



## Determination 2017/024

# Regarding conditions on a consent for independent construction monitoring and certification in regard to recladding of apartments at 10-14 Hobson Street, Auckland

### Summary

This determination considers whether there was sufficient information provided in the building consent application and available to the authority as part of its own inspections, without the independent construction monitoring and certificate for the cladding system, to allow the authority to be satisfied on reasonable grounds that the building work would comply with the relevant clauses of the Building Code if the building work was carried out in accordance with the plans and specifications.

### 1. The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations and Assurance, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.
- 1.2 The parties to the determination are:
  - Body Corporate BC161064, as owner of common areas and representing the owners of apartments 4A, 4B and 4C (“the applicants”). The Body Corporate is represented by a building consultant (“the consultant”).
  - Auckland Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.3 This determination arises from conditions placed on a building consent requiring construction monitoring by the consultant and certification of the cladding system through the provision of various Producer Statements (herein referred to as “independent construction monitoring and certification”).
- 1.4 The matter to be determined<sup>2</sup> is whether the authority correctly exercised its powers of decision in requiring independent construction monitoring and certification of the cladding system when it granted the consent. In making this decision I have considered the information that was before the authority at the point in time that it made the decision to grant the consent; however, in order to decide whether the authority’s decision is to be confirmed, reversed, or modified, I have also considered the additional information that has come to light since the consent was granted.

<sup>1</sup> The Building Act, Building Code, Acceptable Solutions, past determinations and guidance documents issued by the Ministry are all available at [www.building.govt.nz](http://www.building.govt.nz) or by contacting the Ministry on 0800 242 243.

<sup>2</sup> Under sections 177(1)(b) and 177(2)(a) of the Act.

## 1.5 Matters outside this determination

- 1.5.1 This determination is one of three determination applications concerning the alterations to this property.
- 1.5.2 The initial application for this determination concerned the conditions on the consent. During the submission process for this determination, matters concerning compliance with section 112 with regard to means of escape from fire arose. After receiving agreement from the applicant, on 17 February 2016 I confirmed that the matters for determination concerning the consent conditions and those concerning means of escape from fire would be addressed in two separate determinations.
- 1.5.3 After receiving the an engineer's façade report (refer paragraph 6.2), the authority raised concerns regarding the granting of the building consent with respect to the effect of wind pressures imposed on the cladding system. The authority sought to have this matter included in this determination; however the applicants did not wish to have the scope of this determination expanded. The authority then applied for a separate determination.
- 1.5.4 The matters involved in the subject alterations are therefore considered in three separate but concurrent determinations as follows:
- Determination 2017/024 (this determination) in regards to the conditions imposed by the authority when it granted the consent.
  - Determination reference #2823, which considers fire safety matters in relation to the proposed work.
  - Determination 2017/014<sup>3</sup>, which was applied for by the authority and concerns the compliance of the cladding system in regards to the effect of wind pressures likely to be imposed on the system and whether the authority was correct to grant the building consent.
- 1.5.5 This determination is limited to the requirement for independent construction monitoring and certification of the cladding system. While much of the information is relevant to the other determinations, this determination does not consider the matters covered in those other two determinations.

## 1.6 The evidence

- 1.6.1 The evidence considered in this determination includes a number of reports prepared by the consultant or for the consultant, provided to the authority, and for the Ministry by a variety of advisors.
- 1.6.2 In making my decision, I have considered:
- the submissions of the parties, including relevant parts of submissions made in respect of the other two determinations and submissions made at the hearing
  - the relevant parts of the reports described in Table 1 below
  - the reports of the independent experts commissioned by the Ministry to provide advice on this matter
  - the other evidence in this matter.

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<sup>3</sup> *Determination 2017/014: Regarding a building consent for the recladding of apartments at 10-14 Hobson Street, Auckland*, Ministry of Business, Innovation, and Employment, 9 March 2017.

- 1.6.3 Some reports include evidence for all three determinations, while others relate only to the subject matter in this determination. Within this determination, the reports and authors are given the following titles:

**Table 1: The reports**

Date	Report provided by:	Report for:	Title and description of content
Nov 2014	The consultant	authority	<b>The consultant's remedial works plans</b>
Nov 2014	The first engineer	consultant	<b>The first engineer's report</b> Engineering calculations by the consulting engineers for the project (attached the alternative solution façade report)
Dec 2014/ Mar 2015	The consultant	authority	<b>The alternative solution façade report</b> Provided with the application for building consent: a review of project documentation to assess compliance of the wall cladding system
July 2015	The second engineer	consultant	<b>The second engineer's report</b> Structural engineering wind pressures calculations by a civil and structural engineering consultancy.
Aug 2015	The third engineer	consultant	<b>The third engineer's façade report</b> A façade engineering report by a structural and façade engineer who was on the authority's "approved list" of persons with façade engineering expertise
24 September 2015 – Building consent granted			
13 October 2015 – combined application received for this determination & reference #2823			
Dec 2015	The architect	Ministry	<b>The architect's report</b> A review of the consent documentation and opinion regarding the requirement that a specialist façade engineer be engaged and for the wind calculations to be peer reviewed
April 2016	The fourth engineer	authority	<b>The fourth engineer's façade report</b> A review of the architect's report and opinion regarding the requirements included on the consent.
7 July 2016 – application received for Determination 2017/014			
Aug 2016	The expert	Ministry	<b>The expert's initial report</b> A desktop review of the documentation with respect to design wind speeds/wind loads and comment on lateral load (wind and seismic) displacements.
Sept 2016	The expert	Ministry	<b>The expert's updated report</b> A revised report in response to questions raised by the fourth engineer

- 1.6.4 In regard to the calculation of wind pressure design parameters and expected loads, this determination refers to values calculated for Ultimate Limit State (“ULS”) conditions and Serviceability Limit State (“SLS”) conditions.

