Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2011/020

Subject to clarification of 18 July 2011[1]

The refusal to amend a building consent for remedial work to a 12-year-old house with monolithic cladding at 95 Hebron Road, Waiake, North Shore City

1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[2] ("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 owners I and D Dodds ("the applicants") acting via an agent
- the North Shore City Council ("the authority"[3]), carrying out its duties as a territorial authority or building consent authority.

I have included North Harbour Building Consultants Ltd ("the consultant") as a person with an interest in the matter to be determined.

[1] The clarification is appended to this determination as pages 20 to 22.
[2] 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.
[3] After the application was made, and before the determination was completed, North Shore City Council was transitioned into the Auckland Council. The term authority is used for both.

1.3 This determination arises from a decision by the authority to refuse to grant an amendment to a building consent for proposed remedial work to a 12-year-old house, because it is not satisfied that the proposed repairs will comply with certain clauses[4] of the Building Code (Schedule 1, Building Regulations 1992). The authority's concerns relate to the weathertightness and durability of the proposed repair work, and the condition of the original timber framing.

1.4 The matter to be determined[5] is therefore whether the authority's decision to refuse to issue an amendment to the building consent for the proposed repairs is correct. In deciding this matter, I must consider whether:

1.4.1 Matter 1: The proposed remedial work

Whether the remedial work proposed for the external envelope of the house will result in the external claddings ("the claddings") complying with Clause B2 Durability and Clause E2 External Moisture of the Building Code. The claddings include the components of the systems (such as the monolithic wall cladding, the windows, the decks, the roof claddings and the flashings), as well as the way the components have been or will be installed and work together. This matter also includes whether the proposed repairs will result in the timber framing complying with Clause B1 Structure of the Building Code. I consider this matter in paragraph 7.

1.4.2 In order to determine Matter 1, I have addressed the following questions:

(a) What is the current weathertightness condition of the house, including the level and significance of moisture penetration and the consequential damage to the framing? I address this question in paragraph 6.

(b) Taking account of the current condition, are the proposed repairs likely to result in the house complying with the Building Code? I address this question in paragraph 7.5.

1.4.3 Matter 2: The durability considerations

Whether the elements that make up the building work not affected by the remedial work comply with Building Code Clause B2 Durability, taking into account the age of the house. I consider this matter in paragraph 8.

1.5 In making my decision, I have considered:

- the submissions of the parties
- the reports by the property inspection company commissioned by the applicants ("the inspection company")
- the remedial work proposed by the consultant
- the 'House Evidential Report' dated 22 August 2010, which provides the results of monitoring the moisture detection system installed by the applicants
- the report of the expert commissioned by the Department to advise on this dispute ("the expert")

[4] In this determination, unless otherwise stated, references to sections and clauses are to sections of the Act and clauses of the Building Code.
[5] Under section 177(1)(b) and 177(2)(a) of the Act

- the other evidence in this matter.

2. The building work

2.1 The building work consists of a large house that is three storeys in part and is situated on a steep east-sloping site in a high wind zone for the purposes of NZS 3604[6]. Construction is generally conventional light timber frame, with a concrete floor slab to the garage, concrete footings, concrete block foundations and a timber framed subfloor to the remaining building. The house has monolithic wall claddings, aluminium windows and a mix of flat membrane and pressed metal tile roofs. The house is very complex in plan and form and is assessed as having a high to very high weathertightness risk.

2.2 The eastern end of the house is two-storeys-high ("the east section") while the western end has two-storeys above the ground floor garage ("the west section"). Above each section, raised 20^{o} pitch hipped roofs with central flat roofs ("the pyramid roofs") are linked with flat roofs bordered with parapets. Lower roofs extend at varying levels to form lean-tos against upper walls. On the west elevation, a three-storey-high monolithic clad "chimney" structure rises through the lean-to roof. The pyramid roofs have eaves of about 400mm overall and the lean-to roofs generally have no eaves or verges.

2.3 The decks

2.3.1 In the east section, a large enclosed deck extends around the east and west walls of the dining/family areas ("the main deck"), with the eastern side situated partly over of the ground floor games room and a recessed area on the north side situated over the ground floor office. In the west section, two small enclosed cantilevered decks extend from the north walls of the first and second floors above the garage doors.

2.3.2 The enclosed decks were constructed with tiled floors, although tiles have since been removed from the upper cantilevered deck. The decks have monolithic clad balustrades, with timber cappings and stainless steel handrails that continue above open metal balustrades that form 'inserts' within the balustrades.

2.3.3 A large open timber deck extends around the east and west walls of the ground floor. The ground floor deck has a spaced timber slat floor and open metal balustrades, with an open timber sub-floor and steps leading to a lower level swimming pool and further steps to the main north entry.

