Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2010/80

Refusal to issue a building consent for remedial work to an existing house with a code compliance certificate at 15C Chatfield Place, Remuera, Auckland

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 are:

- the applicant, which is the Auckland City Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.
- the owner, Mrs R Weber ("the owner") who is represented by a company providing building remediation and repair services ("the remediation company").

[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

1.3 This determination arises from a decision by the authority to refuse to grant a building consent for remedial work to the monolithic wall cladding of an existing house with a code compliance certificate, because it considered it had insufficient information to enable it to be satisfied on reasonable grounds that compliance with the Building Code (Schedule 1, Building Regulations 1992) would be achieved.

1.4 Specifically, the authority cited that it could not be satisfied that compliance with Building Code clauses[2] B1 Structure, B2 Durability, E2 External moisture, E3 Internal moisture, F1 Hazardous agents on site, and H1 Energy efficiency would be achieved by the proposed remedial work.

1.5 I therefore consider the matter for determination[3] is whether the authority was correct to refuse to issue a building consent for the proposed remedial work.

1.6 I note the authority has raised concerns about the use of a boron injection system to treat the existing timber framing. This work was completed before the application for building consent was made and is not included as a part of the proposed remedial work. I therefore do not consider that it part of the matter to be determined, however, I have discussed this in paragraphs 6.6 to 6.9.

1.7 In making my decision, I have considered the submissions of the parties, the information presented at the technical meeting (refer to paragraphs 4.4 to 4.7), the report of the independent expert commissioned by the Department to advise on this dispute ("the expert") and other evidence in this matter. I emphasise that each determination is conducted on a case by case basis.

2. The building work

The existing building

2.1 The existing house, which was built in 1993 to 1994, is situated on a steep west to east sloping site that is in a low wind zone for the purposes of NZS 3604[4]. The house is founded on a concrete block foundation, retaining walls, a concrete ground slab and strip footings and is constructed of a light timber frame. The external walls are clad with stucco plaster applied over fibre cement sheets which are fixed directly to the timber framing.

2.2 The pitched roof is generally clad with asphalt shingles over plywood, with a small curved section of roof clad with a composite bitumen copper sheet membrane.

2.3 Evidence suggests the external framing was originally treated to provide some resistance to decay. In September 2009, a boron injection system was used to treat the existing timber framing without removing the wall cladding or lining.

2.4 A non destructive moisture monitoring system has been installed using permanently installed moisture probes ("the moisture probes"). The moisture probes have been installed into the bottom plate at the lower and mid-floor levels of the house.

[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] In terms of section 177(b)(i) of the Act
[4] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

The proposed remedial work

2.5 The application for a building consent was for proposed remedial work of 'drying skirt at base and midfloor', 'eye brow and sill around window', 'concrete nib to front entry' and covers:

- the installation of a drying skirt to all areas of the bottom storey and mid-floor to re-engineer the existing cladding system to provide for drying where necessary
- the installation of concrete nibs to improve the existing cladding to ground clearances
- the installation of features to deflect moisture from vulnerable building details; window eyebrow deflectors to head flashings on exposed windows and stop end flashings to relevant apron flashing terminations
- the inspection of existing framing and other hidden elements at the bottom plates to provide reasonable grounds assurances on the overall state of the structure.

The drying skirt

2.6 The drying skirt is made of EIFS[5] cladding and is 'a modified polystyrene band with pre-coats of mesh and lamina and a diamond cavity cut into the back'. The purpose of the drying skirt is described by the remediation company as:

> A device fitted to areas around a building to change the wall design allowing drying to occur and water to drain out. The drying skirt is particularly useful when retrofitted to walls in areas where water is known to accumulate. The drying skirt involves removing portions of the existing cladding from key locations around the building to allow ventilation, drainage and drying forces to be increased to accelerate drying. The drying skirt enables the bottom plate or boundary joist to be exposed so that it can be both examined for structural integrity and/or have treatments and preservatives applied to kill or reduce the rate of fungal growth during the drying process.

The window eyebrow deflectors

2.7 Window eyebrow deflectors are 'modified polystyrene bands with pre-coats of mesh and lamina that are installed above head flashings to deflect moisture from the head and window system'. The purpose of window eyebrow deflectors is described by the remediation company as:

> Eyebrow deflectors … retrofit onto existing window systems and improve the deflection of window systems and protect the head flashing on sensitive systems by pushing running water off the wall face before it hits the window.