## 2. The building work

- 2.1 The property is an existing apartment block situated within Auckland city centre. The building consists of ground floor and basement car parking, with the remaining upper floors containing apartments. The apartments undergoing the re-clad make up the fourth and fifth floors.
- 2.2 The building was originally constructed as a warehouse, and in the late 1970s was converted to a commercial building. In early-to-mid 1990s it was converted to apartments, and at that time the upper level timber-framed apartments (4A, 4B and 4C) were constructed on top of the existing reinforced concrete building.

- 2.3 The two-storey upper level apartments were originally clad with a direct fixed EIFS<sup>4</sup> system, with a texture-coated modified plaster finish. One of the apartments (4A) was re-clad in 2011/2012 with an express joint panel cladding over a rigid air barrier – this is the same proprietary cladding specified in the building consent application that is the subject of this determination.

## 2.4 The alterations

- 2.4.1 The alterations that are subject of the building consent and that gave rise to the dispute include:
- remediation and replacement of deck membranes for all three apartments, which requires cladding to be removed to allow for upstands to be installed to all deck/wall junctions
  - cladding reinstated to apartment 4A on completion of the above work
  - remediation of existing timber framing to external walls, and recladding of apartments 4B and 4C to match apartment 4A.

## 2.5 The cladding system

- 2.5.1 The new cladding system is installed over the remediated existing external walls where the timber studs are at 600mm centres maximum. The structural battens are to be installed at 600mm centres maximum, to align with the timber studs spacing.
- 2.5.2 The proprietary cladding is a negative expressed joint cladding system consisting of a rigid air barrier (“RAB”), weather seal tapes, horizontal joint socket and façade panels fixed to proprietary structural fibre-cement-based battens which form a cavity between the panels and the rigid air barrier. The façade cladding panels are 9mm thick medium density fibre-cement sheets, and the 19mm thick x 70mm wide structural battens are provided by the cladding manufacturer.

## 2.6 The consent documentation

### *The consultant’s technical specification*

- 2.6.1 The consultant’s technical specification accompanying the building consent application stated the following:
- PERFORMANCE, WIND
- The design wind pressures are to AS/NZS 1170.2. [The manufacturer’s] technical specifications are suitable for these conditions. Refer to technical specification to check the wind pressure limits.
- Up to:
- 2.5kPa ULS [proprietary] panel on [proprietary] structural cavity batten...
- 2.6.2 The consultant’s technical specification provided a general description of the panel as a product, noting that it was manufactured to AS/NZS 2908.2<sup>5</sup>, was tested to AS/NZS 4284<sup>6</sup> for weathertightness, and BRANZ appraised (refer paragraph 2.6.4).

<sup>4</sup> Exterior insulation and finishing system

<sup>5</sup> Australian and New Zealand Standard AS/NZS 2908.2 Cellulose-cement products - Flat sheets

<sup>6</sup> Australian and New Zealand Standard AS/NZS 4284:2008 Testing of building facades

### ***The manufacturer's technical specification***

- 2.6.3 The manufacturer's technical specification covers the use of the cladding system on buildings where the maximum wind pressure on the façade is up to 2.5kPa ULS.

### ***The BRANZ Appraisal***

- 2.6.4 The proprietary cladding system has a BRANZ Appraisal<sup>7</sup> ("the appraisal"), which includes the following limitations in scope and relevant requirements:
- Maximum wind pressures for structural and weathertightness design:
    - 1.5 kPa ULS and 1.0 kPa SLS for studs at maximum 600mm centres
    - 4.5 kPa ULS and 3.0 kPa SLS for studs at maximum 400mm centres.
  - Limited to residential buildings within scope of E2/AS1, which covers buildings with a maximum height from ground to eaves of to 10m.
  - All buildings incorporating the cladding system to be subject to specific engineering and weathertightness design. Designers will be responsible for the frame design and for the incorporation of the cladding system in accordance with the manufacturer's instructions.
  - Window and door joinery installations in the cladding system to be subject to specific weathertightness design. The appraisal relies on joinery being subject to specific engineering design with regards to wind load and deflection for the design wind pressures.

## **3. Background**

- 3.1 The consultant attended a pre-consent application meeting with the authority on 8 August 2014, with the advice notes stating the following:

19. Reclad application shall include:
  - 19.1 A completed [authority] agreement to provide a quality assurance programme on completion of the building work form, and
  - 19.2 A project specific quality assurance programme specifically outlining methodology for reconstruction of the building for each elevation ...
31. Buildings over 10m high are outside the scope of New Zealand Standard NZS 3604<sup>[8]</sup>, and Acceptable Solution E2/AS1. Specific engineering and weathertightness design shall be submitted e.g. wind pressure calculations, framing structural requirements etc.
32. Buildings incorporating façade cladding systems are subject to specific weathertightness and engineering design in order to demonstrate compliance with the [Building Code]. Application shall include supporting producer statement (PS1/PS2). Compliance with AS/NZS 4284 to be demonstrated.

### **3.2 The alternative solution façade report**

- 3.2.1 As part of the building consent application lodged on 4 December 2014, the consultant provided a report on the proposed façade panel system ("the alternative solution report"), which reviewed project documentation to assess compliance of the wall cladding system with relevant performance requirements of the Building Code.

<sup>7</sup> BRANZ Appraisal No.467 (2005) amended 30 August 2013

<sup>8</sup> New Zealand Standard NZS 3604:2011 Timber framed buildings

3.2.2 The report included the following comments (in summary):

- A ‘peer review process’ would be undertaken by the cladding manufacturer during construction, with a producer statement provided on completion verifying that the cladding was installed in accordance with instructions.
- Although the wind zone of the building falls within the scope of ‘normal compliance documents’, the building’s size and location is beyond that scope and a specific review of the façade system is therefore required.
- The building falls within the design parameters nominated by the cladding manufacturer and the cladding system has been designed accordingly.