2.4 The cladding

2.4.1 The monolithic cladding is a proprietary system described by the manufacturer as a 'solid render system'. The cladding consists of 4.5mm fibre-cement sheets fixed through the building wrap directly to the framing timbers, and covered with three coats of fibreglass mesh-reinforced modified plaster finished with a two-coat system. The system includes purpose-made uPVC flashings to windows, edges and other junctions.

[6] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

2.4.2 The technical information dated January 1999 noted that vertical control joints should be provided for walls exceeding 15m in length and horizontal control joints for walls over 5m in height. I note that the coating system has a current BRANZ Appraisal Certificate (No.477) which is limited to its use over a drained cavity. Within that certificate, vertical control joints are specified at a maximum of 5.4m.

2.5 The consultant took seven timber samples from exterior wall framing and forwarded them to a testing laboratory for analysis, and the biodeterioration consultant's analysis confirmed the samples as boron treated to an equivalent of H1.2 (see paragraph 3.8.2). However, the expert observed some nogs that were marked 'Kiln Dried – Keep Dry', indicating these were untreated. I therefore consider that, in the main, the wall framing to this house is likely to be treated to a level that will provide resistance to fungal decay, with some secondary timber members untreated.

3. Background

3.1 The authority issued a building consent (No. E13030) for the house to the former owner on 5 May 1998 under the Building Act 1991. The authority apparently carried out various inspections during construction during 1998, although I have not seen copies of those inspection records.

3.2 According to the consultant, the house was substantially completed by the end of 1998; although the final inspection was not carried out until July 2002 (I have not seen a record of that inspection). According to the former owner, that inspection identified outstanding items which were resolved over the next twelve months.

3.3 When the house was re-inspected on 23 August 2003, the authority noted that 'some cracks have appeared in the cladding' and asked for a weathertightness report on the cladding to 'certify for weathertightness'. The applicants purchased the house without a code compliance certificate in late 2003.

3.4 The 2004 request for a code compliance certificate

3.4.1 In a letter to the authority dated 10 February 2004, the former owner asked the authority to 'waive the requirement for a weathertightness report and issue a code compliance certificate'.

3.4.2 The authority responded on 4 March 2004, explaining the additional care needed to assess the weathertightness of monolithic claddings, given the 'recent information and knowledge' about 'face sealed' systems without cavities; and concluding that it:

> ...cannot be satisfied that the cladding system as installed on the above building will meet the functional requirements of Clause E2 External Moisture of the New Zealand Building Code and is therefore unable to issue a code compliance certificate.

3.5 The inspection company's reports

3.5.1 August 2006

The applicants engaged the inspection company, which inspected and scanned the house using an infrared thermal imaging camera on 11 August 2006. The report noted evidence of moisture penetration through the main deck and within some walls below the deck, recommended some minor remedial sealing and noted that other areas appeared weathertight.

3.5.2 August 2007

A second inspection was carried out on 3 August 2007, which again found evidence of moisture penetration to areas associated with the main deck. Evidence of moisture was also found to the north wall to the stairwell void. The report again noted that other areas inspected during the 'random test' appeared weathertight and recommended further minor remedial sealing and repairs.

3.5.3 December 2007

Following leaks from the main deck soffit, a re-inspection of the deck was carried out at the applicants' request. The report dated 6 December 2007 noted that 'substantial' damage and rot had been found and framing had been replaced in the office wall below the deck outside the dining area. The report again recorded evidence of moisture penetration and damage and this time concluded that 'extensive remediation will be required' to the deck.

3.6 The 2008 refusal of a code compliance certificate

3.6.1 Following the inspection company's December 2007 report (see paragraph 3.5.3), some limited repairs may have been carried out and the applicants applied to the authority for a code compliance certificate.

3.6.2 The authority replied on 28 February 2008, explaining that occurrence of moisture ingress, together with the use of untreated timber framing had become a major problem to the structural integrity of buildings, and cladding systems were now selected to suit the particular weathertightness risks. The authority identified 16 design and construction features of the house that it considered to be risk factors and listed 7 weathertightness defects.

3.6.3 The authority also required the 'important and urgent' removal of soffit linings to the cantilevered decks to the west section to allow inspection of the underlying junctions and the condition of the framing to those decks.

3.6.4 The authority concluded that it could not issue a code compliance certificate as:

> ... we are not satisfied on reasonable grounds that the following compliance requirements have been achieved.
>
> 3.1 Compliance of the cladding systems complied with clauses E2 External Moisture and B2 Durability of the New Zealand Building Code.
>
> 3.2 Compliance of all other elements of your building with clause B2 Durability of the New Zealand Building Code

3.6.5 As a 'way forward' the authority advised that a 'Certified Weathertightness Surveyor' should investigate 'all weathertightness issues' and to provide a 'remedial works proposal' for the authority's approval. The authority also noted that 'a target repair approach' could be undertaken under an amendment to the original building consent. However recladding the house would require applying for a new consent.