Concrete nibs

2.8 Concrete nibs are 'Remedial concrete nibs formed at locations where ground line thresholds are inadequate and lowering ground lines is implausible.'

[5] Exterior insulation finishing system

3. Background

3.1 The existing house, constructed in 1993 to 1994, has a code compliance certificate.

3.2 The owner lodged an application for a building consent for the proposed remedial work (No. BC/2009/5268) on 12 September 2009.

3.3 On 23 November 2009, the authority wrote to the owner explaining that it was unable to issue a building consent for the proposed remedial work because it was 'unable to be satisfied that once the works are complete they will be Building Code compliant'. The authority subsequently informed the owner that it would apply to the Department for a determination about its decision to refuse to issue a building consent for the proposed remedial work.

3.4 The Department received an application for a determination on 8 December 2009, however the application fee was not received until 24 March 2010.

4. The submissions

4.1 In a letter to the Department dated 23 November 2009, accompanying the application for determination, the authority noted:

- the proposed remedial work constituted an alternative solution and the application for a building consent did not contain sufficient information to demonstrate its compliance with the relevant Building Code Clauses
- the application for a building consent did not contain information to confirm:
    - Clause B2 – the durability of structural members, wall linings and insulation
    - Clause C3 – the compliance of the fire rated external wall
    - Clause B1 – the methodology for identification of damaged timber and its replacement and the compliance of the structure
    - Clause E2 – the resistance to moisture penetration of the drying skirt, and the effect of the boron treatment system in terms of undue dampness to the building elements
    - Clause F1 – the effect of the boron injection system and its compliance
    - Clause H1 – the thermal performance of the walls and their compliance considering the replacement of parts of the existing cladding with drying skirts.

4.2 In its application the authority also forwarded copies of:

- the building consent application that included:
    - a weathertightness risk assessment using the E2/AS1 risk matrix
    - an installation guide for the installation of the drying skirt, including technical descriptions and details describing the installation and investigation procedures
    - engineering design calculations
    - a case study of another house that has moisture probes and a drying skirt installed

- photos showing examples of houses where drying skirts have been installed
- results from the moisture readings taken from the moisture probes
- a specification for the adhesive to be used to retrofit the new cladding features
- testing results for tests carried out on the drying skirt cladding material
- architectural drawings detailing the proposed remedial work

- correspondence from the authority to the owner.

4.3 The remediation company submitted copies of their work scope documents.

The technical meeting

4.4 A technical meeting was held on 23 April 2010 at the request of the remediation company. The remediation company presented information about the proposed remedial work, and the methodology and research that guided the design of the proposed ongoing monitoring programme for the house.

4.5 The remediation company also presented general information about:

- their building improvement process ("the building improvement process") for diagnosing and managing repairs to buildings including particular information about the verification part of the process ("the verification process")
- examples of some of the more than 1000 buildings that the remediation company have investigated
- the non destructive diagnostic monitoring system that has been developed using the moisture probes and the research about timber moisture transport pathways and the way moisture moves through the framing of a house
- the research about the boron injection treatment system, which is designed to use the timber's natural water transport pathways to spread and deposit the treatment into the external framing of the building
- the spot testing process the remediation company uses to test the existing boron levels and the boron levels achieved through the use of the boron injection treatment system where the moisture probes have been installed.

4.6 The remediation company presented information specific to the house about:

- the moisture readings and the evidence that has been collected about the moisture ingress into the house
- the proposed remedial work for the house
- the building improvement process for the house, including the ongoing monitoring and long term maintenance plans.

4.7 The remediation company submitted a report entitled 'Project Report' ("the project report") for the house. The project report included:

- a project description and overview, which states 'Objective is to repair and maintain property. This is the consentable building work.'
- items called 'Areas of Consideration' that show details of the verification process, 'workscopes' for each item and include details listed as compensatory factors, contributory factors, care instructions, and improvement options.

The further submissions

4.8 Following the technical meeting, a further submission was received by the Department from the remediation company on 4 June 2010. The submission is entitled 'Project Lodgement Report' ("the project lodgement report").