### 3.3 The first engineer’s report

3.3.1 The consultant’s report attached engineering calculations, which included design and wind pressure calculations for the wall cladding system (see Table 2 below, with maximum values highlighted and shown in bold):

**Table 2: The first engineer’s wind calculations**

Maximum pressures	Positive wind pressures (kPa)	Negative wind pressure (kPa)	Design wind pressure (kPa)
Within 2m of corner	<b>1.10 ULS</b> <b>0.70 SLS</b>	<b>-1.40 ULS</b> <b>-0.90 SLS</b>	<b>0.72 ULS</b> <b>0.49 SLS</b>
Main body of wall	0.80 ULS 0.50 SLS	-0.70 ULS -0.50 SLS	
Design wind speed			34.7m/s (ULS) max. 28.50m/s (SLS) max
Design wind zone			Medium
Height above ground			24 metres

### 3.4 The requests for further information

- 3.4.1 On 21 January 2015 the authority wrote to the consultant with a request for further information (“RFI”), including that the alternative solution report be ‘signed by both the author and peer reviewer’.
- 3.4.2 On 3 February 2015 the authority wrote to the consultant regarding the alternative solution report, noting that the authority was unable to be satisfied on reasonable grounds as to compliance with the Building Code and setting out a number of comments in relation to the content of the alternative solution report. On 19 February 2015 the consultant responded to the RFI of 21 January, noting an intention to address the cladding issues.
- 3.4.3 In a letter dated 2 March 2015, the authority advised the consultant of the items from the RFI that were resolved, noting that the cladding issue remained outstanding. The consultant addressed the issues in a letter dated 3 March 2015.
- 3.4.4 On 16 March 2015, the authority wrote to the consultant with a request for further information, noting that the use of the verification method E2/VM1 was restricted to buildings up to 10m in height, and requiring confirmation from a façade engineer that wind pressures would be no greater than those in NZS 3604 or E2/VM1.

### 3.5 The second engineer’s report

3.5.1 The consultant engaged another civil and structural engineering consultancy (“the second engineer”) to undertake more detailed wind pressure calculations for the building. The second engineer provided the consultant with a report dated 1 July

2015 which considered individual elevations of the upper two levels of the building, zoning each elevation as follows:

- Area A: 2.8m from outer corners
- Area B: 2.8m from inner corners
- Area C: Main body of wall (remaining wall)

3.5.2 The report included design and wind pressure calculations for the wall cladding system on each face of the building (see Table 3 below, with maximum values highlighted and shown in bold<sup>9</sup>):

**Table 3: The second engineer's wind calculations**

Maximum pressures	Positive wind pressures				Negative wind pressures				
	Elevations <sup>10</sup>	North	East	South	West	North	East	South	West
Area A (outer corners)									
(ULS kPa)	<b>1.36</b>	0.85	0.65	1.04	-1.12	<b>-1.47</b>	<b>-1.12</b>	<b>-1.47</b>	
(SLS kPa)	0.94	0.59	0.42	0.71	-0.77	-1.01	-0.73	-1.01	
Area B (inner corners)									
(ULS kPa)	<b>1.36</b>	0.85	0.65	1.04	-0.84	<b>-1.10</b>	<b>-0.84</b>	<b>-1.10</b>	
(SLS kPa)	0.94	0.59	0.42	0.71	-0.58	-0.76	-0.55	-0.76	
Area C (main body)									
(ULS kPa)	<b>1.36</b>	0.85	0.65	1.04	-0.56	<b>-0.73</b>	-0.57	<b>-0.73</b>	
(SLS kPa)	0.94	0.59	0.42	0.71	-0.39	-0.50	-0.37	-0.50	
Design wind pressures									
(ULS kPa)	<b>1.13</b>	0.71	0.54	0.86	1.13	-0.71	-0.54	<b>-0.86</b>	
(SLS kPa)	0.78	0.49	0.35	0.59	0.78	-0.49	-0.35	-0.59	
Design wind speed									
(ULS kPa m/sec max)	<b>43.40</b>	34.40	30.00	37.80	<b>43.40</b>	34.40	30.00	37.80	
(SLS kPa m/sec max)	35.96	28.50	24.22	31.32	35.96	28.50	24.22	31.32	

3.5.3 I note the highest positive wind pressures calculated by the second engineer apply to the north wall of apartment 4A, which was re-clad in 2011 and will remain unchanged. For east, south and west walls that are being re-clad, maximum wind pressures are the highlighted negative values.

### 3.6 The third engineer's façade report

3.6.1 The consultant engaged a structural and façade engineer ("the third engineer") to review documentation and wind pressure assessments and to provide an opinion on the compliance of the proposed wall cladding system with Clause E2 of the Building Code as an alternative solution.

3.6.2 On 12 August 2015 the consultant responded to an RFI, advising they had engaged a façade engineer ("the third engineer") to review the cladding systems suitability as an alternative solution as well as a firm of civil and structural engineers to verify the wind pressures.

3.6.3 The third engineer described the proposed construction and reviewed the documentation and calculations provided to date. The third engineer noted that the cladding manufacturer had fulfilled requirements for assessing the cladding system in accordance with the following key aspects of the relevant standard AS/NZS 4284 (in summary):

<sup>9</sup> I have derived the associated SLS figures using the engineer's calculated SLS/ULS ratios and include these within

<sup>10</sup> Shielding applied to North, East and South faces

- The façade cladding to be designed as a complete system.
- Test samples and components to be representative of the building façade.
- Materials of the test samples to be same type, size, method of construction, details, flashings and fixings as the building façade.
- Tests to include water penetration, structural SLS and strength ULS testing.
- Testing to be undertaken by an accredited testing facility.