3.6.6 The authority added that, if all remedial work was completed to its satisfaction, a letter (which I take to exclude a code compliance certificate) would be issued:

> ...stating it is satisfied on reasonable grounds that the building work has been completed to the approved building consent, and to the performance requirements of the New Zealand Building Code, except for clause B2 Durability. A copy of this letter will be kept on the Council's file.

3.7 The inspection company's April 2008 report

3.7.1 The inspection company carried out a more extensive investigation of both the east section and the west sections of the house and provided an 'infrared & probe moisture inspection report' dated 9 April 2008.

3.7.2 Moisture readings were taken 'around windows/doors, skirtings and at variable wall levels where accessible'. The report recorded moisture levels varying from 13% to more than 40% and recorded evidence of moisture in a number of locations.

3.7.3 Despite the number of elevated moisture readings, the report noted that most areas tested during the 'random moisture test' were 'within building code specifications', but concluded that remedial work was needed to the decks and to some windows.

3.8 The consultant's engagement

3.8.1 The applicants engaged the consultant to prepare proposals for remedial work to the house. The consultant used the results from the inspection company's reports to develop a scope of work and specification for the repairs. The initial proposal was developed in July 2008, with further development and revision that resulted in the final scope of works provided to the authority in January 2010 (see paragraph 3.11).

3.8.2 As part of his ongoing investigations, the consultant forwarded seven samples of timber framing for laboratory testing for timber treatment and decay. The laboratory report dated 3 November 2008 did not identify sources of the samples within the building, but confirmed that the samples were treated to an equivalent of H1.2. Advanced decay was identified in one sample and 'prolific fungal growths' in the remaining six other samples.

3.9 The inspection company's continuing reports

3.9.1 November 2008

The inspection company again investigated the house, providing a report on 17 November 2008. Moisture readings were taken in the same positions as the previous report as well as in the stairwell walls. The report noted that the majority of the readings were well within an acceptable range; however I note that the report included 12 readings of 17% and above and one reading of more than 30%.

The report photographed defects and concluded that the house had 'some systemic issues which primarily stem from two main areas – roofing and deck defects.'

3.9.2 August 2009

A further report, this time titled 'weathertightness inspection report' was completed following an investigation on 17 August 2009. This report followed the same format and came to the same conclusion as the November 2008 report; identifying some additional areas of concern which required 'opening for evaluation'. (I note that the readings reported for this inspection are not dated and are identical to those listed in the previous November 2008 report, which leads me to conclude that the readings may have been carried over from the November 2008 report.)

3.10 The roof repairs

3.10.1 In September or October 2009, repair work was carried out to the flat roof areas above the pyramid roofs to the east and west sections. A producer statement dated 21 October 2009 was supplied by the roofing installer, together with 15-year workmanship warranties. However, I note that this work is still included in the proposed scope of work revised in January 2010 (refer paragraph 3.11.3).

3.10.2 The consultant provided a statement dated 1 December 2009, which stated that the water penetration at the perimeter of the 'two pyramid small roof areas' had been addressed by (in summary):

- a new plywood substrate overlaid above the original membrane, to greater falls and a 'skirt' at the junction with the metal tiles to the sloping hip roof
- a torch-on bitumen-based membrane applied, extending over the skirt and bonded to the tiles.

3.11 The consultant's scope of remedial work

3.11.1 The consultant revised the scope of remedial work and submitted it to the authority, applying for an amendment to the building consent for 'minor remedial works' and attaching also a 'request for waiver or modification of building code' for the durability provisions to apply from the date of substantial completion in December 1998.

3.11.2 The consultant included the following points about the investigation and work:

- Numerous areas require attention and the scope of work uses information from:
  - laboratory analysis of timber samples dated 3 November 2008 (see paragraph 3.8.2), which identified the timber as H1.2 boron treated with decay limited to one deck joist in the second floor cantilevered deck
  - the inspection company's August 2009 report (see paragraph 3.9.2), including moisture readings recorded during that inspection.
- Framing timber in all identified high risk areas will be investigated by removing wall linings; and all damaged timber shall be replaced with H3.1 treated timber, with sound timbers protected with site-applied preservative.

- Non-invasive moisture testing shall be carried out only, to identify variations in moisture levels and to locate potential problem areas, with invasive moisture testing used to confirm excess moisture (which was defined as over 16%).
- Photographic records shall be made of all areas of repair, a maintenance schedule will be provided and appropriate producer statements and warranties will be provided.

