010.

4. The submissions

4.1 The consultant provided copies of:

- the original and amended consent drawings
- the other building consent documentation

- the authority's and engineer's inspection records
- the three identical notices to fix
- the consultant's report on the notice to fix
- the correspondence with the authority
- various photographs, producer statements, certificates and other information.

4.2 The authority's initial submission

4.2.1 In letters to the Department dated 6 April 2010, the authority noted its 'serious concerns regarding the quality and completeness of the remedial work' taking account of the 'poor understanding of the building control process' and inaccuracies in correspondence.

4.2.2 The authority considered there had been poor project management; demonstrated by 'the number of failed, missed and incomplete inspections', including the lack of engineering inspections of some structural elements. In particular, the required inspection of the repaired framing was 'a crucial and critical inspection to ensure that the damage to the timber framing' had been satisfactorily repaired.

4.2.3 The authority stated that it could not be satisfied that the completed work complies with the consent drawings or the building code, the notices to fix have not been complied with, a final inspection has not been requested and an application for a code compliance certificate has not been received. The authority added that it:

> ...does not accept any of the documentation supplied by [the project manager] as a suitable means of compliance as his statements are not supported by valid evidence and are not consistent with the correspondence and events that [the authority] has on file.
>
> [The project manager] appears to have been engaged by the owners to act as their agent and to provide quality and technical assurance but appears to have failed to monitor the requirements of his own specifications and the requirements of the Building Consent.

4.2.4 In addition to information listed in paragraph 4.1, the authority provided copies of:

- some additional building consent documentation
- some additional correspondence with the project manager
- some additional photographs.

4.3 The engineer's submission

4.3.1 Following receipt of the authority's submission, I sought advice from the engineer regarding the missing inspections and the extent of further investigation required for the engineer to confirm the adequacy of those specific design elements not reviewed during construction (excluding standard structural elements).

4.3.2 The engineer responded in an email dated 13 April 2010, noting that the following elements would require exposure and inspection to confirm their existence and detailing (in summary):

- connections of the living room beam to supporting studs

- the nailing of the plywood deck diaphragm in several sample areas
- the outside edge of the new foundations to the legs of the portal frame.

4.3.3 The engineer also provided additional description of the exposure required and the involvement of the builder prior to, during and following the inspection. This would enable an unqualified PS4 to be issued.

4.4 The draft determination and the responses received

4.4.1 A draft determination was issued to the parties for comment on 25 August 2010. The applicant accepted the draft in a letter dated 3 September 2010.

4.4.2 The authority responded in a letter dated 7 September 2010 which I have taken as non acceptance of the draft determination. The authority reiterated many of the issues regarding disputed inspections, which had been discussed at length in the draft. However the authority also explicitly referred to the following items:

- The department should seek additional evidence as to whether the house does or does not comply with B1 and B2 insofar as it applies to B1
- There is no evidence to show damaged framing was replaced.

4.4.3 The authority did not agree with my suggestion that it use an agreed third party to oversee and report on further investigation and it submitted that:

> A third party will be of little benefit to the Council, as a third party's findings / opinions have no legal status which the [authority] can rely upon.
>
> The applicant has sought this Determination to verify compliance with Clause B I Structure. … If the Department is concerned that it does not have sufficient evidence to make a Determination then the Department must seek the additional evidence.

4.4.4 The expert was engaged to carry out further site investigations of the house to verify that damaged framing had been replaced; the results of this investigation were contained in a supplementary report dated 26 October 2010. The determination has been amended to reflect the additional information gathered.

4.5 The authority's subsequent submissions

4.5.1 The authority responded to the email from the engineer (refer paragraph 4.3.2) and the expert's supplementary report in an email to the Department dated 9 November 2010.

4.5.2 The submission questioned why the Department 'may accept' the 'unconditional' PS4 producer statement which excluded certain elements. The submission repeated the items from the 14 January 2009 notice to fix that the authority advised it had not been given the opportunity to inspect. The authority did not consider that the supplementary report provided sufficient evidence to determine compliance with Clauses B1 and B2 saying that:

> [The authority is] not satisfied on reasonable grounds that the building complies with B1 and B2 without a total or substantial de-clad of the building unless, the Determination specifically states that all building elements comply with Clauses B1

> and B2 and [the authority was] instructed to issue the Code Compliance Certificate by the Department …

4.6 My response to the authority

4.6.1 While the expert was engaged to carry out an additional inspection, I do not accept the authority's position as expressed in paragraphs 4.4.3 and 4.5.2.

4.6.2 I believe reasonable grounds exist for me to be satisfied that the building work complies with Clause B2 and that position is reflected in the decision. Subject to the satisfactory verification of the work described in paragraph 4.3.2 the building work will also comply with Clause B1.

4.6.3 In my view it is unreasonable for the authority to take the view that, in this instance, compliance can only be established through the decision of a determination.