3.6.4 The third engineer summarised the calculations carried out by the first and second engineers, analysing maximum wind pressures as follows (I have included associated SLS figures within the table):

**Table 4: The third engineer's analysis**

Wind analysis		Maximum corner wind pressures	Maximum main body wind pressures
Non-directional wind	(ULS kPa)	1.10	0.80
	(SLS kPa)	0.70	0.50
North directional wind	(ULS kPa)	1.36	1.36
	(SLS kPa)	0.94	0.94
East directional wind	(ULS kPa)	<b>-1.47</b>	-1.10
	(SLS kPa)	<b>-1.01</b>	-0.76
South directional wind	(ULS kPa)	-1.12	-0.84
	(SLS kPa)	-0.73	-0.55
West directional wind	(ULS kPa)	-1.47	-1.10
	(SLS kPa)	-1.01	-0.76
Maximum governing wind pressures (negative pressure)			<b>-1.47</b>
Maximum allowable wind pressure per manufacturer's testing <sup>11</sup>			<b>±2.50</b>

3.6.5 The third engineer also reviewed documentation against the performance requirements of Clause E2 and the Verification Method E2/VM1, and noted the satisfactory performance of the cladding system used in similar projects and locations, including the installation to Apartment 4A in the same building in 2011.

3.6.6 The third engineer recommended that construction monitoring be provided to ensure that 'all construction details are successfully applied on-site' and concluded that:

...[the cladding system] used as an alternative solution for the proposed re-clad at apartment units 4B & 4C will establish compliance with the objective, functional requirement and performance of the NZBC Clause E2.

(In a later email to the authority the engineer expanded on his reasons for recommending construction monitoring – see paragraph 7.2.3.)

### 3.7 The building consent and conditions

3.7.1 The consultant provided the second and third engineers' reports to the authority, and on 10 September 2015 the authority advised the consultant that 'the report for E2 can be accepted'. The authority noted that the report referred to construction monitoring to confirm compliance and asked the consultant to confirm who would be responsible for monitoring the cladding work. The consultant responded on

<sup>11</sup> Based on installation on the proprietary structural battens

15 September 2015, advising that the consultant would undertake construction monitoring and provide a producer statement.

3.7.2 The authority issued the building consent, No. B/2014/14852, on 24 September 2015 with an attached schedule of inspections and documentation required that included:

- a Producer Statement Construction (PS3) and certification for the rigid air barrier
- a Producer Statement Construction (PS3) for the installation of the cladding
- a Producer Statement Construction Review (PS4) together with observation records for the cladding installation from the consultant.

(In this determination the documents listed above are referred to as “certification” of the cladding system.)

### **3.8 The determination applications**

3.8.1 On 13 October 2015 the Ministry received an application for determination from the consultant on behalf of the applicants. Further information was requested from the parties on 20 November 2015. The consultant and the authority responded with the requested information on 23 and 30 November respectively.

3.8.2 During the processing of this determination application, the authority asked for the scope to be expanded to address the matter of the authority’s decision to grant the building consent. The consultant, on behalf of the owners, did not agree to the scope of the matter being expanded.

3.8.3 On 7 July 2016 the authority applied for a separate determination on the exercise of its power of decision to issue the building consent, noting that this was in regard to the proprietary cladding system specified for the building work (refer paragraph 1.5.3).

## **4. The initial submissions**

### **4.1 The applicants**

4.1.1 The consultant provided a written submission with the application for determination that set out the background to the dispute and a timeline of events. The consultant stated that the applicants agreed to the independent construction monitoring and certification of the cladding system as a means to have the consent granted in order that the project could commence, but dispute there is any need for observations and certification additional to inspections carried out by the authority during and on completion of construction. The consultant noted that this was not a requirement of the consent issued for the same re-cladding work carried out previously to apartment 4A.

4.1.2 The consultant submitted:

- the work is low risk and of standard construction using a commonly installed cladding system
- the requirement for independent construction monitoring and certification is beyond that which is required under section 49 of the Act

- the authority is required<sup>12</sup> to have the in-house expertise or capacity to carry out and rely on inspections for such a commonly installed cladding system.

4.1.3 In further correspondence, dated 2 November 2015, the consultant requested the application be broadened to include the following matters that the authority required prior to granting the building consent:

- The authority required the consultant’s alternative solution report be peer reviewed.
- The authority required specific wind speed calculations provided by the structural engineer be peer reviewed.
- The authority ‘suggested that all [fire] separation elements be brought up to the current standards’.

(The issue of wind speed calculations and fire separation were made the subject of separate determinations.)

4.1.4 The consultant provided copies of the following documents:

- The re-clad pre-application meeting advice notes.
- Correspondence between the parties.
- The documents provided in support of the building consent application, including:
  - drawings and specification
  - the alternative solution review report dated 3 March 2015
  - the façade engineering report dated August 2015
  - fire safety report dated 11 September 2015
  - the consultant’s quality management plan
  - engineering calculations, November 2014 and July 2015.
- The authority’s practice note *AC2226: Applying the term as near as is reasonably practicable, version 5* (April 2014)

## 4.2 The authority

4.2.1 The authority acknowledged the application for determination, and made a submission setting out the authority’s view of events leading up the granting of the consent, noting that construction monitoring was included as advisory notes to the consent and was not a statutory condition.

4.2.2 The authority submitted the following (in summary):

- The pre-application meeting raised the issue of specific engineering design and weathertightness design for buildings over 10m in height.
- The third engineer’s façade report recommended ‘construction monitoring ... for on-site performance requirements and compliance with [Building Code Clauses B1, B2, and E2] to ensure that all construction details are successfully applied on-site for final approval of code compliance certificate...’

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<sup>12</sup> In accordance with the *Building (Accreditation of Building Consent Authorities) Regulations 2006*

- The authority accepted the third engineer's façade report and the consultant subsequently advised it would undertake the construction monitoring. The consent was issued with the construction monitoring referred to in advisory notes.

## **5. The architect's report**

### **5.1 General**

5.1.1 As noted in paragraph 1.6, I engaged a registered architect to assist me ("the architect"). I requested the architect review the building consent documentation and provide an opinion on the authority's requirements that a specialist façade engineer be engaged and wind speed calculations be peer reviewed.