3.11.3 Drawings and specifications were provided and the list of the discrete repairs to be carried out included the following work (in summary):

- **joinery repairs:**
  - plaster ground out with 6mm wide sealant installed to joinery flanges
  - all joinery mitres and other junctions resealed
- **the enclosed decks:**
  - deck tiles, membranes, and balustrade cladding removed
  - damaged timber replaced, doors removed, deck falls installed
  - new waterproofing membrane, extended under cladding and door sills
  - new internal gutters, drainage outlets and overflows
  - balustrades re-clad, with 15^{o} sloping top, membrane to top and to form saddle flashing to junctions with wall
  - new removable spaced timber deck floors installed over membrane
- **the spaced timber deck:**
  - ribbon plate refixed over packers to provide 12mm gap at cladding
  - timber steps detached from cladding and independently supported
- **general cladding repairs:**
  - correct clearances to paving and ground surfaces established
  - capillary gap increased at cladding base overlaps to concrete
  - plaster at fascias etc ground out, extended up behind boards and sealed
  - new concrete nib beside garage door installed
  - install vertical movement joints at 3.6m maximum centres
  - cladding penetrations sealed, downpipes refixed, gate/trellis detached
  - meter box sealed and membrane head flashing installed
  - cladding cracks repaired
  - repaint exterior with approved acrylic elastomeric coating system
- **roof claddings and junctions:**
  - new membrane roof over new substrate to pyramid roofs, with membrane extended to overlap and be bonded to metal tiles (refer paragraph 3.10)
  - new membrane to other flat roof areas, extended to flash all junctions
  - new drain outlets and rain heads reinstalled, with spreaders to downpipes

- new metal cappings with sloping tops to parapets
- membrane flashings to the bottom edges of metal tile roofing and apron flashings with kickouts at bottom of metal tile to plaster junctions and 20mm gaps at ends of gutters
- at the curved dormer, membrane extended over fascia board and to the junction with the metal tile roofing.

3.11.4 The itemised written descriptions of the discrete repairs were cross-referenced to marked-up elevations and floor plans, with some sketched details provided for joinery jamb repairs, the removable timber deck floors, deck balustrades, gutters and falls, and the concrete nib beside the garage door.

3.12 The authority's response

3.12.1 In a letter to the consultant dated 16 July 2010, the authority refused the application for the amendment to the consent because it did 'not believe on reasonable grounds that [the] proposal will bring the dwelling into full compliance' with the relevant provisions of the Building Code.

3.12.2 The authority's general concerns included the following (in summary):

- the use of thermal imaging for investigation, which is not a generally accepted means of diagnosing weathertightness problems
- the inspection company's lack of experience in 'conventional' and accepted approaches to diagnostic surveys'
- the consultant's approach of removing interior linings rather than cutting inspection panels in the cladding to inspect construction at-risk points
- the lack of mention of variations from any equilibrium moisture content in the framing, considering the limited treatment confirmed in the tested samples.

3.13 The moisture detection system

3.13.1 A moisture detection system was subsequently installed in the house, which involved the installation of 128 permanent moisture detection units ("MDU's") into the exterior walls of the house. These probes were inserted into the bottom plates at each level and are intended to be periodically monitored.

3.13.2 The probes record moisture content at about 4mm from the outer face of the bottom plates. As well as moisture levels, a 'timber strength comparative measurement tool' is inserted, which provides a comparative indication of the residual timber strength at the inner and outer sides of the bottom plate.

3.13.3 The suppliers recommend that probes are read at least every 6 months to monitor moisture levels against natural seasonal equilibrium levels in order to 'be warned of maintenance requirements and leaks that have developed subsequent to construction or last repair'. Guidance from a 'suitably qualified building professional' is recommended for interpretation.

3.13.4 A 'MDC House Evidential Report' dated 22 August 2010 provided readings as at 4 August 2010, with a further report dated 6 October 2010 providing records of the

timber samples extracted when the probes were installed. The August 2010 readings included:

- 54 readings (more than 40% of probes) were 18% or above
- 18 readings (about 15% of probes) were 25% or above
- 8 readings (about 6% of probes) were 35% and above.

The January 24 2011 summer readings subsequently provided included:

- 16 readings (more than 12% of probes) were 18% or above
- 8 readings (more than 8% of probes) were 25% or more
- 4 readings (more than 4% of probes) were 35% or more.

3.14 The Department received an application for a determination on 11 October 2010.

4. The submissions

4.1 The applicants provided copies of:

- the original building consent
- the inspection record for the 'final recheck' on 23 August 2003
- the letter from the authority to the former owner dated 4 March 2004
- the inspection company's reports from August 2006 to August 2009
- the letter from the authority to the applicants dated 28 February 2008
- the timber technologist's report dated 3 November 2008
- the 'MDC House Evidential Reports on probe results and timber samples
- the consultant's proposed scope of work, revised January 2010
- the letter from the authority to the consultant dated 16 July 2010.

4.2 The authority did not acknowledge the application or make a submission in response.

4.3 A draft determination was issued to the parties for comment on 10 January 2010.

4.4 The consultant responded in an email dated 4 February; including the following comments (in summary):

- 40% of probe readings over 18% does not mean 40% of the house was over 40%. (I note the draft determination did not make that inference.)
- Sampling was not carried out on the games room framing as it was planned to expose this framing by removing the internal wall framing.
- The games room wall was included in the proposal and proposed repairs to exterior plaster would not result in vulnerable junctions between old and new plaster.
- The scope of the repairs provides the opportunity to address concerns raised in the draft.