5. The expert's reports

5.1 As mentioned in paragraph 1.6, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the house on 1 and 16 June 2010, providing a report that was completed on 15 July 2010. This was augmented by an additional inspection completed on 19 October 2010 with the results contained in a supplementary report dated 26 October 2010.

5.2 The expert noted that the purpose of his inspection was to assess compliance of the building envelope with Clauses E2 and B2 and to comment on the repaired framing in regard to Clause B1. The inspection was limited to the walls of the house, and the expert did not inspect the exterior or interior of the roof.

5.3 The expert described the overall quality of the building work as 'average', noting that the weatherboards appeared to be installed in a 'professional manner' although some areas of finishing and painting were incomplete.

5.4 The repaired framing

5.4.1 The owners' builder exposed framing at sample areas known to have been decayed; removing soffit lining or weatherboards and cutting out small sections of plywood at:

- the underside of the projecting bay at the southeast ensuite
- the lower wall of the southeast ensuite
- at three areas along the bottom of the wall originally beneath the enclosed deck (now beneath the new extension to the living area).

5.4.2 The expert noted that most of the framing was new timber, but observed some 'slight water staining' on the underside of the ensuite floor and its framing.

5.5 Window installation

5.5.1 The expert noted that the re-used aluminium windows were rated for a 'very high' wind zone according to the standard applying at the time[6], rather than the specific wind zone that now applies. Aged and deteriorating sealant was present at a number of mitres and some mitres were open.

5.5.2 Facings and scribers were not yet sealed and painted and the expert removed sill and jamb facings at a northwest window to observe the underlying construction.

5.5.3 The expert noted that:

- an inner head flashing extending across the cavity is visible over the head flange of the window, with an outer flashing extending from behind the lower weatherboard and over the top of the timber facing
- the facings at the jambs are either packed out to overlap the jamb flange, or are rebated over the flanges
- a sill flashing has been installed, possibly to collect moisture resulting from the window mitres, but the facing at the sill is packed out to sit over the sill flange and some of the facings are sealed against the weatherboards at the bottom.

5.6 The deck

5.6.1 The expert noted that liquid-applied membrane was used in lieu of the butyl rubber membrane specified in the consent documents. The membrane is installed over a plywood substrate and extends over the lower weatherboard at the wall junction.

5.6.2 At the outer edge of the deck, the membrane extends over a small upstand and down the vertical face, with balustrade uprights fixed through the membrane into framing.

5.7 Moisture levels

5.7.1 The expert inspected the interior of the house and took non-invasive moisture readings, noting moisture levels related to the re-used west corner lounge window. in the sill reveal and the skirting

- 40% in the sill reveal at the west corner (below the sealant corner joint and at an open mitre joint
- 40% in the skirting below the southwest jamb.

5.7.2 The expert also noted elevated moisture levels of 26% and 28% at the deck upstand. I note that moisture levels above 18% generally indicate that external moisture is entering the structure and further investigation is required and moisture readings over 40% indicate that the timber is saturated and decay will be inevitable over time.

5.8 Commenting on the wall cladding, the expert noted that:

General

- sealing, filling and paintwork to the weatherboards, facings and scribers is incomplete

[6] NZS 4211: 1985 Specification for performance of windows (now superceded)

- investigation is needed of the cause(s) of the slight water staining observed to the flooring and framing of the ensuite bathroom
- there are insufficient clearances from the bottom of the weatherboards to the adjacent ground or paving
- the subfloor under the new bedroom lacks sufficient ventilation – with ventilation limited to that provided via the adjacent ground floor deck

The re-used windows

- the mitres to some of re-used windows are sealed with aging, brittle sealant and the mitre to the lounge corner window has opened, with high moisture levels recorded in the corner of the window reveal
- further investigation is needed to determine the full extent and cause(s) of very high moisture levels recorded around the west corner window to the lounge
- the window sills need further investigation, as moisture is able to enter behind the unsealed timber jamb and sill facings and is trapped by sealed junctions between the bottom of the sill facings and the weatherboards

The upper level deck

- the liquid-applied deck and canopy membrane is not weatherproof, with high moisture levels recorded adjacent to the balustrade uprights
- the membrane is wrinkling in some areas and the wall junction is unlikely to be durable, with the membrane adhered directly against the weatherboards.

5.9 Taking into account the limited construction quality and the specific design wind zone of the site, the expert concluded that some 'minor modification' of details in some areas were required. However, based on the areas inspected, the expert was satisfied that water damaged timber had been replaced during the remediation work.

5.10 A copy of the expert's report was provided to the parties on 16 July 2010.

5.11 The expert was engaged to carry out further site investigations of the house to verify that damaged framing had been replaced (refer paragraph 4.4.4). The expert carried out invasive checking at 12 further sites and no damaged or decayed timber was found.