5.1.2 The architect provided a report dated 15 December 2015 that was forwarded to the parties on 16 December.

### **5.2 Independent construction monitoring**

5.2.1 The architect noted that there are a number of relevant factors for an authority to consider when deciding whether or not it has the capacity and competency to undertake the necessary inspections, or whether it should seek third party monitoring.

5.2.2 In regards to the cladding system this would include:

- whether the cladding was unique or building-specific
- whether the system was proposed to be used close to or in excess of any design parameters
- the scale and complexity of the project
- the documentation that is called up under the building consent application.

5.2.3 The architect observed that in this case:

- the cladding system is relatively common
- the installation was proposed to be in accordance with the manufacturer's technical instructions
- there were no apparent building-specific design elements
- the calculated wind pressures are well below the manufacturer's limit for the cladding system
- there was no apparent risk or concern from the manufacturer's point of view with the use of the product in this way
- the project is small scale and no more complex than many domestic projects
- the PS3s and product warranties (or equivalent documentation) called up in the building consent application were required by the consultant under the building contract.

5.2.4 The architect concluded that in his opinion it would be 'relatively straightforward for a competent building inspector to assess on-site compliance' and the authority's list of inspections seemed 'more than adequate'. The architect saw no issue with the authority seeking to obtain PS3s and product warranties that were called up in the consent application to be included in the application for a code compliance

certificate, but noted that the authority had not requested the completed QA programme which would provide a fairly comprehensive record of the work as carried out on site.

- 5.2.5 The architect reviewed the documentation provided in the building consent application and the clarification and amendments to the drawings submitted prior to the consent being issued, noting that most of the changes are fire design matters. With regard to the cladding system, the architect considered the design and documentation submitted with the consent application was adequate for the purpose of processing the consent.
- 5.2.6 In regards to the cladding system as an alternative solution, the architect noted that the building work does not fall within the parameters of either E2/VM1 or E2/AS1, but this was due only to the limitation in scope to buildings up to 10m in height.
- 5.2.7 The architect noted that local wind pressures were well within the limitations identified by the manufacturer in the technical information, and together with the previous use of the cladding system on apartment 4A, the building consent 'should have been a relatively straight forward one to process with respect to compliance of the proposed cladding system'.

## **6. The first draft determination, and the fourth engineer's report**

### **6.1 The first draft determination**

- 6.1.1 On 7 March 2016 I issued a first draft of this determination to the parties for comment. The draft determination concluded that the alternative solution report was adequate in providing sufficient information to establish compliance, and that the third party monitoring in addition to the scheduled inspections by the authority and the provision of PS3s was unwarranted in this case.
- 6.1.2 On 7 March 2016 the authority advised it had engaged a Chartered Professional Engineer who has specialist expertise in façade engineering ("the fourth engineer") to review and respond to the architect's report and provide an opinion on the matters relating to the façade cladding system.
- 6.1.3 On 8 March 2016 I queried why the authority was taking this step when the authority had already accepted the alternative solution report and granted the building consent, and when the matter for consideration in this determination was the conditions on the consent.
- 6.1.4 In a response dated 31 March 2016, the authority advised it did not accept the conclusions in the first draft determination and submitted that in its opinion the architect was not competent to comment on the façade issues – this in the authority's view meant the resulting conclusions in the draft determination were flawed.
- 6.1.5 The authority provided a final copy of the fourth engineer's façade report on 4 April 2016.

### **6.2 The fourth engineer's façade report**

- 6.2.1 The fourth engineer made detailed comments on the architect's report, and commented generally on the steps involved in assessing a façade, noting that the assessor must then use their 'experience and knowledge to fill in any gaps in the available information and make his assessment'.

- 6.2.2 The fourth engineer considered that it was reasonable for the authority to require detailed monitoring by a third party because (in summary):
- The BRANZ appraisal requires ‘specific engineering and weathertightness design’, which was not included in the consent documents and which should have been carried out by a façade professional.
  - A façade professional who understands specialist façade design is the appropriate person to carry out inspections and monitoring.
  - An authority inspector is a generalist and therefore cannot properly assess the façade construction.
- 6.2.3 The fourth engineer commented on the architect’s report and the third engineer’s report as follows (in summary):
- Required weathertightness performance must be determined then assessed against a confirmed weather performance rating, which can only be determined by prototype testing for a specific project.
  - AS/NZS 4284 can be used to test any façade; its use for the subject façade was limited to ‘typical details’ and to set principles for junction design. None of the test reports adequately confirm performance.
  - There is no cladding standard that requires testing of façades, so the proof of adequacy is the responsibility of the parties involved in a specific project. Without specialised knowledge to correctly assess limited information, it is reasonable to require the involvement of a specialist façade consultant.
  - There is no evidence of performance rating of the metal joinery and associated junctions for the subject façade.
- 6.2.4 The fourth engineer reviewed the façade specification and commented that the most significant performance parameters for the subject façade are ‘design wind pressures and thermal, seismic and building movement effects, which impose displacements on the façade’. In regards to wind pressures the fourth engineer noted:
- The design wind pressures calculated by the first and second engineer appear ‘low as they do not consider that windows can be left open in a wind event’.
  - The wind pressures noted in the façade specification ‘are also low and should not be used for façade design’.
  - The second engineer provided only ULS pressures, but SLS pressures are required in façade design to assess deflections of major components and to derive the water penetration rating from the positive design pressure.
- 6.2.5 The fourth engineer considered that it was reasonable for the authority to require the engagement of a specialist façade engineer and to require the façade wind pressure calculations to be peer reviewed because ‘none of the façade design wind pressures were correct or complete’.

### **6.3 The scope of the matters being determined**

- 6.3.1 After receiving the fourth engineer’s façade report, on 15 June 2016 I emailed the parties to clarify the matters being considered in this determination and the authority’s position in relation to the fourth engineer’s façade report. I noted that the fourth engineer’s assessment challenged the wind speed/wind loading, the standards that had been applied, and the assessment process used to establish whether the

cladding is suitable for use in the circumstances, and that this raised doubt about the third engineer's façade report (which I note was authored by a person who was on the authority's "approved list" of persons with façade engineering expertise).