4.5 The applicants responded on 24 February 2011 submitting additional summer moisture readings (refer to paragraph 3.13.4) and results of decay testing of additional samples. The tables showed a reduction in moisture levels in a number of locations and a correlation between 'VCR readings' and the condition of the timber framing.

4.6 In a further submission on 1 March 2011 the applicants commented (in summary):

- The determination should address the question of how to correct certain timber conditions
- The authority and Department should have transparent policies regarding remediation procedures, which owners can follow economically, speedily and correctly with regard discrete repairs or total reclads. (I address this in paragraph 7.3)
- Owners should not have to re-submit documents for consent applications for remedial work; then have to prepare new drawings, specifications and application documents while knowing they will be forced again seek a determination.

4.7 The authority accepted the draft in a response received on 8 March 2011.

5. The expert's report

5.1 As mentioned in paragraph 1.5, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Architects. The expert inspected the house on 3 November 2010, providing a report dated 18 November 2010. A copy of the expert's report was provided to the parties and the consultant on 25 November 2010.

5.2 The expert noted that his inspection considered the as-built condition of the house in order to assist in assessing the adequacy of the proposed repairs, noting that past repairs had been attempted and the some of the framing was exposed.

5.3 The plaster cladding

5.3.1 The expert described the plaster cladding, referring to the manufacturer's details at the time of construction in 1999 and noting that the manufacturer's uPVC mouldings had been installed at various junctions and intersections in the original cladding.

5.3.2 The expert noted cladding cracks to every elevation, which he considered likely to be due to one or a combination of:

- moisture expansion of framing due to leaking, particularly around decks
- the lack of cladding control joints.

5.4 Window and door installation

5.4.1 The expert noted that windows and doors were face-fixed against the fibre-cement backing sheets, with metal head flashings and no jamb or sill flashings. He observed that the joinery installation included uPVC mouldings at jambs and sills, and was generally in accordance with the manufacturer's 1999 details, except that:

- the timber frame openings are not consistently wrapped
- the head flashings project further forward than shown in the detail
- the uPVC moulding at the sill lacks drainage in some areas and is close to the front of the cladding – preventing effective interception of joinery leaks
- the sealant between the uPVC jamb moulding and the aluminium jamb flange has been plastered over, with cracks appearing at the junctions.

5.4.2 The expert noted that some high moisture levels recorded around windows were likely to have resulted from deck leaks above, while others were likely to be from the windows themselves (for example at the corner windows to the west section).

5.5 The decks

5.5.1 The expert noted that tiles to the upper cantilevered deck were removed, along with the soffit linings to all enclosed decks. Severe decay was apparent in the framing of all decks, which extended into the 'wall zone' and internal particle board flooring.

5.5.2 The obvious history of moisture penetration and timber damage to the deck framing would have resulted from one or more of the following:

- defects in deck membranes, including at junctions with walls or balustrades
- defects in the internal gutters
- defects in the clad balustrades, including timber cappings and handrail fixings.

5.6 Other junctions

5.6.1 The expert noted that apron flashings at metal tile to wall junctions are metal, with the visible sections appearing satisfactory. The ends relied on sealants for weathertightness, with no saddle flashings and kickouts at the ends. There were also no signs of saddle flashings to junctions of parapet cappings with walls.

5.6.2 At the bottom of the cladding, the uPVC base mouldings appeared satisfactory, but these had been cut away at decks to improve clearances; resulting in unsealed plaster, insufficient overlaps and compromised fixings to backing sheets. While clearances above paving were that shown in the manufacturer's details they were not consistently at or more than 100mm; however clearances to unpaved areas were satisfactory.

5.6.3 At the top of the cladding, plaster had been applied after fascias and barge boards were installed, resulting in gaps and insufficient overlaps. In some areas, uPVC channels had been retro-fitted to fill the gaps.

5.7 Moisture levels

5.7.1 The expert noted evidence of moisture damage associated with areas of known high moisture levels: in the carpet and fixings, plasterboard stopping and the trims. As there was no dispute that the house was leaking, the expert did not carry out moisture testing and instead tested the reliability of readings from the installed MDU probes.

5.7.2 The expert took invasive readings using long probes from the inside on either side of some MDUs to compare results; concluding that the probe readings were reliable. The expert noted that the probe readings had last been recorded in August, so were likely to represent the 'peak seasonal variation'. However, the expert pointed out:

- the lack of readings from within deck balustrades
- the limited readings associated with deck framing
- the exposed framing that would have been drying out.

The expert also noted the elevated moisture detection readings from the August 2010 report (refer paragraph 3.13.4).

5.7.3 The expert concluded that the moisture penetration had been significantly worse than implied from the inspection company's limited testing and investigations, although the latter was used as the basis of the consultant's repair proposals.