4.9 The project lodgement report states its purpose is to explain the decision making process and that it provides reasonable grounds to support the issue of a building consent for the proposed remedial works, and where required provides evidence to support compliance with the Building Code of the proposed alternative solutions. Further, the report states:

> The application as it stands satisfies compliance on 'reasonable grounds' because the application has sufficient documentation providing why it meets the Building Code with sufficient supporting evidence. Therefore this application can be peer reviewed on this basis.

4.10 The project lodgement report has five main sections:

- owner objectives
- proposed building works including information about the verification process
- proposed future management plans
- decision making process
- project auditing.

The draft determination

4.11 A draft determination was issued to the parties for comment on 22 June 2010.

4.12 The authority accepted the draft determination without comment on 30 June 2010. In response to various emails, the authority noted that there has been no independent analysis of boron levels or the effect of the treatment on other building elements, and the effect of the boron injection system on existing fungi or moulds in the timber.

4.13 The remediation company, on behalf of the applicant accepted the draft determination on 8 July 2010, however, made submissions dated 8 July 2010, 13 July 2010, 22 July 2010, and 23 July 2010, and commented as follows:

- The verification process provides adequate removal of framing to allow suitable sized samples to be tested. At opening, further treatment is applied to ensure any exposed framing is fully saturated. Samples are taken to verify the injection results. Therefore, independent third party testing of boron treatment levels can be done when the portions of the external cladding are removed to install the drying skirt, and at this stage, the state of the baseplate and midfloor timber can be verified.

- The condition of the building elements with respect to the bracing and insulation should be verified and checked when the cladding is removed. If the framing is damaged due to moisture ingress over a long period of time, bracing units and metal bolts could be rusted, and this should be checked during the verification process, not at building consent stage, as it cannot be resolved before the building consent is issued due to the nature of the remediation process.
- The checking of building elements such as bracing is provided for in the verification process. The advantage of the process they had developed for diagnosing and managing repairs to buildings if is that it does not assume the condition of hidden elements, but allows provision for inspection of these elements through the verification process at the points in the building where they are most likely to fail.
- Bracing calculations have been provided. The house was built in a period when the wind zones were higher and have now been downgraded, so there is a significant over bracing within the existing building, so some natural downgrade is tolerable. Replacing internal linings to external walls that provide bracing may be needed if wetted linings are discovered or where building paper requires replacement and this can be checked during the verification process, not at building consent stage.

5. The experts report

5.1 As mentioned in paragraph 1.7, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Architects. The expert was engaged to provide a report about the existing house and comment on the proposed remedial work. The expert inspected the house on 29 March 2010 and provided a report on 9 April 2010.

Moisture readings

5.2 Prior to the boron injection system being used on the building, the previous moisture readings from the moisture probes of the non-destructive diagnostic monitoring system on 9 May 2008 were:

- 10 readings greater than 17% but less than 20%
- 14 readings greater than 20%.

5.3 The expert took moisture readings using the moisture probes and found

- 4 readings greater than 17% but less than 20%
- 17 readings greater than 20%.

5.4 The expert noted that moisture readings taken during the inspection are likely to be higher than previous moisture readings as a result of the boron injection system that was used to treat the existing timber framing, however, the readings show a general reduction back to close to pre-treatment levels, particularly at locations where the readings were low prior to the treatment.

5.5 The expert noted that some moisture readings remain high which may be a combination of:

- differential drying of the framing between areas exposed to sunlight and others in full shade
- differential absorption of boron
- continuing water ingress.

Weathertightness observations

5.6 With respect to the weathertightness of the external envelope of the house, the expert observed the following:

Ground levels

- the bottom of the plaster was finished at or below ground level to all elevations, other than the north half of the west elevation, where it was finished on top of the retaining wall, which provides a capillary pathway for ground moisture to rise up the plaster and diffuse into the framing and could trap moisture that may drain down the line of the building wrap at bottom plate level

Flashings at windows and doors

- the aluminium window and door frames were fitted flush with the fibre cement sheets
- the windows were without sill or jamb flashings
- the sealing of the sill relied on the application of the plaster to the sill and jamb
- there was evidence of moisture ingress where parts of the plaster reinforcing mesh was rusted and the outermost layer of building paper was thin and weak
- there was moisture damage between the sliding window in the master bedroom
- the garage door was without a head flashing or drip feature

Roof flashings and membrane

- at the west side, the bottom of the plaster was finished close to the shingles
- at the east side, a new flashing has been fitted to the existing construction and has been cut into the existing plaster, and is not lapped behind the plaster to provide a drainage path
- the curved roof appeared well fitted, however, there were rust stains near the junction of the plaster to the roof and there is no kickout at the base of the flashing
- the copper foil finish of the roof membrane at the curved roof was split in several places

The cladding

- cracks had formed in the plaster at the junction between the concrete masonry base, at narrow sections of plaster, and between the casing bead and the plaster
- the sealant had failed at some control joints

Cladding penetrations

- the weathertightness of the penetrations at the ventilation grills and meter box relied on a close fit and sealant.