- 6.3.2 On 15 July 2016 the authority advised it would make a separate determination application in respect of the concerns about the cladding system in regards to the effect of wind pressures likely to be imposed on the system and whether the authority was correct to grant the building consent (refer paragraph 1.5).
- 6.3.3 On 7 July 2016 I suggested that a technical meeting be held with the parties with the fourth engineer present. The authority was of the view that questions could be put directly to the fourth engineer, and the proposal for a technical meeting was abandoned.

## **6.4 The expert's report<sup>13</sup>**

- 6.4.1 I engaged an expert who is a Chartered Professional Engineer ("the expert") to assist me in regards to Determination 2017/014 with respect to the appropriate design wind speeds and wind loading for the cladding. The expert concluded that the design wind pressures for the cladding were within the maximums specified in the BRANZ appraisal.
- 6.4.2 The expert provided an initial report dated 19 August 2016, which was forwarded to the parties on the same day. The fourth engineer responded to this report in an email received on 9 September 2016, challenging the basis on which the expert formed his opinions.
- 6.4.3 Following responses, the expert provided an updated report on 21 September 2016, which was forwarded to the parties on 23 September.

## **7. The second draft determination and submissions, and the hearing**

### **7.1 The second draft determination**

- 7.1.1 On 25 August 2016 I issued a second draft of this determination to the parties for comment; I had taken into account the fourth engineer's report in my considerations. The conclusions reached in the second draft remained the same as those in the first draft.
- 7.1.2 The consultant responded on 6 September 2016, accepting the findings of the draft without further comment.
- 7.1.3 On 9 September 2016 the authority advised it did not accept the analysis or decision in the second draft of this determination. The authority submitted that the opinion of the fourth engineer either had not been taken into consideration or had been disregarded in the determination. The authority requested a hearing be held on the matter.
- 7.1.4 The consultant provided further comment in an email on 3 October 2016, noting that the applicants had agreed to the consent conditions in order for the project to continue, but that the authority's application for Determination 2017/014 meant that work had stopped pending an outcome of that determination.

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<sup>13</sup> The expert's report and the fourth engineer's response to that report is summarised in more detail in Determination 2017/014

## 7.2 The hearing

- 7.2.1 On 13 October 2016 I held a hearing in Auckland. I was accompanied by a Referee engaged by the Chief Executive under section 187(2) of the Act, together with three officers of the Ministry.
- 7.2.2 The hearing was attended by three officers of the authority, the façade expert engaged by the authority, the authority’s solicitor, and two representatives of the consultant acting on behalf of the applicant. All the attendees spoke at the hearing to clarify various matters of law and fact and were of assistance to me in preparing this determination.
- 7.2.3 During the hearing the authority tabled a written submission, along with an email from the third engineer dated 25 January 2016. In that email the engineer stated that ‘any project over 10m in height is not a low risk, and hence not a standard construction’. The engineer also noted that a concluding point in his report ‘was specifically aimed to recommend façade monitoring’ and that he believed the monitoring needed to be by a ‘registered façade engineer<sup>14</sup> or an experienced façade professional to ensure proper installation of the [cladding system is] completed according to the manufacturer’s technical specifications and therefore achieving full compliance...’. The third engineer stated he considered the authority’s inspecting officers ‘are not qualified to perform any façade construction monitoring of any residential or commercial multi-storey projects of heights exceeding 10m ... due to their ability to sign off Producer Statement Construction Review – PS4 certificates’.
- 7.2.4 The consultant made verbal submissions, and tabled correspondence from September/October 2016 with a technical support manager from the manufacturer who stated that
- This system has been tested in accordance with E2/VM1 as well as AS4284. The system as per [an attached] 4284 certificate states clearly that it is tested to 2.5kPa s/s. So I am not sure how [the fourth engineer] has concluded that the system is tested to just under the SLS pressures acting on this project.
- Considering the scope of the project and the information provided at the time, we confirmed the [cladding system panels] are suitable and product will be covered under our standard warranty. ...
- I have also been to the site and [have] viewed few areas of the RAB board and [cladding] installation and based on this visual observation it appeared fine to me.
- 7.2.5 The discussions held at the hearing are summarised in Appendix B. Discussions centred largely on technical matters regarding compliance of the cladding system and the provision of information to establish compliance relevant to Determination 2017/014. The opportunity was also taken to briefly discuss matters relating to fire safety issues that concern determination reference #2823. I have not included in the summary of the hearing the points raised regarding matters covered under the other two determinations.
- 7.2.6 It was suggested that this issuing of this determination be delayed to allow the question of compliance of the façade system to be determined. That determination (2017/014) was issued on 9 March 2017.

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<sup>14</sup> I note here that while there is a register of engineers in New Zealand and there are façade engineering societies, there is no formal qualification or register of façade engineers in New Zealand.