5.8 Decay analysis

5.8.1 The expert noted that the decay analysis dated 3 November 2008 had informed the consultant's development of the scope of work, but pointed out:

- for six samples, replacement is stated as not necessary, but only if the wood is 'not interspersed with more seriously affected framing'
- for three of those six samples, removal of deck soffits shows that serious decay is very likely in nearby timber.

5.8.2 The expert considered that sampling was too limited and missed significant areas; such as games room walls under the main deck and also the balustrade framing (which was likely to be built on-site where some untreated timber was used).

5.9 The consultant's scope of work

5.9.1 The expert assessed the consultant's list of proposed repairs and details; providing a table that commented in detail on every repair item in the consultants list. Due to its length and detail, that table is not summarised in this determination, however I consider the comments in this table should provide some guidance in the further development of the proposal for remedial work.

5.9.2 The expert also made general comments on the repair approach and some of the proposed details, including:

The direct-fixed cladding

- The house has a high to very high weathertightness risk, and there has been little attempt to mitigate or reduce the risk.

- The value of patching direct-fixed plaster cladding on a very high risk house should be carefully reviewed and reconsidered.
- An experienced remediation building surveyor or architect is likely to recommend at least partial re-cladding over a drained cavity.

The past investigations

- The discrete repair approach was based on assumptions of leaking and decay damage which has subsequently proved to be significantly worse than originally anticipated.
- Moisture penetration and decay is apparent in areas not covered by the scope of repairs, with no proposals for repair associated with:
  - the games room west wall
  - the southwest corner of the garage
  - the efflorescence on the garage retaining wall
  - the blackened timber below the living room corner window.
- The initial decay analysis was insufficient and therefore unreliable and procedures for identifying decay and required replacement are not specified.

Repairs to the plaster cladding

- Several proposals are ill-conceived, with some likely to cause further leaking as many repairs involve cutting away existing plaster and resulting in many vulnerable junctions between new and existing plaster.
- Discrete repairs will involve disc grinders applied to remove old plaster, which will risk damage that can lead to future leaks; to fibre-cement backing sheets, various fixings, uPVC flashings and the existing building wrap.
- There is no evidence of endorsement from the cladding manufacturer for the proposed method of repairing the cladding.

5.9.3 The expert considered that some of the above comments are examples of how:

> ...deficiencies in the investigation processes, and subsequent analysis led to mistakes and omissions in the diagnosis and proposals for repair...

5.10 The consultant responded to the expert's report in an email on 4 February 2011 which reiterated items raised in response to the draft but noted in addition;

- the consequences of variations from manufacturers details were not explained
- the sketches provided in their submission are only indicative and that a draftsman would be engaged to provide all the detail required by council.

6. The current weathertightness condition

6.1 Weathertightness risk

6.1.1 This house has the following environmental and design features which influence its weathertightness risk profile:

Increasing risk

- the house is three-storeys high in part and in a high wind zone
- the house is very complex in plan and form, with many complex junctions
- there are roofs of varying materials and levels, roof parapets and dormer windows, with complex wall to roof junctions
- there are unconventional window units
- the walls have monolithic cladding fixed directly to the framing
- there are three enclosed decks with monolithic-clad balustrades, two of which are cantilevered from the first and second floor levels
- there are limited eaves projections to shelter the cladding

Decreasing risk

- the external wall framing is generally treated to a level that provides some resistance to decay if it absorbs and retains moisture.

6.1.2 When evaluated using the E2/AS1 risk matrix, these features of the house show that one elevation demonstrates a very high weathertightness risk rating with the remaining a high risk rating. If the details shown in the current E2/AS1 were adopted to show code compliance, the solid plaster cladding would require a drained cavity for all elevations on this house. However, I also note that a drained cavity was not a requirement at the time of construction.

6.2 Conclusion on the current weathertightness condition

6.2.1 It is clear from the expert's report, the moisture levels recorded in the MDU probes and the evidence of severe decay, that the external envelope is unsatisfactory in terms of its weathertightness performance which has resulted in moisture penetration over many years with severe decay to some of the framing. There is evidence of significant long term moisture penetration that has lead to severe decay to parts of the timber framing (see paragraph 7.5.3).

6.2.2 Past investigations into the condition of this house failed to identify the significance and extent of the many defects in the external envelope; and attempts to apply 'patch' repairs to weatherproof the claddings have clearly proven to be ineffective.

6.2.3 Considerable work is required to make the wall cladding weathertight and durable. Further investigation is necessary, including the systematic survey of all risk locations, to determine causes and the full extent of moisture penetration, timber damage and the repairs required.

Matter 1: The proposed remedial work

7. Discussion

7.1 I consider the evidence of significant moisture penetration and decay in the timber framing indicates further investigation is required into the extent of damage and the framing replacement that will be needed. Additional records of test and probe check results provided by the applicants may well form part of that investigation.