The proposed remedial work

5.7 The expert noted that the Department's publication 'External moisture – A guide to weathertightness remediation' describes a diagnosis process including visual assessment, sample cut outs, and laboratory analysis.

5.8 The expert noted the remediation company's report covers the condition of the bottom plates, the moisture readings taken over a period of time from the permanently installed moisture probes, and other observations and evidence of the condition of the drillings and timber strength tests. The expert noted that two cut outs were made below the master bedroom window, however, this information was not part of the remediation company's report.

5.9 The proposals make reference in several places to work which will be carried out if decay is identified, however there is not sufficient information describing the processes for identification of decay or how decisions will be made about timber replacement.

5.10 The installation of drying skirts is a proposed alternative solution and there is no published independent information or assessment about Building Code compliance. There is also no information provided regarding possible damage and cracking to the existing plaster and the installation of the drying skirts to the existing plaster.

5.11 A copy of the expert's report was provided to the parties for comment on 13 April 2010.

6. Discussion

Framework for assessing the extent of Building Code compliance required by the Act

6.1 The proposed remedial work constitutes an alteration to an existing building with a code compliance certificate, and therefore must be considered under section 112 of the Act. Under section 112, the building after the alteration must:

- comply as nearly as is reasonably practicable with respect to means of escape from fire, and
- comply as nearly as is reasonably practicable with respect to the provision of access and facilities for people with disabilities, and
- continue to comply to as at least the same extent as before the alteration for all other Building Code clauses.

6.2 Section 112 does not override the section 17 requirement that all building work must comply with the Building Code, to the extent required by the Act, unless the building work is subject to a waiver or modification of the Building Code.

6.3 I note that the authority has raised a number of issues that relate to the existing building. The application for a building consent is for the installation of a drying skirt at the base and mid-floor, the installation of eye brow deflectors and sills to windows and a concrete nib to the front entry (refer to paragraph 2.5). I have therefore considered:

- whether the remedial work (which is the new building work) will comply fully with the Building Code
- whether the building, after the remedial work carried out, will comply as nearly as is reasonably practicable with respect to means of escape from fire (there is no requirement for the building to have provisions for access and facilities for people with disabilities)
- whether the building, after the remedial work is carried out, will continue to comply to as at least the same extent as before the alteration for all other Building Code clauses.

6.4 I note that it is my view that once a code compliance certificate has been issued for building work, an authority is unable to take any action in respect of that work unless:

- the building is dangerous, is earthquake-prone, or is insanitary, or
- the owner decides to alter the building, change its use, or change its intended life.

6.5 While the condition of the building may mean that it is not currently code-compliant, this of itself does not oblige a building owner to bring the existing building into compliance with the Building Code. A building owner is only obliged to undertake building work in respect of an existing building for the reasons given in paragraph 6.4.

The boron injection system

6.6 On the view I have taken of the matter to be determined, the use of the boron injection system is not relevant to the matter of the decision of the authority to refuse to issue the building consent. This is because the boron injection system was applied to the framing as part of earlier building work and is not a part of the building consent application that is in dispute. However, I have made some general observations with respect to the boron injection system in order to assist the parties. I note these comments (paragraphs 6.7 to 6.9) are not in respect of this house, but in respect of the use of the boron injection system generally.

6.7 At the technical meeting, evidence was presented which supports the following points:

- the boron injection system uses boron, which is a well established and commonly used timber treatment
- the use of the boron injection system means the product injected into the treated or untreated pinus radiata framing assists in ensuring that the injected timber retains a level of boron that should provide protection against decay
- the natural flow pattern of the product through the timber ensures the widespread dispersal of the product through the framing in which the boron is injected
- some liquid injected will drop naturally by gravity to the bottom of the framing, and the remainder will dry by diffusion
- the product provides some protection from existing and future decay.