## 8. Discussion

- 8.1 The matter in dispute is the authority's exercise of its powers of decision in granting the building consent subject to independent construction monitoring and certification for the cladding system (see paragraph 3.7.2). The authority attached to the building consent a 'schedule of inspections and documentation required for compliance', and Section C of that document included a list of producer statements and warranty relating to the cladding system.
- 8.2 In processing the building consent the authority made a number of requests for further information regarding the use of the cladding system, resulting in a review of the consent documentation by the third engineer. The third engineer concluded the cladding system would comply as an alternative solution, but recommended construction monitoring (see paragraph 3.6.6). I note an authority is not obligated to follow such recommendations and can form its own view about whether they should be acted upon; this is particularly relevant given the third engineers rationale for the monitoring (refer paragraph 7.2.3).
- 8.3 For the purpose of this determination I must consider whether there was sufficient information provided in the building consent application and available to the authority as part of its own inspections, without the independent construction monitoring and the certification for the cladding system, to allow the authority to be satisfied on reasonable grounds that the building work would comply with the relevant clauses of the Building Code if the building work was carried out in accordance with the plans and specifications.
- 8.4 As noted in paragraph 1.5.3, Determination 2017/014 has been issued and that considered whether the authority was correct to issue the consent for the installation of the cladding system considered herein, taking into account the effect of wind pressures likely to be imposed on the cladding. Determination 2017/014 concluded:
- the maximum wind pressure on the cladding to the alterations was less than that stated in the BRANZ appraisal, and the building consent was correctly issued
  - the wind pressures experienced by the proposed work (a two-storey alteration located on top of a 4-storey building in a medium wind zone) were no worse than would be experienced by a stand-alone two storey building located at ground level in a VH wind zone.
- 8.5 In respect of the cladding system the following is noted:
- the cladding is a relatively common and established system, and has a BRANZ appraisal which has been in place since 2005
  - the installation was to be in accordance with the manufacturer's instructions, which the manufacturer had also sighted
  - the cladding system is robust (cavity over a RAB), there are no building-specific design elements, and the project has a low level of complexity
  - it is only to be installed over two levels – it is not applied as the sole cladding to a multi-storey building.
- 8.6 The approach taken by the authority, when processing the building consent application, was essentially that the recladding has weathertightness risks that are beyond those of a low-rise timber-framed building located at ground level. The building height significantly exceeds that to which E2/AS1 applies, and the BRANZ

appraisal and the technical literature from the manufacturer both state that specific engineering design is needed for the cladding system. While specific engineering design was not carried out in this instance, the work done by the manufacturer noted by the third engineer (see paragraph 3.6.3) must be considered the equivalent of a such a design.

- 8.7 I concur with the views expressed by the architect (refer paragraph 5.2). Independent construction monitoring is not typically required for buildings where a relatively common cladding system will be used and will be installed in accordance with the manufacturer's instructions with no building-specific design elements.
- 8.8 I am therefore of the view that independent construction monitoring, in addition to the scheduled inspections by the authority and the provision of the producer statements for the cladding installation, is unwarranted in this case.
- 8.9 While Determination 2017/014 was helpful to me in determining that the cladding's performance requirements are not more onerous than a building within the scope of E2/AS1, I do not consider I have had to rely on any new information that arose during that determination that was not available to the authority before it granted the consent. It is noted that the maximum wind pressures considered appropriate in Determination 2017/014 are not significantly different to that derived by three engineers before the consent was issued.
- 8.10 Information presented at consent stage that compared the proposed work with an equivalent low-rise building at ground level, would have assisted the authority in concluding that the weathertightness risks associated with the work were not significant, and therefore that an inspection regime similar to that for a building within the scope of E2/AS1 was appropriate.
- 8.11 I note that the same cladding had already been installed at this level on the building under a building consent issued by the authority in 2011 for which a code compliance certificate has been issued. There are currently no known weathertightness issues associated with this work, nor has the authority raised any concerns about the compliance of the cladding as installed. The in-service performance of the existing cladding supports the conclusions regarding likely compliance of the proposed work.
- 8.12 Although I have concluded that the independent construction monitoring and certification should not have been required, the consultant had agreed to this in order to have the consent granted so that the project could commence. In light of this, I see no benefit to be gained in now modifying the building consent to remove the conditions.

## **9. The decision**

- 9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the authority incorrectly exercised its powers of decision in requiring independent construction monitoring and certification of the cladding system when granting building consent No. B/2014/14852.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 24 April 2017.

John Gardiner  
**Manager Determinations and Assurance**

## Appendix A

A.1 Relevant sections of the Building Act 2004 to this determination include:

### **48 Processing application for building consent**

...

(2) A building consent authority may, within the period specified in subsection (1A), require further reasonable information in respect of the application, and, if it does so, the period is suspended until it receives that information.

### **49 Grant of building consent**

(1) A building consent 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.

## Appendix B

### B1 Summary of submissions made at the hearing held on 13 October 2016.

<b>The second draft determination</b>
<b>Authority</b>
The fourth engineer's report was not recorded in the second draft determination and appears not to have been considered. The report raises concerns with the accuracy, coverage and relevant expertise of the architect and the first engineer's report; it is a relevant consideration in this determination.
There is a difference of positions between various experts that must be reconciled in this determination and Determination 2017/014. The authority provided its reasons for why the fourth engineer's assessment and conclusions should be preferred.
Evidence is same for both determinations and the determinations need to be consistent – there is an interrelationship of the issues involved.
For Determination 2017/014, the issue being tested is the sufficiency of the information provided to enable the consent to be granted (with/without the conditions imposed) – and the fourth engineer's report raises questions about that. In regard to the standard and quality of evidence required for an alternative solution, there is a question of how far beyond the Acceptable Solution a design is before there is an increase in the standard of the level of information being required. The height was an indicator that the consent application needed a careful review. The authority would be remiss if it ignored the advice it received about whether there was enough information.
For this determination application the issue is whether the conditions were reasonable. The condition was imposed because it was recommended by the applicants' own engineer in the consent application. It was reasonable to rely on that, and possibly negligent if the authority ignored that recommendation.
The authority expressed its concerns in relation to its obligations in respect of compliance certification and decisions compromised by availability of specialist façade engineers. On the basis of the third engineer's report the authority was of the view it is an area of specific expertise that is outside the authority's usual competencies.
<b>Information provided in support of the building consent</b>
<b>Authority</b>
The building consent was not "relatively straightforward", and the application lacked the required information; the position the authority reached was that the consent could only be granted subject to the conditions imposed. Specific engineering and weathertightness design were required as per the BRANZ appraisal and manufacturer's technical specifications, but were not provided.
The expert's reports identifies that there is a clear gap in the relevant compliance documents for buildings 10-25m in height. It is appropriate for the authority to seek additional information and impose conditions in these circumstances.
It was the applicant's own engineer's report provided in support of the building consent application that included a recommendation for construction monitoring. This view was reinforced by the engineer in correspondence to the authority on 25 January 2016 (refer paragraph 7.2.3). It was reasonable for the authority to pick up that recommendation and include it as a condition to the consent.
Specific engineering and weathertightness design needs to be undertaken by a 'qualified façade specialist', and that specialist needs to undertake construction monitoring and certification. This is not a process that the authority's inspecting officers are capable of completing.
<b>The fourth engineer</b>
The cladding system <i>may</i> be adequate, but the information to establish this has not been provided.
An adequate assessment would need to look at the available test reports, and identify the gaps for the proposed use in the particular circumstances, and then a façade engineer form a view as to whether the information is adequate.