7.2 Whether code compliance can be achieved for the plaster walls to this house by either remediation or re-cladding, or a combination of both, can only be made after this more thorough investigation of the claddings and of the condition of the timber framing. This will require a careful analysis by an appropriately qualified expert, and should include a full investigation of the causes, extent, level and significance of the timber decay to framing. Once that decision is made, the chosen remedial option can be submitted to the authority for its approval.

7.3 I consider that concerns expressed by the applicants in their response to the draft determination are matters of process that are not matters to be determined. I note that determinations are on a case by case basis and do not cover authority administrative policies or general cases. In this case the matter to be determined is whether a specific proposal will result in a hose being made code compliant. The matter of targeted repairs versus total re-clad for stucco cladding will always depend on specific circumstances. The expert's comments in paragraph 5.9.2 outline some of the difficulties achieving durable results when carrying out localised repairs to solid plaster.

7.4 I note that the Department has produced a guidance document on weathertightness remediation[7]. I consider that this guide will assist the owners in understanding the issues and processes involved in remediation work to the house, and in exploring various options that may be available when considering the upcoming work.

7.5 Conclusion

7.5.1 Taking account of the expert's report (refer paragraph 5.9), the evidence provided by the parties, and the lack of appropriate investigation into the extent of defects and subsequent damage, I am of the opinion that the proposed repairs to the external envelope of this house are unlikely to result in the claddings providing adequate weathertightness and durability in compliance with Clauses E2 and B2 of the Building Code.

7.5.2 In regard to the severely damaged timber framing and the potential for further damage as yet undiscovered, and taking note of the consultants' submission, I am also not satisfied that the proposed repairs will result in the timber framing to the house complying with Clause B1 Structure of the Building Code. Consequently there is some urgency for further investigation to determine the extent of damage, particularly to the deck structures.

[7] External moisture – A guide to weathertightness remediation. This guide is available on the Department's website, or in hard copy by phoning 0800 242 243

7.5.3 I also draw to the urgent attention of the authority the evidence of advanced timber decay to the decks, and the likelihood that further investigation may reveal more extensive decay of associated beams and wall framing, which could compromise the structural integrity of the decks and other parts of the building. I urge the authority to investigate this further and if required, to issue a notice in terms of s124(1)(c)(i) to initiate appropriate corrective action (refer also paragraphs 9.3 and 9.4).

Matter 2: The durability considerations

8. Discussion

8.1 The authority has concerns about the durability, and hence the compliance with the Building Code, of certain elements of the building taking into consideration the completion of the house in 1998.

8.2 The relevant provision of Clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods ("durability periods") "from the time of issue of the applicable code compliance certificate" (Clause B2.3.1).

8.3 In previous determinations (for example Determination 2006/85) I have taken the view that a modification of this requirement can be granted if I can be satisfied that the building complied with the durability requirements at a date earlier than the date of issue of the code compliance certificate, that is agreed to by the parties and that, if there are matters that are required to be fixed, they are discrete in nature.

8.4 Because of the extent of further investigation required into the timber framing and therefore the house's structure, and the potential impact of such an investigation on the external envelope, I am not satisfied that there is sufficient information on which to make a decision about this matter at this time.

9. What is to be done now?

9.1 The authority should issue a notice to fix that requires the owners to bring the house into compliance with the Building Code, identifying the apparent moisture penetration, the severe damage to the timber framing and the requirement for further, investigation. It is not for the notice to fix to specify how the moisture penetration and decay are to be remedied and the building brought to compliance with the Building Code. That is a matter for the owners to propose and for the authority to accept or reject.

9.2 When the authority has issued the notice to fix. The applicants should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified matters. That proposal should take into account the expert's general comments in paragraph 5.9.2 and the other matters in this determination. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

9.3 I do not consider that a notice to fix is appropriate to deal with the specific concerns relating to the structural integrity of the decks. Section 121 of the Act gives the meaning of dangerous building work, as outlined in the Appendix (refer paragraph A.1).

9.4 If the decks are investigated and classified as dangerous in terms of s121(1)(a)(i), then the authority is able to give written notice to 'reduce or remove the danger' under Section 124 which sets out the powers of territorial authorities in respect of dangerous buildings (refer Appendix, paragraph A.2).

10. The decision

10.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the proposed repairs to the external envelope will not result in this house complying with Clauses B1, B2 and E2 of the Building Code, and accordingly I confirm the authority's decision to refuse to issue an amendment to the building consent.

Determination 2011/020 was signed for and on behalf of the Chief Executive of the Department of Building and Housing on 9 March 2011.

John Gardiner
Manager Determinations

A. Appendix: The legislation

A1 With regard to whether the deck structure is dangerous, the relevant section of the Act is:

> **121 Meaning of dangerous building**
>
> (1) A building is **dangerous** for the purposes of this Act if,—
>
> (a) in the ordinary course of events (excluding the occurrence of an earthquake), the building is likely to cause—
>
> (i) injury or death (whether by collapse or otherwise) to any persons in it...