5.12 The expert's supplementary report was forwarded to the parties on 4 November 2010. The authority's response to this is contained in paragraph 4.5

Matter 1: The external envelope

6. Weathertightness

6.1 Generally the claddings appear to have been installed in accordance with good trade practice. Taking account of the consultant's report, the photographs and the other evidence, I am satisfied that the new roof, including its framing, is adequate. However, taking account of the expert's report, I conclude that remedial work is necessary in respect of the wall areas outlined in paragraph 5.8.

6.2 I consider the expert's report establishes that the current performance of the building envelope is not adequate because it is allowing water penetration through some wall areas at present. Consequently, I am satisfied that the building work does not comply with Clause E2 of the Building Code.

6.3 In addition, the building work is also required to comply with the durability requirements of Clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the house to remain weathertight. Because the cladding faults on the house are likely to allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.

6.4 Because the faults identified with the claddings occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 5.8 will result in the building work being brought into compliance with Clauses B2 and E2

6.5 The expert has noted that the re-used windows require maintenance. Effective maintenance is important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code and is the responsibility of the building owner. The Department has previously described these maintenance requirements, including examples where the external wall framing of the building may not be treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

Matter 2: Structural requirements

7. Discussion

7.1 The monitoring of structural elements

7.1.1 The engineer has clarified his level of monitoring and the scope of work covered by the 'PS4 – Construction Review' dated 28 October 2009; explaining that the latter is limited to structural elements (see paragraph 3.9). (I note that this applies also to the 'PS1 – Design' dated 8 December 2008, which similarly covers 'Part only' of the proposed design work).

7.1.2 I also note the engineer's comment that the bracing walls are not specific design elements, and would therefore not normally be expected to be inspected by an engineer.

7.1.3 I acknowledge the authority's concerns that the engineer did not inspect the building work until some specific design elements were concealed and I therefore sought the engineer's advice (see paragraph 4.3). Taking account of the engineer's response, I consider that the elements described in paragraph 4.3.2 require inspection by the engineer. On satisfactory completion of that process, an unqualified producer statement for construction review can be provided by the engineer to the authority.

7.1.4 Until the above is carried out to the satisfaction of the engineer, I do not have sufficient evidence to provide reasonable grounds to conclude that the altered house complies with Clause B1 Structure.

7.2 The repaired framing

7.2.1 The repaired framing to the original house is also required to comply with the durability requirements of Clause B2, insofar as it applies to Clause B1. For the building to remain structurally adequate throughout its effective life, it is critical that all damaged timber has been replaced.

7.2.2 Due to the lack of a recorded pre-wrap inspection, the parties disagree as to the extent of oversight and whether there are reasonable grounds on which to be confident that all damaged timber has been replaced with appropriate new framing.

7.2.3 The evidence available to me includes the following:

- The authority's view that any visits during the relevant period were in connection with other matters and no inspections of the repair work were requested or carried out. The authority also noted the apparent speed of the repair work and the lack of inspection and/or meeting records during that time.
- The builder's and project manager's statements that the repair process was agreed with the authority's inspector; and inspections were carried out on an ongoing informal basis as the walls were progressively repaired.
- The construction photographs prior to and during the repair process clearly show the timber as MSG8 H3.2 and the timber supplier's invoices which showed appropriately treated timber delivered to the site.
- The consultant's report and photographs of the new roof structure, including his opinion that, where parapet framing has been removed, there is evidence that existing sound timber has been treated with preservative.
- The expert's first investigation and report, where the areas exposed and inspected showed timber had been replaced (see paragraph 5.4).
- The expert's subsequent investigation of 12 further exposed sample sites found no damaged or decayed timber (see paragraph 4.4.4).

7.2.4 Taking account of the above, I consider that the expert's initial and subsequent investigations have indicated the damaged framing has been satisfactorily repaired. I therefore consider there are reasonable grounds for the view that the repaired framing complies with Clause B2, insofar as it applies to Clause B1.

8. What is to be done now?

8.1 While I am satisfied that the authority made an appropriate decision to issue a notice to fix for the building work, the notice should be amended to take into account the findings of this determination and to exclude any matters since resolved.

8.2 The amended notice to fix should identify the items listed in paragraph 5.8 and paragraph 7.1.3 and refer to any further defects that might be discovered in the course of investigation and rectification, but should not specify how those defects are to be fixed. That is a matter for the owner to propose and for the authority to accept or reject.

9. The decision

9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the external envelope does not comply with Clause E2 of the Building Code, and Clause B2 with respect to Clause E2, and accordingly I confirm that the authority was correct to issue a notice to fix.

9.2 In addition, I determine that the authority is to modify the most recent notice to fix issued in respect of this work to take account of the findings of this determination.

9.3 On the evidence currently available to me, I am unable to determine whether the building work complies with Clause B1 of the Building Code.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 7 December 2010.

John Gardiner
Manager Determinations