An experience of a façade engineer could make a comparison with Acceptable Solutions E2/AS1 and E2/VM1, identify the gaps in the information, and establish whether the gaps are bridged, and issue a PS2.
The air infiltration and water penetration ratings have not been provided, and no capacity to resist these has been provided.
Rather than reliance on the manufacturer's statement of compliance to 2.5kPa, a report was needed from a façade engineer that notes they have properly considered all the of the issues (departures from E2/AS1), with an explanation of why they consider compliance is achieved in the circumstances and to provide a PS2,
<b>The consultant</b>
As well as reliance on the BRANZ appraisal and testing to establish compliance, three engineers were engaged, and advice was sought from the manufacturer as well as the manufacturer undertaking a review of the specific design. The consultant can see no reason for the additional requirement for construction monitoring as a condition of the consent. The consultant was unaware of any other building with comparable loadings where these conditions have been included in the consent and there is a cost burden in meeting the conditions. The consultant expressed concern about other projects with much larger construction periods.
The consent was issued on the basis of the information provided and certain parameters with regard to design wind pressures. If the information provided in support of the building consent application was accurate, there is nothing different in regards to what the authority would have to inspect from a 3604 building.
There is nothing about the building that sits outside of the parameters contemplated in E2/AS1 for standard 3604 buildings other than the height. The only reason the height becomes an issue is the wind pressures, and it was the consultant's view that this aspect was adequately addressed in the consent documents.
In regards to whether the calculations were correct, the consultant had three engineers plus the manufacturer provide information on this building – if this was not acceptable to the authority it would be difficult to know where to turn to for advice on this type of project.
The manufacturer had undertaken a review of the drawings provided for the building consent application, had been involved in design process, provided confirmation on compliance through testing, and gave advice on the specific process.
Based on the advice that the consultant received, and that the cladding had previously been consented for apartment 4A, they didn't expect the conditions to be imposed: the wind loadings are equivalent or similar to those covered by E2/AS1 for standard 3604 buildings, and the consultant believed they could rely on standard manufacturer's details and that it is not uncommon for the authority to inspect installation of this system in standard 3604 buildings.
The consultant did not take the recommendation for "construction monitoring" <sup>15</sup> in the third engineer's report to mean anything more than what would be covered by usual inspections carried out by the authority during construction The independent monitoring required in this case is not something that has been required in projects with similar circumstances.
When providing the information for the consent the consultant acknowledged that façade engineering input and testing information (4284) was required, and this was duly provided.
The consultant disputes the view set out in the third engineer's correspondence on 25 January 2016 regarding the requirement for monitoring by a façade engineer, and considers it may be a matter of promotion of personal interest by the author – the recommendations made by the third engineer do not align with current industry practice.
The authority did not require a PS2 from a façade engineer when it granted the consent, and this could have been provided if it was considered necessary. The engineer's reports provide the same assurances as a PS2 would have, and the third engineer was a person

<sup>15</sup> The hearing included discussion on the term "construction monitoring" and what is meant by that term. It was acknowledged that the term is not used in reference to inspections carried out by authorities during construction but is another party, such as a designer, architect or engineer.

on the authority's list of approved producer statement authors. The consultant queried what additional value a PS2 would have over the report.
<b>Granting of the consent</b>
<b>Authority</b>
Without the conditions included in the advisory notes the authority could not be satisfied as to compliance and would not have granted the building consent.
The authority is reliant on the expert assessment of the fourth engineer, which confirms the authority was acting reasonably when it issued the building consent subject to the conditions that it did. The assessment also raises the question of whether there was enough evidence and material in the building consent application to be satisfied that the building work would comply.
If the determination removes the conditions on the consent it then raises the issue of whether the consent can 'survive' – it is the authority's view that the consent cannot.
<b>The fourth engineer</b>
The review considered whether the information provided to the authority was adequate; if the information, including wind pressures were adequate and correct and could be relied on as being correct, there would be no reason for the authority to impose the conditions it did.
The reports didn't deal with weatherproofing at all.
The fourth engineer is not suggesting that compliance would not be achieved, but rather that there wasn't enough information. The dispute regarding wind loadings between experts is not significant as they are all in same ball park. The fourth engineer considers that at the industry level there is not enough testing and more work to be done in that respect.
The third engineer hadn't put forward the right sort of analysis (a gap assessment). A PS2, preferably in form of IPENZ Producer Statements, along with set of stamped drawings should have also been provided, and an undertaking regarding oversight (once a month) and a PS4. The combination of a PS2 & PS4 would cover both design and installation
<b>The consultant</b>
The authority should be able to come to a view as to whether the cladding system is or is not appropriate, rather than repeating that it <i>may</i> be.
The history of the building should be taken into context – suggestions that the building is subject to excessive loadings is not representative of what is seen from the in-service history. In addition there is no evidence of leaks in the same cladding system already applied to apartment 4A – some level of assurance can be drawn from the in-service performance, which is currently 1/3 through its durability period
The third engineer is supposed to have the weatherproofing understanding, and the cladding manufacturer has given specific advice that they consider the cladding will meet the performance requirements of the Building Code.
There is nothing in the manufacturer's specification details that the authority wouldn't normally inspect on a day-to-day basis; given it is "out-of-the box" standard details, there is no benefit in having independent observations for the cladding installation.