A2 With regard to the authority's powers if the deck structure is found to be dangerous, the relevant section of the Act is:

> **124 Powers of territorial authorities in respect of dangerous, earthquake-prone, or insanitary buildings**
>
> If a territorial authority is satisfied that a building is dangerous, earthquake prone, or insanitary, the territorial authority may—
>
> (c) give written notice requiring work to be carried out on the building, within a time stated in the notice... ... to—
>
> (i) reduce or remove the danger...

Clarification of Determination 2011/020 regarding the refusal to amend a building consent for remedial work to a 12-year-old house with monolithic cladding.

1. Background

1.1 This clarification of Determination 2011/020 is made by me, John Gardiner, Manager Determinations, Department of Building and Housing ("the Department"), for and on behalf of the Chief Executive of that Department, under section 189 of the Building Act 2004 ("the Act").

1.2 The application for Determination 2011/027 ("the Determination") was received on 11 October 2010, under Part 3, Subpart 1 of the Act. The Determination was made on 9 March 2011.

1.3 The parties to the determination were:

- the owners, I and D Dodds, acting via an agent ("the applicants")
- the North Shore City Council, carrying out its duties and functions as a territorial authority and a building consent authority ("the authority").

1.4 North Harbour Building Consultants Ltd, as the consultant that had acted for the owners, was considered to be a person with an interest in the matter to be determined ("the consultant").

1.5 I considered that the matter for determination was whether the authority's decision to refuse to issue an amendment to the building consent for the proposed repairs was correct.

1.6 The determination found that the proposed repairs to the external envelope would not result in the house complying with Clauses B1, B2 and E2 of the Building Code, and accordingly the determination confirmed the decision of the authority to refuse to issue an amendment to the building consent.

2. The application for clarification

2.1 I received a letter dated 6 April 2011 from a legal advisor acting on behalf of the consultant seeking a clarification of the determination in terms of section 189 of the Act. The clarification request noted that the consultant had provided a submission in response to the draft clarification which outlined the context to the recommendations that the consultant had made to the owners and that this had not been taken account of and therefore the determination made unfair criticisms in regards to the consultant's scope of remedial work.

2.2 The submission from the consultant, dated 4 February 2011, stated:

> 2.2.1 This [building consent] application was lodged without my knowledge or approval; and if my approval had been sought, it would not have been given. I would have made it very clear to the applicants that the application would not succeed, and the contents of the [authority's] rejection letter needed to be addressed first.

2.3 The submission also noted that:

> 2.3.1 The sketches provided are just that and are indicative only – the next step would be to engage a draughtsperson to provide all the detail required by the Council.

2.4 The application for clarification requested that the 'full reasons for [the consultant's] recommendations should be set out in the [determination] so that the criticisms are placed in context; or alternatively that the consultant not be named as a person with an interested in the determination.

3. The legislation

3.1 Section 189 of the Act says:

> The chief executive may, within 20 working days after making a determination, amend the determination to clarify it if--
>
> (a) the chief executive… on the application of a party to the determination, considers that the determination requires clarification; and
>
> (b) the clarification is either--
>
> (i) not material to any person affected by the determination; or
>
> (ii) agreed to by the parties to the determination; and
>
> (c) no appeal against the determination is pending.

3.2 I am treating the consultant's legal advisor's letter of 6 April 2011 as an application for clarification under section 189 of the Act.

4. The draft clarification

4.1 Copies of a draft clarification were forwarded to the parties for comment on 26 April 2011.

4.2 The owners and the authority accepted the draft clarification with no comment in responses received on 13 June and 21 June respectively.

4.3 The consultant responded by email on 13 July 2011 and requested that paragraph 4.4 of the determination be further amended to clarify that the "application" under discussion was an application for the determination rather than the application for an amendment to the building consent.

5. Discussion

5.1 Although the comment from the consultant regarding the building consent application does not alter my view as to the compliance of the proposed remedial work or the correctness of the authority's decision, it does provide the context in which the consultant's scope of remedial work should be viewed which was not clearly reflected in the determination.

6. Clarifying amendments to the determination

6.1 In accordance with section 189 of the Act, I hereby amend Determination 2011/020 as follows:

Paragraph 1.5 amended as follows:

6.1.1 In making my decision, I have considered

- the submissions of the parties and person with an interest
- …

Paragraph 3.11.4 is amended as follows:

6.1.2 …beside the garage door. The consultant has submitted that the sketches provided were 'indicative only' and that a draughtsman should have been engaged to provide the required detail to the authority.

Paragraph 4.4 is amended as follows:

6.1.3 The consultant responded in an email dated 4 February 2011 and noted that in his view the application for a determination should not have been made and that 'the contents of the [authority's] rejection letter needed to be addressed first'. The consultant's submission also noted the following (in summary):

- …

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 18 July 2011.

John Gardiner
Manager Determinations