6.8 The evidence has not been verified by an independent third party in terms of the analysis of levels of boron treatment achieved by the boron injection system generally. I note this in respect of the system as a whole, not in respect to this house. It is my view that because of the nature of this product and method of application, the remediation company should seek analysis and testing from a truly independent third party.

6.9 I also note the effect of the product with respect to the following items does not seem to be fully known and should also be verified by an independent third party in addition to the above:

- other existing building elements, for example, the swelling of the timber which could affect wall linings and bracing, and the wall insulation
- existing toxic mould spores that could be in the wall cavity.

The refusal of the building consent

6.10 Section 49 of the Act requires '[An authority] must grant a building consent if it is satisfied on reasonable grounds that the provisions of the Building Code would be met if the building work were properly completed in accordance with the plans and specifications that accompanied the application.'

6.11 The authority considered that it did not have sufficient information to provide reasonable grounds that compliance with the Building Code would be achieved by the proposed remedial work.

6.12 I have assessed the building consent application in terms of section 112 of the Act, in conjunction with the comments of the expert, and note that the building consent application does not include:

- a scope of works that sufficiently describes the project and the extent of work intended to be carried out
- an assessment of the extent of the existing building elements that are to remediated and it is therefore not apparent how the remedial work will correct the defects

- a description of the processes for the identification of decay or issue of instructions for the replacement or repair of framing
- information to address the installation of the drying skirts, which are a proposed alternative solution in terms of:
  - the propensity for damage and cracking to the existing plaster
  - the installation of the drying skirts to ensure the existing cladding continues to comply to the same extent as before
- a description of the processes to address the compliance of the bracing or insulation to the existing house, which is required, after the alteration, to comply to the same extent as before
- a description of the processes to address the compliance of the fire rated wall, which is required, after the alteration, to comply to 'as nearly as is reasonably practicable'.

6.13 While these are a relatively small number of issues, it is my view that the authority was correct to refuse to issue the building consent, because of the items listed in paragraph 6.12.

6.14 The authority raised a large number of issues (refer to paragraph 4.1) and not all of these are related to the proposed remedial work. Many of the issues related to the Building Code compliance of the existing building. As noted in paragraph 6.5, while the condition of the building may mean that it is not currently code-compliant, this of itself does not oblige a building owner to bring the existing building into compliance with the Building Code.

The project lodgement report

6.15 The project lodgement report provided during the determination process (refer to paragraphs 4.8 to 4.10) provides a clear project brief, description, information about the current state of the building, and proposed work-scopes for the remedial work.

6.16 The information presented at the technical meeting about the evidence that has been collected on moisture ingress into the house, the proposed remedial work, and the building management process for the house, including the ongoing monitoring and long term maintenance plans has led me to concluded that the scope of works for this building and processes supporting the work are robust.

6.17 The project lodgement report, together with the information presented as a part of the building consent application are, in my view, sufficient in most areas to demonstrate compliance with the Building Code to the extent required by the Act.

6.18 However, there are some areas where further information will be required to support the building consent application.

6.19 I note these areas are listed in the project lodgement report as areas of consideration, however, I am of the view that the information provided about the process is not sufficient. It is my view that a more detailed outline of the verification process is required for the building consent application. The project lodgement report should include more detailed information about who is responsible for the assessments of the various building elements, and the criteria that will be used to make decisions.

6.20 However, I accept the remediation company's point that the advantage of the process is that the condition of hidden elements such as bracing are not assumed, but are assessed as a part of the verification process, and are best dealt with during this verification process.

6.21 I understand that the remediation company plans to use the project lodgement report as the main document to support the application for the building consent. There has been additional information about the verification process provided to me during the Determination (refer to paragraph 4.13). It is my view that the project lodgement report requires a more detailed description of the verification process as described in paragraph 6.19 to support the application for a building consent.

General

6.22 In respect of remediation work generally, I note that remediation of non weathertight buildings is a complex area, and it is important that the remediation process and solution is appropriate to the particular building, the circumstances, the extent of the non weathertightness, and I note that this is an emerging field with knowledge and experience still developing.

6.23 I also note that determinations are conducted on a case by case basis.

7. The decision

7.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the authority was correct to refuse to issue a building consent for the proposed remedial work.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 2 September 2010.

John Gardiner
Manager Determinations